



## Inventory of Mountain value chains



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## D4.1: Inventory of Mountain value chains

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## Table of Content

1. Introduction .....	17
2. Methodology .....	18
3. Pan-European inventory of mountain value chains .....	19
4. Austria .....	23
ALMO alp oxen .....	23
“Almenland” mining tunnel cheese .....	26
“Almenland” fish .....	28
“Almenland” honey .....	30
“Almenland” schnaps .....	32
“Almenland” herbs .....	34
“Murauer” hay milk .....	36
“World of wood” Murau .....	38
“Muraurer” beer .....	42
“Murbodner” potatoes .....	45
“Osttiroler” mountain lamb .....	47
“Lungauer Eachtling” .....	49
“Mölltal-Glockner” lamb .....	51
“Murbodner” beef .....	53
“Weizer” sheep farmers .....	56
“Kärntna Lâxn” (lake trout from Carithia) .....	58
Artic char and trout from the Region Ausseerland .....	61
“Murtaler” pumpkin seed oil .....	64
Organic products from mountain areas (“Bio vom Berg”) .....	66
Styria beef .....	68
Wines of Kitzeck im Sausal, South Styria .....	70
5. Spain .....	72
High quality cork .....	72
Leather handcraft .....	74
Anea (Bulrush) handcraft chairs and baskets .....	76

Traditional local sweets and pastries.....	78
La Troje seeds .....	80
Chestnut products.....	82
Jacetania Bread.....	84
Lamb production - Cooperativa Ganadera del Valle de los Pedroches (COVAP).....	86
Organic Iberian goose.....	88
Iberian Ham (Jamón Ibérico) Protected Designation of Origin (PDO) - Los Pedroches .....	90
Protected Geographical Indication (PGI) beef .....	92
Andalusian white goats .....	94
Guadarrama goats .....	96
Spanish fighting bull (Toro de Lidia).....	98
Cheese from Picos de Europa .....	100
Goat cheese from Sierra Morena .....	102
Honey from Sierra Morena.....	104
Borda beer.....	106
Bailandera beer.....	108
Hunting in Sierra Morena .....	110
Spirits - anis and cherry drinks .....	112
Astronomy tourism (Starlight tourism) .....	114
Sustainable Rural tourism .....	116
Suckling goat from Malaga.....	118
Lamb Meat from Zuheros.....	120
Transhumance livestock .....	122
Elderly care in Carcabuey .....	124
Indigenous pulses, cereals, and fruits of Ascara (Jaca).....	126
Gofio Canario.....	128
Cherries from Castillo de Locubín .....	130
Grazalema wool blankets, textile craftsmanship.....	132
Subbética Ecológica, production and consumption of organic food.....	134
Mantecados de Rute, Traditional Christmas cakes made mainly from lard.....	136
Quince juice & vinegar from Carcabuey and Priego de Córdoba.....	138

Wood charcoal from Gran Canaria island.....	140
Production of spirits, liquors, and brandies, following traditional recipes. ....	142
Wines of the Contraviesa .....	144
Organic Olive Oil from Zuheros.....	146
Olive oil Protected Designation of Origin "Sierra de Segura" .....	148
Lanjarón, spring and mineral water from Sierra Nevada.....	150
Breeding of purebred Spanish horses .....	152
"Azpi Gorri" Goat Breed .....	154
BETIZU, Basque Country endangered breed.....	156
Euskal Txerria Pig.....	158
Meat from Cervera de Pisuerga and the Palencia Mountains.....	160
Veal from Cantabria .....	162
Botillo from El Bierzo.....	164
Mycology in the mountains of Soria.....	166
Spanish Vignerons from Huesca Pirineos .....	169
Production of chestnut and wine in Ribeira Sacra .....	171
6. Portugal .....	173
Mineral Water from almost virgin natural spring at 1400 m altitude .....	173
Traditional sheep's milk cheese .....	175
Traditional sheep's milk cottage cheese.....	177
Lamb meat from an autochthonous sheep breed .....	179
Goatling meat .....	181
Smoked Sausages.....	183
Rye Bread made from cereals grown at the mountain.....	185
High mountain honey from heatherlands.....	187
Chestnut (seed) from chestnut groves at mountain hillsides and surroundings .....	189
Local bean variety from Manteigas municipality .....	191
Wine from Serra da Estrela .....	193
Brandy made from Juniperus communis from Serra da Estrela.....	195
Liqueur from Sambucus nigra flower from Serra da Estrela .....	197
Arbutus unedo tree fruit from mountain hillsides and surroundings .....	199

Liqueur made from sour cherry from Serra da Estrela.....	201
Wool Products from Bordaleira Serra da Estrela autochthonous sheep breed .....	203
Products made from Burel, a specific wool fabric. ....	205
Tourism based on thermal water from thermal springs at Serra da Estrela. ....	207
Such as Hiking, Mountain Biking, Birdwatching and Fishing .....	209
Energy production from Hydroelectric Power Plants at Serra da Estrela .....	211
DO Douro Wine.....	213
7. Italy .....	215
Parmigiano Reggiano -Emilia-Romagna- .....	215
Chestnut flour –Tuscany- .....	217
POD Honey production and social farm -Liguria- .....	219
Melise, apple cultivation -Molise- .....	221
Cheese production “Di Nucci” -Molise-.....	223
“Naturavicina” – vegetables & olive oil-Molise-.....	225
Potatoes and cookies – Centre of Sardinia- .....	227
“La Concordia” dairy cooperative –Sardinia- .....	229
Garlic and Herbs –Basilicata-.....	231
“Pepper” -Basilicata- .....	233
Milk and cheese - Marche- .....	235
“Honey production” -Marche- .....	237
Chestnut flour -Calabria-.....	239
PDO Cheese –Sicily- .....	241
“Honey” -Lazio- .....	243
Pork Meat -Tuscany-.....	245
Chestnut flour -Tuscany-.....	247
Aromatic herbs -Tuscany- .....	249
Landscape and Potatoes – Aosta valley .....	251
A close supply chain to produce bread - Aosta Valley-.....	253
Apple cider - Aosta valley- .....	255
Didactic farm -Emilia Romagna-.....	257
Potatoes – Emilia Romagna-.....	259

Hazel nuts – Campania-.....	261
Traditional Italian Nougat -Campania-.....	263
“Caciocavallo” cheese form southern “Dauni” mountains .....	265
Apple – Friuli Venezia Giulia- .....	267
Cheese – Friuli Venezia Giulia-.....	270
Porks meat -Pidmont- .....	272
Mila, Dairy industry -Trentino alto adige-.....	274
Organic Eggs -Piedmont-.....	276
Milk from Lessina park -Veneto-.....	278
Bovine Cheese – Lombardia-.....	280
Limousine beef cattle -Lombardia- .....	282
Honey – Friuli Venezia Giulia-.....	284
Organic district in Val di Vara -Liguria- .....	286
Organic wine production for premium wines -Trentino Alto Adige- .....	288
Wine and Tourism -Aosta Valley-.....	290
Island Wine from Lipari -Sicily-.....	292
La Cattedra -Commons farming for social and educational purposes -Veneto- .....	294
Etna wine -Sicily- .....	296
Wine and Tourism -Liguria-.....	298
Grape wine on terraces -Valtellina in Lombardia-.....	300
Viticulture in the Central Appenninian –Abruzzo- .....	302
PEFC certified wood from collective forests management – Friuli Venezia Giulia- .....	306
8. Scandinavian Countries .....	308
Organic Farming .....	308
Family-owned forestry.....	310
Sami Handicraft - Duodji .....	312
Sami Tourism Destinations .....	314
Nature-based Tourism .....	316
Organic and demeter certified herbs .....	318
Organic and demeter certified juices .....	320
Natural-grown berries.....	322

Fly fishing in Hemsedal .....	324
Fish farming - PDO (Protected Designation of Origin) Rakfish from Valdres .....	326
Organic milk.....	328
Goat cheese/Undredal Brown Cheese - PGI.....	330
Pultost cow cheese .....	332
Barley flour and groats .....	334
Organic primitive grain muesli.....	336
Free ranged animals .....	338
Meat products (dry and cured meat) .....	340
Cider from Hardanger (PGI).....	342
Sami reindeer herding.....	344
Artisanal beer from Stjørdal.....	346
9. Slovakia .....	348
Labelled traditional cheese products.....	348
Mountain milk labelled products.....	350
Lamb meat.....	352
Processed wool.....	354
Beef breeding .....	356
Agritourism.....	358
Medicinal herbs production .....	360
High quality oils for food and cosmetics .....	362
Horse breeding .....	364
Domestic timber production.....	366
Processed domestic timber.....	368
Wood building.....	370
Game meat for domestic consumption.....	372
Wilde mushrooms collection.....	374
Beekeeping.....	376
Beekeeping with agritourism .....	378
Spirit drinks from juniper .....	380
Spring and mineral water .....	382



Winter ski recreation .....	384
Climatic Spa.....	386
10. Serbia .....	388
Fresh lamb meat produced from Sjenica sheep .....	388
Sjenica dry sheep meat - PDO.....	391
Zlatar cheese - PDO. ....	394
Potato from Ivanjica - PDO. ....	397
Buckwheat flower and shells .....	399
Vaccinium Myrtillus from National Park Kopaonik .....	401
Trout fish.....	403
Tourism in Zlatibor mountain.....	406
Vlasina honey - PDO .....	409
Pilot hard cheese from sheep and cow milk.....	411
Mixed milk (cow and sheep) white cheese in brine.....	413
Donkey milk and rural tourism.....	416
Arilje raspberry - PDO .....	418
Herbal tea - Saturejea Montana .....	421
Berries cultivated in Kopaonik Mountain National park.....	424
Wild mushrooms .....	426
Beef fresh and dry meat and sausages.....	428
Adventure Travel Network.....	431
Pilot carpet - POD.....	434
Dried sausage from locally produced livestock - POD .....	436
11. France .....	438
Brocciu Corse - PDO .....	438
On-farm processed cheeses .....	440
Dry cured pork - PDO.....	442
Dry cold meat.....	444
Miels de Corse - PDO .....	446
Unedo arbutus honey - PDO .....	448
Corsican chestnut flour - PDO.....	450

Aromatic plant: Immortelle de Corse .....	452
Corsican milk lamb.....	454
Corsican milk kid.....	456
Vitellu Corsu .....	458
Pin Lariccio .....	460
Boar hunting .....	462
Peri-village vegetable and fruit production.....	464
Mountain apple production.....	466
Corsican olive oil - PDO .....	468
Firewood .....	470
Conventional field crops.....	472
Extensive livestock farming.....	474
Market gardening.....	476
Clairette de Die - Wine production .....	478
Organic aromatic and medical plants .....	480
Stone fruits: peach and apricot.....	482
Picodon - PDO.....	484
Fruits with pips.....	486
Agritourism.....	488
Organic still wine.....	490
Garlic .....	492
Small scale poultry farming .....	494
Savoi - the Reconquest of the winemakers .....	496
12. Czech Republic.....	498
Mineral water .....	498
High quality beef .....	500
Cow – Dairy products.....	502
Goats – Dairy products .....	504
Sheep – Dairy products.....	506
Chicken production .....	508
Herbal tea .....	510

Marmalade.....	512
Valašský frgál (sweet cake).....	514
Herbal liqueurs.....	516
Bee products.....	518
Fruit spirits .....	520
Sumava sheep wool.....	522
Beer from local small breweries .....	524
Syrups .....	526
Rosehip wine .....	528
Game meat .....	530
Smoked meat and sausages.....	532
High-quality wood processing .....	534
Low-quality wood processing .....	536
13. Greece.....	538
Graviera cheese (Gruyere) .....	538
Dry Anthotyros cheese.....	541
Meat (Sheep and goat breeding for meat production) .....	543
Traditional edible products of Gergeri .....	545
Wine (PDO) .....	547
Cretan Tsikoudia (traditional distilled spirit drinks from grape pomace) .....	549
Olive oil products (PDO) .....	551
Carobs (carob products and by-products) .....	553
Aloe Vera.....	555
Chania Mountain Chestnut.....	557
Pefkothimaromelo (Apiculture activity – Chania) .....	559
Pottery and Ceramics.....	561
Dittany .....	563
Prickly Pear Cactus.....	565
Kozani Red saffron (PDO) .....	567
Florina Peppers.....	569
Legumes of Feneos .....	571

Apples of Pelium/Zagora (PGI) .....	573
Epirus Feta cheese (PDO) .....	575
Potatoes .....	577
Frumenty.....	579
14. United Kingdom .....	581
Mineral water .....	581
Hard white cows' milk cheese (PGI).....	584
Scottish Heather honey .....	586
Sporting game - organised hunting of deer. ....	588
Fly fishing of wild salmon. ....	590
Government investment allows restoration for biodiversity and investment in C sequestration. .....	592
Rewilding (Nature Restoration) .....	594
Forestry - on edges.....	596
Scotch beef (PGI) .....	598
Welsh Lamb (PGI) .....	600
Artisanal/bespoke timber products (such as furniture, toys, jewellery).....	602
Highland cows - bred for genes and cultural status .....	604
Jewellery made from heather .....	606
Mountain wool for Harris tweed.....	608
Hydropower - upland river lakes for renewable energy.....	610
Wind energy.....	612
Scotch whisky (PDO) .....	614
Adventure experience .....	616
Independent and guided visits (visiting wild places and seeing wildlife) .....	618
Climbing or walking of popular/accessible peaks .....	620
Winter sports (downhill skiing and snowboarding).....	622
Venison - Farmed and wild deer .....	624
Spirits (Gin).....	626
Beeswax products including soap, candles, skincare, and food wraps.....	628
Breakfast puddings (e.g., Haggis, black pudding, white pudding).....	630

15. North Macedonia.....	632
Juniper essential oil .....	632
Honey in Maleshevija .....	634
Mushrooms .....	636
Berries .....	638
Medicinal herbs.....	640
Tea herbs.....	642
Plumbs.....	644
Potatoes .....	646
Cheese .....	648
Round wood for processing .....	650
Firewood for households.....	652
Lamb meat.....	654
Hunting .....	656
Rural tourism in Maleshevija - Mountain related tourism .....	658
Forestry seed and seedlings .....	660
Kozhuvchanka - Drinking water produced from a spring in a Kozhuv Mountain .....	662
Oriental tobacco.....	664
Wine - Vranec .....	666
Bee families in North Macedonia.....	668
Propolis (bee glue).....	670
Honey, fruits - honey with dried fruits of plum, apricot, and fig.....	672
Royal Jelly - Mixture of royal jelly, bee glue, pollen, and honey.....	674
Pinecones - Dry pinecones with purpose of decoration.....	676
16. Switzerland .....	678
Traditional alpine dairy products .....	678
Traditional alpine meat (and other animal) products.....	680
Traditional alpine fruit products .....	682
Wine .....	684
Traditional alpine herbs.....	686
Traditional alpine vegetable products.....	688

Game animals.....	690
Wood .....	692
"Bergkartoffeln" gourmet potatoes.....	694
Beer .....	696
Grain and cereal products .....	698
"GranAlpin" cereal products .....	700
Mushrooms .....	702
"Röteli" - cherry liquor .....	704
"Soglio" cosmetics .....	706
"Patrimont Switzerland" saving old breeds .....	708
Mountain honey .....	710
Touristic services .....	712
Saffron .....	714
Veg Alp .....	716
"Orma" Whiskey.....	718
Alpine Fish .....	720
Frutti per tutti.....	722
"ZOJA" apple tasting box .....	724
"AlpenPionier" hemp products.....	726
"Alpinavera" Nuts .....	728
"Valser Naturstein" quartzite .....	730
"AlpenHirt" dried meat.....	732
"Allesmassiv" carpentry.....	734
Alps Art Academy & Art Safiental.....	736
Tête de Moine cheese PDO .....	738
Franche Montagne Horse breed .....	740
Gruyère d'alpage AOP .....	742
Jogitz yogurt .....	744
Toetché.....	746
Trout farming .....	748
Mustard.....	750

Malt.....	752
Absinthe.....	754
Vacherin Mont d'Or cheese AOP .....	756
Agritourism.....	758
NaturaBeef bio.....	760
Wood .....	762
Wool .....	764
Honey .....	766
Raw mountain milk.....	768
Goat's cheese .....	770
Medicinal plants and organic aromatic herbs .....	772
Horse meat .....	774
Sheep's cheese .....	776
Merlot from Alps - Ticino .....	778
17. Hungary .....	780
Cold mountain shelter – Knowledge economy .....	780
Gastro village – Köveskál ‘Eat the View.’ .....	782
Nivegy-valley small family wineries .....	784
Pumpkin seed products in Boldva .....	786
Trizs, the fruitful village .....	788
Orfű mills, bakery, and visitor centre products.....	790
Biscuits and chocolate from Pannonhalma.....	792
Cosmetics, health products and herbal tea in Pannonhalma.....	794
Traditional potato from Olaszfalu .....	796
Traditional cabbages from Olaszfalu.....	798
Logging, timber production, afforestation, maintenance, leisure, sport .....	800
Forest adventure experience in Csesznek .....	802
Skiing and downhill cycling .....	804
Honey .....	806
Organic garlic.....	808
Organic farming and wine production.....	810

Pasta (a social economy project) .....	812
Ecological garden (a joint enterprise) .....	814
The tastes of Monostor .....	816
Ranger - truffle hunting .....	818
Living Country house - farm museum.....	820
Sustainable local food system project .....	822
Nivegy-valley artisan cheese makers .....	824
18. Romania .....	826
Eco-fertilizer .....	826
Mountain honey .....	828
Certified Ecotourism.....	830
Firewood .....	832
Live sheep and lambs .....	834
“Mozzarella” .....	836
“Gastro local” .....	838
All season tourism.....	840
Therapeutic bee products .....	842
Hydroelectric power station .....	844
Telemea.....	846
“Brânză de Burdu” .....	848
Hoewzu’ ceramics.....	850
Dlceață .....	852
Farmed and processed mountain trout.....	854
Public Goods from High Nature Value (NHV) grasslands.....	856
Forest with protection function .....	858
“Brânză Horezu” .....	860
“Pastrama de Oaie”.....	862
“Salam Montan Angus” .....	864
19. Bulgaria .....	866
Wild collected medical plant.....	866
Wild collected mushrooms .....	868



Wild collected forest fruits .....	870
“Chiprovisti” carpets .....	872
High Nature Value (HNV) grassland.....	874
“Sirene” cheese.....	876
“Linbul Farm” .....	878
Mountain milk.....	880
“Food from the mountain” farmers’ association .....	882
All season mountain tourism .....	884
Skiing.....	886
“Meadows in the mountain” festival .....	888
“Iskar Gorge” day trips .....	890
Mountain health/spa tourism .....	892
“Strandzhanski manov med” (Strandzha manna honey) .....	894
Essential oils and cosmetics .....	896
Strawberries and raspberries .....	898
Certified timber and wood products.....	900
Hunting .....	902
Culinary Guidebook to the Eastern Rhodopes .....	904
20. Turkey.....	906
Goat and sheep milk and dairy products .....	906
Fresh Vegetable (Greenhouse tomatoes) .....	908
Cultivated Mushroom .....	910
Fresh Fruit (Apple).....	912
Fresh Fruit (Grapes) .....	914
Fresh Fruit (Pears).....	916
Extra virgin olive oil.....	918
Chestnut .....	920
Tulum cheese (from goat and sheep milk) .....	922
Tulum Cheese .....	924
Pine Honey .....	926
Tea Leaves .....	928

Anzer honey.....	930
Gruyere and Kashar Cheeses.....	932
Fig.....	934
Chestnut .....	936
Pine Nuts .....	938
Cheese .....	940
Almond .....	942
Hazelnut .....	944
21. Additional VCs .....	946
Wines of Winnigen - Germany .....	946
Vipava valley orange wines - Slovenia .....	948
Acknowledgements.....	950
Reference .....	950

## List of Figures

Figure 1: Described value chains in European Member States and associated countries. ....	20
Figure 2: Distribution of value chains across sectors (A) and innovative character (B). ....	21
Figure 3: Value chains distribution by clusters in EU and associated country. ....	22

## 1. Introduction

Mountain ranges host the 16% of the European population and cover 36% of the areas, crossing many national borders. Public goods provided by mountain areas originate in the great diversity of ecosystems and land uses that characterise these areas.

European Mountain areas are very specific contexts. The main studies at European scale (Nordregio, 2004, European Environmental Agency, 2010, Gløersen et al., 2016) show that population trends vary from one area to another and that their economies - that have experienced industrialization and tertiarization at different level - are quite different. Therefore, it is difficult to group them together as suffering of a common handicap, even though they are classified as Areas facing Natural Constraints (ANCs). However, common traits of European mountain areas are their higher vulnerability to climate and socioeconomic treats. Due to their geomorphological characteristics (e.g., high altitude, steepness, remoteness) the exposure of mountain areas to climate change, extreme events, and socio-economic disturbances, such as warmer temperature, desertification, avalanches, landslides and rockfalls frequency (Kohler et al., 2010), marginalisation, depopulation, and land abandonment (Keenleyside et al., 2010), and increased economic competition is higher than lowland areas.

To analyse the dynamics and interaction of humans with the geomorphological and biophysical factors characterizing mountain areas (e.g., high altitude, steepness, remoteness, diversity of ecosystems, landscape amenities), the objective of this deliverable is to map the diversity of value chains (VCs) in all European mountains.

To account for the spatial heterogeneity of mountain areas and to cover the highest diversity of VCs configurations, the MOVING project has developed a specific taxonomy (Box 1) which has been used as reference to identify, and spatially allocate the VCs characterized in this inventory.

### **Box 1. The MOVING project taxonomy**

In the MOVING project, we define:

- **Mountain Reference Regions:** Mountain Area as for the definition/delimitation specified in the MOVING project proposal.
- **Mountain Reference Landscape:** municipality - LAU1 according to the European Nomenclature of Territorial Units for Statistics (NUTS) - located within the Mountain Reference Region defined above.
- **Value chain:** the full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), and delivery to final users/consumers.

However, a high degree of flexibility is used for the definition of the Mountain Reference Landscapes associated with the characterised VCs since the LAU territorial classification is not

followed by all the investigated countries. This is especially the case for associated countries. In these cases, VCs have been associated with higher categories in the NUTS classification hierarchy (NUTS3, districts, and/or NUTS2), according to the availability of socio-economic data.

To provide an extensive overview of the diversity of “*mountain*” VCs configurations, the inventory covers all European mountain regions located in EU Members States and associated countries, and it describes 472 value chains (VCs), including emergent VCs, and those based on circular bio-economy processes, ecosystem service provision, innovative governance methods, novel market strategies, and digital innovations. VCs engaged in the valorisation of cultural and knowledge-based local resources are also included in the inventory. Each VCs is characterized accounting for the local material and non-material assets (e.g., land use, landscape amenities, cultural knowledge) they rely upon, the main human actors managing these resources, and the current (predicted) challenges VCs are (will be) confronted with in face of the foreseen climatic, socioeconomic, and demographic trends. Where present, innovations already in place as well as those envisioned to address those challenges are also described for each VC. Additional geographical, demographic, and socioeconomic data describing the local context each VC is embedded in are also provide in the inventory. Such information is useful to identify commonalities among the VCs present in European mountain regions.

This inventory is based on a purposive sampling of VCs to select across the European mountain regions located in EU Members States and associated countries, those most representative of each mountain area. Therefore, the inventory does not suggest that any specific VC associated with a geographic area is the only found in this location, but it aims at providing an overview of the diversity of mountain VCs by describing and characterizing a selection of VCs in European mountain areas. Indeed, the VCs selection is framed by the interests and knowledge of the different MOVING partners which span from academia to NGO, passing through companies providing consultancy and advisory services. Therefore, this might imply that some – also potentially interesting – VCs have been ignored and are missing in this inventory.

Relevant information arises from this inventory. First, agriculture plays a key role in supporting livelihoods of mountain communities, as it is showed by the relatively high number of livestock and plant-based VCs in the inventory. Moreover, the collected VCs strongly rely on the integration of different capital forms (natural, social, cultural) and knowledge with a distinctive local attribute. Innovations identified in the selected VCs is related to new products, as well as – and probably more relevant for the sustainable development of mountain areas – to the way “traditional” products are produced and the values (cultural, nature preservation, etc.) that are attached to them.

## 2. Methodology

This inventory has been developed following a seven steps methodology. A list of all mountain VCs was collected, detailing the connected regions and the main end-products to ensure the inventory covers the wider range of European and associated countries and includes different

VCs typologies. In the second step, a “VC card” template - in the form of an excel sheet - was prepared to collect all data needed for the VCs’ characterization. According to the participatory approach that characterizes the Moving project, the first version of this template was shared and discussed with all the project partners involved in this task (T4.1). Adjustments, comments, and suggestions were integrated and three partners – namely, UCO, HUTTON, and ZHAW – were asked to pilot the template. After accommodating the pilot suggestions in the final version of the VC card template, each partner involved in the inventory (see the Acknowledgement session) was asked to collect data and information for twenty mountain VCs in their respective countries<sup>1</sup>. Collected data were provided by partners through a combination of desk analysis and expert opinion. Finally, all collected data were analysed and synthesised in this report.

### 3. Pan-European inventory of mountain value chains

The MOVING VCs inventory spans over more than 70 Mountain Reference Regions, which extend over 21 EU Member States and associated countries (Figure 1)<sup>2</sup>.

Eastern European countries are the most represented in the inventory, with the 37.7% of VCs located in the massifs present in these regions. Southern European countries are equally represented with around the 30%, while Central European countries account for around the 23% of the represented VCs. Lastly, around the 9% of the described VCs are in Northern European countries.

The selection of VCs presented in this document is limited to VC that have their primary resource base – namely, agriculture, forestry, and fishery – in mountain areas. This restriction complies with the overall interest of the Moving project to link mountain VCs to the vulnerability land use systems in mountain areas to external climatic and socio-economic stressors. Mountain VCs related to non-primary, manufacturing, and service sectors, which are the sectors generating the higher share of gross value added and providing higher share of employment opportunities, not included in the inventory.

Most of the characterised VCs are engaged in the production of food commodities, while around the 13% are aimed at the valorisation of local assets (natural resource, landscape amenities, and cultural knowledge) through the production of traditional artifacts and energy, and the provisioning of tourist reception facilities and public goods (e.g., ecosystem services).

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<sup>1</sup> University of Cordoba (UCO) and Highclere Consulting (HHC) collected data related to mountain value chains in more than one European and associated countries/regions, respectively.

<sup>2</sup> Two wine VCs located in Germany and Slovenia, respectively, are not shown in the Figure 1.

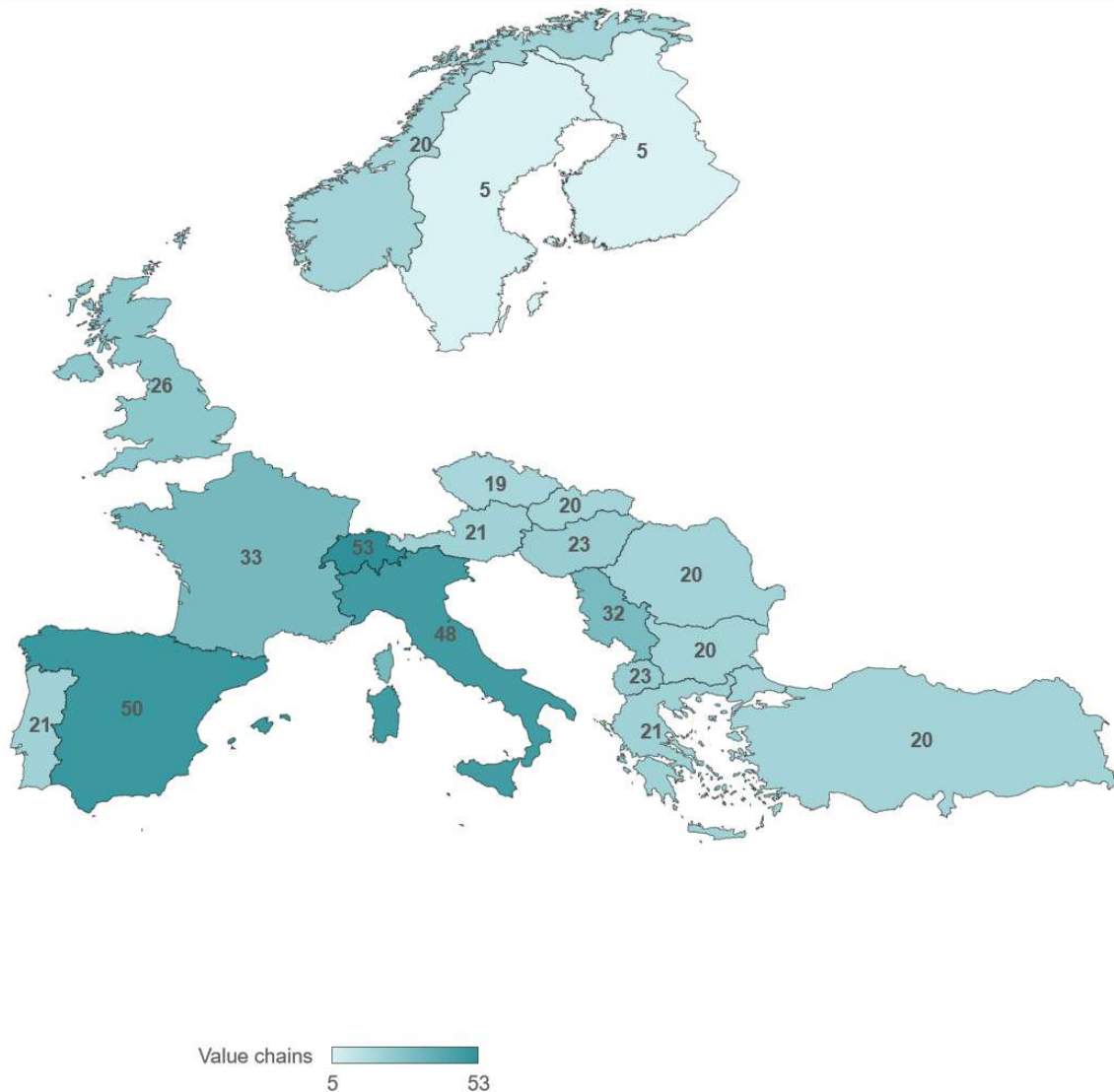


Figure 1: Described value chains in European Member States and associated countries.

In terms of innovation, the VCs in the inventory are almost equally distribute into innovative and traditional VCs. The collected VCs are identified as innovative if any deviation from conventional activities related to the VC’s products, processes, marketing strategies, and governance systems have been identified. Such innovations can be endogenous<sup>3</sup>, exogenous<sup>4</sup> or retro-innovation (see Zagata et al. (2020)).

<sup>3</sup> Endogenous innovation is based on learning experiences and “knowledge capital stocks” existing in the area/region.

<sup>4</sup> Exogenous innovation borrows learning experiences and “knowledges capital stocks” originated elsewhere (e.g., e-commerce).

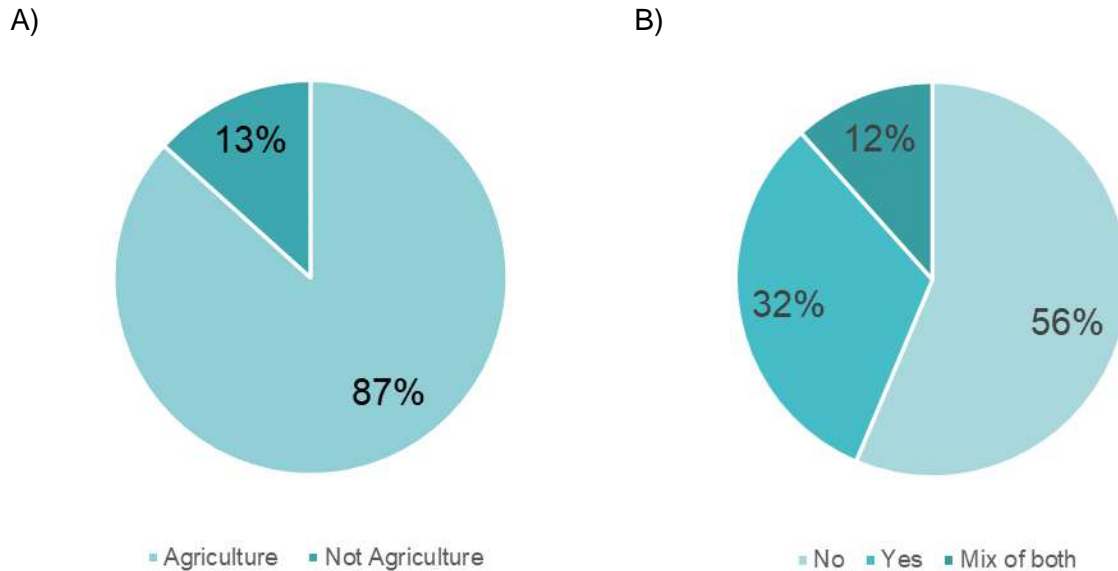


Figure 2: Distribution of value chains across sectors (A) and innovative character (B).

Although the inventory provides an extensive overview of VCs associated with mountain areas without aiming at conducting a census of all VCs located in these areas, it suggests that most of the VCs' activities in European mountain areas are related with the production of agri-food commodities, including plant-based food and drinks ( $\approx 47\%$ ), and animal-based products ( $\approx 34\%$ ). To a lower extent, VCs located in mountain areas relate to the valorisation of natural resources, cultural knowledge, and the provisioning ecosystem services in the form of public goods. Rural tourism, the production of traditional artifacts (e.g., jewellery, fabrics, carpets), and public goods provisioning represent around the 10% of the VCs in the inventory. The large presence of managed and unmanaged forests in mountain areas, is reflected in the proportion of VCs associated with the valorisation of wood for energy and furniture productions. This category account for around the 5% of the VCs included in the inventory.

Although the inventory does not suggest that any specific VC associated with a geographic area is the only VC found in this location, Figure 3 shows the relevance of VCs clusters in each European Member State and associated countries.

Agri-food VCs associated with the production of plant-based – including alcohols and soft-drinks - and animal-based products, are widespread across all countries. These VCs seem to be more concentrated in Central and Southern and European, where more than 20 VCs associated with the production of plant and animal-based products have been identified in many countries (Spain, Portugal, France, Italy, Spain, Switzerland, Greece, and Austria). The VCs engaged in the valorisation of cultural knowledge and natural resources trough the production of traditional

artifacts and the provisioning of public goods seem to be concentrated in Spain, United Kingdom, and some Eastern European countries (e.g., Bulgaria and Romania).

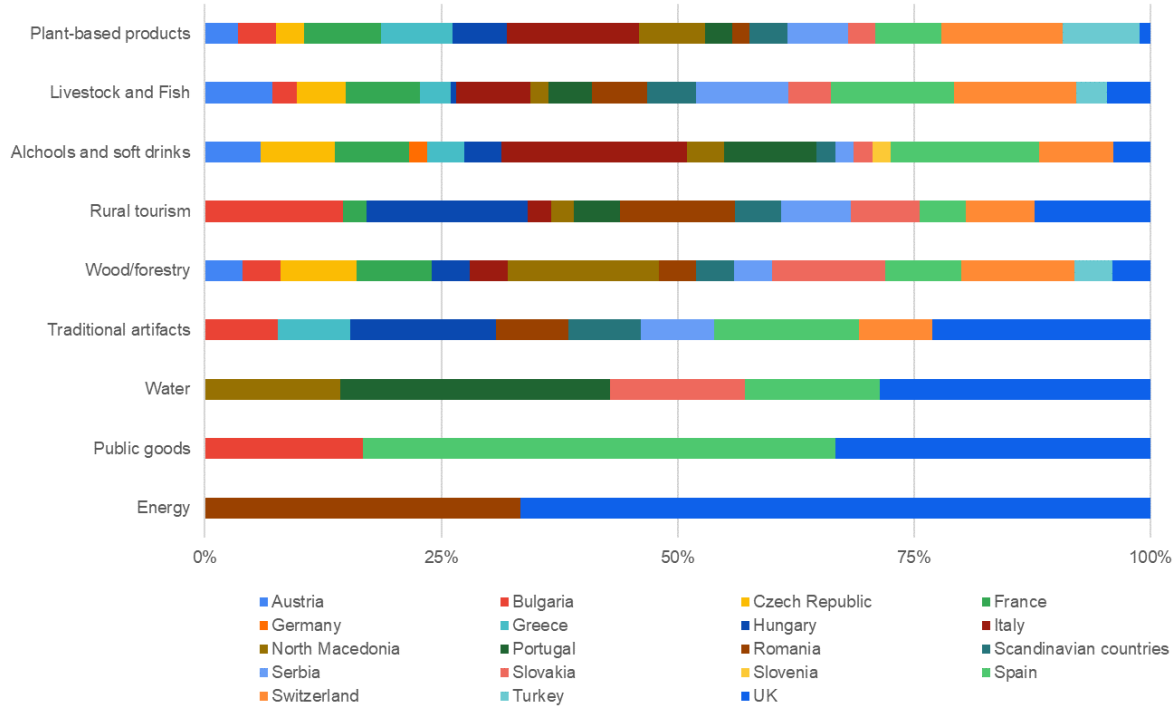


Figure 3: Value chains distribution by clusters in EU and associated country.

A different pathway is identified for VCs associated with the valorisation of local natural resources and landscape amenities through rural tourism and the delivery of public goods. The VCs connected to these activities are more represented in Eastern European countries (e.g., Bulgaria, Romania, and Hungary), and the United Kingdom, Switzerland, and Spain.



## 4. Austria

### ALMO alp oxen

ALMO is an alp oxen farmers association with about 500 members. The registered brand is owned by the farmers' association.

Weiz is in the region "Almenland" (transl.: Styrian alpine pasture region), which is one of the biggest connected pasture-regions in Europe (total 125 pastures, 36,6 km<sup>2</sup>). The pasture is between 1.200 and 1.500 m above sea level. The climate is characterized as humid, having a lot of thunderstorms. The rock formation is diverse, primarily limestone, further: phyllite, slate and greywacke.

Reference mountain landscape statistics  
(A: Data from NUTS3 AT224)

Reference mountain chain		Austrian Alps	
Reference mountain landscape		Weiz (District)	
Size of the area (km <sup>2</sup> )	1,098	Average per capita income €/year	21,444 <sup>A</sup>
Altimetry (m; min-max)	454– 1,720	Total Gross Value Added (GVA) (€ million)/year	8,141 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	82.5	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	3.7%	Primary:	11.7% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	4,310	Secondary (including construction):	32.5% <sup>A</sup>
		Tertiary:	55.7% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	30	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	4,555	Primary:	11.5% <sup>A</sup>
Protected areas	Yes	Secondary:	29.9% <sup>A</sup>
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ALMO is the lead high quality product of the LEADER-region „Almenland & Energieregion Weiz-Gleisdorf“, and well embedded into the regional development. ALMO is based on traditional pasture framing and characterised by exceptionally high animal welfare standards (cooperation with an Austrian animal welfare NGO). Through the cooperation between farmers and with other

value chain actors (veterinaries, butchers, retailers, tourism, regional development agency) several innovations emerged. ALMO is a label for quality ox products and the lead product of the region. "ALMO" (Almo Steirisches Almochsenfleisch) is protected as word mark. The Association „Steirische Bergland Marktgemeinschaft“ comprises approx. 500 farmers, who own the brand, and raise ca. 3.000 oxen per year. ALMO is marketed via Almenland Marketing GmbH, only three retail partners can sell ALMO, but nearly all regional restaurants offer the meat. All farmers participate in the Austrian Program for Environmentally Sound Agriculture (ÖPUL), 10 % are organic. Close connection to regional development and relevance for (agro-)tourism (Urlaub am Bauernhof) → positive impacts. Lead product of the "Genussregion Almenland" ("region of culinary delight": promoting local food specialties; quality standards set by the AgrarMarkt Austria). The cooperation between the farmers' association and business partners is on eye level, and implies unusual contracts, such as guaranteed prices independent from the market prices. Moreover, quality standards are developed in cooperation between farmers and business partners.

### Key local assets

Key assets in the VC are:

- Own regional slaughterhouse (cooperation with sheep farmers, free range pig farmers, local butcher) enhances the regional value creation.
- Close connection with regional development: ALMO serving as lead product.
- Considerable contribution to the preservation of the landscape: the landscape plays an important role for (hiking) tourism in the region.
- Pasture farming has a tradition over centuries - being part of the regional identity.

### Challenges

Predicted changes in climate (extreme weather conditions: drought, heavy rain) are likely to have effects on the feed base for this pasture-based meat production as the vegetation might change, and the cultivation of feed for the wintertime might change as well. An increasing wastage of alpine pasture areas might demand in future for adjusting the pasture intensity and to significantly improve the quality of the forage plant growth. Many of the ALMO producers are small scale, women led farms. They are economically very vulnerable, if the stable price arrangements cannot be kept up, their income security is at risk.

### Innovation

Many innovations, especially their implementation, were/are based on social relations and engage various actors within the VC. Drivers for innovations have always been members of the initiative and the network it is embedded in due to its embeddedness into the broader regional development initiatives, ALMO key persons work together with others in local action groups, which have been set up within LEADER for different projects. This leads to a cross-sectoral exchange of ideas and insights into various fields of broader regional development concept. Most innovations resulted from different actors bringing in different knowledge and different expertise e.g., specific feeding practices (to achieve a very high meat quality) have been developed by the farmers in cooperation



with one of the business partners, and a consultant (innovation-based practice and academic knowledge).

## “Almenland” mining tunnel cheese

14 different types of cheese from cow, sheep and goat made of only local hey milk is matured in a former silver mine 100m deep in the mountain. It was initiated by an enthusiastic cheese lover, who turned his passion into a job, bought the "pit house" in 2009 and had a 270 m tunnel built into the mountain and converted the "pit house" into a "cheese workshop". The cheese is produced by the local Almenland dairy.

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The Almenland small local dairy produces various types of cheese (cow, sheep, goat – all milk from the region: pasture farming and hay), which then is further processed by the Almenland Stollenkäse GmbH, which ten is sold mainly in Austria and South of Germany, but also

internationally. The cheese is sold via small delicacy shops, supermarkets and through a web shop. The cheese is branded as Almenland product. Cheese is produced in many other regions in the Austrian Alps; some of them are also made from hay milk; the maturing in a former silver mine is unique.

### **Key local assets**

The initiative perfectly fits into the Almenland "Genussregion" ("region of culinary delight ": promoting local food specialities; quality standards set by the AgrarMarkt Austria); it adds value to the milk producing sector in the area; cooperation with the tourist sector is of mutual benefit; cooperation with other local Almenland producers: the company's online marketing platform does not only sell the cheese, but various (nearly all) other Almenland products.

### **Challenges**

As the cheese production relies exclusively on milk from the Almenland, challenges in milk production also affect this initiative. Predicted changes in climate (extreme weather conditions: drought, heavy rain) are likely to have effects on the feed base for this pasture-based meat production as the vegetation might change, and the cultivation of feed for the wintertime might change as well. An increasing wastage of alpine pasture areas might demand in future for adjusting the pasture intensity and to significantly improve the quality of the forage plant growth.

Another challenge refers to upscaling: the quantity of production is limited, while at the same time the demand is increasing – also internationally.

### **Innovation**

Specific processing: the cheese is matured in the tunnel of the former silver mine. Some types for a quite long time (1.5 years); the cheese is only mad from local hey milk, and many different types of cheese are produced. Participation in international cheese competitions: several awards have been achieved: e.g., the "Arzberger Ursteirer" was even vice world champion in the USA. Moreover, it is well embedded in regional activities, and sold under the Almenland umbrella quality brand. It contributes to the touristic programme by means of guided tours and educational programmes, where visitors learn about the cheese, the maturation process, the history of the company and the Almenland region. Cheese tastings are offered as well.

## “Almenland” fish

The Almenland Fish (trout and char) is a high-quality product, which is marketed under the Almenland brand and MSC certified. The Stocking fish come exclusively from certified pond farms in Styria. They are used with a weight of approx. 10 days / piece. This means that the Almenland fish spends most of its life in the pure Almenland waters. He is fed with a GMO-free quality feed and sold at an age of 24-36 months. The fish is exclusively raised by certified pond owners from the Almenland Nature Park in fresh spring water (8-14 ° C water temperature). The slow growth is ensuring high quality, GMO-free feeding, controlled by the animal health service.

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\*2 share of total GVA/year

\*3 share of total employment)/year

Four fish farmers have teamed up and value solidarity-based cooperation. One farm breeds the fish from the egg and supplies the other farms with seedlings. One does not market the fish but supplies the others. The others sell the fish directly to consumers, gastronomy, and retailers. One of these two farms also runs a restaurant, sells processed fish products (e.g., smoking), and offers educational events about fish. "Almenland Fish" is not a traditional Austrian food, however important for the Almenland region. In Austria there are other regions, where the fish is the lead product of a "region of culinary delight" (Genussregion) without being a traditional Austrian food. In five other regions the fish is both classified as traditional Austrian food and marketed via a Genussregion: Kärntna Låxn (lake trout), Ausseerland Seesaiblinge (artic char), Mattigtal Forelle (trout), Salzkammergut Reinanken (coregonus = salmon) and Ybbstal Forelle (trout). In addition, there are 3 other regions (total 8), where the fish is only classified as traditional Austrian food (without being a Genussregion): Neusiedlersee Fisch (fish from lake Neusiedl), Steirisches Teichland - Karpfen (carp from the region "Styrian pondland"), Waldviertler Karpfen (carp from the region "Waldviertel"). Another four fish varieties are nation-wide classified as traditional food: trout, common carp, coregonus (salmon) and artic char.

### Key local assets

The fish represents a product, which fits well into the regional development initiative of Almenland "region of culinary delight").

### Challenges

As cold-blooded animals, fish are particularly susceptible to changes in their ambient temperature. Particularly cold stenothermic species, i.e., fish species that are difficult to deal with increases in temperature, are affected by global warming and highly vulnerable.

### Innovation

Fish farming is not usual for the region and responds to the increasing demand for domestic freshwater fish. Four fish farmers have teamed up and value solidarity-based cooperation. One farm breeds the fish from the egg and supplies the other farms with seedlings. One does not market the fish but supplies the others. The others sell the fish directly to consumers, gastronomy, and retailers. One of these two farms also runs a restaurant, sells processed fish products (e.g., smoking), and offers educational events about fish. The initiative responds to the increasing demand for a product, and to be able to offer high quality products, farmers cooperate.

## “Almenland” honey

A group of innovative beekeepers (4 farms - ca. 1.200m) from the Almenland region has set itself the goal of not only producing alpine honey of special quality, but also a variety of other high-quality products, such as chocolates, mead, and various products with propolis, wax. Numerous awards confirm their quality work. Moreover, they offer educational programmes and beekeeping seminars, and they have set up cooperation with medical experts for apitherapy.

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The value chain includes 4 bee product producing farmers, who market their products either via direct sale (on farm) or through regional partners (shops and gastronomy). They offer educational programmes and vocational trainings and cooperate with the Austrian apitherapy association. In



2019, there were 30.237 registered beekeepers with 390,607 bee colonies in Austria, and around 4,000 tons of honey were produced in Austria. This refers to a degree of self-sufficiency of 46% (highest per capita honey consumption in the EU is in Germany and Austria). As is typical for Austrian agriculture in general, the beekeeping sector is structured on a small scale. The beekeepers cultivate an average of 13 colonies. There are only a few professional beekeepers in Austria (approx. 1.5%), but they manage 20% of the bee colonies. The focus of Austrian beekeeping is on the federal states of Styria (where the VC described in this card is located as well), Upper Austria and Lower Austria. Almost 60% of Austria's beekeeping businesses are based there.

### Key local assets

Key local assets are:

- close connection with regional development: contributing to the "Genussregion Almenland" ("region of culinary delight": promoting local food specialities; quality standards set by the AgrarMarkt Austria)) – marketed under a common brand
- educational programmes and professional trainings enrich the touristic offers.

### Challenges

Beekeepers and their bees are very closely linked to local weather conditions, thus highly sensitive to climate change issues. Especially in winter, fluctuating temperatures disturb the hibernation of the bees. As soon as the thermometer rises above 10 ° C, the first bees fly off, but usually cannot find any flowers. If they even keep brood due to longer warm periods in the winter months, this weakens the colonies even more, because they can only generate the necessary brood nest temperature of approx. 35 ° C by consuming their food supplies. As soon as it gets cold again, the temperature fluctuations demand enormous heating power. That costs the people unnecessary energy. In mild winters, the bees also breed all year round. This favours the development and multiplication of the Varroa mite because it then also multiplies in the brood cells together with the bee brood in winter. Several, ever-growing generations of Varroa mites can also arise in this way. Most beekeepers do not take notice of this situation in spring because their bee colonies multiply rapidly during this time. The rude awakening follows the summer solstice. From this point on, the bees reduce their colony size to get through the winter as a smaller colony. The varroa multiplication, which takes place up to the summer solstice, then kills bee colonies in summer. There have also been indications for years that a change in temperature in spring disrupts the fine coordination between the pollinator insects and the plants to be pollinated.

### Innovation

The VC is of particular interest as it is focussing with a product that is essentially produced in many other places in Austria (and elsewhere) on the value of being produced in a mountainous area. Moreover, the diversification in terms of offering a broad range of products, as well as linking with the medical sector (even engaging in related studies), and cooperation with the local tourism in the context of educational programmes and for selling their products makes this initiative interesting.

## “Almenland” schnaps

Traditional fine brandies and liqueurs are made from wild fruits and old fruit varieties. Typical for the Almenland is the rowanberry brandy, which is made from the mountain ash berries that grow there in the wild. Some distilleries also offer guided tours through the distillery including a tasting.

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The farms use their own or wild fruits and market their products (mainly) individually either through own on farm shops, via internet, the local gastronomy, and regional shops. Many farms in Austria distil their fruits and those from wild nature (particularly in mountainous areas) - many of them produce in line with high quality standards.

## Key local assets



The high-quality products fit well with the "Genussregion Almenland" ("region of culinary delight": promoting local food specialities; quality standards set by the AgrarMarkt Austria), and enriches the tourist programme by means of offering guided tours and degustations.

### **Challenges**

Changing weather conditions due to climate change may impact the vegetation - wild plants as well as the cultivation of fruits to be processed for schnaps.

### **Innovation**

Schnaps is a traditional product in Austria, but this initiative is of particular interest as the farmers develop a variety of unusual high-quality types of alcoholic drinks.

## “Almenland” herbs

Twelve herb farmers from the Almenland Nature Park founded an association in order to jointly process and sell various products made from herbs under the "Almenland Kräuter" brand. The herbs are grown in small-scale organic cultivation or collected in the wild nature. All are harvested by hand. They offer a large variety of different herbs and a wide range of products ranging from food and drinks to cosmetic and wellness products.

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The association links 12 farms, which are certified organic. Some of the processing is done individually, other within the cooperation. The products are mainly sold locally via small shops,

through a joint shop, online, and through hotels. Products made from herbs are produced in many other areas in the Austrian mountainous regions as well.

### **Key local assets**

The initiative is well embedded in the regional development strategy of Almenland "Genussregion" ("region of culinary delight": promoting local food specialties; quality standards set by the AgrarMarkt Austria). Some of the educational programmes are carried out in cooperation with the nature park and imply activities raising awareness for the natural habitat in the area and health related aspects; activities also enrich the touristic programme. Moreover, from an ecological perspective, the cultivation of herbs helps improve the quality of near-natural areas by enabling more diverse agricultural production with less use of pesticides. Flowering plants provide insects with nectar and pollen at different times of the year and thus have the potential to reduce habitat fragmentation. Preserving areas suitable for wild collection and carefully collecting herbs is a suitable way of preserving the diversity of permanent grasslands without changing the type of land use. On the one hand, this represents an increased food supply for insects, and, on the other hand, it offers additional income for the local farmers.

### **Challenges**

Extreme weather conditions because of climate change do not only change the natural vegetation, but also cultivation practices. While some of the herbs are quite robust against climate change, others will need more complex treatment (e.g., irrigation), or will need to be replaced by other varieties.

### **Innovation**

The VC is particularly innovative in terms of products: they offer beside traditional food products made from herbs (e.g., tea, herbal salt, pure herbs), they created different spice mixes, liquor, syrups, and sweets with birch sugar. Moreover, they produce soaps and creams as well as incense materials. First, the cooperation of the farmers by setting up an association is an interesting business model, secondly the product range is innovative. Finally, they are well embedded in the regional development, and cooperate with the nature park, the local gastronomy, and hotels, which promote their products, use, and sell them. They offer educational/touristic programmes.

## “Murauer” hay milk

150 certified organic mountain farms participate in hay milk production. The initiative started in 206 based on conventional farming and turned then in 2008 to an organic scheme.

The district of Murau is a peripheral region in the center of Austria – north to Carinthia and east to the Lungau (a NUTS3 region in Salzburg, see VC of Lungauer Eachtinge – therefore next to the „cold pole “of Austria). The region can be considered as (very) peripheral (main roads are far away; the high-level rail link on the edge of the district will be lost in the next few years due to a new route). The river Mur (after which the region is named) flows through the main valley. The district of Murau is enclosed by the Niedere Tauern mountains in the north, the Seetaler Alps in the east and the Gurktaler Alps in the south and west. The lowest place is at an altitude of 650 m above sea level and the highest place 1,763 m above sea level. The highest elevation is at 2,740 m. The district of Murau is one of the most densely wooded areas in Styria, thus wood in general play a major role economically and thematically. The district has the largest closed stand of Swiss stone pines in Central Europe. The district also has a relatively small-scale industrial structure and has been scoring increasingly in the field of tourism for years.

### Reference mountain landscape statistics

(A: Data from NUTS3 AT226)

Reference mountain chain	Austrian Alps		
Reference mountain landscape	Murau (District)		
Size of the area (km <sup>2</sup> )	1,385	Average per capita income €/year	21,615 <sup>A</sup>
Altimetry (m; min-max)	650–2,740	Total Gross Value Added (GVA) (€ million)/year	2,877 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	19.8	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-6.15%	Primary:	4.5% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	12,940	Secondary construction):	(including) 39.6% <sup>A</sup>
		Tertiary:	55.8% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	82	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	1,613	Primary:	7.9% <sup>A</sup>
Protected areas	Yes	Secondary:	29.6% <sup>A</sup>
		Tertiary:	62.5% <sup>A</sup>

\*1 Nearest settlement with population > 100,000

\*2 share of total GVA/year

\*3 share of total employment)/year

The products are marketed under the trademark “Zurück zum Ursprung” (“back to the origin”) and sold throughout Austria via a supermarket discounter. The production of organic hay milk is based on extensive agricultural practices. The economic viability is dependent on public support and price premia payments.

The farms use their own or wild fruits and market their products (mainly) individually either through own on farm shops, via internet, the local gastronomy, and regional shops. Many farms in Austria distil their fruits and those from wild nature (particularly in mountainous areas) - many of them produce in line with high quality standards. There are other hay milk related VCs in Austria, but this is unique due to its specific labelling scheme.

### Key local assets

The maintenance of mosaic like areas of grassland, meadows, alpine pastures and High Nature Value farmland through cattle grazing, hay mowing, and aftermath reduces scrub and tree encroachment as well as the risk of mudflows and landslides, and thereby guarantees high levels of biodiversity. Moreover, the economic viability of organic milk producing farms is increased, which is a big farming sector in the region of Murau (there are more than 440 organic farms in the region - approx. 35% participate in the "back to the origin" initiative). The added value for the region is calculated by a research institute, for dairy products there is 51-80% added value for the region. The contribution to regional resilience is calculated as well.

### Challenges

Challenges refer to climate change related issues, such as effects on the feed base for this pasture-based milk production as the vegetation might change, and the production of hay for the wintertime. Moreover, the specific actor constellation grants much power to the trademark, resp. the supermarket.

### Innovation

Establishment of a joint quality certification scheme and joint marketing and sales strategy. Under the trademark quality standards are set, extension services, quality assurance and the traceability are managed. That leads to a product differentiation, which creates an added value, and the marketing is exclusively via selling through the large supermarket discounter. The initiative responds to various shortcomings and development in the milk sector, such as the EU milk market with price volatility and an intensification of production, but also to an increasing consumer preference for regional and sustainable products.



### **“World of wood” Murau**

The Holzwelt Murau was founded as an association for regional development, which links hotels, restaurants, and other touristic businesses from the region with businesses in wood construction, carpentry, and wood-based energy production.



The district of Murau is a peripheral region in the center of Austria – north to Carinthia and east to the Lungau (a NUTS3 region in Salzburg, see VC of Lungauer Eachtlinge – therefore next to the „cold pole“ of Austria). The region can be considered as (very) peripheral (main roads are far away; the high-level rail link on the edge of the district will be lost in the next few years due to a new route). The river Mur (after which the region is named) flows through the main valley. The district of Murau is enclosed by the Niedere Tauern mountains in the north, the Seetaler Alps in the east and the Gurktaler Alps in the south and west. The lowest place is at an altitude of 650 m above sea level and the highest place 1,763 m above sea level. The highest elevation is at 2,740 m. The district of Murau is one of the most densely wooded areas in Styria, thus wood in general play a major role economically and thematically. The district has the largest closed stand of Swiss stone pines in Central Europe. The district also has a relatively small-scale industrial structure and has been scoring increasingly in the field of tourism for years.

#### Reference mountain landscape statistics

(A: Data from NUTS3 AT226)

Reference mountain chain		Austrian Alps	
Reference mountain landscape		Murau (District)	
Size of the area (km <sup>2</sup> )	1,385	Average per capita income €/year	21,615 <sup>A</sup>
Altimetry (m; min-max)	650–2,740	Total Gross Value Added (GVA) (€ million)/year	2,877 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	19.8	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-6.15%	Primary:	4.5% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	12,940	Secondary construction):	(including) 39.6% <sup>A</sup>
		Tertiary:	55.8% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	82	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	1,613	Primary:	7.9% <sup>A</sup>
Protected areas	Yes	Secondary:	29.6% <sup>A</sup>
		Tertiary:	62.5% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The association aims to promote, as well as the economic, ecological, and social development of the district or region of Murau. By means of a joint brand many companies, initiatives, organizations, and public bodies should be recognizable in their corporate design as part of a region. The initiative links various key actors from tourism, the wood sector (production and

processing), farms, companies from the sector of renewable energy, but also educational institutions. Lots of different activities are implemented, such as e.g.:

- wood as primary product for the (green) building sector (label 'ReinHolz')
- Construction of the biomass farm and logistics center Naturwärme St. Lambrecht.
- Construction of many small hydropower plants (stock 45: 150,000 MWh).
- Regional electricity generation supplies a surplus in the summer months.
- solar energy: equipping 50% of all buildings in the Murau district with solar or photovoltaic systems.
- Cooperation between plumber enterprises and regional energy producers
- Cooperation and networking of organic farmers for the production and processing of organic products
- joint regional marketing for organic products in cooperation with gastronomy, trade, and tourism.

There are similar initiatives within other Energy Model Regions in other mountainous regions as well (e.g., Almenland).

### Key local assets

The initiative addresses the economically most relevant sectors in the region; wood is an important additional income source for food producing farmers in mountainous areas. Accompanying awareness-raising measures are not only supposed to strengthen a positive perception of the Holzwelt Murau initiative within the region, but also to raise awareness for climate change related issues. The initiative also implies sustainable mobility: The Murtal train is powered by regional green electricity, which is to be the driving force behind the Austrian flagship region for sustainable mobility in rural areas.

### Challenges

Changing climatic conditions are increasingly affecting the forest. Necessary sensible adjustments to forest management must be designed for a very long-term period and consider scenarios of climate developments. Although forestry has a relatively high adaptability compared to other sectors, the implementation of individual measures is time-consuming and expensive. In addition, the results often only show up after many years. The forest is not only affected by climate change, but it also plays a key role in adapting to it and for climate protection. Consequently, wood-based businesses are on the one hand at risk due to climate change, on the other hand they offer solutions as well.

### Innovation

The actor constellation is interesting as it links the economically most important sectors within the Region and fosters the interface between them. Building on the Murau energy vision, the



implementation and steering-related structure of an energy competence center for renewable energy sources is being developed and reinforced by the climate and energy forum. The integration and joint organization of all energy-related activities relating to the climate and energy model region Holzwelt Murau is the main goal of the energy competence center. Municipalities and large companies act as role models for the region. The raw material wood serves as the most important resource in the Murau district. Another important economic pillar is tourism (especially winter). In addition, the region is characterized by a very high proportion of alternative forms of energy (biomass, waterpower, solar systems, wind power). The combination of these two aspects as main pillar of a regional development strategy going along with a regional brand and awareness raising measures is linking various actors, which is an interesting perspective.

## “Muraurer” beer

Murauer is the biggest brewery in Austria which is organized as cooperative.

The district of Murau is a peripheral region in the center of Austria – north to Carinthia and east to the Lungau (a NUTS3 region in Salzburg, see VC of Lungauer Eachtinge – therefore next to the „cold pole“ of Austria). The region can be considered as (very) peripheral (main roads are far away; the high-level rail link on the edge of the district will be lost in the next few years due to a new route). The river Mur (after which the region is named) flows through the main valley. The district of Murau is enclosed by the Niedere Tauern mountains in the north, the Seetaler Alps in the east and the Gurktaler Alps in the south and west. The lowest place is at an altitude of 650 m above sea level and the highest place 1,763 m above sea level. The highest elevation is at 2,740 m. The district of Murau is one of the most densely wooded areas in Styria, thus wood in general play a major role economically and thematically. The district has the largest closed stand of Swiss stone pines in Central Europe. The district also has a relatively small-scale industrial structure and has been scoring increasingly in the field of tourism for years.

Reference mountain landscape statistics  
(A: Data from NUTS3 AT226)

Reference mountain chain		Austrian Alps	
Reference mountain landscape		Murau (District)	
Size of the area (km <sup>2</sup> )	1,385	Average per capita income €/year	21,615 <sup>A</sup>
Altimetry (m; min-max)	650– 2,740	Total Gross Value Added (GVA) (€ million)/year	2,877 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	19.8	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-6.15%	Primary:	4.5% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	12,940	Secondary (including construction):	39.6% <sup>A</sup>
		Tertiary:	55.8% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	82	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	1,613	Primary:	7.9% <sup>A</sup>
Protected areas	Yes	Secondary:	29.6% <sup>A</sup>
		Tertiary:	62.5% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The cooperative is an important company for the region, since, beside their 169 employees, they source their ingredients as regional as possible. The brewery has also some sustainability certificates. The Murauer beer is the flagship food production of the district/region “Murau.” The Murauer brewery is very engaged in sustainability effort within their own company but also to promote and increase regionality – e.g., just as this VC description has been finished it was announced that the brewery supports the production of malting barley from the region with a long-term aim of sourcing the barley exclusively from Styria. They are not certified as organic, but have the products are certified with the Austrian “Umweltzeichen,” which is a government-awarded seal of approval for green business that identifies environmentally friendly products and services. The marketing is national and international via different channels. It is the first EMAS company in Austria and a “Klimabündnis” company (Klimabündnis is network of municipalities to support climate action; companies can also be certified). The production of its beer is carbon-neutral in balance sheet terms. The beer is however not organic. The brewery has 5 depots outside the MRL for their logistics: in Tamsweg (Lungau / Salzburg; neighbouring NUTS3 region to the west), Klagenfurt (Carinthia), Zeltweg (same NUTS3-region as the brewery, but to its east) and in Graz (the capital of Styria). Beer is a traditional Austrian beverage being in the top 5 worldwide regarding per capita consumption. Thus, there are many small breweries producing traditional beer sorts, craftbeer etc. The marketing of the beer is mainly in Styria but the beer is available in nearly every supermarket nation-wide. In Austria there are only a few breweries that are cooperatives of which Murauer is the biggest one (employees, production scale) and maybe the most famous.

### Key local assets

Murauer is a very old beer brand, thus, the traditional brewing art is used for their marketing. The regional sourcing and engagement make the brewery an important actor within the region, especially since this region is rather peripheral. The fresh water from the region is regarded as important asset for their product quality.

### Challenges

The brewery Murau has a well-established value chain. A challenge might be the competition with other breweries, since Murauer is one of few bigger breweries in Austria that is still independent and does not part of to the Brauerei Union Österreich AG that belongs to Heineken. A second ongoing challenge is to keep the water quality for the beer production which is of special importance because of their sustainability efforts and certificates.

### Innovation

The brewery’s sustainability efforts in the production process can be seen as very innovative as well as their initiatives to source their ingredients as regional as possible. Like many other breweries Murauer also develops a range of products. It is also a sponsor of events and festivals in Styria (and beyond), where they also serve own lemonade. The brewery can also be visited in the “Bierapotheke” (which is a word play: Apotheke = pharmacy). Murauer provides a broad range of beer products, of which the main products (e. g. Märzen) are available at every supermarket and bars in Styria (and mostly also in other federal states) and special beer sorts (also wheat beer



and alcohol-free beer) are available in certain restaurants, supermarkets, and shops as well as online. Additionally, Murauer has an own lemonade production (name: "Murelli") with an increasing number of different tastes, which was in the beginning only available on tap, but meanwhile in bottles. Interestingly the price is very low (half the prize of a Coca Cola; at the same level as lemonades with the private labels of supermarkets).

## “Murbodner” potatoes

Nineteen farms produce 7,000 tons of the highest quality potato and refined products. 89 communities in the upper Mur Valley are involved in the project. The initiative cultivates different varieties of potatoes, and it also implies tuber conservation (seeds).

Murtal is a very young district that was created by merging two former districts. The district is named after the river Mur. The Mur valley is bordered in the north by the Niedere Tauern, by the Gurktaler Alps as well as the Styrian Randgebirge (Seetlaler Alpe, Stubalpe, Gleinalpe). The alpine to high alpine region is in the western part of Upper Styria at an altitude between 800 and 2700 m above sea level. The region is characterised by a southern alpine climate. The valley areas show cold, continental weather with temperature inversions in winter and moderate temperatures in summer. Compared to the other landscapes of Styria, the Murtal is one of the landscapes with the lowest precipitation in Styria. The mountain flora is conditioned by the soil and climatic conditions and is characterised by a variety of alpine plants.

Reference mountain landscape statistics  
(A: Data from NUTS3 AT226)

Reference mountain chain		Austrian Alps	
Reference mountain landscape		Murtal (District)	
Size of the area (km <sup>2</sup> )	1,675	Average per capita income €/year	20,615 <sup>A</sup>
Altimetry (m; min-max)	318– 2,552	Total Gross Value Added (GVA) (€ million)/year	2,877 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	42.8	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-3.01%	Primary:	4.5% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	34,467	Secondary (including construction):	39.6% <sup>A</sup>
		Tertiary:	55.8% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	90	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	1,840	Primary:	7.8% <sup>A</sup>
Protected areas	Yes	Secondary:	29.6% <sup>A</sup>
		Tertiary:	62.5% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The products are sold via a supermarket under the label 'Wir sind Steirer' (trademark owned by this supermarket), and they are marketed via various forms of direct sale being branded as 'Murbodner Erdäpfel;' the product placement was supported by the 'Agricultural Innovation Center' (LIZ) from the region. 19 farms cultivate different varieties of potatoes and they do seed breeding as well. The potatoes are sold via a supermarket under the label 'Wir sind Steirer' (trademark owned by this supermarket), and they are marketed via various forms of direct sale (on-farm sale, online) being branded as 'Murbodner Erdäpfel.' The compliance "region of culinary delight" quality scheme is controlled by the AMA. The cultivation of potatoes for the mass markets happens in the flat lands in Eastern and Southern Austria. There are few other mountain regions where the potato is cultivated and marketed as quality products (also in supermarkets) such as Lungauer Eachtlinge (see "Lungauer Eachtling").

### Key local assets

The "region of culinary delight" does not only favour the potato producing sector but promotes the whole region in terms of touristic attraction, which boosts the local economy. The cooperation of producers, traders, restaurateurs, and tourism professionals to create a "region of culinary delight" brings added value and reputation to the region.

### Challenges

Potatoes are among those crops that grow under inhospitable conditions and at high altitudes, and few crops provide a comparably high yield of nutrients per cultivated area. This is particularly important where land is scarce, like in mountainous areas. Although they are a labour-intensive crop, thanks to their high yield and usually good selling price, they can also be grown competitively by small farmers. However, changing weather conditions might also affect the way of cultivating potatoes and the breeds used.

### Innovation

A "Genussregion" ("region of culinary delight": promoting local food specialties; quality standards set by the AgrarMarkt Austria) was set up in the context of the "Murbodner Erdäpfel", which links tourism with potato products and festivals around that topic. The concept supports a region to be marketed together with its typical products or foods. The connection of the region and a specific food product offers a promising opportunity to better link the tourist sector, esp. gastronomy with local food products. In addition, the "Genussregion" is used as marketing strategy to gain higher value from a "simple" product such as potatoes.



## “Osttiroler” mountain lamb

East Tyrol is one of the regions in Austria with the highest number and density of sheep. Sheep farming in this region has been a tradition for centuries, mainly for wool production.

Lienz is in East Tyrol which is an exclave of the Austrian federal state of Tyrol, which has no border to the main federal state of Tyrol. East Tyrol has a large share of the Hohe Tauern, with the highest mountains in Austria (241 peaks above 3000 meters are in East Tyrol). Half of the district area lies above 2000 meters above sea level, with a large proportion of alpine areas. Approximately 9,1 percent is used for agriculture. The climate is harsh and dry. There are large microclimatic differences between the Lienz valley floor, the rugged Tauern valleys and the Gailtal valley with its high precipitation. East Tyrol shows complex geological patterns (limestone, primary rock, dolomite, metamorphic rocks of the "Tauernfenster"). These, together with the different altitudes and climatic conditions, lead to a high local biodiversity of native alpine plants and herbs.

Reference mountain landscape statistics  
(A: Data from NUTS3 AT333)

Reference mountain chain		Austrian Alps	
Reference mountain landscape		Lienz (District)	
Size of the area (km <sup>2</sup> )	2,020	Average per capita income €/year	20,326 <sup>A</sup>
Altimetry (m; min-max)	395– 3,660	Total Gross Value Added (GVA) (€ million)/year	1,533 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	26.5	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-1.45%	Primary:	1.2% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	19,537	Secondary (including construction):	36.3% <sup>A</sup>
		Tertiary:	62.5% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	128	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	2,545	Primary:	8.3% <sup>A</sup>
Protected areas	Yes	Secondary:	30.2% <sup>A</sup>
		Tertiary:	61.6% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Since the 1950s there has also been meat production due to high competition of the wool with synthetic fibres. Due to the topography and high altimetry cattle farming was not an option. Since

2006 this VC is embedded in a "Genussregion" ("region of culinary delight": promoting local food specialities; quality standards set by the AgrarMarkt Austria). About 400 farmers are loosely connected with each other via the "Osttiroler Lämmerring", which is a group within the Raiffeisen cooperative East-Tyrol. Both are of special importance for the producers since they are responsible for the marketing of about 75 % of the lambs (75 % of these are sold alive in eastern Austria and international, 25 % are slaughtered for the marketing in supermarkets). 25 % of the lambs are sold directly to consumers or the regional gastronomy. On average, 37, 8 sheep are kept per farm in East Tyrol. This stock size is an absolute top value when considered Austria-wide (16.4 sheep per keeper). Mountain sheep farming has also been traditional in 13 other regions in Austria (e.g., see "Mölltal-Glockner" lamb and "Weizer" sheep farmers) that are considered to have traditional sheep farming – not all of them are mountainous regions.

### **Key local assets**

Sheep farming has a tradition for centuries in this region. The shift to meat production in the 1950s was necessary to find new marketing opportunities. The cultural landscapes is important for the marketing strategy – also the cultivated traditional sheep breeds.

### **Challenges**

Challenges refer to climate change related issues, such as effects on the feed base for this pasture-based milk production as the vegetation might change, and the production of hay for the wintertime. Moreover, the specific actor constellation grants much power to the trademark, resp. the supermarket.

### **Innovation**

Establishment of a joint quality certification scheme and joint marketing and sales strategy. Under the trademark quality standards are set, extension services, quality assurance and the traceability are managed. That leads to a product differentiation, which creates an added value, and the marketing is exclusively via selling through the large supermarket discounter. The initiative responds to various shortcomings and development in the milk sector, such as the EU milk market with price volatility and an intensification of production, but also to an increasing consumer preference for regional and sustainable products.

## “Lungauer Eachtling”

“Lungauer Eachtlinge” (“Eachtling” is a dialect word from Salzburg for “potato”) are produced in the central Alps of Austria in the federal state of Salzburg, where the potato grows very well. Lungauer Eachtling is regarded as traditional Austrian food.

Tamsweg is in the Lungau region which is congruent with the district of Tamsweg in the southeast of the province of Salzburg, Austria. The Lungau in Salzburg is an inner alpine basin at over 1,000 meters above sea level, delimited by mountain ranges that influence the harsh climate and vegetation quite decisively. The region is also known as the "Austrian cold pole". The region is particularly sheltered from the wind and low in precipitation due to the surrounding mountains. The natural, humus-rich, sandy soils (primary rock weathered soils) found in the region are particularly well suited for potato cultivation. Optimal climate and soil conditions make the Lungau a potato health area with low pest pressure.

Reference mountain landscape statistics  
(A: Data from NUTS3 AT321)

Reference mountain chain		Austrian Alps	
Reference mountain landscape		Tamsweg (District)	
Size of the area (km <sup>2</sup> )	1,019	Average per capita income €/year	20,216 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	698 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	19.8	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-2.77%	Primary:	2.1% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	16,955	Secondary (including construction):	26.1% <sup>A</sup>
		Tertiary:	71.9% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	90	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	1,079	Primary:	10.2% <sup>A</sup>
Protected areas	Yes	Secondary:	26.5% <sup>A</sup>
		Tertiary:	63.3% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Different potato varieties have been cultivated there since the end of the 18th century. Since 2005 this VC is embedded in a "Genussregion" (“region of culinary delight”: promoting local food

specialities; quality standards set by the AgrarMarkt Austria). The "Lungauer Saatzeit- und Saatbauverein" markets two thirds of the edibles via food retailers and Salzburg Lagerhaus (a cooperative of RWA Raiffeisen Ware Austria AG that sells agricultural goods, building materials, construction, and garden commodities). The rest is marketed directly by the members of the association. Also, this association is important for the breeding and reproduction of the potato. The high cost of potato cultivation together with poor prices have caused the area under cultivation in the region to fall from 366 hectares in 1959 to 150 hectares in 2000. The Genusregion is thus of importance for the marketing. The "Lungauer Eachtling" is a quality product that is also sold in supermarkets. At present, about 150 hectares of potatoes are planted by 400 farmers, of which the "Lungauer Saatzeit- und Saatbauverein" manages about 40 hectares (representing 28 farmers). Around 60 percent of the acreage is cultivated according to organic standards. The harvest is used as seed potatoes (40 %), food potatoes (40 %) and fodder potatoes (20 %). The cultivation of potatoes for the mass markets happens in the flat lands in Eastern and Southern Austria. There are few other mountain regions where the potato is cultivated and marketed as quality products (also in supermarkets) such as Murbodner Erdäpfel (see other "Murbodner" potatoes).

### Key local assets

The "Lungauer Saatzeit- und Saatbauverein" is the most important actor in this VC, because the association has been the bearer of traditional knowledge that is used to cultivate and breed the (different) potato (varieties). The "isolated" location of the region is advantageous for potato cultivation (e.g., lower incidence of rot diseases).

### Challenges

Due to the alpine climate conditions and the altitude of the cultivated areas at over 1,000 meters above sea level, the yields per hectare are rather modest. Therefore the "Genusregion" and niche markets are very important for the potato farmers.

### Innovation

The "Lungauer Eachtling" is marketed as a quality product because the region allows for appropriately qualitative products, but large quantities cannot be produced. The work of the Lungauer Saatzeit- und Saatbauverein, which initiated the Genusregion, is highly relevant. The "Lungauer Eachtling" is marketed as quality product which is connected to the Austrian quality food initiative "Genusregion." Most producers are organic farmers. Transparency is also very important: The origin of Lungauer Eachtling must be traceable from the field to the retailer. To this end, every farmer is required to keep records of which potato varieties were grown on which areas and when they were harvested according to variety. In food retailing, the packaged goods are labelled with the name and address of the agricultural producer, variety, method of production (organic or conventional), quantity, delivery date, cooking type, and address of the seed growers' association.

## “Mölltal-Glockner” lamb

Sheep farming in this region has been a tradition for centuries. Due to the topography and high altimetry cattle farming was not an option. Since 2006 this VC is embedded in a “Genusregion” (“region of culinary delight“: promoting local food specialities; quality standards set by the AgrarMarkt Austria). “Glöckner Lamm“ is protected as word mark designation since 2005.

Spittal an der Drau is in the Mölltal, an inner alpine dry area with a hygric continental climate due to its location in the lee of the Northern and Southern Limestone Alps. The annual precipitation is rather high, increasing with the altimetry. The sheep graze up to 3000 m above sea level. The regional soil and climate conditions result in a mountain flora characterized by a diversity of alpine plants.

Reference mountain landscape statistics  
(A: Data from NUTS3 AT212)

Reference mountain chain		Austrian Alps	
Reference mountain landscape		Spittal an der Drau (District)	
Size of the area (km <sup>2</sup> )	2,765	Average per capita income €/year	19,933 <sup>A</sup>
Altimetry (m; min-max)	512- 2,143	Total Gross Value Added (GVA) (€ million)/year	3,181 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	27.44	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-3.39%	Primary:	3.3% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	42,315	Secondary (including construction):	28.9% <sup>A</sup>
		Tertiary:	67.7% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	75	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	2,288	Primary:	8.8% <sup>A</sup>
Protected areas	Yes	Secondary:	23.9% <sup>A</sup>
		Tertiary:	67.5% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

About 94 sheep farmers are associated within the cooperative “ARGE Glocknerlamm“ which was founded in 2003. These cooperative processes and sells the lamb products to private customers retailers and the regional gastronomy. The “Glocknerlamm-Fest” – tightly connected with tourism – is a central event for the marketing of the lamb products. The extensive grazing of the sheep

contributes to the stability of the vegetation cover as well as to the improvement of the water storage capacity. Mountain sheep farming has also been traditional in 13 other regions in Austria (see VC AT 14 and 15) that are considered to have traditional sheep farming – not all of them are mountainous regions.

### **Key local assets**

Sheep farming has a tradition for centuries in this region. The cultural landscapes are important for the marketing strategy – also the cultivated traditional sheep races. The lamb is the key product of the region.

### **Challenges**

The region is situated within the highest mountains of Austria and the topography of the mountains does not allow for various farming practices. Sheep farming therefore is one of the few income possibilities for the mountain farmers. Climate change affects this region regarding biodiversity loss and neophytes as well as a changing water balance.

### **Innovation**

The knowledge regarding the husbandry is traditional - also the cultivated races. The marketing as local speciality can be characterized as innovative. The sheep plays a crucial role for the mountain farming in this region. Additionally, the maintenance of pasture farming is also important for the maintenance of the cultural landscapes which is important for hiking tourism. To secure the income the “Genussregion” and the marketing as a local speciality plays an important role for this VC.

## “Murbodner” beef

'Murbodner' is a cattle race and label at the same time conducted by an association of breeders. The cattle are marked with an official mark (ear tag) in accordance with the Austrian Animal Identification and Registration Ordinance 2007 and are recorded in a database.

Murtal is a very young district that was created by merging two former districts. The district is named after the river Mur. The Mur valley is bordered in the north by the Niedere Tauern, by the Gurktaler Alps as well as the Styrian Randgebirge (Seetaler Alpe, Stubalpe, Gleinalpe). The alpine to high alpine region is in the western part of Upper Styria at an altitude between 800 and 2700 m above sea level. The region is characterised by a southern alpine climate. The valley areas show cold, continental weather with temperature inversions in winter and moderate temperatures in summer. Compared to the other landscapes of Styria, the Murtal is one of the landscapes with the lowest precipitation in Styria. The mountain flora is conditioned by the soil and climatic conditions and is characterised by a variety of alpine plants.

### Reference mountain landscape statistics (A: Data from NUTS3 AT226)

Reference mountain chain		Austrian Alps	
Reference mountain landscape		Murtal (District)	
Size of the area (km <sup>2</sup> )	1,675	Average per capita income €/year	20,615 <sup>A</sup>
Altimetry (m; min-max)	318– 2,552	Total Gross Value Added (GVA) (€ million)/year	2,877 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	42.8	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-3.01%	Primary:	4.5% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	34,467	Secondary (including construction):	39.6% <sup>A</sup>
		Tertiary:	55.8% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	90	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	1,840	Primary:	7.8% <sup>A</sup>
Protected areas	Yes	Secondary:	29.6% <sup>A</sup>
		Tertiary:	62.5% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

Murbodner cattle is the result of traditional knowledge about cattle breeding and husbandry in Austria. The Murbodner cattle is an autochthonous breed of cattle from Austria. Only registered animals can take part in the beef quality program approved by the Agrarmarkt Austria (AMA). The oxen come from suckler cow husbandry and are hired by the fatteners in spring and autumn (in sum there are approx. 350 small scale farms engaged). The approximately 1.000 animals slaughtered each year spend half of their life with their mother before they are fattened. It is fed with grass and maize silage and a bit grain. The oxen are slaughtered at an age of 22-24 months. The current population of Murbodner cattle in Austria is around 4,500, of which around 3,400 are dams. The oxen meat from Murbodner beef is available under the brand „Landbeef Österreichisches Rindfleisch für Genießer“ (transl.: “Landbeef Austrian beef for connoisseurs”). The meat from the Murbodner oxen is only available three to four times a year and is marketed on-farm, through regional food retailers (only in Styria and southern Burgenland) and through regional gastronomy. Young oxen from Murbodner or crossbred animals are also popular for special branded meat programs (e.g., ALMO – “ALMO alp oxen”), thus there are linkages to other high quality meat production initiatives.

### Key local assets

The Murbodner adds value to the meat, which is of relevance as it is all small-scale farms, which are engaged in this initiative. Moreover, it contributes to landscape preservation through pasture farming, and it holds up the cultural heritage by preserving an autochthonous cattle breed.

### Challenges

Predicted changes in climate (extreme weather conditions: drought, heavy rain) are likely to have effects on the feed base for this pasture-based meat production as the vegetation might change, and the cultivation of feed for the wintertime might change as well. An increasing wastage of alpine pasture areas might demand in future for adjusting the pasture intensity and to significantly improve the quality of the forage plant growth.

### Innovation

Protection of an endangered autochthonous domestic livestock breed: The innovation lies mainly in the protection and preservation of the genetic make-up, and the related marketing structure. Is the uptake of breeding of this ancient Austrian cattle breed, which dates to 4th century BC. It became widespread in the Eastern Alps and Alpine foothills and was recognized as a Styrian local breed in 1869. After the WW2, the Murbodner was quickly displaced by Fleckvieh. The last breeding organisation dissolved in 1970. In 1982 the Austrian National Association for Gene Reserves started a preservation program for Murbodner breed. Since 2003 the Murbodners managed by Murbodner Breeders Association. The close connection with the geographical area and traditional knowledge is of particular interest:

- Special soil and climatic conditions result in a rich local flora, which enables the extensive keeping of Murbodner cattle on pastures and alpine pastures.
- the cattle are fed with feed such as hay, silage, and grummet, which come from the region.



- Due to this way of husbandry, beef with characteristic features in terms of composition can be produced. The meat of Murbodner beef is of culinary high quality.
- The rearing of Murbodner cattle is the result of traditional knowledge that was passed on to those who work in this area: Traditional knowledge and experience of animal husbandry (adaptation of the herds to the conditions of the environment, know-how of the farmers, type of beef production, improvement genetic material), the butcher's know-how (animal transport, experience in slaughtering, cutting, meat maturing) and the experience of the Murbodner cattle breeders' association.

## “Weizer” sheep farmers

Weizer Schafbauern“ (Sheep farmers from Weiz) is cooperative of about 300 sheep farmers in the district of Weiz within the LEADER region „Almenland-Energieregion Gleisdorf“. They produce meat (lamb is the main product), milk and milk products (cheese, yogurt, cream) of different varieties and cosmetics. The wool is also used for textiles. They have different marketing relations (direct marketing, online shop, supermarket, ...). The Weizer mountain lamb is classified as traditional food in Austria.

Weiz is in the region “Almenland” (transl.: Styrian alpine pasture region). which is one of the biggest connected pasture-regions in Europe (total 125 pastures, 36,6 km<sup>2</sup>). The pasture is between 1.200 and 1.500 m above sea level. The climate is characterized as humid, having a lot of thunderstorms. The rock formation is diverse, primarily limestone, further: phyllite, slate and greywacke.

### Reference mountain landscape statistics (A: Data from NUTS3 AT224)

Reference mountain chain		Austrian Alps	
Reference mountain landscape		Weiz (District)	
Size of the area (km <sup>2</sup> )	1,098	Average per capita income €/year	21,444 <sup>A</sup>
Altimetry (m; min-max)	454– 1,720	Total Gross Value Added (GVA) (€ million)/year	8,141 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	82.5	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	3.7%	Primary:	11.7% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	4,310	Secondary (including construction):	32.5% <sup>A</sup>
		Tertiary:	55.7% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	30	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	4,555	Primary:	11.5% <sup>A</sup>
Protected areas	Yes	Secondary:	29.9% <sup>A</sup>
		Tertiary:	58.5% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The main actor of this VC is the cooperative called “Weizer Schafbauern - Die Schaferei“. This cooperative owns the brand “Määh“ to distribute its products. Another important actor is the

„Weizer Bergland Spezialitäten Vertriebs - GmbH“ that runs a slaughter house together with ALMO farmers, free a range of pig farmers and a local butcher. This VC does not have an official organic certificate, but the products are promoted with higher animal welfare standards. Mountain sheep farming has also been traditional in 13 other regions in Austria that are considered to have traditional sheep farming – not all of them are mountainous regions.

### **Key local assets**

The Murbodener adds value to the meat, which is of relevance as it is all small-scale farms, which are engaged in this initiative. Moreover, it contributes to landscape preservation through pasture farming, and it hold up the cultural heritage by preserving an autochthone cattle breed.

### **Challenges**

Sheep farming has a tradition since the middle age especially in areas where cattle cannot graze. In cooperation with ALMO farmers, free range pig farmers and a local butcher the Weizer Schafbauern have bought the old regional slaughterhouse, which was then rebuild in line with the EC regulation for organic certification. In important asset is the cultural landscape of the region, which is important for hiking tourism.

### **Innovation**

The knowledge regarding the husbandry is traditional. The main innovation of the VC considers their marketing and resource sharing (e. g., the slaughterhouse) via the cooperative. They sell their products using the brand „Määh“ (referring to the sheep sound). The sheep plays a crucial role for the maintenance of small structured extensive farming in this region. In 1994 the cooperative was founded to provide a better base of the processing and marketing of the farmers products. The brand “Määh” is of importance for the joint marketing. Products are available via direct selling but also in the supermarket chain “SPAR” and in local restaurants and high class gastronomy. The lamb is the flagship product of the Weizer Schafbauern.

## “Kärntna Låxn” (lake trout from Carinthia)

The "Kärntna Låxn" (= lake trout from Carinthia) is a quality fresh fish product from Upper Carinthia. From there already in the 14th century this fish was delivered to the imperial court in Vienna.

Spittal an der Drau is in Carinthia, the southernmost federal state of Austria. The fish is produced in the mainly mountainous region Upper Carinthia (NUTS3: AT212). Since Carinthia is located south of the Alps, the climate is almost Mediterranean in summer. It is characterized by relatively constant weather conditions with high solar radiation, which alternates with thunderstorms and intense precipitation. While summers are hot and moderately humid, winters are long and harsh. Autumn and winter often feature temperature inversions with calm winds, dense fog over the frosty valleys, and mild, sunny weather higher up in the foothills and mountains. The fish is produced at an altitude between 751 and 843 meters above sea level in 15 natural ponds supplied with spring and stream water. The water temperature of the ponds varies between 8 degrees Celsius and 15 degrees Celsius. The natural ponds are supplied with sufficient fresh water, so no enrichment with oxygen is necessary. The average pond area is about 1 hectare.

### Reference mountain landscape statistics (A: Data from NUTS3 AT212)

Reference mountain chain	Austrian Alps		
Reference mountain landscape	Spittal an der Drau (District)		
Size of the area (km <sup>2</sup> )	2,765	Average per capita income €/year	19,933 <sup>A</sup>
Altimetry (m; min-max)	512- 2,143	Total Gross Value Added (GVA) (€ million)/year	3,181 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	27.44	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-3.39%	Primary:	3.3% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	42,315	Secondary (including construction):	28.9% <sup>A</sup>
		Tertiary:	67.7% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	75	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	2,288	Primary:	8.8% <sup>A</sup>
Protected areas	Yes	Secondary:	23.9% <sup>A</sup>
		Tertiary:	67.5% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

A few years ago, 4 fish farms managed to breed again a fish species that was firmly rooted in former times and to anchor it as a fixed point both among consumers and gastronomy. Since 2008 this VC is embedded in a “Genussregion“ (~ region of local food specialities; quality standards set by the AgrarMarkt Austria), which means that the fish is a regional high quality product. The fish is sold directly, via the gastronomy and mainly by an association named "ARGE Oberkärntner Fisch". This association is a cooperation of the 4 fish farmers (who produce "Kärntna Låxn"), some fish breeders and innkeepers, the regional fishing association, and the LAG Nockregion-Oberkärnten. The fish is the lead product of the like named "Genussregion" and in these regards a representative quality product of the region. Positive impacts on the SES regards the re-stabilization of wild populations of the lake trout, since fish, which is sold, comes from fish farms with natural ponds. The 4 producers of “Kärntna Låxn” are situated in the districts: Spittal an der Drau, Feldkirchen (both same NUTS 3 region) and Villach Land. Beside "Kärntna Låxn" there are also four other regions in Austria, where the fish is both a traditional Austrian food and the lead product of a "Genussregion": Ausseerland Seesaiblinge (artic char), Mattigtal Forelle (trout), Salzkammergut Reinanken (coregonus = salmon) and Ybbstal Forelle (trout). In addition, there are 3 other regions (total 8), where the fish is only classified as traditional Austrian food (without being a Genussregion): Neusiedlersee Fisch (fish from lake Neusiedl), Steirisches Teichland - Karpfen (carp from the region "Styrian pondland"), Waldviertler Karpfen (carp from the region "Waldviertel"). Another four fish varieties are nation-wide classified as traditional food: trout, common carp, coregonus (salmon) and artic char.

### Key local assets

The production of "Kärntna Låxn" has been a tradition for more than 500 centuries. The name of this fish has been an important marketing asset since ever. The "crystal clear" water from one of the high mountain regions in Austria is also part of the marketing communication. The "ARGE Oberkärntner Fisch" is important for the fish breeding and marketing.

### Challenges

Due to overfishing mainly in Lake Millstatt in the 1970s the fish population decreased dramatically.

The marketing as a high-quality product is a niche that allows a) a better income for the producers and b) to cultivate the fish sustainably. The trout is known to be vulnerable to climate change. Lake Millstatt is a deep lake which is not that affected although in average the temperature increased by more than 2 °K. Since the fish is mainly produced in "monocultures" in natural ponds that are not so deep, the production might be more affected than wild populations of these fish in the big lakes and rivers.

### Innovation

The marketing under the name of "Kärntna Låxn" has a long history. After the problems of overfishing in the 1970s there have been made great efforts to rebuild the natural fish stock and the lake trout population by breeding in near-natural ponds since the late 1990s. In 2001, four fish farms around lake Millstatt and neighbouring lakes began to breed the fish species (lake trout), which was the dominant species in earlier times, and to offer it again to consumers and in the



gastronomy. The “ARGE Oberkärntner Fisch” (see key actors) has been an important cooperation for the stabilization of the sustainable fish farming: stable fish population and new marketing. Also the “Genussregion” (“region of culinary delight”: promoting local food specialities; quality standards set by the AgrarMarkt Austria) has been a key factor of success.

## Arctic char and trout from the Region Ausseerland

Fishing in this area happens since the Neolithic Age and Bronze Age due to the salt mining in Hallstatt. Since the 13th century there has been professional fishing in this region. The fish was delivered to the imperial court in Vienna and the temporal imperial court in Graz.

Leizen is in the Ausseerland region, which is situated at an altitude between 650 and 2000 meters above sea level in the geographical heart of Austria. The landscape is characterized by the highest mountain of Styria and several crystal-clear lakes. The climate is alpine with short summers and long winters. Precipitation is high. The Arctic char are native to the lake Altaussee, lake Grundl, lake Toplitz and lake Kammer - all between 700 and 720 meters above sea level. The fish also lives in small mountain lakes at an altitude between 1500 and 1600 meters above sea level.

Reference mountain landscape statistics  
(A: Data from NUTS3 AT212)

Reference mountain chain		Austrian Alps	
Reference mountain landscape		Liezen (District)	
Size of the area (km <sup>2</sup> )	3,318	Average per capita income €/year	20,610 <sup>A</sup>
Altimetry (m; min-max)	589- 2,993	Total Gross Value Added (GVA) (€ million)/year	2,733 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	24.00	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.94%	Primary:	3.6% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	43,972	Secondary (including construction):	28.1% <sup>A</sup>
		Tertiary:	68.2% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	108	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	2,425	Primary:	6.4% <sup>A</sup>
Protected areas	Yes	Secondary:	35.1% <sup>A</sup>
		Tertiary:	67.7% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Fishing rights for the lake Altaussee were always in private hands, while those for the lake Grundl were exercised by the aristocracy and nowadays by the Austrian Federal Forests. Since 2005 this VC is embedded in a „Genusregion“ (~ region of local food specialties; quality standards set

by the AgrarMarkt Austria), which means that the Ausserland Seesaibling (artic char) and Ausserland Forelle (trout) are a regional high quality product.

There is no central actor for the fishing in Ausseerland. However, the fish is marketed via the Federal Forests – a federal organization that manages wood lands and lakes in Austria – as well as since 2018 via the fishery Ausseerland which continues the tradition of catching char and trout from wild populations at lake Grundl. This fishery combines old expertise and tradition with the latest technology and innovative methods. There is a cooperation of this fishery with two professional fishermen of the Federal Forests who catch several fish from the lake Grundl, lake Toplitz and lake Hallstatt which is marketed as wild fish. The fish is marketed as fresh fish (put on ice) or smoked fish directly to the regional gastronomy and to consumers. Especially in the management of the lakes, the issue of sustainability plays an essential role. The demand for domestic wild-caught fish far exceeds the supply. Nevertheless, the lakes are fished according to a strict management plan to still find enough fish in the lakes in the future. The closed season begins in mid-September and lasts until mid-March. Ausseerland Artic Char or Trouts are not a traditional Austrian food, however the lead product of the like named Genusregion, although in contrast to many other regions of this type, there is no central actor or cooperation among those concerned in the VC. In Austria there are also other regions in Austria, where the fish is the lead product of a "Genusregion" (without being a traditional Austrian food). In five other regions the fish is both classified as traditional Austrian food and marketed via a Genusregion: Kärntner Låxn (lake trout), Ausseerland Seesaiblinge (artic char), Mattigtal Forelle (trout), Salzkammergut Reinanken (coregonus = salmon) and Ybbstal Forelle (trout). In addition, there are 3 other regions (total 8), where the fish is only classified as traditional Austrian food (without being a Genusregion): Neusiedlersee Fisch (fish from lake Neusiedl), Steirisches Teichland - Karpfen (carp from the region "Styrian pondland"), Waldviertler Karpfen (carp from the region "Waldviertel"). Another four fish varieties are nation-wide classified as traditional food: trout, common carp, coregonus (salmon) and artic char.

### Key local assets

Fishing in this region has a very long tradition. Still, the fishing methods are traditional, but combined with state-of-the-art technique. To secure the fish population the closed season is taken very seriously and therefore this VC focuses on quality, not on quantity. Since the fish is only marketed only within the region, spring and summer tourism plays a central role. In this regard Hallstatt and the commodification of its history (especially Asian tourists) is a main part of the tourism in the region and thus for this VC. The "crystal clear" water from one of the high mountain regions in Austria is also part of the marketing communication.

### Challenges

Arctic chars love water temperatures just above to the freezing point and are very sensitive to higher temperatures. This is a threat in the context of climate change. About a decade ago, the number of chars in the lakes declined drastically. This was due to the introduction of river perch and their rapid reproduction, as well as an overstocking of pike. Various methods were used to



restore the balance of the lakes. The spawn of perch was removed using spruce branches as traps and pike were targeted. In addition, the catch of char was drastically reduced.

### **Innovation**

The fish is mainly marketed as fresh or smoked fish within the region. Because of the closed season between mid of September until mid of March this char is a seasonal product to ensure a sustainable management of fish in the lakes (sustaining the fish population), although the demand for the fish far exceeds this seasonal availability. The fishing in Ausserland has a long tradition. A recent actor since 2018 is the Ausserland Fishery. The processing facility was completely renewed in 2020 according to the highest quality standards and hygiene regulations. Smoking of the fish is also carried out using state-of-the-art technology. The Genussregion itself is not a central actor compared to other regions using the concept of Genussregionen. The fish (of this VC) is basically available as fresh and smoked fish only in the region. Therefore, tourism plays a central role in this VC.

## “Murtaler” pumpkin seed oil

Climate changes in recent years have introduced the pumpkin cultivation in new regions, such as in the Murtal. It might be expected that the production of pumpkin seed oil might be further extended towards mountainous areas. In general, the Styrian pumpkin seed oil (PGI) is mostly / traditionally produced in non-mountainous areas. Due to changes in climate, in recent years pumpkins are also cultivated in the mountainous region ‘Murtal.’ Some farmers produce pumpkin seed oil, but they are not allowed to use the PGI “Steirisches Kürbiskernöl” as the region was not producing that oil during the registration of this oil as PGI.

The district of Bruck-Mürzzuschlag was created only recently during a district merger. It is in the eastern Alps in the northeast of Styria. The weather is very changeable. The region is in the northern limestone Alps. The main valley is the Mürz valley, where the river Mürz flows into the river Mur near Bruck an der Mur. This valley intersection "Mur-Mürz-Furche" has been an industrial area for decades. In the North of the Mürz valley there are also many side valleys, from where the Mürz river is fed.

### Reference mountain landscape statistics (A: Data from NUTS3 AT212)

Reference mountain chain	Austrian Alps		
Reference mountain landscape	Bruck-Mürzzuschlag (District)		
Size of the area (km <sup>2</sup> )	2,157	Average per capita income €/year	22,671 <sup>A</sup>
Altimetry (m; min-max)	279- 2,381	Total Gross Value Added (GVA) (€ million)/year	5,539 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	45.76	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-3.71%	Primary:	2.2% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	7,926	Secondary (including construction):	47.5% <sup>A</sup>
		Tertiary:	50.2% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	55	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	1,822	Primary:	3.6% <sup>A</sup>
Protected areas	Yes	Secondary:	35.3% <sup>A</sup>
		Tertiary:	61.0% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The oil is produced by 4 family farms, who sell their product on-farm, in farmers' cooperative shops and other small shops in the region. The marketing is supported by the regional tourism initiative (Spielberg Tourismus). Pumpkin seed oil is usually not produced in Austrian mountainous regions.

### **Key local assets**

The production of pumpkin seed oil enriches the local culinary landscape.

### **Challenges**

As already addressed above, farmers are not allowed to market the oil by using the PGI label. The fact that pumpkin seed oil from the Murtal is not officially a "Styrian pumpkin seed oil" is due to that only products from certain regions are intended for this label. The growing areas of the pumpkins must correspond to defined political districts. A bit ridiculous in this context is, that these traditional pumpkin growing areas are not only located in Styria, but they can also be found in Burgenland and Lower Austria, but the area is not expandable, even if it is located in Styria.

### **Innovation**

The cultivation of pumpkins, which had not been grown in that region traditionally, was introduced by some farmers. In cooperation with a local distillery a unique schnaps with pumpkin seeds was created. Styrian pumpkin seed oil (PGI) is mostly / traditionally produced in non-mountainous areas. However, recently also in the mountainous region 'Murtal' some farmers produce pumpkin seed oil, are however not allowed to use the PGI "Steirisches Kürbiskernöl." Thus, the regulatory framework is of high interest in the context of this VC.

## Organic products from mountain areas (“Bio vom Berg”)

“Bio vom Berg” is a Tyrolian brand owned by a cooperative (BioAlpin e.G.) of about 600 farmers and small-scale food processors (bakery, alpine dairy). The aim of the cooperative is to support small farmers and mountain farmers to run their farms in an economically decent way as well as to support organic farming and thus help to sustain the cultural landscape. Besides traditional products they provide premium products and products that are not typical to be produced in mountain regions. They have a close cooperation with the regional supermarket chain M-Preis.

Reference mountain landscape statistics			
Reference mountain chain		Austrian Alps	
Reference mountain landscape		Außerfern (NUTS3)	
Size of the area (km <sup>2</sup> )	1,236	Average per capita income €/year	19,960
Altimetry (m; min-max)	568- 3,720	Total Gross Value Added (GVA) (€ million)/year	1,432
Population density (Inhabitants/km <sup>2</sup> )	26.55	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	3.42%	Primary:	0.8%
Total bed places (BPs) in tourist accommodations/year	25,884	Secondary (including construction):	39.2%
		Tertiary:	60.0%
Road distance from Urban Poles* <sup>1</sup> (km)	96	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	1,015	Primary:	2.9%
Protected areas	Yes	Secondary:	28.2%
		Tertiary:	68.8%

\*<sup>1</sup> Nearest settlement with population > 100,000  
\*<sup>2</sup> share of total GVA/year  
\*<sup>3</sup> share of total employment)/year

The cooperative provides an income basis for the mountain farmers which is also of importance regarding the multifunctionality of the mountain landscape, which has value for tourism and for the identity (organic products from the region). At the same time there is an investment in the development of new products as well as the cultivation of “unusual” crops regarding mountain regions (unusual regards the economic feasibility). Premium products are used to cross-finance less profitable products. The supermarket chain M-Preis is an exclusive partner for the marketing

of the products of BioAlpin and has also an important role for the product development. All in all, this VC helps to increase the resilience of the farmers and the associated socio-ecological system. This VC is of special interest because of its actors' structure and the governance of these structure. However, it does not meet the criteria regarding the mountain landscapes system. This VC is widespread across the country and it can be associated with at least 4 additional NUT3 regions: Innsbruck, Tiroler Unterland, Tiroler Oberland, and Osttirol.

### **Key local assets**

On the one side the cooperative BioAlpin helps that farmer from the cooperative having a better income and improved marketing options. On the other side the landscape and the small size of mountain farms is an important asset for BioAlpin to promote regional, organic products in Tyrol. The cooperation among farmers as well as the cooperation with M-Preis at eye-level allows knowledge transfer and innovation. Traditional knowledge as well as innovation plays a crucial role for BioAlpin.

### **Challenges**

Mountain farmers struggle having enough income for their produce – the cooperative gives them a structure for a better marketing and income. Climate change is a challenge for vegetable/fruit farmers in regard the increasing heat (and heat waves) and thus for irrigation. For pasture farms climate change regards mostly biodiversity and is a logistically challenge because of the prolongation of the summer grazing period.

### **Innovation**

Bio vom Berg exists since 2002 as a brand of the BioAlpin cooperative. This cooperative allows democratic decision making, coordination of the production and the development of new products to secure the income of the farmers. The aim of the cooperative is to support small farmers and mountain farmers to run their farms in an economically decent way as well as to support organic farming and thus help to sustain the cultural landscape. The farmers try to provide a complementary set of products to avoid over production and therefore decreases in prices. Another aim of these efforts is to increase the diversity of products. Revenue from premium products (like different sorts of cheese) are invested in the development of new products (such as beer) and in the development of for mountain regions untypical and unprofitable products (such as grain). They have a close partnership at eye level with the Tyrolian supermarket chain M-Preis that also invest in product development of BioAlpin.

## Styria beef

In the beginning, 30 years ago, "Styria Beef" was supposed to be a brand for a quality beef product to improve the marketing of the products and increase/secure the income of the participating mountain farmers. "Styria beef" then changed very quickly to a quality label for organic beef products in Styria. Meanwhile, there are about 700 farmers selling under the label Styria Beef. The distribution is diverse: direct selling, via supermarkets and restaurants. This VC covers the whole area of the federal state of Styria.

Leizen is in the Ausseerland region, which is situated at an altitude between 650 and 2000 meters above sea level in the geographical heart of Austria. The landscape is characterized by the highest mountain of Styria and several crystal-clear lakes. The climate is alpine with short summers and long winters. Precipitation is high. The Arctic char are native to the lake Altaussee, lake Grundl, lake Toplitz and lake Kammer - all between 700 and 720 meters above sea level. The fish also lives in small mountain lakes at an altitude between 1500 and 1600 meters above sea level.

### Reference mountain landscape statistics (A: Data from NUTS3 AT212)

Reference mountain chain		Austrian Alps	
Reference mountain landscape		Liezen (District)	
Size of the area (km <sup>2</sup> )	3,318	Average per capita income €/year	20,610 <sup>A</sup>
Altimetry (m; min-max)	589- 2,993	Total Gross Value Added (GVA) (€ million)/year	2,733 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	24.00	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.94%	Primary:	3.6% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	43,972	Secondary (including construction):	28.1% <sup>A</sup>
		Tertiary:	68.2% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	108	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	2,425	Primary:	6.4% <sup>A</sup>
Protected areas	Yes	Secondary:	35.1% <sup>A</sup>
		Tertiary:	67.7% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Styria beef is a premium beef product of organic farmers from Styria. Their homepage states that "Styria beef" is only available on-farm, small food shops, high class gastronomy and online, but it's also available in certain supermarket. The BIO-BEEF GmbH is the main actor owning the brand. The company "Karnerta" is named as a key player in the marketing of Styria beef to retailers, restaurants, and the whole sale. The butcher "Marcher" is one of the online shops of Styria Beef. The Styrian branch of the association "Bio Austria", which is the main actor for organic certification, education, and marketing in Austria, is an important promoter of Styria Beef. There are some farmers from the neighbouring federal states of Carinthia and Lower Austria supplying Styria beef. This VC is widespread across the country, and it can be associated with at least 4 additional NUTS3 regions: Östliche Obersteiermark, Oststeiermark, Tiroler West- und Südsteiermark, and Westliche Obersteiermark.

### Key local assets

Since this VC extends throughout the federal state no specific answer can be given. However, Styria beef can be seen as a community since there is exchange among the farmers from the different regions. Further, the "natural landscapes" are a key asset in the marketing of Styria beef. The feeding is used as argument for the special taste of the beef.

### Challenges

Mountain farmers struggle having enough income for their produce – Styria Beef provides in this regard a niche by producing and selling a premium product. Climate change is a challenge for pasture farms mostly regarding biodiversity and logistically because of the prolongation of the summer grazing period. Some alpine pastures are used as ski slopes which is an overall challenge that might change during climate change. An increasing artificial snow infrastructure is a challenge regarding the "beauty" of the landscape.

### Innovation

The invention of "Styria Beef" was a reaction due to the lack of quality beef products in the late 1980s in Austria. Styria beef has not only been representing itself as a new brand but has set new standards regarding animal welfare (suckler cow husbandry) that are now common in mountain farming practices in Austria. Styria beef is one of the first initiative that introduced suckler cow husbandry. Due to the difficult beef market situation in the 1980s Styria Beef was founded as a quality beef brand that did not take long to become an organic brand. The marketing of the product using a set of channels: direct marketing, restaurants, and supermarkets.

## Wines of Kitzek im Sausal, South Styria

The municipality of Kitzek im Sausal is in southern Styria and is the highest wine-growing district in Austria. Well-known wineries have helped the wines from this village to achieve international reputation.

Kitzeck-Sausal is the coolest local appellation in southern Styria and is strongly influenced by the alpine air streams. Most of the vineyards are located at altitudes between 400 and 650 metres above sea level, which creates a unique microclimate.

Reference mountain landscape statistics  
(A: Data from the NUTS2: AT22; B: Data from the NUTS3 AT225)

Reference mountain chain	Kor Alps		
Reference mountain landscape	Kitzeck im Sausal		
Size of the area (km <sup>2</sup> )	16,3	Average per capita income (€)/year	40,000 <sup>A</sup>
Altimetry (m; min-max)	564-671	Total Gross Value Added (GVA) (€ million)/year	5,106 <sup>B</sup>
Population density (Inhabitants/km <sup>2</sup> )	75,45	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	2	Primary:	2.8% <sup>B</sup>
Total bed places (BPs) in tourist accommodations/year:	338	Secondary:	41% <sup>B</sup>
		Tertiary:	56.2% <sup>B</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	118	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	42	Primary:	9.62% <sup>B</sup>
Protected areas	Yes	Secondary:	32.18% <sup>B</sup>
		Tertiary:	50.21% <sup>B</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The fact that Styrian viticulture has now achieved international renown is largely thanks to the STK (Styrian Terroir and Classic Wine Estates) association. The 12 STK wineries, including the Wohlmuth winery in Kitzek, pursue the goal of vinifying wines of unmistakable character and bringing out the typical features of the terroir. Founded in 1986, STK initially stood for fresh, fruity,





and typical white wines. With the classification of the single-vineyard wines, based on the Burgundian system, the premium segment of Styrian growths is now also defined and recognisable by a quality mark: The "STK", which is printed on the capsule or on the label. Many winegrowers from the surrounding villages also have vineyards in neighbouring Slovenia.

### **Key local assets**

Due to its special agricultural charm and the impressive panoramic view, the community became known in the 19th century. Through the development of the area in terms of transport, the improvement of the infrastructure of the village and through determined advertising, it was possible to create a further, economically significant mainstay with tourism.

### **Challenges**

More than 50 % of the cultivated area has a slope of more than 26% and up to 90%. These slopes make viticulture a special challenge, which is why it is often called Styrian Mountain viticulture.

### **Innovation**

In this region, there is a mixture of traditional and innovative approaches. A lot of work is done by hand, and the wines are often made from traditional grape varieties typical for the region. On the other hand, there is a big movement of many winegrowers who have come together to practice natural, organic viticulture and fruit growing. 140 farms from 9 regions throughout Styria participate in the so-called LEADER project. The main innovation is to produce more sustainably to protect the climate and, for example, to use less fertiliser in the crops. The winegrowers also advertise it, which casts an overall positive image on the region.

## 5. Spain

### High quality cork

High quality cork is a specific product of the Mediterranean mountain areas. Cork oak trees have multiple benefits for the social-ecological-system, including carbon sequestration or prevention against erosion and desertification. Additionally, they are considered as part of the cultural heritage of the region. These trees are one of the key elements of the “dehesa” landscape and its corresponding high multifunctionality and diversity.

Hornachuleos surface is part of the “Hornachuelos Natural Park”, the biggest protected area of the province. Its landscape is dominated by Mediterranean forest with holm oaks, cork oaks and undergrowth, in addition to riverside woods of willows, ashes and alders. It also hosts a big diversity of aromatic plants and grass species; and it has high hydrological value, with two reservoirs, El Retortillo and Bembezar, standing within the town's boundaries. Hunting is another important activity of the mountain reference landscape. More than 60% of the area has a slope above 15%.

#### Reference mountain landscape statistics

Reference mountain chain	Sierra Morena		
Reference mountain landscape	Hornachuelos		
Size of the area (km <sup>2</sup> )	585,84	Average per capita income (€)/year	10,437
Altimetry (m; min-max)	144–789	Total Gross Value Added (GVA) (€ million)/year	13,153
Population density (Inhabitants/km <sup>2</sup> )	4.93	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-6.3%	Primary:	10.5%
Total bed places (BPs) in tourist accommodations/year	40	Secondary (including construction):	17.6%
		Tertiary:	71.9%
Road distance from Urban Poles* <sup>1</sup> (km)	46.1	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	308	Primary:	13.8%
Protected areas	Yes	Secondary:	17.1%
		Tertiary:	57.0%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Harvesting requires a traditional generational knowledge. Mules and donkeys are mostly used to carry the cork to the warehouse. There are limited transformation plants in the mountain reference region, which means that the region loses the value added associated with the transformation of the raw material. Portugal is the key destination for the export of the raw material. This VC is present all along Sierra Morena, in Seville, Huelva, Jaén and Córdoba provinces.

### **Key local assets**

The VC relies on cork trees and the Iberic Peninsula hosts the biggest densities of them (surface in Spain between 400000 and 500000 ha.). These trees produce after 30 years a layer of cork, but not the one that can be used as a cork product, but for being used as bonded material. After another 9 years, a new layer will be grown and called "secundero o refugo", and finally 9 years later, the first cork can be harvested. The cork oak trees play an important role in the regional sustainability as they capture CO<sub>2</sub>, maintain the soils from the erosion and desertification and host great biodiversity. The harvest technique is ancient, and the knowledge is transmitted through generations. The loss of generational replacement is causing a loss of knowledge, especially in cork extraction techniques, which puts the sustainability of the value chain at risk.

### **Challenges**

The cork oak is an economic engine in rural areas with a significant lack of regular employment and at risk of depopulation. The improvement of the value chain through the support of digitalisation and the identification of vulnerability risks to make adaptation decisions is fundamental for the sustainability of this VC. Some specific challenges are the followings: new materials that compete with cork (plastic lids, synthetic porous materials, wax); reduced number of employees and lack of capacity building for the workers; plant diseases that attack the cork trees and hamper the cork production (e.x., Phytophthora); integrating the transformation process of the raw material in the region; stationarity of the harvest and the need to use mules for the work due to the land characteristics (accessibility and slope). In addition, these trees do not start being productive until they reach almost 50 years.

### **Innovation**

The cork value chain is a traditional one, where no innovations have been identified.

## Leather handcraft

High quality leather products made with traditional methods in family businesses. This is one of the historical craftsmanship of the region. It is characterised by small producers and artisans. It is characterised by small producers and artisans. In the region there are leather tanneries and craftspeople who transform the tanned leather into goods.

Montoro is an agricultural municipality and olive grove constitutes the main source of income for its households. The surroundings of the urban settlements are dominated by olive plantations that cover around the 80% of the cultivated area. In addition, this territory hosts the Iberian Lynx, the most endangered feline of the world. More than 60% of the area has a slope above 15%.

### Reference mountain landscape statistics

Reference mountain chain		Sierra Morena	
Reference mountain landscape		Montoro	
Size of the area (km <sup>2</sup> )	585.84	Average per capita income (€)/year	11,444
Altimetry (m; min-max)	144–789	Total Gross Value Added (GVA) (€ million)/year	13,153
Population density (Inhabitants/km <sup>2</sup> )	15.86	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-6.30%	Primary:	10.5%
Total bed places (BPs) in tourist accommodations/year:	141	Secondary (including construction):	17.6%
		Tertiary:	71.9%
Road distance from Urban Poles* <sup>1</sup> (km)	42.6	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	1,202	Primary:	13.8%
Protected areas	Yes	Secondary:	17.1%
		Tertiary:	57.0%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

In the region of Los Pedroches there is an association of artisans (OFIARPE). The quality and reputation of this product is an aspect based on its long history, a long path of knowledge transfer and improvements along generations. The skin comes mostly from goat, pigs and, especially

cows. In addition, hunting species are also used for certain works. This VC is present in other regions of Spain and MRLs within Sierra Morena: Cardeña, El Viso, Peñarroya-Pueblonuevo, Cortelazor, La Carolina.

### **Key local assets**

As an historical craftsmanship, leather crafts are part of the cultural heritage of the region and the knowledge about this work represents a cultural asset. In addition, the leather itself comes from animals that are mostly grazed in the region, and from hunting species.

### **Challenges**

Key challenges of this VC are related to:

- Access to the markets.
- Compete with industrial products and globalised markets.
- Loss of traditional knowledge.

### **Innovation**

The innovation comes mostly with new products as the activity is diversifying and producing all kind of leather goods. In addition, in most cases, the artisans have started e-commerce platforms and websites to sell their products. In the past they used to produce leather products associated with hunting and bull fighting activities (Hunting boots, etc.). Nowadays, the production has widened to everyday goods such as bags, wallets, all kinds of shoes, watch straps, etc. In addition, starting with e-commerce strategies is a way to get access to new markets.

## Anea (Bulrush) handcraft chairs and baskets

This VC relates to natural resources of the region, the bulrush. This is a traditional VC that once was very popular and now is under threat of extinction.

Galaroza is located at the core of the Sierra de Aracena y Picos de Aroche Natural Park. Its main production is wood furniture. The region is covered by a dense mediterranean forest and dehesas. In the higher areas, the holm oaks are substituted by the cork oaks and then by the pyrenean oaks and chesnut trees. The area has high precipitation rates with mild temperatures.

### Reference mountain landscape statistics

Reference mountain chain	Sierra Morena		
Reference mountain landscape	Galaroza		
Size of the area (km <sup>2</sup> )	22.13	Average per capita income (€)/year	9,572
Altimetry (m; min-max)	490–830	Total Gross Value Added (GVA) (€ million)/year	9,599
Population density (Inhabitants/km <sup>2</sup> )	61.95	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-13.9%	Primary:	8.3%
Total bed places (BPs) in tourist accommodations/year:	16	Secondary (including construction):	27.5%
		Tertiary:	64.2%
Road distance from Urban Poles* <sup>1</sup> (km)	96.8	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	100	Primary:	17.3%
Protected areas	Yes	Secondary:	13.9%
		Tertiary:	68.8%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The key activities are the harvest of the Bulrush, and the artisan work with it; first to prepare the material and then to build the chairs and baskets. As a natural product it is quite sustainable as it grows naturally in the region and in other river basins of the country. The production is carried out by individual artisans that learnt the method from their parents.

## Key local assets



The local natural asset is the Bulrush leave that grow in the river basins and besides the water bodies. The VC is sustained on the knowledge of the artisans and the product is part of the cultural heritage of the region.

### **Challenges**

Abandonment of traditional craftsmanship with the associated loss of knowledge. The challenge is to energise this activity and develop it to be sustainable in our times. Otherwise, it will disappear.

### **Innovation**

The innovation comes mostly with new products as the activity is diversifying and producing all kind of leather goods. In addition, in most cases, the artisans have started e-commerce platforms and websites to sell their products. In the past they used to produce leather products associated with hunting and bull fighting activities (Hunting boots, etc.). Nowadays, the production has widened to everyday goods such as bags, wallets, all kinds of shoes, watch straps, etc. In addition, starting with e-commerce strategies is a way to get access to new markets.

## Traditional local sweets and pastries

High quality products that have become part of the traditional recipes of the region. The use of local products from the mountain characterises their taste.

The Andújar is crossed by the Guadalquivir river in its southern edge. The south of it presents an agricultural landscape dominated by olive plantations. Moving towards the north, the dehesa landscape begins where the landscape turns hillier getting into the Natural Park, where some pyrenean oak patches appear in the upper altitudes. The fauna is very diverse, hosting many emblematic species, among which the Iberian lynx stands out.

### Reference mountain landscape statistics

Reference mountain chain		Sierra Morena	
Reference mountain landscape		Andújar	
Size of the area (km <sup>2</sup> )	964.33	Average per capita income (€)/year	13,566
Altimetry (m; min-max)	200–1283	Total Gross Value Added (GVA) (€ million)/year	10,686
Population density (Inhabitants/km <sup>2</sup> )	37.97	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-6.5%	Primary:	14.9%
Total bed places (BPs) in tourist accommodations/year:	263	Secondary (including construction):	20.0%
		Tertiary:	73.5%
Road distance from Urban Poles* <sup>1</sup> (km)	41.8	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	1,180	Primary:	9.4%
Protected areas	Yes	Secondary:	16.4%
		Tertiary:	74.1%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The sweets are mostly produced in small bakeries along the municipalities of Sierra Morena. In some cases, the quality is guaranteed using certified products such as PDO or organic olive oil, and other local products. However, the quality is mostly guaranteed by the baker. The singularity of this VC is the use of traditional ingredients that come from the natural ecosystems and diverse traditional VCs (olive oil, nuts, honey, herbs, liquors or wine, pig fat).



### **Key local assets**

Most of the recipes include the use of local traditional products both wild and elaborated such as wine and liquors, olive oil, aromatic herbs and spices or nuts that come from the Mediterranean forest that dominate the area. Cultural assets linked to traditional recipes and their connection with specific cultural festivities (easter, Christmas or others) are also significant. The VC is present all along Sierra Morena: Huelva, Sevilla, Córdoba and Jaén.

### **Challenges**

To maintain its connection with the local social-ecological-system by using local ingredients. Another challenge may be keeping the bakeries profitable if depopulation rates persist over time.

### **Innovation**

The local sweet and pastries value chain is a traditional one, where no innovations have been identified.

## La Troje seeds

This VC related to the production and reproduction of local varieties of seeds, which are the result of multiple generations of farmers using these varieties along the mountain range. This activity is supported by the breeding of endogenous vegetables and fruit trees. All the activities are carried out under the framework of agroecology and represent a support for local economies.

Located in the Northern Sierra, its main activity in the past was used to be related to livestock (being grazed in the open forests "dehesas" of oaks and ash trees). Within the MRL there is a part of the water reservoir of el Atazar that is visited by many citizens from the area and Madrid city during summer to enjoy a bath.

### Reference mountain landscape statistics

Reference mountain chain		Sierra del Guadarrama	
Reference mountain landscape		El Berrueco	
Size of the area (km <sup>2</sup> )	28.43	Average per capita income (€)/year	14,858
Altimetry (m; min-max)	830–1164	Total Gross Value Added (GVA) (€ million)/year	18,458
Population density (Inhabitants/km <sup>2</sup> )	27.33	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	28.42%	Primary:	0.25%
Total bed places (BPs) in tourist accommodations/year:	539	Secondary (including construction):	25.9%
		Tertiary:	73.8%
Road distance from Urban Poles* <sup>1</sup> (km)	66.3	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	16	Primary:	0.66%
Protected areas	Yes	Secondary:	25.0%
		Tertiary:	75.0%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The cooperative La Troje is the main actor but cannot be seen isolated from the network in which they operate (from residents of the area to other organisations, research institutions and municipalities). Their impact on the social-ecological-system comes with the promotion and use of local varieties that enhance the knowledge on local food production and they are normally less

dependent on external inputs (as they are adapted to local conditions), making the system more resilient.

### **Key local assets**

The natural assets are the seeds and plants they produce that are product of an evolution over generations of farmers that have used them in this region. Therefore, the local traditional knowledge plays an important role in this VC. Regarding the social assets, they are part of 19 initiatives and networks that work on creating and spreading knowledge on agroecology. These can be from research initiatives to grass roots activism or policy-oriented working together with research institutes, civil organisations, and municipalities.

### **Challenges**

Key challenges for this VC are:

- The loss of endemic varieties that cannot be retrieved anymore.
- The climate change causing rapid changes in the local conditions that may hamper the efficacy of these seeds.
- The policies that regulate the seed trade and production.
- The access to markets and the dominance of commercial varieties of seeds.
- The change on diets that leave aside many traditional vegetables and do not attend to seasonality.

### **Innovation**

Plant breeding is not an innovative activity nor are the varieties or techniques that they are using. However, the innovation comes with the multidisciplinary of this association. They breed local varieties in collaboration with local experts, putting in value the local and traditional ecological knowledge. In addition, they give courses on various topics related to gardening (from seedling to composting). They distribute their own products to keep the direct relationship with the consumers or they sell at small stores that share their principles. They are a cooperative that works to build regional networks of agroecology.

## Chestnut products

The Chestnut VC is characterized by high quality products connected with the natural ecosystem, the chestnut forest. The raw product is commercialised in the national market and exported to USA, Canada, and Eastern Europe.

Galaroza is located at the core of the Sierra de Aracena y Picos de Aroche Natural Park. Its main production is wood furniture. The region is covered by a dense mediterranean forest and dehesas. In the higher areas, the holm oaks are substituted by the cork oaks and then by the pyrenean oaks and chesnut trees. The area has high precipitation rates with mild temperatures.

### Reference mountain landscape statistics

Reference mountain chain		Sierra Morena	
Reference mountain landscape		Galaroza	
Size of the area (km <sup>2</sup> )	22.13	Average per capita income (€)/year	9,572
Altimetry (m; min-max)	490–830	Total Gross Value Added (GVA) (€ million)/year	9,599
Population density (Inhabitants/km <sup>2</sup> )	61.95	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-13.9%	Primary:	8.3%
Total bed places (BPs) in tourist accommodations/year:	16	Secondary (including construction):	27.5%
		Tertiary:	64.2%
Road distance from Urban Poles* <sup>1</sup> (km)	96.8	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	100	Primary:	17.3%
Protected areas	Yes	Secondary:	13.9%
		Tertiary:	68.8%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The chestnuts have the organic certification and in Galaroza are harvested, manipulated, and packed in a big plant to be sold to big retailers. The innovation is related to the preparation plant that is equipped with modern technology, merging a traditional product with novel technologies.

Within the region, other small companies are innovating in the product, transforming the chestnuts into jam, flour, and other elaborated products.

The chestnut is a wild product traditionally used in many dishes. Nowadays its use has been reduced significantly in the cuisine. However, the product has high nutritious value and possibilities of transformation (flour, jam, bakery sweets). In this MRL we can find a company that produces organic chestnuts (harvested from natural forest), clean them, and prepare them to be sold within the country and abroad (USA, Canada, and Eastern Europe). The organic certificate is given by the Andalusian Committee of Organic Agriculture. This VC is also present in Castaño del Robledo.

### **Key local assets**

There are around 5000 ha of chestnut forest in the Sierra de Aracena y Picos de Aroche Natural Park. Among them there are 5 varieties of chestnut. They are ancient trees that produce high volumes of chestnuts every year.

### **Challenges**

The main challenge for this VC is represented by the need to move beyond the raw product, innovating with it and adding value to it.

### **Innovation**

Two key innovations have been identified in this VC:

- New processes linked to the fruit selection, packaging and the sale and marketing.
- The presence of small companies selling elaborated products based on chestnuts.

## Jacetania Bread

This VC is characterized by high reputed product made with artisanal methods. The Jacetania bread is part of the cultural heritage of the region.

Ansó is in the valley of the Veral river, in the occidental part of the Pyrenees. Surrounded by mountain and sharp valleys, its boundaries touch France in the north, where the municipality border covers an extense longitudinal area along the Pyrenees' limits with France.

### Reference mountain landscape statistics

Reference mountain chain	Pyrenees		
Reference mountain landscape	Ansó		
Size of the area (km <sup>2</sup> )	224	Average per capita income (€)/year	11,807
Altimetry (m; min-max)	765–2640	Total Gross Value Added (GVA) (€ million)/year	5,551
Population density (Inhabitants/km <sup>2</sup> )	1.72	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-21.4%	Primary:	15.0%
Total bed places (BPs) in tourist accommodations/year:	674	Secondary (including construction):	21.6%
		Tertiary:	63.4%
Road distance from Urban Poles* <sup>1</sup> (km)	52	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	25	Primary:	13.4%
Protected areas	Yes	Secondary:	25.0%
		Tertiary:	61.5%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

This VC is associated with traditional bakeries. As mentioned before, the techniques that each baker uses are legacies from a century of bread making in each locality. The ovens work with fire, giving to the bread a special flavour and consistency. They are simply made with sour dough, water, flour (of different cereals) and salt. The specificity of each of them comes with the bread-making legacy of the family or locality. In most cases, the sales stay within the municipality. Normally there is a bakery in the principal settlement and then the baker delivers them in a small

truck to houses, restaurants, and small stores in the surrounding villages. The VC is present in many municipalities of the region such as Bailo, Canal de Berdún or Santa Cilia.

### **Key local assets**

As in the beginning of the last century there was a communal wood oven in each locality, every person of the town was involved in the bread making. While women were making the doughs at home, one specific person oversaw the baking. This changed with the civil war, as the army wanted those who were baking to become official bakers at the army. Today, this knowledge passes from parents to children or from masters to apprentices, keeping recipes with singularities of each locality. In fact, each family used to "label" their bread with a personal touch by marking or printing or shaping the dough in a singular manner before cooking it.

### **Challenges**

This VC is strongly threatened by rural depopulation the VC is losing customers as the bread is mostly sold in the proximity market. In addition, the industrial bread at supermarkets and food stores is a competitor.

### **Innovation**

The local sweet and pastries value chain is a traditional one, where no innovations have been identified.

## Lamb production - Cooperativa Ganadera del Valle de los Pedroches (COVAP)

High quality products with high reputation in national and international markets. COVAP is a cooperative of producers of animal products. It is connected to the social-ecological-system as the sheep graze in the dehesas of the region.

Pozoblanco is the biggest and the most populated municipality of the northern area of Córdoba (NUTS3), and the capital of Los Pedroches region. The landscape is similar along the region, dominated by extense dehesas of holm oak and cork oak used for extensive livestock.

### Reference mountain landscape statistics

Reference mountain chain		Sierra Morena	
Reference mountain landscape		Pozoblanco	
Size of the area (km <sup>2</sup> )	329.8	Average per capita income (€)/year	15,648
Altimetry (m; min-max)	280-726	Total Gross Value Added (GVA) (€ million)/year	13,153
Population density (Inhabitants/km <sup>2</sup> )	52.2	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-3.3%	Primary:	10.5%
Total bed places (BPs) in tourist accommodations/year:	181	Secondary (including construction):	17.6%
		Tertiary:	71.9%
Road distance from Urban Poles* <sup>1</sup> (km)	70.6	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	779	Primary:	13.8%
Protected areas	Yes	Secondary:	17.1%
		Tertiary:	57.0%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

COVAP is one of the biggest Spanish cooperatives with 4500 livestock partners, located in Los Pedroches region, in Sierra Morena. It counts with 789 meat sheep farms of the breed merina. The cooperative is the key actor, which includes the producers, workers related to the feeding products, workers of the slaughterhouses, lab technicians, inspectors, administrators, and



commercials. Simultaneously, while the activity is totally dependent on the dehesa ecosystem, it could harm it if overgrazing occurs. The VC is present in other provinces of Sierra Morena such as Seville and Huelva. In addition, it is present in all the municipalities of Los Pedroches region in Cordoba: Alcaracejos, Añora, Belalcazar, Belmez, Cardeña, Conquista, Dos Torres, El Guijo, El Viso, Espiel, Fuente Obejuna, Hinojosa del Duque, La Granjuela, Los Blazquez, Pedroche, Peñarroya- Pueblonuevo, Pozoblanco, Santa Eufemia, Torrecampo, Valsequillo, Villanueva de Córdoba, Villanueva del Rey, Villanueva del Duque.

### **Key local assets**

The natural asset is the dehesa ecosystem and landscape. The social asset is very important in this case as it is a cooperative scheme that has control over all the stages of the VC; it gives support to the producers, and it facilitates the commercialisation. Lastly, the cultural aspect is again integrated in the practices, a cultural heritage resulting from a long tradition of livestock management in dehesa ecosystems.

### **Challenges**

The key challenges for this VC relate to:

- Keep growing in the international markets.
- Keep energising the livestock industry in the region to maintain the production while avoiding overgrazing.

### **Innovation**

The innovation is that the cooperative coins every part of the value chain, from the animal production, feeding products, slaughter and transformation, and commercialisation. It works together with researchers to control and improve the quality. It is the one of the few slaughterhouses and transformation centres in Spain certified to export meat to the United States. In addition, the installations of the slaughterhouse are certified to produce organic and halal meat. There is also an e-commerce platform in their website. Future innovation might be referred to:

- New processes in terms of covering all the meat industry processes within their cooperative, including the laboratory analysis.
- New marketing strategies because of the export-oriented approach and the possible certifications.

## Organic Iberian goose

This VC represents a successful innovative product in the region, and diversification in the VCs traditionally associated with the dehesas.

The urban settlement of Constantina is declared Good of Cultural Interest for its historical heritage and architecture. The temperatures are mild with high rates of precipitations for the region. The landscape is dominated by Mediterranean forest and dehesa landscapes (holm oaks and cork oaks mostly).

### Reference mountain landscape statistics

Reference mountain chain	Sierra Morena		
Reference mountain landscape	Constantina		
Size of the area (km <sup>2</sup> )	481.6	Average per capita income (€)/year	12,434
Altimetry (m; min-max)	85-903	Total Gross Value Added (GVA) (€ million)/year	35,778
Population density (Inhabitants/km <sup>2</sup> )	12.2	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-11.0%	Primary:	5.34%
Total bed places (BPs) in tourist accommodations/year:	0	Secondary (including construction):	20.7%
		Tertiary:	73.9%
Road distance from Urban Poles* <sup>1</sup> (km)	72.6	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	357	Primary:	5.9%
Protected areas	Yes	Secondary:	17.4%
		Tertiary:	76.7%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Ganso Ibérico (Iberian Goose) is the only company producing goose in the dehesa. The farm has a field of 1500 ha of dehesa where the geese live freely in plots of 200 ha that they rotate to maintain the grass. Their product has the organic certification. They import the goose chicks from France when they have less than 2 days of age. The breeds they use are Toulouse and Embdem. They work with batches of 2000 geese and their total production goes beyond the 9000 animals per year. They sell eggs, raw meat, and some elaborated products mostly to restaurants and gourmet stores. Most of their production is exported outside Spain (around the 80% in 2013).

### **Key local assets**

The specificity of this product is the landscape where it is placed. It is the only goose production located in the dehesa (open holm oak forest) with an extensive regime. The physical activity of the geese in the land together with the consumption of acorns makes of this product something unique.

### **Challenges**

Key challenges for this VC can be related to the access to international markets where the goose consumption is more common than in Spain.

### **Innovation**

This VC is about breeding of goose in the dehesa ecosystem to produce goose meat and eggs. The area is on the route of migratory geese. So, back in 2010, the producer thought that it would be also adequate to breed geese in this area with market purposes. Still today there is only one company producing goose products in the dehesa. Not only they sell the eggs and the meat, but they also cure the meat to produce a sausage with high densities of oleic acids caused using acorns in their diets, like the iberian ham.

## Iberian Ham (Jamón Ibérico) Protected Designation of Origin (PDO) - Los Pedroches

High quality product with great embeddedness in the dehesa social-ecological-system. The PDO represents quality assurance and territorial identity of the product. The Iberian ham is one of the significant traditional food products nationwide. This VC is a key element for the sustainability of dehesa ecosystem.

Pozoblanco is the biggest and the most populated municipality of the northern area of Córdoba (NUTS3), and the capital of Los Pedroches region. The landscape is similar along the region, dominated by extensive dehesas of holm oak and cork oak used for extensive livestock.

### Reference mountain landscape statistics

Reference mountain chain		Sierra Morena	
Reference mountain landscape		Pozoblanco	
Size of the area (km <sup>2</sup> )	329.8	Average per capita income (€)/year	15,648
Altimetry (m; min-max)	280-726	Total Gross Value Added (GVA) (€ million)/year	13,153
Population density (Inhabitants/km <sup>2</sup> )	52.2	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-3.3%	Primary:	10.5%
Total bed places (BPs) in tourist accommodations/year:	181	Secondary (including construction):	17.6%
		Tertiary:	71.9%
Road distance from Urban Poles* <sup>1</sup> (km)	70.6	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	779	Primary:	13.8%
Protected areas	Yes	Secondary:	17.1%
		Tertiary:	57.0%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

To be labelled as PDO Los Pedroches, the pigs must be at least 75% Iberian breed and must graze extensively in the dehesa within the area of Los Pedroches with a maximum density of 12 pigs per hectare. There are three types of labels (black, red, and green), indicating the % of Iberian breed (75% or 100%) and the type of feeding (acorns/natural pastures or cereals/legumes). Being

completely embedded in the High Nature Value (HNV) dehesa ecosystem, the quality of the final product depends on the wellbeing of the landscape. The VC is present in the following municipalities: Alcaracejos, Añora, Belalcazar, Belmez, Cardeña, Conquista, Dos Torres, El Guijo, El Viso, Espiel, Fuente Obejuna, Hinojosa del Duque, La Granjuela, Los Blazquez, Pedroche, Peñarroya- Pueblonuevo, Pozoblanco, Santa Eufemia, Torrecampo, Valsequillo, Villanueva de Córdoba, Villanueva del Rey, Villanueva del Duque.

### **Key local assets**

The dehesa is a highly anthropized ecosystem (combining livestock, forestry, and agricultural production), but at the same time with a very high exosystemic richness. The management of the dehesa is a cultural heritage highly rooted in the territory and the basis for its sustainability.

### **Challenges**

Key challenges for this VC are related to:

- Increasing the recognition of the Spanish Iberian ham, and positioning it on international markets
- High density of animals in some farms that may harm the dehesa ecosystem.
- Fungus *Phytophthora* that attacks holm and cork oaks, which are the two main tree species in the dehesa ecosystem.
- Digitalisation, from the use of remote sensors to control the number of animals (carrying capacity) to infrared systems to guarantee the origin and quality level of the product (cebo, recebo, acorn). Digitalisation can play a fundamental role in controlling the traceability of the product as a guarantee of its quality. The sustainability of the dehesa, the basis of this value chain, is also supported by digitalisation, with early detection systems for pests and diseases or acorn harvesting forecasting based on remote sensors.

### **Innovation**

The main innovation of this VC is the use of e-commerce for their sales. In addition, they have one of the few meat processing plants that certified to export to USA. E-commerce and processing plants to enhance their marketing strategies and to access the international markets.

## Protected Geographical Indication (PGI) beef

The PGI Guadarrama is a quality certification linked to the Guadarrama Mountain Region. It consists of an extensive cow feeding in natural mountain pastures until they reach the fattening stage. The certification links the mountain range with a high-quality meat with proper traceability.

Colmenar Viejo is in the transition from the peri urban area of Madrid city into the Guadarrama Mountain region. It is dominated by open forests of oaks (dehesas) and a hilly landscape. The main urban settlement has grown recently due to its proximity and good communication with Madrid city via road or train.

### Reference mountain landscape statistics

Reference mountain chain		Sierra Guadarrama	
Reference mountain landscape		Colmenar Viejo	
Size of the area (km <sup>2</sup> )	182.9	Average per capita income (€)/year	18,300
Altimetry (m; min-max)	600-1423	Total Gross Value Added (GVA) (€)/year	1.118.032
Population density (Inhabitants/km <sup>2</sup> )	283.85	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	16.8%	Primary:	1.1%
Total bed places (BPs) in tourist accommodations/year:	153	Secondary (including construction):	25.7%
		Tertiary:	73.2%
Road distance from Urban Poles* <sup>1</sup> (km)	32.9	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	173	Primary:	1.5%
Protected areas	Yes	Secondary:	21.53%
		Tertiary:	76.9%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The VC includes the farmers and the associated slaughterhouses and selling points. It is mandatory to breed limousine, charoles or avileña (and autochthonous breed from the region) cows to be part of the certification. They must graze in natural pastures and the calves must drink milk from their mothers during the first 6/7 months. The slaughter occurs between the 12th and

18th months. The use of any kind of growing or fattening hormone is forbidden. The potential negative impact is the overgrazing in some plots. However, as most of the extension of the PGI belongs to protected areas, this aspect is controlled. Another important element of this VC is the mechanism of control and labelling conducted by the certification organism (Indicación Geográfica Protegida «Carne de la Sierra de Guadarrama»). The breed can take place only in the territories described by the PGI, but the slaughtering and product elaboration can take place all along Madrid region. The territories for the PGI include around 80 municipalities within Madrid Region, being most of them, but not all, located in mountain areas.

### **Key local assets**

The PGI beef must come from cows fed by natural pastures until the fattening stage. Thus, it is vital to keep the quality of those pastures. In addition, those landscapes as an outcome of the co-evolutionary process between natural ecosystems and human practices, have a huge cultural significance. For many people, they are an important element of their personal identity.

### **Challenges**

Key challenges for this VC relate to markets assess and the competition with meats that come from intensive farming and global markets.

### **Innovation**

The local sweet and pastries value chain is a traditional one, where no innovations have been identified.

## Andalusian white goats

There is a successful registration of a quality scheme that aims to retrieve Spanish autochthonous breeds. The Andalusian white goat is an endangered breed. It is adapted to meridional mountain areas, specially to the Andalusian Mountain ranges where it grazes extensively producing various ecosystem services.

Aroche is in the occidental edge of the Natural Park. The landscape is a mosaic of dehesas and pastures with hilly geography intertwined with forests of holm and cork oaks and chestnuts. It represents an ideal ecosystem for extensive grazers. Consequently, in this MRL, the Iberian pig is also very relevant. train.

### Reference mountain landscape statistics

Reference mountain chain		Sierra Morena	
Reference mountain landscape		Aroche	
Size of the area (km <sup>2</sup> )	894.4	Average per capita income (€)/year	14,145
Altimetry (m; min-max)	420-507	Total Gross Value Added (GVA) (€)/year	9,599
Population density (Inhabitants/km <sup>2</sup> )	48.7	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	6.7%	Primary:	8.3%
Total bed places (BPs) in tourist accommodations/year:	251	Secondary (including construction):	27.4%
		Tertiary:	64.2%
Road distance from Urban Poles* <sup>1</sup> (km)	97.1	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	351	Primary:	17.3%
Protected areas	Yes	Secondary:	13.9%
		Tertiary:	68.8%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The average size of the herds is of 176 animals. This breed is focused on meat production, marketing milky goats. The quality is certified with the label 100% Autochthonous breed under the supervision of the Asociación Nacional de Criadores de Ganado Caprino de Raza Blanca Andaluza (ABLANSE) (National Association of Andalusian White Breed Goat Breeders). In addition, the 49% of the productions have the organic certification. The main impact of this VC is



transforming ecosystems with high density of bushes, which prevents an over naturalization of forests. Consequently, it works for the fire prevention as these areas are highly prone to summer fires when there is too much woody biomass. In addition, the herd improves the soil structure and quality as well as acting as seed disseminator. This VC is also present in other MRLs such as Fuente Obejuna, Alanís, Cazalla de la Sierra, Castillo de las Guardas, Alájar, Cumbres Mayores, Encinasola, Villaviciosa de Córdoba.

### **Key local assets**

The breed is adapted to steep mountain areas with difficult access, especially the Mediterranean mountains. In fact, around 61% of the herds graze inside protected areas. The 46% graze in communal pastures, where they deliver multiple services. Finally, the breeding practices have a long history of interaction with these lands, adding a strong cultural value to this VC.

### **Challenges**

Key challenges for this VC relate to:

- To retrieve the population of this breed
- To fight against rural depopulation and the loss of traditional practices by maintaining and nurturing shepherd practices and by making this VC more suitable with modern life (83% of the shepherds are above 40 years old)
- To improve their market position, increasing the sales and prices to make the VC more profitable.

### **Innovation**

The local sweet and pastries value chain is a traditional one, where no innovations have been identified.

## Guadarrama goats

This is an autochthonous goat breed with public ownership. The herd is owned by the municipality of El Boalo. The herd grazes in the natural mountain pastures of the region, generating numerous ecological benefits, especially in relation to fire prevention.

El Boalo belongs to the TERRAE Network. This is a national network of municipalities that use the principles of the Agroecology as values and basis for their development. Therefore, they aim for a sustainable future for their municipalities, with special attention to food chains and social cohesion.

### Reference mountain landscape statistics

Reference mountain chain		Sierra del Guadarrama	
Reference mountain landscape		El Boalo	
Size of the area (km <sup>2</sup> )	40.1	Average per capita income (€)/year	18,555
Altimetry (m; min-max)	930-2,227	Total Gross Value Added (GVA) (€)/year	111,602
Population density (Inhabitants/km <sup>2</sup> )	190.95	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	15.4%	Primary:	1.2%
Total bed places (BPs) in tourist accommodations/year:	101	Secondary (including construction):	19.9%
		Tertiary:	78.8%
Road distance from Urban Poles* <sup>1</sup> (km)	55.3	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	37	Primary:	1.4%
Protected areas	Yes	Secondary:	23.3%
		Tertiary:	72.2%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The goats produce various values. On one side, the milky goats are sold for cooking traditional dishes. In addition, it serves as touristic asset as the activity is also promoted by the administration of the Guadarrama National Park. There are some conflicts with the other livestock producers of the area in the use of common lands. Also, the neighbours of the municipality play a role because they live with the herd, so they must agree with its presence as a public asset. Regarding the connection with the social-ecological-system, the herd generates multiple benefits and ecosystem

services (e.g., fire prevention, cleaning the public land of bushes, composting, cultural asset, and a potential profitable activity).

### **Key local assets**

Guadarrama goat breed is an endemic and threatened breed. The herd grazes in mountain pastures, contributing to the land maintenance. In addition, the local promotion of this herd reinforces the identity of this mountain region, connecting people, places, and practices.

### **Challenges**

Key challenges for this VC relate to:

- Abandonment of traditional practices and jobs (shepherd) due to societal and structural changes (demography, modern lifestyle, global markets, competitiveness, etc.)
- 2) Economic profitability
- Conflicts with livestock producers in getting access to natural resources (those producers consider the herd as a recreational activity and less important than their meat businesses)
- Finding an interested group of people that may take care of the herd.

### **Innovation**

Extensive grazing is not an innovative practice, but the public character of this herd, owned by the municipality, is an innovative governance system. However, due to complications in the management and conflicts with some neighbours and other producers, they are currently looking for interested people to take care of the herd. In addition, this activity is used to develop the School of Shepherds that take place every year with this herd. Finally, the herd is a touristic asset with the initiative "Shepherd the goat" launched by the municipality of El Boalo. The ownership of the herd is quite special, being the municipality who oversees the expenses and the management of the whole activity. In addition, adding value to this traditional activity with the School of Shepherds and the touristic packages is an innovation in the value chain of small-scale goat production.

## Spanish fighting bull (Toro de Lidia)

Toro de Lidia is a VC with high reputation and relates to the cultural heritage and traditions of the region. It is unique in Europe for the product itself and the cultural load that it carries. The bull fighting breeding occupies thousands of hectares of dehesa in the province of Jaen. Nowadays, bull-related tourism is perceived by some farmers and administration as a promising asset for the region.

La Carolina is the natural entrance to Andalusia region through the Despeñaperros Natural Park. The surface is covered by extensive olive groves along with abundant pastures and mid-mountain areas with pines and holm oaks.

### Reference mountain landscape statistics

Reference mountain chain		Sierra Morena	
Reference mountain landscape		La Carolina	
Size of the area (km <sup>2</sup> )	201.2	Average per capita income (€)/year	14,648
Altimetry (m; min-max)	423-1,293	Total Gross Value Added (GVA) (€)/year	10,686
Population density (Inhabitants/km <sup>2</sup> )	75.34	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-4.7%	Primary:	14.9%
Total bed places (BPs) in tourist accommodations/year:	280	Secondary (including construction):	17.6%
		Tertiary:	67.5%
Road distance from Urban Poles* <sup>1</sup> (km)	65.1	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	316	Primary:	17.1%
Protected areas	Yes	Secondary:	18.2%
		Tertiary:	55.7%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The extension of these farms is of thousands of hectares around the region. The quality is guaranteed by the National Association of Lidia Livestock Farms (Asociación Nacional de

Ganaderías de Lidia), with more than 400 associated farms, from which 27 are in the province of Jaén. The activity is highly related to the dehesa ecosystem, the natural habitat of the bull in Spain. Therefore, many claim the role of this livestock in the conservation of the dehesa. This VC is present in many areas of Sierra Morena, but we will put the focus on Jaén as it is the province with the highest number of bulls fighting breeding farms in Andalusia region. Within the province, this VC can be found in the following municipalities within Sierra Morena: Aldequemada, Bailén, Baños de la Encina, Carboneros, Guarromán, Jabalquinto, La Carolina, Linares, and Santa Elena.

### **Key local assets**

Apart from the bulls, the dehesa is the main natural asset linked to the VC. It is the natural habitat for the bull. In addition, this VC has an enormous cultural load for its supporters and practitioners.

### **Challenges**

The decrease in popularity and recognition of bull fighting can threaten the breeding because the value of the bulls in the slaughterhouses is not profitable enough. Therefore, nowadays the prosperity of this VC relies upon bull fighting.

### **Innovation**

The innovation is the added value of tourism through bull livestock in the region. Apart from the bulls, now many producers offer visits and accommodation in the farms. With this, they are also fostering a change in the idea towards this practice by letting visitors know how the livestock is cattle and maintained.

## Cheese from Picos de Europa

With four PDOs and two PGIs, this is the region with highest density of quality certifications in cheesemaking in Europe. The cattle graze in common mountain pastures within the National Park and the surroundings. The cheeses are part of the cultural heritage of the region and an important touristic asset.

Cabrales is fully integrated in Picos de Europa. It has a high mountain geography with multiple peaks above the 2000 meters. Many of its land is bare rock and more than 70% of its surface has slope above 35%. However, there are also areas of mild relief mountain pastures where the cattle are grazed. The climate is temperate and humid (average temperature/year 12°C and 1700mm of precipitation).

### Reference mountain landscape statistics

Reference mountain chain		Picos de Europa	
Reference mountain landscape		Cabrales	
Size of the area (km <sup>2</sup> )	238.3	Average per capita income (€)/year	14,776
Altimetry (m; min-max)	130-2,650	Total Gross Value Added (GVA) (€)/year	21,555
Population density (Inhabitants/km <sup>2</sup> )	8.15	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-13.8%	Primary:	1.4%
Total bed places (BPs) in tourist accommodations/year:	2,960	Secondary (including construction):	27.1%
		Tertiary:	71.4%
Road distance from Urban Poles* <sup>1</sup> (km)	102	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	174	Primary:	4.1%
Protected areas	Yes	Secondary:	19.8%
		Tertiary:	76.1%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

There are 6 main different kind of cheeses in the area, shared by three provinces (NUTS2). The blue cheeses from this region stand out nationwide and even competing in international cheese awards. The quality is certified by the four PDOs and two PGIs. As mentioned above, this cheese

is highly linked to the social-ecological-system, being produced by the milk of the animals that graze in common mountain pastures, maintaining this symbolic element of the regional landscape. In addition, the caves have been used for many generations to cure and keep the cheese, giving them a special flavour. This VC is present in the following municipalities: Cabrales, Peñamellera Alta, Cangas de Onís, Onís, Amieva, Ponga, Cabezón de Liébana, Camaleño, Cillórigo de Liébana, Peñarrubia, Pesaguero, Potes, Tresviso, Vega de Liébana, Posada de Valdeón, Oseja de Sajambre.

### **Key local assets**

A key element of this VC is the mountain pasture of Picos de Europa where the cattle (cow, goats and sheeps) graze freely. The farming activity and the cheesemaking are complementary parts of a common tradition, making a product that is very embedded in the social-ecological-system. In fact, for many cheeses the curation and aging take place in natural caves.

### **Challenges**

Key challenges for this VC relate to:

- Abandonment of traditional practices (shepherds and artisan cheesemakers) with lack of generational replacement
- Low production and scarce marketing strategies

### **Innovation**

The innovations are related to e-commerce strategies (still not very developed) and the geographical certifications. E-commerce and the labelling are both part of new marketing strategies.

## Goat cheese from Sierra Morena

High quality goat cheese from the autochthonous goat breed florida andaluza. The goats have grazed along these natural pastures for centuries, being totally connected with this land use and enabling this way its natural maintenance.

Cazzalla de la Sierra is in the foothills of the Sierra Norte de Sevilla, part of the Sierra Morena, which acts as a border between the region of Andalusia and the regions of Extremadura and Castilla-La Mancha.

### Reference mountain landscape statistics

Reference mountain chain		Sierra Morena	
Reference mountain landscape		Cazzalla de la Sierra	
Size of the area (km <sup>2</sup> )	356.4	Average per capita income (€)/year	12,378
Altimetry (m; min-max)	80-763	Total Gross Value Added (GVA) (€)/year	35,778
Population density (Inhabitants/km <sup>2</sup> )	13.14	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-6.5%	Primary:	5.3%
Total bed places (BPs) in tourist accommodations/year:	0	Secondary (including construction):	20.7%
		Tertiary:	73.9%
Road distance from Urban Poles* <sup>1</sup> (km)	78	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	311	Primary:	5.9%
Protected areas	Yes	Secondary:	17.4%
		Tertiary:	76.7%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The place where the goats sleep and graze is the same as the cheese production, all happens in the same farm. The goats are milked every day and the milk is sent to a lab for analysis. All the milk they use comes from their goats. The goat breed is autochthonous and is certified as such by the label 100% Raza Autóctona (Autochthonous breed), a distinctive label for various animal products created by the Spanish Ministry of Agriculture, Fisheries and Food (Ministerio de Agricultura, Pesca y Alimentación). There are other goat cheese producers in Sierra Morena.



Another case can be found in Guarromán where the family business "Besos y Quesos" is following similar cheese making but with goats of the Malagueña breed.

### **Key local assets**

The goats graze around natural grasslands and open forests of oaks and olives within the boundaries of the farm, that is inside a protected area. Thus, the richness of the ecosystem is high. The water they use comes from local water streams. The VC is very local as most of their consumers are from the same municipality. Finally, this activity is a traditional practice of the area for generations. Therefore, it is part of the cultural heritage of the region.

### **Challenges**

Key challenges for this VC relate to:

- The scarce number of herds of this goat breed compromises its continuity and its beneficial effects on the social-ecological-system.
- Competing with the industrially produced cheese.
- The need expanding the selling scope beyond the province.

### **Innovation**

The innovation to point out is related to the energy use and waste management. The farm uses solar energy for its functioning. The wasted water is treated with bioremediation in an artificial pond nearby. Afterwards, the water is used in the family garden. It is an innovation in the waste management mostly.

## Honey from Sierra Morena

High quality product linked to an ecosystem that offers high diversity of flora for the bees. Apart from the conventional marketing and commercialisation, nowadays the e-commerce is also being used.

Obejo, located in the Guadiato Valley, is a hilly area covered by mediterranean forest and olive plantations, crossed by multiple rivers and streams.

### Reference mountain landscape statistics

Reference mountain chain	Sierra Morena		
Reference mountain landscape	Obejo		
Size of the area (km <sup>2</sup> )	214.6	Average per capita income (€)/year	13,172
Altimetry (m; min-max)	150-769	Total Gross Value Added (GVA) (€)/year	13,153
Population density (Inhabitants/km <sup>2</sup> )	9.36	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	7.00%	Primary:	10.5%
Total bed places (BPs) in tourist accommodations/year:	0	Secondary (including construction):	17.6%
		Tertiary:	71.8%
Road distance from Urban Poles* <sup>1</sup> (km)	39	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	236	Primary:	13.8%
Protected areas	Yes	Secondary:	17.1%
		Tertiary:	57.0%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The bees are not fixed in a same place during the whole year, instead, they are moved to different locations along the region to get more flavours. In the case of this VC, the bee products have the organic certification from the Andalusian Committee of Organic Agriculture. They own 1,200 beehives and produce around 80000 kg of honey per year. They produce a positive impact on the social-ecological-system as the bee keeping is an activity that, if it is not overexploited, generates multiple benefits in the local ecosystems through the pollination. It is also present in other MRLs such as Montoro but without the organic certification.

## Key local assets

This VC is dependent on the local flora. Among the species that are used we can find the following: heather, orange blossom, holm oak, thyme, rosemary, eucalyptus and multiple flowers from Mediterranean forests.

## Challenges

Key challenges for this VC relate to:

- Business growing and possible access to new markets nationwide and even beyond, in other European countries.
- effects of climate change on the flowering periods.
- diseases that attack the bees.

## Innovation

The innovation in this VC relates to the valorisation of:

- new food-products associated with honey such as propolis, royal jelly, meloja (cooked honey with pumpkin fibres), and nuts bars.
- new products on honey-based cosmetics that reach the 30% of the business profits certification and e-commerce.

Additionally, new marketing strategies are emerging that include the organic certification, the e-commerce and the cooperation with bigger food retailers that distribute nationwide and across the EU.

## Borda beer

Local place-based brewery that combines two singular aspects. On one side, it is a sustainable and organic beer production that reuses the outcomes for compost and animal feed. On the other side, it is coined in a horizontal cooperative (Bebidas y Maridajes de Aineto. S. Coop.) where the first aim is to energise and revive the locality of Aineto and the rest of the Guargera valley that had been abandoned by the mid of the past century.

Sabiñanigo is in the Pyrenees, the main mountain range in Spain. It hosts, four mountain valleys (Aurín, Gállego, Basa y Guarga) and 82 towns, being only 54 of them inhabited. This is partly caused by the isolation of many of these settlements and the movement to bigger towns and cities with better infrastructure, services and employment opportunities. It has great assets for nature-based and outdoor recreation tourism.

### Reference mountain landscape statistics

Reference mountain chain	Pyrenees		
Reference mountain landscape	Sabiñanigo		
Size of the area (km <sup>2</sup> )	586.8	Average per capita income (€)/year	26,691
Altimetry (m; min-max)	660-2,753	Total Gross Value Added (GVA) (€)/year	5,551
Population density (Inhabitants/km <sup>2</sup> )	15.65	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-1.15%	Primary:	15.0%
Total bed places (BPs) in tourist accommodations/year:	0	Secondary (including construction):	21.6%
		Tertiary:	63.4%
Road distance from Urban Poles* <sup>1</sup> (km)	39	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	236	Primary:	13.4%
Protected areas	Yes	Secondary:	25.0%
		Tertiary:	61.5%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

First key actor is the Aineto project for the rehabilitation of the locality. Also, the municipality of Sabiñanigo (LAU 1) where the town is located, played a key role back in 1987 giving permission

to the new inhabitants to settle in. The beer has two organic certifications, the European and the one from the region of Aragón. The VC is totally embedded in the social-ecological-system. The use of natural water flows and wild ingredients together with the values of the project, make of this VC an organic activity within the valley. Other actors are all the selling points that they have around Aragón (they do not sell nationwide). This project challenges the schemes of our current system by empowering the inhabitants of a locality whose decisions are taken equally. It is an example of a place-based experience that fosters social and ecological justice. Not mentioned before, the brewery creates every year the "solidarity beer" to support social projects of the Aragón region.

### Key local assets

The natural assets they take straight from the valley are the water and some other wild ingredients (elderberries/flowers). In addition, the whole Aineto works only with renewable energy obtained directly in the valley. Regarding the social assets, the values of the Aineto project are vital for the longlasting experience of rehabilitation of an abandoned locality. These values are assembly decision-making with the participation of every inhabitant, integral organic production for every crop of the locality, no private property within Aineto, and no new constructions.

### Challenges

Key challenges for this VC relate to:

- Fighting against rural depopulation by generating economic activities and employment
- Having better infrastructure in the locality (e.g., repair and maintenance of the access road to Aineto; access to broadband internet, etc.)
- Encouraging people to visit the locality and enjoy the beer instead of having to reach further markets.

### Innovation

The beginning of the brewery was a challenge as it started in a depopulated town of Aineto within the municipality of Sabiñanigo with the aim of revitalizing it. The brewery is in an old livestock building following the philosophy of the whole project which is based on using the existing buildings instead of constructing new ones. The waste from the beer production is whether composted or used to feed the livestock. The brewery's motto is that money should circulate 7 times in the place they live before leaving the region. For the beer production they only use organic inputs. In addition, they use local ingredients to innovate in the beer production, adding new tastes and aromas that come straight from the valley (red cabbage or elderberry). As mentioned before, the brewery has a horizontal cooperative and is placed in a revitalized town and is integrated in the Aineto project that had been started by the 80's.

## Bailandera beer

Successful place-based cooperative of women connected to the territory and engaged with local producers' networks; Use of organic and proximity ingredients and quality certification through "Participatory Guarantee System".

Bustarviejo is a rural municipality located in the northern range of Madrid. It is remote and isolated as it is surrounded by mountains. One of the historical economic resources of the landscape is the granite quarry together with extensive low intense cattle and agriculture. Today, this region is hosting more and more visitors attracted by its natural assets. In this region, called the "Poor Range/Sierra", the cooperativism is considerably alive among neighbours and municipalities.

### Reference mountain landscape statistics

Reference mountain chain		Sierra de Guadarrama	
Reference mountain landscape		Bustarviejo	
Size of the area (km <sup>2</sup> )	56.20	Average per capita income (€)/year	17,104
Altimetry (m; min-max)	1,000-1,833	Total Gross Value Added (GVA) (€)/year	33,805
Population density (Inhabitants/km <sup>2</sup> )	44.8	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	18.6%	Primary:	1.7%
Total bed places (BPs) in tourist accommodations/year:	254	Secondary (including construction):	13.1%
		Tertiary:	85.17%
Road distance from Urban Poles* <sup>1</sup> (km)	64.7	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	24	Primary:	3.74%
Protected areas	Yes	Secondary:	15.2%
		Tertiary:	81.06%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The VC has a direct positive input for the locality of Bustarviejo, where the brewery/bar is situated. They produce 7 varieties of beer with multiple selling points in 28 municipalities along the mountain range of Madrid apart from their own bar in Bustarviejo and through their website. The labelling and certification scheme is built on trust as is a Participatory Guarantee System.

Nonetheless, they invite everyone interested to visit their brewery. To sell in Madrid city, they have multiple selling points in bars and stores, and at the coworking space Madrid Km 0. Although their brewery is in Bustarviejo, they participate in a project called "Organic Hops from Madrid Region" that aims to enhance the production of local varieties of hops, and this way they create impact in other municipalities of the region. The hops grow naturally and wild in the river basin of many rivers of the region (indeed it is known with 13 different names across the region). Therefore, its production close to the brewery helps to reduce the environmental impact and carbon footprint of beer making while allowing the livelihood improvement and diversification.

### Key local assets

The beer is very integrated in the municipality, and they are proud of it. With the brewery they try to approach other initiatives with shared principles to generate synergies and promote alternatives to the mainstream food production and consumption.

### Challenges

Key challenges for this VC relate to:

- Access to the markets to also reach consumers from other municipalities and from the capital city.
- Knitting networks of producers in times where rural areas have suffered a great depopulation and land abandonment.

### Innovation

Bailandera beer uses ingredients of proximity and organic and has a quality certification through a participatory guaranteed system. Their compromise with the sustainability also reaches the machinery of the brewery, using recycled materials coming from other agroindustry and adapted to the brewery. In addition, their activity goes beyond the beer making as they are engaged in a project to retrieve and enhance the production of autochthonous varieties of hops. The brewery is a cooperative with equal participation, involvement, and salary for each of the five women that own it. Apart from the hops project, they participate in Madrid Km 0, a coworking space to rethink and manage the stock, transport, and delivery of agroecological products coming from the rural areas of the region to the city of Madrid. Around this project, different initiatives generate synergies to access to markets and consumers from the city.

## Hunting in Sierra Morena

This activity is very connected with the natural assets of the region and is relevant for several traditional dishes. In addition, this activity represents an important aspect of the regional heritage and traditional practices.

Bustarviejo is a rural municipality located in the northern range of Madrid. It is remote and isolated as it is surrounded by mountains. One of the historical economic resources of the landscape is the granite quarry together with extensive low intense cattle and agriculture. Today, this region is hosting more and more visitors attracted by its natural assets. In this region, called the "Poor Range/Sierra", the cooperativism is considerably alive among neighbours and municipalities.

### Reference mountain landscape statistics

Reference mountain chain		Sierra Morena	
Reference mountain landscape		Hornachuelos	
Size of the area (km <sup>2</sup> )	585.84	Average per capita income (€)/year	10,437
Altimetry (m; min-max)	144 -789	Total Gross Value Added (GVA) (€/year)	13,153,128
Population density (Inhabitants/km <sup>2</sup> )	4.93	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-6.3%	Primary:	6.5%
Total bed places (BPs) in tourist accommodations/year:	40	Secondary (including construction):	20.0%
Road distance from Urban Poles* <sup>1</sup> (km)	46.1	Tertiary:	73.46%
Number of agricultural holdings	308	Employment by sector* <sup>3</sup>	
Protected areas	Yes	Primary:	9.44%
		Secondary:	16.41%
		Tertiary:	74.15%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

In the Sierra Morena Cordobesa, there are around 1500 hunting grounds and 70000 hunters registered, and the extension of the hunting area within the province is of 437.852 ha. The area is covered by multitude of land uses, such as fields, dehesas (open oak forests) and Mediterranean forests. In addition, all along the Sierra Morena, and in the part that belongs to



Corodba, there are protected areas where hunting is allowed. The main prey of the area is deer with more than 13000 animals hunted per year during the hunting period (from October to February). This VC is present all along the Sierra Morena region, including the provinces (NUTS2) of Huelva, Seville, Córdoba and Jaén.

### **Key local assets**

This activity relies upon the local fauna (deers, wild board, rabbits) and thus on tehir habitats. Here the dominant ecosystem is the oak forest and the dehesas and montados. The cultural asset is linked to cultural heritage and traditional practices.

### **Challenges**

The hunting sector is experiencing an industrialization that put under threat the natural ecosystems on which this activity depends.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.

## Spirits - anis and cherry drinks

High quality product with old tradition in the area. The important wine production that Cazalla de la Sierra had during the 15th and 16th centuries, resulted in the distillation of the leftovers to obtain the alcohol with which this drink began to be manufactured. Today there is a museum in the area to explore the history behind the local wines and spirits.

Cazalla de la Sierra is in a mid-mountain area with a mosaic landscape that combines dense forests with dehesa and agricultural fields. Therefore, the agricultural production is diverse in the region, combining crops with low-intensity livestock. The urban settlement has historic constructions and monuments from the XV and XVI centuries. The MRL is also well known by other artisanal products such as olive oil or dry-cured meat.

### Reference mountain landscape statistics

Reference mountain chain		Sierra Morena	
Reference mountain landscape		Cazalla de la Sierra	
Size of the area (km <sup>2</sup> )	356.39	Average per capita income (€)/year	12,387
Altimetry (m; min-max)	80 -763	Total Gross Value Added (GVA) (€)/year	35,778
Population density (Inhabitants/km <sup>2</sup> )	13.14	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-6.5%	Primary:	5.3%
Total bed places (BPs) in tourist accommodations/year:	40	Secondary (including construction):	20.7%
		Tertiary:	73.9%
Road distance from Urban Poles* <sup>1</sup> (km)	46.1	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	308	Primary:	5.9%
Protected areas	Yes	Secondary:	17.4%
		Tertiary:	76.7%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

In Cazalla de la Sierra there used to be around 15 distilleries, but only two remain today. Its quality was once certified by a Comitee of Cazalla producers, which disappeared with the other distilleries. Nowadays, the quality is recognised based on the history of this product and its

relationship with the locality, keeping the traditional making. In fact, the name of Cazalla for these kinds of drinks directly refers to the municipality of Cazalla de la Sierra that once was the main producer of anis drinks. The production of Cazalla started as a complementary industry of wine making and thanks to the wild aniseed that grows in the region. Nonetheless, the vines from the region Sierra Norte de Sevilla and the produced wines are still a growing asset, producing quality wines under a PDO label.

### **Key local assets**

The main asset nowadays is the cultural heritage that this drink represents for the locality. For its making, with only two destileries left in the area, knowledge on traditional destilery is necessary. However, this VC is obviously based also on natural resources, especially local cherries, and wild aniseed.

### **Challenges**

The challenge associated with this VC is related to its survival in a time when the consumption of anis and cherry drinks is less popular.

### **Innovation**

There are two kinds of innovation. One occurred years ago with the introduction of cherries into the production system to make a new drink. The other is the e-commerce. The new product was the introduction of the cherry in anis drinks. The marketing strategy is linked to the e-commerce.

## Astronomy tourism (Starlight tourism)

This VC aims to promote the night sky as a local asset, developing this way a local and regional sustainable tourism. This asset is highly threatened by the increase in light pollution that comes along with urban sprawl.

Montoro is an agricultural municipality and olive grove constitutes the main source of income for its households. The surroundings of the urban settlements are dominated by olive plantations that cover around the 80% of the cultivated area. In addition, this territory hosts the Iberian Lynx, the most endangered feline of the world. More than 60% of the area has a slope above 15%.

### Reference mountain landscape statistics

Reference mountain chain		Sierra Morena	
Reference mountain landscape		Montoro	
Size of the area (km <sup>2</sup> )	585.84	Average per capita income (€)/year	11,444
Altimetry (m; min-max)	144 -789	Total Gross Value Added (GVA) (€)/year	13,153
Population density (Inhabitants/km <sup>2</sup> )	15.86	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-6.3%	Primary:	10.5%
Total bed places (BPs) in tourist accommodations/year:	141	Secondary (including construction):	17.6%
		Tertiary:	71.9%
Road distance from Urban Poles* <sup>1</sup> (km)	42.6	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	1,202	Primary:	13.8%
Protected areas	Yes	Secondary:	17.1%
		Tertiary:	57.0%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The Starlight sites are scenarios that incorporate the preservation and observation of the sky as part of the natural, scenic, cultural, and scientific heritage and encourage “Star Tourism,” promoting infrastructure, products, activities, and training of specialized guides in sustainable tourism. The VC is endorsed by the Starlight Foundation, born in 2007 with the "Declaration in Defense of the Night Sky and the Right to Starlight” and is an action of UNESCO supported by



the International Astronomical Union. The key actors are: Starlight Foundation, Asociación para el Desarrollo Integral (ADIT) de Sierra Morena Cordobesa; Grupo Desarrollo Rural (GDR) Sierra Morena Cordobesa, local municipalities, and accommodation services. It highly depends on the willingness of the municipalities to preserve the night sky and their engagement with the project. The VC is present in 2 Starlight Reserves within Sierra Morena. The Sierra Morena reserve includes 8 municipalities: Montoro, Obejo, Adamuz, Villaharta, Espiel, Villanueva del Rey, Villaviciosa de Córdoba, and Hornachuelos. The Pedroches Reserve includes another 17 municipalities: Cardeña, Conquista, Villanueva de Córdoba, El Guijo, Santa Eufemia, El Viso, Villaralto, Alcaracejos, Torrecampo, Añora, Pozoblanco, Pedroche, Dos Torres, Hinojosa del Duque, Fuente la Lancha, Villanueva del Duque and Belalcázar.

### **Key local assets**

The local asset is the night sky. There are local conditions (especially light pollution) that determine whether the sky may be an asset. The initiative also aims to preserve cultural traditions, both aboriginal and classical, that relate to the night sky.

### **Challenges**

To protect the already threatened night sky; to promote sustainable tourism based on night sky observation and engagement with local assets, and to therefore challenge the mainstream tourism model.

### **Innovation**

This VC is innovative as it considers night sky as a touristic asset and develops an alternative and sustainable regional tourism model. It is initiated by the declaration of Starlight Reserves for the conservation of night skies and by broadcasting astronomy through courses, seminars, and other activities. The innovation is both endogenous and exogenous because the Starlight Foundation is a worldwide organisation. However, the VC of our interest is developed by the localities who decide to join the initiative, fostering the same goals for their regions. The innovation comes with considering sky as an asset with recreational and cultural potential that needs to be first protected and then enjoyed and acknowledged as something of great value for human well-being.

## Sustainable Rural tourism

This VC integrates various assets of the region. It mainly relies on the valorisation of cultural and natural landscape amenities, bird watching, and local gastronomy.

The locality is integrated in the Natural Park of Aracena and Picos de Aroche and this has conditioned its economy. The ecosystem is dominated by holm oaks and cork oaks in a dehesa landscape, where livestock grazes (important for the Iberian ham production in the area) and dense forests of similar tree species complemented by arbutus, bushes of juniper and rockrose and diverse aromatic herbs. In Aracena we can find the Iberian Ham Museum (Museo del Jamón) where the visitor can learn about the relationship between Iberian pigs and ham and the dehesa ecosystem. In addition, the Ruta de Jabugo (Jabugo route) links 31 municipalities of the region where ham is produced, with an extensive area within the boundaries of the Natural Park.

### Reference mountain landscape statistics

Reference mountain chain		Sierra Morena	
Reference mountain landscape		Aracena	
Size of the area (km <sup>2</sup> )	184.75	Average per capita income (€)/year	14,444
Altimetry (m; min-max)	200 -851	Total Gross Value Added (GVA) (€)/year	9,599
Population density (Inhabitants/km <sup>2</sup> )	44.68	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	6.7%	Primary:	8.3%
Total bed places (BPs) in tourist accommodations/year:	251	Secondary (including construction):	27.4%
		Tertiary:	64.2%
Road distance from Urban Poles* <sup>1</sup> (km)	97.1	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	267	Primary:	17.3%
Protected areas	Yes	Secondary:	13.9%
		Tertiary:	68.8%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

This VC applies a holistic approach, where nature and culture are intertwined. It aims for a responsible tourism with high commitment to the territory. There are multiple actors: Andalusian

government, ADIT Sierra Morena (regional development association), municipalities, accommodation, restaurants, and other tourism-oriented companies. All the assets on which this VC relies are integrated within the social-ecological-system of Sierra Morena. This VC is present in the Sierra de Aracena and Picos de Aroche Natural Park in Huelva, in the Sierra Norte Sevillana, as well as in the Sierra Morena Cordobesa and in the oriental part around the Andújar Natural Park in Jaén.

### **Key local assets**

This VC tries to merge and intertwine natural assets with the cultural heritage of the region. The main natural assets are the dehesa and mediterranean forests with all the biodiversity they host (emblematic bird species and wild animals among which the Iberian lynx stands out for its singularity). The cultural heritage includes local gastronomies, livestock farming, hunting traditions, and architecture.

### **Challenges**

Key challenges of this VC relate to:

- Making this tourism model more appealing to the visitors and competing this way against the mainstream tourism which is mainly based in coastal areas.
- Raising awareness among the tourists regarding the benefits and opportunities of sustainable tourism
- Resolving seasonality of employment in the tourism sector.

### **Innovation**

There are several innovative initiatives by regional government, municipalities, private businesses, and rural associations. Here are two examples: 1) Los Pedroches and Jabugo Iberian ham routes (ruta de jamón de Los Pedroches y Jabugo) to visit rural areas of great ecological and also social-cultural value, to enjoy the scenic beauty, and to taste iberian ham and enjoy the local gastronomy; 2) Orniturismo, a project partially financed by the European Regional Development Fund to protect and enhance the ornithological heritage of the area and consolidate sustainable tourism activities that reactivate the economy of the region. New products such as Iberian ham routes and bird-watching tours are offered by this type of sustainable rural tourism. These new products (e.g., Iberian ham route) are based on new governance systems, where several actors (conservation, birdwatching, restaurants, accommodation, heritage museums, ...) are involved and collaborate with each other to offer the final product. E-commerce is increasingly being used for promotion and marketing purposes.

## Suckling goat from Malaga

The Malaga goat, a native Spanish breed, is highly prized for its milk production and its suckling goat meat quality. It has excellent fertility rates, being the Malaga milk goat, the first Spanish goat meat, and the first fresh meat in Andalusia, to have a quality label.

The Sierras Tejeda, Almijara and Alhama, are Natural Park since 1999. With its 2,065 m. altitude and very diverse flora, its lands are suitable for the cultivation of vineyards, olive groves, and fruit trees such as orange, fig, and loquat, etc. Its marginal character has favoured the conservation of the landscape, traditional architecture, and its natural values.

Reference mountain landscape statistics  
(A: Data from NUTS3 ES617)

Reference mountain chain		Betic Systems	
Reference mountain landscape		Canillas de Aceituno	
Size of the area (km <sup>2</sup> )	42	Average per capita income (€)/year	8587.56
Altimetry (m; min-max)	150-2050	Total Gross Value Added (GVA) (€ million)/year	28075.1 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	40	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-26.5%	Primary:	2.88 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	573	Secondary:	14.62 <sup>A</sup>
		Tertiary:	82.50 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	47.6	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	226	Primary:	4.21 <sup>A</sup>
		Secondary:	12.62 <sup>A</sup>
Protected areas	Yes	Tertiary:	83.17 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

There are about 300,000 head of Malaga goats in Spain. About 200,000 in the province of Malaga, distributed in more than 1,500 goat farms, the largest European concentration of this livestock. The suckling goat is an animal of one month of age, with a live weight between 8 and 10 kilos, fed exclusively on mother's milk. The breed is controlled through a Stud Book or certification by



the Spanish Association of Malaga Goat Breeders (Cabrama). The "Marca de Garantía Chivo Lechal Malagueño" (Malaga Suckling Goat Guarantee Label) implies the fulfillment of an exhaustive set of conditions. Malaga suckling goat meat is increasingly consumed in the province of Malaga and beyond. 80% of the cattle farms have some territorial base so that the predominant management in the farms is semi-extensive. It confers unique properties, aroma, and flavours to the meat and milk, transmitted to the cheeses and the rest of the derived products.

### **Key local assets**

Malaga goat farming performs important environmental tasks through local resources, fire prevention, soil and biodiversity maintenance, and ecosystem conservation. The Malaga goat generates landscape and takes advantage of crop residues and marginal areas that other livestock types cannot graze. The management of the Natural Park promotes the integration of the goatherds with the natural space management.

### **Challenges**

The greatest challenge is keeping the farms alive in the face of generational replacement problems, excessive bureaucracy, lack of nearby slaughterhouses, low meat prices that remain the same as 20 years ago, and the need to establish an articulation of the sector.

### **Innovation**

Much has been done to promote the quality and differentiated value of this meat. Unfortunately, a strong business model has not yet been secured to accompany the development of new strategies, in any case, associated with some local restaurants that have innovated using the product, its processing, and online sales to take home processed product.

The Malaga goat sector has a great potential for job creation. In addition to agri-food, with all its ancillary industry, catering, and gastronomy or agritourism, there are still other opportunities to be exploited. Cosmetics, linked to goat's milk, or all the goat skin crafts are two examples of lines to be developed.

## Lamb Meat from Zuheros

Traditionally, the Andalusian mountains have hosted an extensive livestock activity, mainly goats and sheep, based on the use of pastures and focused on the production of goat's milk and cheese, as well as the sale of goats and lambs for meat.

Sheep farming with similar characteristics extends to other municipalities of the Sierras Subbéticas Cordobesas (Cabra, Priego de Córdoba, Luque and Carcabuey), and to areas of the province of Córdoba and other Andalusian provinces such as Granada and Seville. Greece, Romania, Italy, and France are other EU countries where sheep farming is important.

Reference mountain landscape statistics  
(A: Data from NUTS3 ES613)

Reference mountain chain	Betic System		
Reference mountain landscape	Zuheros		
Size of the area (km <sup>2</sup> )	42.36	Average per capita income (€)/year	9426.19
Altimetry (m; min-max)	500-1300	Total Gross Value Added (GVA) (€ million)/year	13153.1 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	14.99	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-1.10%	Primary:	10.50 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	169	Secondary:	17.61 <sup>A</sup>
		Tertiary:	71.89 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	65.9	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	151	Primary:	12.9 <sup>A</sup>
		Secondary:	20.62 <sup>A</sup>
Protected areas	Yes	Tertiary:	66.48 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

In the municipality of Zuheros there are about nine livestock farms that usually combine sheep and goats, most of them in semi-extensive regime, totalling about 10,000 head of livestock. Each sheep farm has an average of 500 sheep grazing on several hundred hectares of mountain range. The main resource is obtained from the sale of sheep with an average weight of ten kilos and a price close to 50 € / piece, stable for years. The sheep are sold to feedlots located mainly in the

provinces of Granada and Murcia. There is no sectoral associative structure and certified organic production is not very relevant.

### **Key local assets**

The resources in terms of farms, pastures, livestock, and shepherds are local, although the infrastructure and housing associated with these farms have sometimes been abandoned or are in serious disrepair. There are no known plans for sustainable forest and pastures management. Supplementary feed is purchased from outside the production area.

### **Challenges**

It is a value chain with very little innovation that must ensure sustainable management of the forest and pastures, gain in diversification and fight against the difficult generational renewal of shepherds and average profitability of farms.

### **Innovation**

There are no innovative elements in the value chain, which represents a serious challenge to guarantee the medium-term sustainability of these farms, which are also sometimes located in areas that are difficult to access and do not have facilities that make management attractive.

Sheep farming with similar characteristics extends to other municipalities of the Sierras Subbéticas Cordobesas (Cabra, Priego de Córdoba, Luque and Carcabuey), and to areas of the province of Córdoba and other Andalusian provinces such as Granada and Seville. Greece, Romania, Italy, and France are other EU countries where sheep farming is important.

## Transhumance livestock

Transhumance in Europe is a form of pastoralism consisting of the seasonal movement of livestock along migratory routes in the Mediterranean area and the Alps. Every year, in spring and autumn, thousands of animals are driven from one climatic region to another along historical routes. Spain has a network of 125,000 km of cattle trails, a public good, for the use of people and livestock.

The rearing and maintenance of livestock, the management of land, forests, water resources and natural hazards, as well as the traditional practices of shepherds, make transhumance an important factor in shaping the relationship and interaction of man with animals and ecosystems. Extensive livestock farming, which is much more than transhumance, expresses its contribution to the environmental conservation of the territory when we overlap the areas where it is practiced with the network of livestock trails and the Nature 2000 Network.

### Reference mountain landscape statistics (A: Data from NUTS3 ES614)

Reference mountain chain	Betic System		
Reference mountain landscape	Castril		
Size of the area (km <sup>2</sup> )	243.05	Average per capita income (€)/year	8160.26
Altimetry (m; min-max)	750-1950	Total Gross Value Added (GVA) (€ million)/year	15101.80 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	8.31	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-17.6%	Primary:	7.47 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	764	Secondary:	14.65 <sup>A</sup>
		Tertiary:	77.88 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	125.9	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	726	Primary:	9.74 <sup>A</sup>
		Secondary:	16.46 <sup>A</sup>
		Tertiary:	73.80 <sup>A</sup>
Protected areas	Yes		

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

From the Sierras Cazorla, Segura and Las Villas some 8,000 head of cattle make this round trip every year, on public roads, looking for better pastures and climate. A journey between mountains and plains of 20 days and about 300 km. In the case of the Sierra de Castril in Granada, five herdsmen spend eight days on a journey that extends almost 100 km. Transhumance shepherds have a profound knowledge of the environment, transhumance being one of the most sustainable and efficient methods of livestock rearing. They also have special practical skills related to the production of food and various handicrafts.

### Key local assets

Following the centuries-old practice of livestock transhumance (sheeps, goats and cows), in November the herds that have spent the summer in the highlands of the Natural Park of the Sierras de Cazorla, Segura and Las Villas in Jaén and Castril in Granada, make their journey through the province of Jaén, towards the lowlands of Sierra Morena to spend the winter. With this extensive practice, a single herd combines the management of two farms of high environmental value.

### Challenges

Transhumance must overcome the state of occupation and abandonment of livestock trails and infrastructures, as well as the difficulty of living in places with basic living conditions. The aging of transhumance shepherds and the lack of a public strategy to support extensive livestock farming add to the difficulties of their survival.

### Innovation

Transhumance is essentially a traditional value chain that keeps the associated practices intact. However, recognizing its environmental, economic, and social importance, it has focused the attention of researchers, municipalities, technical projects, and initiatives promoted by civil society aimed at vindicating its survival, the heritage legacy represented by the livestock trails and this peculiar form of livestock economy.

Since 2019, transhumance, the seasonal movement of herds along migratory routes in the Mediterranean and the Alps, has been inscribed by UNESCO (14.COM) on the Representative List of the Intangible Cultural Heritage of Humanity. Numerous national and international initiatives aim to maintain and renew this practice as an appropriate strategy for livestock management and natural ecosystems, testing innovative management alternatives, diversifying new complementary activities, and articulating a widespread social and cultural support movement.

Different Spanish regions and provinces have had a long history of transhumance (Soria, Cuenca, La Rioja among others). In Andalusia, a movement survives between the Sierras of Cazorla, Segura and Las Villas in Jaén, as well as the Sierra de Castril in Granada to Sierra Morena, as well as movements between Sierra Nevada and the plain area of Granada. Similar movements of transhumant cattle are still practiced in other European regions of Italy, Austria, and Greece.

## Elderly care in Carcabuey

In a context of ageing population, care of the elderly represents an important economic activity with local peculiarities. In this case a perception of high quality (self-assessed), specific relevance due to ageing and depopulation in mountain centres in the area, interaction with the environment and territorial identity: survival of intergenerational social cohesion.

Carcabuey is in the Sierra Subbética with practically all its extension forming part of the Natural Park. Its economy depends mainly on the olive growing with a high seasonality in employment and suffers from a process of depopulation, that continues in this trend, and the aging of its population, with almost a quarter of it over 65 years old and an exodus of the younger population that is not engaged in agriculture. On the other hand, it is a highly cohesive society, with strong intergenerational links, maintaining local culture and idiosyncrasy and showing a very participatory character.

### Reference mountain landscape statistics (A: Data from NUTS3 ES613)

Reference mountain chain		Betic system	
Reference mountain landscape		Carcabuey	
Size of the area (km <sup>2</sup> )	79.78	Average per capita income (€)/year	9969.71
Altimetry (m; min-max)	550-1300	Total Gross Value Added (GVA) (€ million)/year	13153.1 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	29.72	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-11.7	Primary:	10.50 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	370	Secondary:	17.61 <sup>A</sup>
		Tertiary:	71.89 <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	82.5	Primary:	12.9 <sup>A</sup>
Number of agricultural holdings	522	Secondary:	20.62 <sup>A</sup>
Protected areas		Tertiary:	66.48 <sup>A</sup>
Size of the area (km <sup>2</sup> )			

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

This highly feminised value chain combines public, private, and social resources in a mixed governance system that incorporates the monetised and the non-monetised, and which is

allowing both these elderly people and local and immigrant women who work in the chain to stay in the territory and for the first time professionalise the sector, while generating tangible and intangible, individual and collective value. It is a self-perceived quality chain in which the cultural, participatory, and social cohesion aspects of the municipality are of great relevance, together with the health, care or family aspects that are generally present in the care field.

### **Key local assets**

Municipal residence for the elderly managed by private company (PROMI). Active participation centre. Dependency assistance company hired by municipality. Emergency carers, a service managed by the Provincial Council. Assistance in the framework of the informal economy. Organised civil society groups (there are 40 associations). Neighbourhood mutual aid. Older people themselves.

### **Challenges**

Ageing population (23% of total population over 65, 12% over 80), negative replacement rate, depopulation, and exodus of young population (11.4% total descent in 10 years), public resources do not cover all needs, informal economy, professionalisation process under development but not consolidated, precarisation of female work, disappearance of local and social cultures of small Sierra communities.

### **Innovation**

Informal and traditional care, from the whole society for the whole society, survive. Then a series of public services have been developed to attend to the needs of the elderly population, which through public-private partnerships have become more professionalised. Its mixed governance, combining traditional care and the new services can be considered an innovation.

Private care company that hires local women and enables them to professionalise their activity. Professionalisation through certificates of professionalism based on experience in the informal sector in a traditionally female sector and closely linked to the non-monetised and informal economy. Maintaining female population under 65 and attraction of immigrant female population (some in the formal sector, more in the informal sector). The value chain presents a scale that allows a multilevel governance system based on the proximity and interaction of all the actors involved, although a greater structuring would be necessary to coordinate the response.

## Indigenous pulses, cereals, and fruits of Ascara (Jaca)

Cielos de Ascara is a unique and responsible project that recovers the natural, cultural, and ecological heritage in the Aragonese Pyrenees. It integrates people with particular social and labour insertion difficulties. The project pursues its members' cooperation to manage natural resources and inputs for organic food production efficiently. The project combines actions in mountain and valley areas and promotes public-private collaboration.

The Canal de Berdún, where Cielos de Ascara is located, is a particular and different territory within the Pyrenean ecosystem. On the other hand, the project is implemented in areas of the provinces of Huesca and Zaragoza, depending on the crop or product. Native legumes (boliche, chickpeas and lentils) and honey in Ascara (Huesca) and melon from Torres de Berrellén in Alagón and Montañana (Zaragoza). Besides, trials will be implemented on the Gardeniers farm in the Cielos de Ascara agroecological social project, with Sigmoid references. Most of the experimentation will be carried out in this area, which belongs to the municipality of Jaca in the Jacetania region and is included in the Natura 2000 Network.

### Reference mountain landscape statistics (A: Data from NUTS3 ES241)

Reference mountain chain	Pyrenees		
Reference mountain landscape	Jaca (Ascara)		
Size of the area (km <sup>2</sup> )	406.35	Average per capita income (€)/year	25838
Altimetry (m; min-max)	650-2100	Total Gross Value Added (GVA) (€ million)/year	5551.3 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	32.31	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-1.83	Primary:	15 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	5929	Secondary:	22 <sup>A</sup>
		Tertiary:	65 <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	72.4	Primary:	13.4 <sup>A</sup>
Number of agricultural holdings	206	Secondary:	25.0 <sup>A</sup>
		Tertiary:	61.5 <sup>A</sup>
		Protected areas	Yes

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year



Besides, the actions will be developed in areas of Sites of Community Importance (SCI) and Special Protection Area for Birds (SPA) of the protected landscape of San Juan de la Peña and Monte Oroel and the Natural Park of the Western Valleys. Part of the Torres de Berrellén melon trials will also be carried out at the research centre Centro de Investigación y Tecnología Agroalimentaria de Aragón (CITA) facilities located in Montañana. The transformation part will be carried out in the Processing Plant of organic vegetables and fruits of the Special Employment Center Gardeniers of ATADES, in the organic canning workshop that manages in Mercazaragoza.

Similar initiatives are found in many rural areas, also sometimes in mountain areas, in Europe. However, the proposal's solidity stands out here, articulated on innovative bases, agroecology, social insertion, and digital bet.

### **Key local assets**

Aragon has an important food heritage. There is a growing demand for sustainable, proximity, healthy, higher quality, and flavourful horticultural products. However, despite the demand, it is currently constrained, and the consumer has hardly any access. Besides, the current market is looking for innovative products as a diversity source for a standardized market occupied by few varieties. Faced with this situation, the project "Organic Production of Foodstuffs linked to the Aragonese Territory" will carry out actions that will allow the recovery of traditional products.

### **Challenges**

The main challenge is to guarantee sustainability in its triple economic, social, and ecological aspects and maintain a solid and flexible collaboration between the institutional and private actors that support the project and articulate an effective interconnection between the different activities promoted by the project. Extending this model and collaborating with other similar initiatives could reinforce its strategy and make it gain visibility. The support of public funding for rural development policies and the connection with urban consumption environments are opportunities to be successfully developed.

### **Innovation**

It is an innovative project in its general strategy of revitalization of rural and mountain areas, with particular attention to areas of natural and cultural interest, which aims to recover traditional varieties, promote organic production and consumption, connect rural and urban areas, generate employment, foster social integration, and stimulate forms of public-private cooperation.

It is an endogenous innovation project that connects multiple local actors while efficiently leveraging public co-financing aimed at promoting territorially based social development.

## Gofio Canario

The gofio of the Canary Islands is a product elaborated mainly from millet or wheat. Its origin is Berber, and the aborigines of the Canary Islands mostly consumed it. In ancient times, different types of Gofio were made using ingredients such as wheat, lentils, barley, and even fern rhizomes. After the Canary Islands' conquest, the variety of cereals grew, since until then, only wheat and barley were used. After the discovery of America, it also began to be made with corn or millet.

As mentioned above, the raw material comes mainly from outside the islands. The economic weight and sociocultural value associated with Gofio's production and consumption are the two essential elements that define its importance in the Canary Islands as a whole.

Reference mountain landscape statistics  
(A: Data from NUTS3 ES70)

Reference mountain chain		Gran Canaria Island	
Reference mountain landscape		Telde	
Size of the area (km <sup>2</sup> )	102.34	Average per capita income (€)/year	23592
Altimetry (m; min-max)	0-1546	Total Gross Value Added (GVA) (€ million)/year	15777.1 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	1003.52	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	1.87	Primary:	1.24 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	1752	Secondary:	12.56 <sup>A</sup>
		Tertiary:	86.20 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	21	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	282	Primary:	2.6 <sup>A</sup>
Protected areas	Yes	Secondary:	11.4 <sup>A</sup>
Size of the area (km <sup>2</sup> )		Tertiary:	86.0 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

In the pre-Hispanic period, Gofio was made manually. With the modernization of technology, the process moved from hydraulic mills to diesel-powered mills to finally produce Gofio with electric mills. The production process includes four phases: Cultivation and harvesting of the cereal; Threshing, cleaning, and selection of the grain; Toasting; Milling. Mills are kept in operation in

almost all the islands, being more frequent in Gran Canaria and Tenerife, with different types of gofio on the market (oats, wheat, millet, spelt...). It is sold directly in the mills, in local commerce, large-scale distribution, and online.

### **Key local assets**

Paradoxically, almost all the raw material are grown abroad. Thus, many mills use mixtures of cereals grown outside the islands or send the local millet seed to distant countries such as Argentina, from where they then receive the grain. The small area of millet grown in the municipality of Telde is often used as cattle feed. In some cases, such as in the Biosphere Reserve on the island of La Palma, a social initiative carries out the entire process. The Canary Islands Government has declared 'El Molino del Conde,' located in Telde, Gran Canaria, an Asset of Cultural Interest.

### **Challenges**

Consumption seems to remain stable, and even the catering industry and other processed foods are beginning to introduce Gofio flour in their offer, while production by the mills remains stable. However, there have been critical moments coinciding with the rise in cereal prices or the competition derived from cereals for other purposes, such as biofuels.

### **Innovation**

New types of gofio have been introduced from cereals such as spelt or multigrain and organic production or range for children. An official competition at the archipelago level promotes every year the quality and innovation of the Canary Islands Gofio sector.

Some mills have outstanding heritage resources related to the history of Gofio production. Others, such as the Molino del Fuego in Telde, are more than one hundred years old. There is a whole cultural and social tradition around Gofio in the gastronomy and food of the Canary Islands that has spread to other South American and African countries.

## Cherries from Castillo de Locubín

It is the first stone fruit to reach the market, adapting very well to cold climates and high-altitude cultivation. The diversity of varieties facilitates a staggered production and harvest, generating employment and boosting complementary economy in Sierra Sur and Sierra Mágina in the province of Jaén.

The extension dedicated to the cultivation of the cherry tree remains stable in the area, around 1,400 ha, with only the oldest trees being renewed. Cherry tree cultivation is complemented by other crops, especially olives. Landscape-wise, the flowering represents an opportunity to develop tourist activities, little exploited in the area, but important in places such as the Sierra de Gata (Cáceres) and Fundao (Portugal).

Reference mountain landscape statistics  
(A: Data from NUTS3 ES616)

Reference mountain chain		Betic Systems	
Reference mountain landscape		Castillo de Locubín	
Size of the area (km <sup>2</sup> )	102.49	Average per capita income (€)/year	9061.47
Altimetry (m; min-max)	600-1250	Total Gross Value Added (GVA) (€ million)/year	10686.3 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	39.5	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-13.7	Primary:	14.91 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	148	Secondary:	17.61 <sup>A</sup>
		Tertiary:	67.48 <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	40.6	Primary:	16.11 <sup>A</sup>
Number of agricultural holdings	1287	Secondary:	21.62 <sup>A</sup>
		Tertiary:	62.27 <sup>A</sup>
		Protected areas	No

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Cultivation has been developed basically in the last 50 years, in family farms. As a result, the harvest can reach 2.5 million kg. Marketing is done both through cooperatives and private companies, directed in an industrial format and around 70% go to the international market, especially Germany and Italy to produce chocolates. The remaining 30% goes to the regional

market. The province of Jaén is the main regional producer and the third in Spain. The sale prices to the industry do not reach one € / kg while the regional sale offers better profitability. Some events organized by municipalities and the Provincial Council contribute to the local promotion of the product.

### **Key local assets**

In the Sierra Sur and Sierra Mágina, up to 9 different varieties are grown (Lamper, Burlat, Summit, Van...), thanks to the suitability of the soils and climate.

### **Challenges**

The main challenge is to improve sales prices to the industry, which do not cover production costs and represent 70% of the crop. On the other hand, spring storms may damage the earliest crop (80% of losses in 2020).

### **Innovation**

This is a traditional value chain that has only slowly introduced initiatives to support marketing (Cherry Festival started in 1984 in Castillo de Locubín), some embryonic gastronomic proposals or liqueur production, but without further development as is happening in other areas (see Fundao in Portugal).

Innovation is at a basic level and refers to initiatives in an initial stage of development and sectoral articulation strategies also in the initial launching phase.

## Grazalema wool blankets, textile craftsmanship

The company, Mantas de Grazalema, uses selected Merino sheep wool to produce blankets, scarves, and other textile garments, combining traditional and handcrafted manufacturing techniques with mechanized processes.

Craft textile production in Grazalema has always had a close connection with its environment. This has provided abundant water, necessary to move the machines, generate good pastures for sheep that influenced the quality of the wool, as well as a social and cultural structure appropriate to organize a production chain that articulated the local economy. Today the natural conditions are still optimal, but the productive and social practices have changed a lot, so the handicraft faces a challenge of survival and reinvention.

Reference mountain landscape statistics  
(A: Data from NUTS3 ES612)

Reference mountain chain		Betic Systems	
Reference mountain landscape		Grazalema	
Size of the area (km <sup>2</sup> )	122.45	Average per capita income (€)/year	10198.96
Altimetry (m; min-max)	450-1550	Total Gross Value Added (GVA) (€ million)/year	23393.7 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	16.44	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-8.9	Primary:	3.22 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	1748	Secondary:	22.64 <sup>A</sup>
		Tertiary:	74.14 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	107.5	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	95	Primary:	3.09 <sup>A</sup>
		Secondary:	18.86 <sup>A</sup>
Protected areas	Yes	Tertiary:	78.05 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The textile craftsmanship had in Grazalema a complete articulation in the different phases of the production process. Successive crises, started in the mid-nineteenth century by the competitiveness of synthetic materials, textile industries located in other Spanish regions, or the absence of competitive transport networks, caused a steady decline in the activity until today with

the presence of a small company, Mantas de Grazalema, which keeps alive that legacy. The type of product has expanded, along with the traditional blankets and scarves. The production is sold directly in two stores located in the municipality as well as throughout Europe and countries like the USA or Japan, increasingly thanks to online sales, difficult to sell through retail due to the current pandemic.

### **Key local assets**

The primary resource continues to be virgin merino sheep's wool from both within and outside the region. Some phases of the process (washing and spinning) have been outsourced, specializing in the weaving, and finishing phase activity.

### **Challenges**

After a flourishing textile industry for more than three centuries, a single company keeps this legacy alive, having to face the difficulties linked to the higher price of handmade products and the negative impact of the economic crisis of 2008 and the current crisis. The main challenge is to survive in this complex socioeconomic environment, which is not very favourable to craftsmanship.

### **Innovation**

There is innovation associated with new products (hats, ties, bags...), customization (yoga and pilates blankets, dogs, and cats...), new designs, connection with the cultural and tourist offer of the municipality, and a very successful online sales platform that partly compensates for the drop in sales due to the current crisis.

## Subbética Ecológica, production and consumption of organic food

It is a successful case of creation, in 2009, of a short organic production and consumption channel based on a territorial radius that brings together nearly 500 consumer families, fifty producers and processors, and several dozen collective consumers.

It generates positive environmental effects (reducing carbon footprint, waste, or soil pollution, contributing to soil and biodiversity conservation) and social impact. It is an exemplary case of a social initiative generating economy model based on agroecological principles. Its contribution to the creation of a collaborative regional network is also recognized.

Reference mountain landscape statistics  
(A: Data from NUTS3 ES613)

Reference mountain chain		Betic Systems	
Reference mountain landscape		Cabra	
Size of the area (km <sup>2</sup> )	229.14	Average per capita income (€)/year	13793.33
Altimetry (m; min-max)	350-1100	Total Gross Value Added (GVA) (€ million)/year	13153.1 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	88.79	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-4.3	Primary:	10.50 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	523	Secondary:	17.61 <sup>A</sup>
		Tertiary:	71.89 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	64.9	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	1362	Primary:	12.90 <sup>A</sup>
		Secondary:	20.62 <sup>A</sup>
Protected areas	Yes	Tertiary:	66.48 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

It is a short-channel value chain where production and consumption work together for a collective interest, the Common Good. The entity is certified within this framework of the Economy for the Common Good as a non-profit association. Under democratic governance principles, it has maintained sustained growth over ten years and reached an annual turnover of over 600,000 €. It employs five people directly and several dozen indirectly. It has encouraged the creation of training programs for the entry of new players into the value chain.





### **Key local assets**

The production activity is located on orchards and other organic farms situated in Cabra and other towns in the Subbetica and south of Cordoba. Other organic productions from nearby areas and provinces. The physical space of reception, processing, distribution, and sale is in the municipality of Cabra.

### **Challenges**

The initiative is aligned with the promotion of agroecology principles, the commitment to short channels, and the aggregation of actors in a territorially based food hub. Ensuring scalability and resilience is its challenge.

### **Innovation**

It is a social innovation that has progressively implemented innovative solutions in the production, processing, storage, distribution, marketing, and consumption phases. It is a successful best practice, implemented by a collective of private actors and consumers, with little public support. The process has innovated agricultural production practices and created a processing workshop, warehouse, and store, maintaining a vast network of collaborative relationships with other actors in the production and consumption of organic food within a radius of 150 km.

## Mantecados de Rute, Traditional Christmas cakes made mainly from lard.

Since the middle of the 20th century, a flourishing value chain dedicated to the production of mantecados has been consolidated. The three main bakeries employ more than three hundred people, many of them women.

The municipality of Rute occupies the southern part of the mountainous area of the Subbética Cordobesa and descends to the foothills occupied by olive groves. The value chain connects with local traditions, although the raw materials do not come from the area. However, they represent an important value in cultural, socio-economic terms and as a territorial brand.

Reference mountain landscape statistics  
(A: Data from NUTS3 ES613)

Reference mountain chain		Betic Systems	
Reference mountain landscape		Rute	
Size of the area (km <sup>2</sup> )	131.14	Average per capita income (€)/year	11765.70
Altimetry (m; min-max)	400-1200	Total Gross Value Added (GVA) (€ million)/year	13153.1 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	75.00	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-6.30	Primary:	10.50 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	407	Secondary:	17.61 <sup>A</sup>
		Tertiary:	71.89 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	82.6	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	983	Primary:	12.90 <sup>A</sup>
Protected areas	No	Secondary:	20.62 <sup>A</sup>
		Tertiary:	66.48 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Rute's mantecados and polvorones enjoy prestige in the region, articulate a relevant local production cluster and generate several hundred seasonal jobs each year. The brand gives a reputation to the municipality, and there is an excellent public-private collaboration capable of supporting the sector. Collaboration with other food sectors of the municipality and related cultural and tourist activity complete an original scenario, even though the raw material comes mostly from different geographical areas.

### **Key local assets**

The wide range of products uses ingredients such as lard, almonds, sugar, and flour. Most of the raw material is acquired outside the place of production. The traditional productive spaces have been joined by museums and shops that, together with other sites, generate a thematic park of Christmas products.

### **Challenges**

Diet changes aimed at reducing animal fats and sugar consumption have led to changes in production and the appearance of new products, trying to keep a consumer offer linked to a traditional holiday such as Christmas competitive.

### **Innovation**

Breaking the seasonality of production is another great challenge. The diversification of the offer and the appearance of new services are considered useful tools for this challenge.

The production of vegan sweets and vegetable fats is an increasingly prominent line of business. Simultaneously, the innovative proposal of artistic chocolate representations, the opening of exhibition spaces and points of sale and the collaboration with other sectors (liquors and hams) attract almost 100,000 visitors to the town in the run-up to Christmas.

## Quince juice & vinegar from Carcabuey and Priego de Córdoba

Quince is traditionally produced from a local, rounded, and small variety in the area. A sweet has been obtained, and more recently, juice and vinegar have also been made.

The cultivation of quince is complementary to olive groves, the main crop in the area, adapting very well to the area's climatic and agronomic environment. It is part of a long-established tradition in the municipalities of Carcabuey and Priego de Córdoba. More recently, the incorporation of new processed products such as juice and vinegar has taken place, thanks to the Cooperative Almazaras de la Subbética, centralizing the process of distribution and marketing of the product.

Reference mountain landscape statistics  
(A: Data from NUTS3 ES613)

Reference mountain chain		Betic Systems	
Reference mountain landscape		Carcabuey	
Size of the area (km <sup>2</sup> )	79.78	Average per capita income (€)/year	9969.71
Altimetry (m; min-max)	600-1300	Total Gross Value Added (GVA) (€ million)/year	13153.1 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	29.72	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-11.70	Primary:	10.50 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	370	Secondary:	17.61 <sup>A</sup>
		Tertiary:	71.89 <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	82.5	Primary:	12.90 <sup>A</sup>
Number of agricultural holdings	522	Secondary:	20.62 <sup>A</sup>
Protected areas	Yes	Tertiary:	66.48 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The production occurs in the small orchards located in the described area, both in dry and irrigated land. The production is destined to different markets for its raw sale in Madrid, Israel, or Germany or for its transformation in Puente Genil, Murcia, France, or Portugal. The harvesting process is carried out with the utmost care because although it is hard, its rind is fragile. Traditional techniques have been replaced by more sophisticated agronomic methods throughout the process, from flowering to harvesting and the rest of the year in the thinning and pruning.

Other areas even nearby (Puente Genil) are specialized in the production of quince jam but not so much juice or vinegar. In other Mediterranean countries such as Italy and Greece, similar quince-based preparations can be found.

### **Key local assets**

Quinces from the production area (Carcabuey, Priego de Córdoba, and Rute) with a harvest between October and November reaching approximately 4,000 tons/year.

### **Challenges**

Progressively it is being produced with more significant environmental and technical care to obtain high-quality fruits. It is a unique market that demands quality and innovation. There is a growing demand for organic quince.

### **Innovation**

Since the end of the 1960s, quince juice production began to be experimented with, and it has been taken up more recently by the Almazaras de la Subbética Cooperative, which has also incorporated quince vinegar (dry and sweet).

It is an innovative mix that combines new products and processes with new marketing strategies and collaboration among many cooperative members and value chains within the same cooperative (olive oil, table olives, almonds, goat's milk, and quince products).

## Wood charcoal from Gran Canaria island

The Gran Canaria Biosphere Reserve is one of the few that keep the charcoal industry alive. In 2014, thanks to the collaboration between the charcoal makers grouped in the "Asociación Charamusco Carboneros de la Cumbre" and the technicians of the Environmental Service of the Cabildo, the brand CARBÓN DE LA CUMBRE was registered.

Carbón de La Cumbre's activity helps with the removal of dry wood from the forest. Therefore, the prevention of forest fires generates economic activity and employment while maintaining an important cultural tradition. The most recent initiative offers, in addition to environmental benefits, the possibility of articulating a public-private collaboration initiative to manage natural ecosystems.

### Reference mountain landscape statistics (A: Data from NUTS3 ES70)

Reference mountain chain		Gran Canaria Island	
Reference mountain landscape		Tejeda	
Size of the area (km <sup>2</sup> )	103.3	Average per capita income (€)/year	18559
Altimetry (m; min-max)	120-1860	Total Gross Value Added (GVA) (€ million)/year	15777.1 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	18.23	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-11.72	Primary:	1.24 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	451	Secondary:	12.56 <sup>A</sup>
		Tertiary:	86.20 <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	38.3	Primary:	2.6 <sup>A</sup>
Number of agricultural holdings	65	Secondary:	11.4 <sup>A</sup>
Protected areas	Yes	Tertiary:	86.0 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Traditional charcoal making is the craft of making charcoal from firewood. This has been an essential source of heat, used for cooking or heating houses. The charcoal maker makes charcoal by building an oven. Since the 16th century, there is evidence of regulations for making charcoal in the Canary Islands mountains. It is a local, ecological product and an example of a renewable resource that promotes the economy and employment in mountain areas, fostering rural

development in the Biosphere Reserve of Gran Canaria, thus strengthening its population. It is sold locally in gas stations and stores in San Mateo, Tejeda, and Artenara.

There has been an extraordinary activity of charcoal production from vegetal remains from the forest or derived from tree pruning in many other European regions. This is also the case of the traditional charcoal and picón production in Andalusia or the charcoal-making traditions in the Basque Country and Navarre.

### **Key local assets**

La Cumbre charcoal is made from raw material from the dry wood of species that grow spontaneously (almond and broom) and without any chemical products.

### **Challenges**

The main challenge is to make sustainable a small artisanal production, linked to the forest's local resources with the industrial type of commercial offers that flood the market with very cheap charcoal offers. On the other hand, maintaining in this context the interest of charcoal makers in a complementary and economically unprofitable activity is another critical challenge, together with the need to carry out a regenerative practice of the forest and not an extractive one.

### **Innovation**

Although it provides innovative nuances by linking an associative structure that brings together the charcoal producers in collaboration with the institution responsible for the Gran Canaria Biosphere Reserve, this is a traditional value chain. On the other hand, Carbón de La Cumbre intends to obtain the FSC® (Forest Stewardship Council) certificate for good practices and sustainable forest use, as most forest areas in Gran Canaria are already recognized.

## Production of spirits, liquors, and brandies, following traditional recipes.

Rute brandy (also called ruteño or anise from Rute) is a dry aniseed brandy typical of Cordoba liquors tradition. The preparation is carried out by hydro alcoholic distillation in stills.

Although most raw materials are resources exogenous to the locality, the cultural heritage, both tangible and intangible, and the employment associated with liquors' production and the associated tourist attraction generate brand value for the municipality.

### Reference mountain landscape statistics (A: Data from NUTS3 ES613)

Reference mountain chain	Betic Systems		
Reference mountain landscape	Rute		
Size of the area (km <sup>2</sup> )	131.87	Average per capita income (€)/year	11765.70
Altimetry (m; min-max)	400-1200	Total Gross Value Added (GVA) (€ million)/year	13153.1 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	75.00	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-6.30	Primary:	10.50 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	407	Secondary:	17.61 <sup>A</sup>
		Tertiary:	71.89 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	82.6	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	983	Primary:	12.9 <sup>A</sup>
Protected areas	Yes	Secondary:	20.62 <sup>A</sup>
		Tertiary:	66.48 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Around 400,000 bottles come out each season from the five current distilleries, especially of the most typical products such as sweet and dry anise, rosoli, or pacharán. Also noteworthy is the increase in alcohol-free liquors in recent years. Some of these distilleries have been active since the 19th century. Along with the production of liquors, they have given value to their historical heritage, receiving thousands of visitors in their facilities as well as in several thematic museums.

There has been an extraordinary activity of charcoal production from vegetal remains from the forest or derived from tree pruning in many other European regions. This is also the case of the



traditional charcoal and picón production in Andalusia or the charcoal-making traditions in the Basque Country and Navarre.

More than 3,000 towns in Spain have manufactured aniseed brandy, reaching more than 10,000 distilleries. In Andalusia, the spirits produced in Cazalla de la Sierra (Sierra Morena) are worth highlighting.

### **Key local assets**

This distillate of high graduation (45°-55°) comes from the artisan distilleries located in Rute and Baena municipality (province of Córdoba) since the 17th century. It is characterized by its elaboration flavored by green anise seed, or Pimpinella Anisum from the fields of the province of Malaga.

### **Challenges**

The aniseed-flavoured spirits sector is less important than in the past, also due to the higher demand for lower alcohol degree beverages, the seventies' industrial crisis, and rigorous tax rates. All of that has contributed to the disappearance of many companies and currently there are only five.

### **Innovation**

Innovation is associated with the need to introduce new products, associated cultural and tourist services and synergies with other productive sectors (mantecados, hams, etc.).

The emergence of non-alcoholic liquors, the opening of tourist and cultural visits to the distilleries, and the creation of thematic museums have allowed a certain revitalization of the sector and maintenance of the activity and territorial prestige linked to the production of spirits in Rute.

## Wines of the Contraviesa

Wines produced from vineyards planted at the highest altitude (1400 meters) in Europe, in small productions and high identity value. The agroecological system is polyculture. Each farmhouse in the area maintains a small winery while a dozen professional firms offer their wines to the market.

The Sierra de la Contraviesa is a mountainous formation flanked by the Sierra Nevada to the north, the Sierra de Lújar to the west and the Sierra de Gádor to the east, near the Mediterranean Sea. This area produces excellent wines thanks to the genuine nature of the grapes and its subsequent artisanal process. The vineyards are among the highest in Europe, which means that the ripening period is longer. The conditions are optimal to produce wines of extraordinary quality.

Reference mountain landscape statistics  
(A: Data from NUTS3 ES614)

Reference mountain chain	Betic Systems		
Reference mountain landscape	Cádiar		
Size of the area (km <sup>2</sup> )	47.28	Average per capita income (€)/year	10146.71
Altimetry (m; min-max)	850-1400	Total Gross Value Added (GVA) (€ million)/year	15101.80 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	30.98	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-10.5	Primary:	7.47 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	182	Secondary:	14.65 <sup>A</sup>
		Tertiary:	77.88 <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	86.4	Primary:	9.74 <sup>A</sup>
Number of agricultural holdings	222	Secondary:	16.46 <sup>A</sup>
		Tertiary:	73.80 <sup>A</sup>
		Protected areas	Yes

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

A small revolution has taken place in the last half century with the consolidation of a dozen wineries in municipalities such as Cadiar, Torvizcon or Murtas. They are small companies that cultivate between 10 and 50 hectares and produce an average of 20,000 litres per year. The

production is destined for the provincial and regional market as well as for the European and North American markets. The vineyards coexist with almond, fig, and olive trees. Some of the wineries are part of the Granada Wine Route, a group of companies whose common objective is "the active enjoyment of the world of wine in the province of Granada". The area is under the PDO Granada with a subzone, Contraviesa Alpujarra, as well as the PGI Cumbres del Guadalfeo.

Other mountain wines are produced in different areas of Spain (Sierra de Ronda, Tenerife Island, etc.) but also in different Greek, German, or Italian regions, among others.

### **Key local assets**

The altitude, slate soils and very little rainfall give these wines a lot of character. Fifty years ago, they began replanting vines of a local variety, the Vigirieja, which coexist with other varieties such as Cabernet Sauvignon. The aim is to maintain the multi-varietal that affects the old vines to produce some special rosé. They produce white and red wines but also rosés, cavas and even sweet wines.

### **Challenges**

Lack of professionalism and high prices can reduce competitiveness and cause surpluses, aggravated by the health crisis. There is no articulated business association, in an environment that is not very conducive to associationism. Climate change is noticeable in the ripening cycles of the grapes.

### **Innovation**

The main innovation has to do with the changeover of most wineries to organic production and the introduction of complementary activities (tourism, tastings, etc.) that inject cash flow into the management of the companies. Vineyards have been renewed in recent decades, as well as the diversity of wine types and markets, the introduction of other cultural and tourist activities, along with widespread organic production and online sales.

## Organic Olive Oil from Zuheros

The organic olive farming can contribute to the conservation of mountain ecosystems, protecting soils, biodiversity and generating social and economic benefits. It adds to existing quality certifications (Protected Designation of Origin), other quality schemes and recognitions linked to the territory, ecology, diversity of varieties or the articulation of the sector.

The municipality of Zuheros is in the Sierras Subbéticas Cordobesas Natural Park, with clear characteristics of a mountain area. Its agriculture and livestock, given the geomorphological characteristics of the area, have always been integrated with the management of the mountain ecosystem. However, the initial abandonment of cereal and legume crops in higher altitude areas, the decrease and simplification of livestock farming and the current evolution of the olive grove which is more closely linked to the mountain (between abandonment and ploughing for its transformation), mark a trend to which only an innovative process (organic production, regenerative practices associated with the conservation of the landscape and the ecosystem, social and business leadership, development of alternative commercial channels) can provide an answer and structure a balance for the coming decades.

Reference mountain landscape statistics  
(A: Data from NUTS3 ES613)

Reference mountain chain		Betic Systems	
Reference mountain landscape		Zuheros	
Size of the area (km <sup>2</sup> )	42.36	Average per capita income (€)/year	9426.19
Altimetry (m; min-max)	500-1300	Total Gross Value Added (GVA) (€ million)/year	13153.1 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	14.99	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-17.2	Primary:	10.50 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	169	Secondary:	17.61 <sup>A</sup>
		Tertiary:	71.89 <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	65.9	Primary:	12.9 <sup>A</sup>
Number of agricultural holdings	151	Secondary:	20.62 <sup>A</sup>
		Tertiary:	66.48 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The organic production of olive oil in mountain areas represents a small group of producers and a niche market that can guarantee their survival if a specific market niche, sufficient public aid, and a process of training and internal leadership are consolidated. At the present time it gathers a small group of producers that generally must go to companies located outside the municipality to acquire inputs and to elaborate the olive oil, except for a small family oil mill that elaborates its own oil. Neither of them puts their oils on the market except in a symbolic way. The local olive oil cooperative does not have an organic production chain, although it does certify its production under the BAENA Denomination of Origin brand. The main reason why this Denomination of Origin was created is the diversity of varieties existing in this municipality, which, however, is hardly valued commercially. The municipality attracts thousands of tourists, which represents an opportunity for the trade of local products.

Similar characteristics occur in many other mountain ranges in Southern Europe where olive oil is produced. However, with some exceptions, a specific value chain has not been articulated that would gain in scale while connecting organic production with innovative and integrated regenerative practices with the conservation of mountain ecosystems and landscapes.

### **Key local assets**

In general, the old traditional olive groves are maintained, based on a complex number of local varieties. However, the replacement of these olive trees, many of which are hundreds of years old, by new specimens is increasing, often altering the plantation framework, and tending towards mono-varietal crops. In areas located at higher altitudes, with difficult access, steeper slopes and difficult mechanization, there is an unstable balance between plots that are beginning to be abandoned and others that maintain a management adapted to the ecosystem with an important presence of associated natural vegetation.

### **Challenges**

Emphasis should be placed on greater interest by producers in innovative systems; greater coordination among producers; the development of processing chains and specific products under organic certification; reference to local varieties of olives and mountain cultivars; the opening of specific marketing channels; synergies with other sectors such as culture, the environment and tourism; adaptation to climate change; technical improvements and capacitation in regenerative agriculture.

### **Innovation**

The value chain has open space for innovation but today it behaves basically as a traditional chain except for the compliance of a small group of producers with the regulations associated with the organic production system. The small group of producers together with a small processing company, develop their practice under the regulations of the European Union for organic production and certification of authorized bodies.

## Olive oil Protected Designation of Origin “Sierra de Segura”

Successful registration of a pioneer quality scheme; traditional olive grove cultivation in combination with a protected area; climate change may favour high-altitude cultivation, maintenance of biodiversity & complementarity.

The Sierra de Segura is part of the Cordillera Prebetica mountain range, with a very rugged topography with high average altitudes (899 metres) and steep slopes, ranging from 520 metres to altitudes of 1809 metres. The area of olive groves protected by the Sierra de Segura Designation of Origin (created in 1979), covers some 40,000 hectares, belonging to more than 8,000 registered farmers, spread over 14 municipalities in the province of Jaén. The average production in the area exceeds 20 million kg of oil. Mountain olive groves have lower yields and higher production costs. However, on the other hand, they have a higher rainfall and milder summers, and harvesting techniques are used to avoid contact between the olives and the ground. All of this contributes to obtaining A PICUAL WITH CHARACTER, oils with their own identity. In addition to the generic certification, they certify early production virgin olive oils and other specific certifications such as KOSHER for the Jewish market.

Reference mountain landscape statistics  
(A: Data from NUTS3 ES616)

Reference mountain chain		Betic Systems	
Reference mountain landscape		Beas de Segura	
Size of the area (km <sup>2</sup> )	159.25	Average per capita income (€)/year	9194.23
Altimetry (m; min-max)	500-1274	Total Gross Value Added (GVA) (€ million)/year	10686.3 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	33.02	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-10.10	Primary:	14.91 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	244	Secondary:	17.61 <sup>A</sup>
		Tertiary:	67.48 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	119.5	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	1183	Primary:	16.11 <sup>A</sup>
		Secondary:	21.62 <sup>A</sup>
		Tertiary:	62.27 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

The Virgin Olive Oil certified by the DO Sierra de Segura is obtained from the fruit of the Picual, Verdala, Royal, and Manzanillo de Jaén olive varieties. The fruit is harvested with little mechanisation in a staggered period between mid-October and mid-February. Average production in the area exceeds 20 million kilograms of olive oil. A total of 8000 producers are linked to the Designation of Origin, as well as 52 registered entities and authorised brands.

The Sierra de Segura Designation of Origin comprises the municipalities of Arroyo del Ojanco, Beas de Segura, Segura de la Sierra, Benatae, Chiclana de Segura, Génave, Hornos de Segura, La Puerta de Segura, Orcera, Puente de Génave, Santiago-Pontones, Siles, Torres de Albánchez and Villarrodrigo, all of which belong to the province of Jaén. Other Mountain Reference Regions in Spain have Designations of Origin totally or partially certifying olive oils produced in mountain areas (PDOs Sierra Mágina, Sierra Cádiz, Priego de Córdoba).

### **Key local assets**

The olive groves are located on slopes (50% of the surface area is on slopes greater than 40%). Almost 50% of the area protected by the Designation of Origin (38,819 ha) is included within the Segura, Cazorla y las Villas Natural Park (16,000 ha). The mountain character facilitates the conservation of the natural, urban, and cultural environment.

### **Challenges**

The main challenge is the generational changeover, which leads to the increasing abandonment of land; in addition, pest treatment without using aerial means and reducing chemical products; mechanisation is almost impossible, and irrigation is deficient.

### **Innovation**

It certifies early harvest olive oils; it acts as an online sales platform for certified companies; it has an accredited tasting panel; it is the oldest Designation of Origin in Andalusia (1979). Early harvesting has been a major step to bring forward the cycle and obtain extra virgin olive oils. The certification of this process is a milestone in terms of guarantee and marketing, as well as the availability of its own panel of tasters and a collective sales platform at the service of certified companies.

## Lanjarón, spring and mineral water from Sierra Nevada

Lanjarón is a brand of natural mineral water owned by Aguas Danone, SA (a Danone Group company), which comes from the Salud spring in Lanjarón in the Sierra Nevada massif in the province of Granada, where it is also bottled. Lanjarón water is very weakly mineralised.

The natural mineral water of Lanjarón originates in the peaks of the Sierra Nevada National and Natural Park, declared a Biosphere Reserve by UNESCO in 1986. The town of Lanjarón is located at the Sierra Nevada foot, having had a historical link with the natural mineral water used both in the spa and in bottled mineral water for human consumption.

### Reference mountain landscape statistics (A: Data from NUTS3 ES614)

Reference mountain chain		Betic Systems	
Reference mountain landscape		Beas de Segura	
Size of the area (km <sup>2</sup> )	60.33	Average per capita income (€)/year	12769.49
Altimetry (m; min-max)	250-3150	Total Gross Value Added (GVA) (€ million)/year	15101.80 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	58.51	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-8.9	Primary:	7.47 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	1470	Secondary:	14.65 <sup>A</sup>
		Tertiary:	77.88 <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	45.5	Primary:	9.74 <sup>A</sup>
Number of agricultural holdings	183	Secondary:	16.46 <sup>A</sup>
		Tertiary:	73.80 <sup>A</sup>
		Protected areas	Yes

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

The springs of Lanjarón were discovered at the end of the 18th century. In 1818, six springs in the town of Lanjarón were declared mineral-medicinal water, including the Salud spring. From 1830 the bottling of the different waters began. In 1950 a glass bottling factory was built. In 1982 Lanjarón went from PVC packaging to be the first brand to bottle Natural Mineral Water in PET.





In 2005 the company sold the spa, while in 2006, the merger by absorption of Aguas de Lanjarón, S.A. by Font Vella S.A., based in Barcelona, was made public. In 2016 it changed its corporate name to Aguas Danone, SA.

Many mountainous regions take advantage of their springs to commercialize mineral waters. In Spain, among others, the Autonomous Communities of Castilla y León, the Canary Islands, Aragón, Catalonia... Similarly, this is the case in the different mountainous areas of the European Union.

### **Key local assets**

Mineral waters have established by law a perimeter of protection, an aquifer recharge zone, keeping under control human, industrial, and livestock activities if they do not affect the quantity or quality of the mineral water. Some waters have the added protection of being born in a National Park, such as the Sierra Nevada.

### **Challenges**

Faced with a private company's business challenges, the company is committed to the environmental and global challenges of our society. Specifically, in the case of Lanjarón, this represents a commitment to nature, reducing the impact of industrial activity, protecting the environment, and promoting the use of sustainable materials and packaging.

### **Innovation**

The company stands out for the innovation applied in its processes and product incorporation and its marketing strategies, business model, and governance, being a publicly recognized challenge to try to combine its management strategy with the planet's global sustainability challenges.

All Lanjarón bottles will be made of recycled plastic by 2021. Besides, they will use a new cap format that remains attached to the bottle. Since its birth, commitment to the environment has been associated with Lanjarón natural mineral water, given its privileged origin. For years, Lanjarón has been dedicating part of its profits to financing different actions to fight against waste disposal and in favour of the circular economy and against depopulation and other socio-ecological problems.

## Breeding of purebred Spanish horses

There is documentary evidence of horse breeding in the Sierra de Cabra since the XVI century. It is a special type of horse, wild, with bone, of great height and very functional. Thanks to the handling and the relief, the foals exploit the best functionality of the Purebred Spanish Horse.

Horses are bred extensively, they grow and develop in a natural environment, where altitude, rain, rocky terrain, and winter cold give them a special strength. Nature itself prepares them to be functional and strong. There are two stud farms with 450 and 650 hectares of land, respectively, which include separate pastures for mares and foals, as well as some unique buildings. Horse breeding is a hallmark of these mountains declared a UNESCO World Natural Park and Geopark because of its impressive karst geomorphology.

Reference mountain landscape statistics  
(A: Data from NUTS3 ES613)

Reference mountain chain		Betic Systems	
Reference mountain landscape		Cabra	
Size of the area (km <sup>2</sup> )	229.16	Average per capita income (€)/year	13793.33
Altimetry (m; min-max)	350-1100	Total Gross Value Added (GVA) (€ million)/year	13153.1 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	88.79	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-4.3	Primary:	10.50 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	523	Secondary:	17.61 <sup>A</sup>
		Tertiary:	71.89 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	64.9	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	1362	Primary:	12.9 <sup>A</sup>
Protected areas	Yes	Secondary:	20.62 <sup>A</sup>
		Tertiary:	66.48 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The breeding of equines has been traditional in the Cabra and Zuheros mountain ranges for centuries, first as work and transport animals, both horses and mules and donkeys. Fifty years

ago, there was a change in production orientation and since then two stud farms have been dedicated to the breeding of the Pura Raza Español (PRE). The horses are highly recognized in morphological and dressage competitions, both national and international, and have even participated in the Olympics. The stud farms follow the complete process of breeding foals that are sold at one year of age or from three years of age when the dressage process begins.

Horses are present in the Spanish mountains. In the 1970s, Galicia had 22,000 wild horses in the mountains. Today, this number has been reduced and it is estimated that there are about half of them left. Even so, it is the largest semi-free-range horse population in Europe. In Portugal, we can mention the Garrano horse, located in semi-freedom in the mountains in the north of the country.

### **Key local assets**

Horses are bred extensively, they grow and develop in a natural environment, where altitude, rain, rocky terrain, and winter cold give them a special strength. Nature itself prepares them to be functional and strong. There are two cattle farms with 450 and 650 hectares, respectively.

### **Challenges**

The successive crises have diminished the national market for the sale of these foals, which on the other hand have their main outlet in the foreign market, where more and more Spanish Purebred horses are being sold.

### **Innovation**

The extensive management taking advantage of the relief and the suitability of the natural pastures, the taming of the colts, the combination with the breeding of black Andalusian cows (native breed) and the opening of a restaurant in one of the cattle ranches are signs of innovation and identity.

The main innovation is linked to the type of mountainous terrain and extensive breeding, as well as the orientation towards the specific breeding of Pura Raza Español (PRE) horses. In some cases, the activity has been diversified by combining beef cattle breeding and the opening of a restaurant.

## "Azpi Gorri" Goat Breed

The Azpi Gorri is a traditional breed of the Basque Country. By the late twentieth century it had become gravely endangered, with an estimated breeding population of 100. In 1997 it was added to the Catálogo Oficial de Razas de Ganado de España, the national register of livestock breeds of the Ministerio de Agricultura, Pesca y Alimentación, and in 2001 it was included in the official list of Basque breeds of the País Vasco. A breed society, the Euskal Herriko Azpi Gorri Elkarte, was formed in 1999; it has kept the herd-book since 2007.

The Parque Natural de Gorbeia is a natural park in the autonomous community of the Basque Country in northern Spain. It is the largest Basque natural park, with an area of 200 km<sup>2</sup>. Its centre is the Gorbeia massif, and includes the municipalities of Areatza, Artea, Orozko, Zeberio and Zeanuri in Vizcaya, and Zigoitia, Zuia and Urkabustaiz in Álava. With the nearby natural park of Urkiola, it forms an important environmental unit.

### Reference mountain landscape statistics (A: Data from NUTS3 ES231)

Reference mountain chain		Cantabrian Mountains	
Reference mountain landscape		Orozko	
Size of the area (km <sup>2</sup> )	102	Average per capita income (€)/year	17633
Altimetry (m; min-max)	150-1350	Total Gross Value Added (GVA) (€ million)/year	32656.5 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	25.74	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	9.4	Primary:	1.60 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	108	Secondary:	49.50 <sup>A</sup>
		Tertiary:	48.90 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	23.4	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	187	Primary:	0.90 <sup>A</sup>
		Secondary:	24.70 <sup>A</sup>
		Tertiary:	74.40 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The breed has its origin in the Pyrenean stock, whose ancestral representative is the capra aegagrus. The main productive use is meat. The suckling goats are slaughtered at around 35 to 40 days after birth, having drunk only their mother's milk. They reach about 10 to 11 kg live weight which becomes 7 to 8 kg carcass weight. The carcasses are left for 3 to 4 days in airing until they are ready to be cooked. The "caprino mayor" (from cull goats, which is usually consumed in rural areas and was once used for canning) is also consumed. Owners are family farms, generally small (20-30 goats). Farms with more than 50 goats are rare and farms with 100 or more goats are exceptional.

It is distributed in the northern part of the province of Álava and in southern Bizkaia, with a few herds in the autonomous community of Navarre.

### **Key local assets**

These animals have a dual aptitude for milk and meat, although there is a marked tendency to sell live kids. They graze freely in the mountains with little human intervention. They like aromatic and medicinal plants. The Azpi Gorri goats follow a regime of extensive exploitation. After April, the herd is sent to the mountains, where the animals live in complete freedom during the 5-6 months of their stay.

### **Challenges**

The main challenge is the conservation of the breed as it is in a serious process of recession. It is recognized as a native breed in the Basque Country and the Spanish state, as well as by the FAO, and is included in the Slow Food Ark of Taste. The Bizkaiko Azpi Gorri Elkarte (BIAGE) brings together Biscayan Azpi Gorri goat breeders.

### **Innovation**

Innovation is related to articulating a local response to a situation that threatens the breed's survival and connects with other international initiatives aimed at the defence of agricultural, livestock, and food biodiversity, such as the Slow Food movement.

Innovation is justified by new public systems and regulations to preserve native breeds, private initiatives by local entrepreneurs, and articulation with social movements that share these objectives.

## BETIZU, Basque Country endangered breed

The Betizu is a breed of small mountain cattle which live in a semi-feral state in some mountainous parts of the Basque Country in both Basque Country and France. It is classified as an endangered breed by both the Ministerio de Agricultura, Pesca y Alimentación of Spain and by the Conservatoire des Races d'Aquitaine in France. It is included in the Official Catalog of Basque Autochthonous Animal Breeds, the Official Catalog of Cattle Breeds of Spain, in the FAO Catalog of the United Nations (DAD-IS), as well as in the Ark of Taste Slow Food.

The historical production area is the Euskalherria mountains. Its peculiarities of great rusticity, together with its historical and traditional value in the Basque mountains, give this breed a special interest for the use of marginal and mountain areas.

### Reference mountain landscape statistics (A: Data from NUTS3 ES220)

Reference mountain chain		Pyrenees	
Reference mountain landscape		Goizueta	
Size of the area (km <sup>2</sup> )	91.5	Average per capita income (€)/year	20063.56
Altimetry (m; min-max)	150-1000	Total Gross Value Added (GVA) (€ million)/year	18142.3 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	7.54	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-11.44	Primary:	3.64 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	282	Secondary:	35.90 <sup>A</sup>
		Tertiary:	60.46 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	67	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	84	Primary:	2.90 <sup>A</sup>
		Secondary:	33.70 <sup>A</sup>
Protected areas	Yes	Tertiary:	63.40 <sup>A</sup>

\*1 Nearest settlement with population > 100,000

\*2 share of total GVA/year

\*3 share of total employment)/year

It is the remaining redoubt of the wild bull or aurochs in the Basque Country. It is a semi-wild breed that moves in the mountains, where it feeds and breeds without human intervention. Males weigh around 400 to 500 kg. and females 350 kg. They are milk carcasses of 30 to 40 kg obtained from calves of 3 to 5 months of life fed exclusively on mother's milk. Without any other type of feed. The mother's diet is based on natural fodder and does not accept feed with transgenic components or additives. The reproductive cycle is associated with the seasons, and they usually give birth to a calf every two years. It is estimated to produce 100 carcasses and 20 jerkies per year. The census in Navarra in 2016 was 603 heads located in 19 farms.

It is one of a small number of semi-feral cattle populations in Europe, with the Albera of the Pyrenees, the Monchina of Cantabria, and the Raço di Biòu of the Camargue. The Government of Navarre has launched a project to conserve this autochthonous breed. They own a herd that inhabits the abandoned village of Sastoya, in the Urraúl Alto.

### **Key local assets**

The management of pastures and forests to ensure the continuity of this breed and its contribution to the sustainable management of ecosystems, fire prevention, and the generation of economic added value are interrelated aspects in this value chain.

### **Challenges**

The main challenge is the conservation of a breed that is in danger of extinction. This involves the availability of pastures and woodlands where this species can reproduce while at the same time intervening in the management of the agroforestry space and offering economic profitability. Entities such as the Asociación de Criadores de Betizu de Navarra- ASBENA are committed to this challenge.

### **Innovation**

Innovation is related to articulating a local response to a situation that threatens the breed's survival and connects with other international initiatives aimed at the defence of agricultural, livestock, and food biodiversity, such as the Slow Food movement.

Innovation is justified by new public systems and regulations to preserve native breeds, private initiatives by local entrepreneurs, and articulation with social movements that share these objectives.

## Euskal Txerria Pig

Until the beginning of the 20th century, every farmhouse in the Basque Country had a small group of pigs. It was a similar situation throughout Celtic Europe, although the livestock trade flourished much more in the Basque Country. There were even three autochthonous breeds of pigs: the Baztanesa, the Chato Victoriano -both extinct- and the Euskal Txerria.

Bidegoian is the highest municipality in the historical territory of Gipuzkoa. Surrounded by farmhouses, forests, and mountains, among which Ernio (1,075 m) stands out. Bidegoian has managed to maintain the essence of rural Gipuzkoa. Also, this isolation has contributed to the preservation of the natural environment that surrounds the municipality in perfect condition. The pigs take care of the beech forest. They graze in the meadows, together with sheep and cows and goats on steep terrain.

Reference mountain landscape statistics  
(A: Data from NUTS3 ES212)

Reference mountain chain		Cantabrian Mountains	
Reference mountain landscape		Bidania-Goiatz	
Size of the area (km <sup>2</sup> )	13.74	Average per capita income (€)/year	17631
Altimetry (m; min-max)	450-1050	Total Gross Value Added (GVA) (€ million)/year	21774.4 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	40.75	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	5.46	Primary:	6.20 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	36	Secondary:	43.80 <sup>A</sup>
		Tertiary:	49.90 <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	37.3	Primary:	0.60 <sup>A</sup>
Number of agricultural holdings	51	Secondary:	28.60 <sup>A</sup>
		Tertiary:	70.70 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year



Pello Urdapilleta, the first producer of the Slow Food Presidium, transforms his flavorful meat into a range of cured meat products. The SLOW FOOD Presidium was created to develop and promote traditional sausages made from Euskal Txerria pigs. The project wants to encourage other local farmers and artisans to follow Pello's example, and results are already being achieved. Euskal Txerria-based dishes are starting to appear on the menus of local restaurants and some renowned Basque restaurants. Pello's model farm is regularly visited by children and students interested in discovering a portion of food that was a staple of the Basque diet for many centuries.

Also called "Pie Noir," the Basque pig is a breed of Iberic pig and is one of the 6 acknowledged local races along with the Gascon, the Limousin, the Corse, the Western White, and the Bayeux. The Basque pig originally comes from the Basque country, Bearn, and Hautes Pyrénées regions of South West France.

Nearly extinct and declared as an endangered species in 1981 by the Ministry of Agriculture, the Basque pig has survived thanks to the perseverance and commitment of a handful of local breeders.

### Key local assets

The Slow Food Presidium pigs are only raised extensively and do not exceed 14 animals per hectare: they graze freely on acorns, chestnuts, hazelnuts, and grass. They only reach a proper fattening phase in their last two months, feeding on corn, beans, and bran (only non-genetically modified feed is used) until they get 120 kilos in weight, at which point they are slaughtered.

### Challenges

Of the three autochthonous pig breeds of the Basque Country until 1974, only the Euskal Txerria survives. In 1929, 158,000 head were registered, but in 1989 there were barely 25 head left. In 1989 in the Aldudes Valley, the "Association of the Pie Noir du Pays Basque" was created around Pierre Oteiza. In 1996 Pello Urdapilleta started the recovery of the "Euskal Txerria" breed. Today he has a herd of Celtic trunk pigs, enjoying extensive meadows and forests. The challenge is to maintain a herd that today has about 400 mothers and 50 boars, slaughtering about 2000 heads per year.

### Innovation

The Urdapilleta online Store delivers a wide range of products, including ham, shoulder, loin, txorizo, cured chorizo, fresh chorizo, txistorra, lukainka, salchichón, pate, and pancetta, among other products.

In the 54-hectare Elola Farm, beautiful green meadows are planted with ryegrass, white and purple clover, mountain grasses and alfalfa, nettle and rumex roots, and the fruits of centenary native hardwoods, which make up most of the the pigs' feed. In winter, the rainy, snowy, icy, and windy season their feed is supplemented with cereals such as corn, beans, barley, fodder, alfalfa, peas, and bran. All this, together with this ancient autochthonous pig breed's slow development, means that their fattening life span is almost 24 months, reaching a weight of 120-140 kg.

## Meat from Cervera de Pisuerga and the Palencia Mountains

"The name 'Carne de Cervera' refers to meat backed by the quality of a priority breed, the pardo alpina, a natural diet, the meadows of the Mountains, and traditional management, with the animals being kept for nine months in the wild and the three winter months sheltered from the cold.

According to the Ministry of Agriculture criteria, the area under study is a region classified as a High Mountain Area. The orography and climate have traditionally marked the human activities and creations in the region. The Cervera sub-region is the least populated of the Palencia Mountains and the one with the highest population dispersion levels. This is due to its structure in small high mountain villages traditionally dedicated to extensive livestock farming. The Montaña Palentina has a natural environment and landscape of outstanding quality that is preserved, in a large part of the area, under three figures of protection: Montaña Palentina Natural Park, Covalagua Natural Area, and the Natural Area of Las Tuerces.

### Reference mountain landscape statistics (A: Data from NUTS3 ES414)

Reference mountain chain		Cantabrian Mountains	
Reference mountain landscape		Cervera de Pisuerga	
Size of the area (km <sup>2</sup> )	325	Average per capita income (€)/year	20463
Altimetry (m; min-max)	950-2500	Total Gross Value Added (GVA) (€ million)/year	3988.5 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	7	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-11.71	Primary:	7.96 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	547	Secondary:	34.45 <sup>A</sup>
		Tertiary:	57.59 <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	116	Primary:	8.70 <sup>A</sup>
Number of agricultural holdings	108	Secondary:	25.30 <sup>A</sup>
		Tertiary:	66.10 <sup>A</sup>
		Protected areas	Yes

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

According to data from the Ministry of Agriculture, in 2019, the production of beef cattle in Spain accounted for 6.3% of everything produced by the countryside, being the third most crucial livestock sector behind pork and poultry. Carne de Cervera de Pisuerga y de la Montaña Palentina is the guaranteed brand created in 1998, which certifies the region's beef products' quality. In 2011, Montaña Palentina Sociedad Cooperativa became part of Agropal Grupo Alimentario, which is currently in charge of its management, control, sale, and distribution. The Carne de Cervera de Pisuerga y de la Montaña Palentina offers the following products: Ternera Blanca Lechal, Ternera Tradicional, and Añejo being the breeds suitable for meat production the Mountain Brown, Limousin and their crosses. In addition to the Quality Label, the product enjoys various distinctions such as "Alimentos de Palencia" and "Tierra de Sabor de Castilla y León." The production area of origin extends to the 27 municipalities that make up the natural region of Montaña Palentina, while since 2010, the native and breeding area of the cattle, whose meat is protected by the Guarantee Label, has been extended to municipalities in the northern region of León and Burgos.

Extensive cattle farming has similar characteristics and problems throughout the Cantabrian Mountains and many other European mountain regions.

### **Key local assets**

Most of the extensive livestock farming in the Cantabrian Mountains is in the public utility forests managed by the Regional Ministry of Development and the Environment in collaboration with the local entities that own them, mostly local councils. The 450,000 hectares are divided into 350,000 hectares of 577 public utility forests in the Montaña Leonesa and 190,000 hectares of 286 public utility forests in the Montaña Palentina. It should be remembered that the Cantabrian Mountains account for more than 50% of the extensive livestock farming territory in the provinces of León and Palencia; in the case of the province of León, a total of 985 public utility forests, and in the case of Palencia, 493.

### **Challenges**

The great challenge of the area is the fight against depopulation, while the extensive cattle farming sector faces the challenge of profitability, diversification, continuity, and integration with other activities. A policy of social awareness regarding the key role of livestock farming for the region's future is essential, ensuring generational replacement, promoting quality and marketing, supporting short channels and means of marketing, and encouraging proper coexistence between livestock wildlife.

### **Innovation**

Although some signs indicate a willingness to innovate both in livestock management systems and in production and marketing processes, a traditional value chain model seems to prevail.

## Veal from Cantabria

Polaciones is a municipality traditionally dedicated to cattle breeding, particularly of the Tudanca breed and the Brown-Alpine breed. In the meadows, there are also horses without stables. Around 25% of the active population is still dedicated to the primary sector.

The Polaciones valley consists of nine villages and three smaller population centers, it is the highest valley in Cantabria. It is a rugged area, with heights exceeding 2000 meters and the third-highest town in Cantabria: Cotillos. The high mountains are populated by forests, with species such as oak, beech, holly, or birch, and shrubs (genista, broom, blueberry). In the high zone, subalpine vegetation can be seen (junipers, rose hips, griñoleras). On the slopes and plains, there are meadows and farmland. In these mountains, wolves, chamois, deer, roe deer, and brown bears can be found, as well as wild boars. Among the birds, it is worth mentioning the griffon vulture and the golden eagle. Several of these species are protected, and hunting is prohibited. Those that are hunted can be hunted in one of the three big game hunting lots of the Saja Reserve.

### Reference mountain landscape statistics (A: Data from NUTS3 ES130)

Reference mountain chain	Cantabrian Mountains		
Reference mountain landscape	Polaciones		
Size of the area (km <sup>2</sup> )	89.77	Average per capita income (€)/year	---
Altimetry (m; min-max)	840-2057	Total Gross Value Added (GVA) (€ million)/year	12432.3 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	2.46	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-10.53	Primary:	1.62 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	60	Secondary:	28.22 <sup>A</sup>
		Tertiary:	70.16 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	94	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	54	Primary:	2.50 <sup>A</sup>
		Secondary:	25.30 <sup>A</sup>
		Tertiary:	72.20 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

A critical production is veal, the meat of cows or steers that have been reared for at least six months up to the time of slaughter. Siete Valles de Montaña is the first cooperative of organic livestock farmers in Cantabria. United for four reasons: for animal welfare, for the consumer's health, to protect the environment, and to continue leading the life they have chosen. They belong to various valleys of Cantabria; some are third and fourth generations of farmers; others have only been living with the cows for three years, but they are all driven by the same interests: to create quality products, beneficial to health, with an authentic flavor, that protects the mountains, that keep the balance with nature, and that follow the SLOW philosophy. They have between 30 and 100 cows of the Charolais and Limousin breeds grazing extensively on their medium-sized farms. They offer different products (churrasco, entrecote, sirloin steak, minced meat) and lots that they serve at home all over Spain and sell in stores in Cantabria and Vizcaya.

Other mountain regions in Europe know of similar initiatives in the cooperative articulation of organic meat producers who market in short channels.

### **Key local assets**

Thanks to grazing, the forests are kept free of fires, and the fields thrive. Animal welfare is fundamental in organic livestock farming, so it is extensive in order calves to be raised in semi-freedom, where they fatten up thanks to their mother's milk, pasture, and organic cereals fodder.

### **Challenges**

The main challenge is to consolidate after four years of operation amid the current health and economic crisis, a short market channel offering the product directly to consumers or through highly specialized commercial channels committed to the same food production philosophy and consumption. Having social, regulatory, and public support for its contribution to sustainability and rural territories can be the counterpart that ensures its survival.

### **Innovation**

Being a traditional production system, it is worth highlighting essential aspects of innovation such as its certified organic production, cooperative structure, and direct marketing channels.

They collaborate with other producers in pioneering initiatives of proximity trade, environmentally and socially committed, as it is the case of "El Super de Los Pastores," the dream of 150 small local producers.

## Botillo from El Bierzo

The term "botillo," translated as sausage, blood sausage, or chorizo, defines a product made from the pig's thick intestines in which various types of pork meat are stuffed. Its origin seems to be Roman, being the main gastronomic identity product of El Bierzo, under the Regulatory Council of the Protected Geographical Indication Botillo del Bierzo.

El Bierzo is an administrative region composed of 38 municipalities of the natural region of the same name located in the western third of the province of León. El Bierzo is divided into a mountainous encirclement, at an average altitude of 800 m above sea level, which surrounds a "hoya" or central depression. The climate facilitates the production of fruits and vegetables, as well as a magnificent variety of wines... The Cofradía Gastronómica del Real Botillo del Bierzo celebrates numerous promotional festivals of the botillo del Bierzo, popularly known as botilladas.

### Reference mountain landscape statistics (A: Data from NUTS3 ES413)

Reference mountain chain	Cantabrian Mountains		
Reference mountain landscape	Polaciones		
Size of the area (km <sup>2</sup> )	89.77	Average per capita income (€)/year	---
Altimetry (m; min-max)	840-2057	Total Gross Value Added (GVA) (€ million)/year	12432.3 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	2.46	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-10.53	Primary:	1.62 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	1182	Secondary:	28.22 <sup>A</sup>
		Tertiary:	70.16 <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	94	Primary:	2.50 <sup>A</sup>
Number of agricultural holdings	429	Secondary:	25.30 <sup>A</sup>
		Tertiary:	72.20 <sup>A</sup>
		Protected areas	No

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The companies associated with the PGI Botillo del Bierzo are meat companies that manufacture, in addition to botillo, a wide range of products including chorizo, salchichón, loin, marinated ribs, black pudding, cecina, androlla, and hams. The companies produce based on traditional, artisanal production processes, introducing quality control and critical points. Botillo del Bierzo is marketed mainly in the Bierzo area, Castilla y León, Madrid, Galicia, and Catalonia. The associated companies are distributed in different municipalities of the region. Several online stores sell botillo and other gastronomic products from Bierzo.

Numerous European regions produce products from different parts of the pig, with varying degrees of territorial identity, development of local brands and certifications, and direct connection with the local ecosystem to obtain the raw materials and other ingredients necessary to produce the products.

### **Key local assets**

The essential ingredients of botillo are the ribs (minimum 65% and maximum 90%) and the pig's tail (minimum 10% and maximum 20%). At the manufacturers' discretion, other components such as tongue, cheek, shoulder, and backbone could be added to a maximum of 20% of the total, and no component of this rest can exceed half of this 20%. Salt, paprika, and garlic, authorized additives, and other natural spices are subsequently added to all the ingredients. The basic ingredients come from the production area and the Autonomous Community of Castilla y León.

### **Challenges**

The botillo has spread to regions bordering El Bierzo. The Regulatory Council of the PGI is responsible for controlling and certifying the production process following the rules established by the corresponding Regulations and Quality Manual. It is forbidden to use names, brands, terms, expressions, and signs that, due to their similarity, phonetic or graphic, with the protected ones, could lead to confusion.

### **Innovation**

This is a traditional value chain that has introduced regulation and certification mechanisms aimed at protecting and recognizing the origin and elaboration process and has also introduced online marketing mechanisms thanks to the prestige that the food products and gastronomy of El Bierzo enjoy in general.



## **Mycology in the mountains of Soria**

Non-wood forest products (NWFPs) – such as cork, resins, gums, wild mushrooms, aromatic and medicinal plants, and wild nuts and berries – provide a multitude of social, cultural, environmental, and economic contributions to human, economic and nature conservation in Europe. In this sense, it is important to recognise, and to leverage, the potential of non-wood forest products to contribute to the UN Sustainable Development Goals (SDGs), and notably to rural development, nature conservation, human well-being, and all of that in line with the European Green Deal.



Navaleno is located between the Sierra de Cabreja, the Picos de Urbión and the Cañón del Río Lobos Natural Park. The Bosque del Pinar Grande is nearby, with an interpretation center and mycological reserve. In the area of the Montes de Soria, old traditions regulated the use and enjoyment of the public utility forests, including small "suertes de pinos" for the enjoyment of the families, who obtained important incomes thanks to the sale of the wood, complementing the family economy thanks to the cattle raising and the mycology among other activities.

Reference mountain landscape statistics  
(A: Data from NUTS3 ES413)

Reference mountain chain		Iberian System	
Reference mountain landscape		Navaleno	
Size of the area (km <sup>2</sup> )	25.03	Average per capita income (€/year)	21963 <sup>A</sup>
Altimetry (m; min-max)	1100-1300	Total Gross Value Added (GVA) (€ million/year)	2154.5 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	30.68	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-14.66	Primary:	8.24 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	639	Secondary:	30.86 <sup>A</sup>
		Tertiary:	60.90 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	167.5	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	1	Primary:	9.20 <sup>A</sup>
		Secondary:	27.50 <sup>A</sup>
Protected areas	No	Tertiary:	63.30 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The "Asociación de Propietarios para la Regulación Micológica Conjunta Montes de Soria" is a non-profit organization that works to ensure the best possible management of the mycological resources of its members. In addition, it facilitates the control and surveillance of the activity, both harvesting and buying and selling goods, and collaborates with the competent administrations in the matter. The Association issues valid permits for the collection of mushrooms in most of the province of Soria. Specifically, for the forests regulated in the enclosures SO-50.002 and SO-50.003. The different types of permits have been established by the owners of the forests and are

revised annually. They consider criteria such as the collector's roots in the area, the sporting or commercial nature of the collection activity, the amount to be collected and the duration of the activity. It also promotes mycotourism activities. The mushroom season in Navaleno lasts almost all year round. There is a local company that acts as a market for the purchase and sale, another company specialized in processing and numerous restaurants including one with a Michelin star. Some Spanish mountain regions carry out mycological exploitation initiatives, with different degrees of importance and regulation. Such is the case in the mountains of León, the sierras of Salamanca and Zamora, as well as the Sierra de Cameros in La Rioja.

### Key local assets

Navaleno is one of the main mycological habitats of the province of Soria; it is the forest mass of black pine and Scot's pine of the region of Pinares. These pine forests are very good producers of *Lactarius deliciosus* (or Níscalo or amizcle), which together with the relative proximity of Soria to the Catalan markets, where it is highly appreciated, makes it the most important species from the economic point of view of these forests. Other species of the genus *Hygrophorus*, *Ilanegas*, *Tricholoma equestre* (or Seta de los caballeros), qualified from the culinary point of view as "excellent", *Tricholoma terreum* (or negrilla), qualified as "good edible"; and, although in smaller quantities, you can also find *Boletus edulis* (or Miguel or White Mushroom) culinarily qualified as "excellent" and *Boletus pinophilus* (or Miguel or Red Mushroom), also qualified as "excellent". The Mycological Days are held every year and in 2007 the Navaleno Mycological Center was inaugurated, which houses a permanent exhibition on the world of mushrooms and organises courses related to the fungi world.

### Challenges

Firstly, ensuring a positive economic, social, and environmental impact on the territory, through the distribution of income among the municipalities, maintenance of an improvement fund and other aspects related to promotion and dissemination. Secondly, making more transparent and regulating the purchase and sale market in accordance with the different Municipal Ordinances. Thirdly, ensuring compliance with national and regional regulations regarding traceability and food safety. Finally, deepening the knowledge of the resource to develop strategies for adaptation to Climate Change.

### Innovation

Different innovative initiatives have arisen related to: the traceability control system thanks to the development of computer applications; creation of species identification centers; development of a program of socio-cultural activities, exhibitions, etc.; processing and buying and selling companies; the "Montes de Soria" association as an instrument of use, management and governance; development of mycotourism activities; synergies with the rural tourism and hospitality sector; development of second homes in the municipality.

## Spanish Vignerons from Huesca Pirineos

Huesca is a historic vineyards region in Aragon. Due to depopulation in last half century, a lot of vineyards were uprooted and now what remains are small productions with identity value. In the last decade, several professional farmers showed interest in getting engaged into the local highly identified production and offer their knowledge and support to local producers. There is a IGP (indication geographical protected) Ribera del Gállego-Cinco Villas.

The Sierra Loarre is a mountainous formation in pre-Pirineos. close to France.in Aragon, in the center of Pirineos. This area produces excellent wines thanks to the genuine fruit of the nature of the grapes and its subsequent artisanal processing. The conditions are optimal to produce wines of extraordinary quality. Depopulation of higher areas is a main problem.

Reference mountain landscape statistics  
(A: Data from the NUTS3 ES241)

Reference mountain chain	Spanish Pyrenees		
Reference mountain landscape	Ayerbe		
Size of the area (km2)	63.8	Average per capita income (€)/year	10,120
Altimetry (m; min-max)	415-835	Total Gross Value Added (GVA) (€ million)/year	15,102 <sup>A</sup>
Population density (Inhabitants/km2)	16.7	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-10.8	Primary:	6.1% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	142	Secondary:	16.8% <sup>A</sup>
		Tertiary:	74% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	100	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	124	Primary:	10% <sup>A</sup>
Protected areas	Yes	Secondary:	15% <sup>A</sup>
		Tertiary:	74% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The Huesca small vineyards and cellars are all located in the higher part of the mountain and were progressively losing economic relevance, with several cases of abandonment. At the same time, In last 50 years, winegrowers of a the lower area started to cooperate and managed to have their typicity acknowledged under the Somontano D.O. The Somontano production is heading to the provincial and regional market as well as to European and North American markets facing a good success. Somontano wine companies started to be interested in the Huesca vineyard and offered local winegrowers their support, in the vineyard and in the cellar, bought their grapes or helped them processing them on site and promote the wines on the market. The interaction between professional wine grower in Samontano and the small-scale producers in Huesca is the key of the value chain success.

### **Key local assets**

The pre-Pirineos (600-1000 m) area is close to high mountains and people from high mountains used to come to buy wine and exchange cheese, meat, and other products. The same from France and from lowlands, who exchanged fruits and vegetables. This region was named: "Reino de los Mallos"(kingdom of rock mountains) and has 2000 years of history, as well as many Romanic churches, Falling in ruins in the last 30 years, due to depopulation and abandonment.

### **Challenges**

Key challenges for this VC are associated with:

- Lack of small producers' professionalism.
- High production costs that can hamper market potentials,
- Climate change is evident in the ripening cycles of the grapes.

### **Innovation**

The innovation in this VC relates to:

- The changeover of most wineries to organic production.
- The introduction of complementary activities (tourism, tastings, etc.).
- The model of cooperation between Huesca small scale, nonprofessional vine and wine producers and the professionals of Somontano.

## Production of chestnut and wine in Ribeira Sacra

The chestnuts and wines produced in Ribeira Sacra, especially in the Quiroga-Bibei subzone, were historically known for their superior quality and provided a high economic yield. Despite these facts this area has suffered from demographic ageing as well as from a demographic decline. Most of the chestnut forest is currently abandoned and the vineyards are getting progressively abandoned as well because the people that upkeep them are ageing and there is not a continuity in this labour.

The landscape presents great differences in altitude the rivers flow at an altitude around 300m and from there the altitude raises sharply. A lot of the riverside is occupied by terraces where the grapes are produced. As you go away from the river and the terrain get flat it becomes easy to find forest of oak, chestnuts, gorse etc.

Reference mountain landscape statistics  
(A: Data from the NUTS2 ES11; B: Data from the NUTS2 ES113)

Reference mountain chain	Galician Massif		
Reference mountain landscape	A Pobra de Trives		
Size of the area (km <sup>2</sup> )	84.1	Average per capita income (€)/year	20,218
Altimetry (m; min-max)	300-1,730	Total Gross Value Added (GVA) (€ million)/year	61,663 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	24	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-4.9	Primary:	5.3% <sup>B</sup>
Total bed places (BPs) in tourist accommodations/year:	393 <sup>A</sup>	Secondary:	25.6% <sup>B</sup>
		Tertiary:	69.1% <sup>B</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	72.6	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	12,821 <sup>A</sup>	Primary:	4.7% <sup>A</sup>
Protected areas	Yes	Secondary:	24.2% <sup>A</sup>
		Tertiary:	1% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

This area falls under the protection of the PDO Ribeira Sacra, which protects and promotes the wines produced in this area using traditional means and practices. The chestnut production can be distinguished by the PGI Castaña de Galicia, this quality scheme protects all the chestnut produced in the autonomous region of Galicia and does not distinguish the chestnut produced in the mountains. Most of the primary producers of both the chestnut and the grapes are small families that own the land. They usually sell the fruits to bigger companies that transform them into other value-added products. This value chain is also present in most of the mountain areas of the Spanish north and north-west. Similar VC can be found in other states such as Italy or France.

### **Key local assets**

The microclimate of the Ribeira Sacra allows this region to produce some of the finest Spanish wines. It also favours the chestnut production giving it a calibre and a sweet taste that are very valued in the market, especially for roasting.

### **Challenges**

The lack of formation on the maintenance and exploitation of both the chestnut and the vineyards represents a huge barrier for the incorporation of the local youth to the local value chains. Formation on the business side of the activity is also required. Most of the grape producers lack formation on enology making it hard to step up on their business transforming it into more valuable goods as wine and liquor. Also, the spread of *Dryocosmus kuriphilus* is damaging the productivity and viability of the local chestnut forest.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.

## 6. Portugal

### Mineral Water from almost virgin natural spring at 1400 m altitude

High importance geological resource. Internationally distinguished product. This is the first Portuguese water bottled in 100% recycled plastic (RPET).

With stunning landscapes, Manteigas is a municipality with 4 parishes, in the district of Guarda in the Centre region of Portugal. Manteigas shares with the municipalities of Seia and Covilhã, the highest point in mainland Portugal at 1993 meters of altitude. The main village of Manteigas is in the Zêzere Glacier Valley, which is a great example of landscape modelling by glaciers, with its 'U' shape. Historically, the most important economic activities in Manteigas are related to pastoralism, sheep's cheese production and wool industry.

Reference mountain landscape statistics  
(A: Data from NUTS3 TP16J)

Reference mountain chain		Betic Systems	
Reference mountain landscape		Canillas de Aceituno	
Size of the area (km <sup>2</sup> )	123.28	Average per capita income (€)/year	13122.6 <sup>A</sup>
Altimetry (m; min-max)	496-1993	Total Gross Value Added (GVA) (€ million)/year	2534.7 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	24.7	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.15%	Primary:	4 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	403	Secondary:	24 <sup>A</sup>
		Tertiary:	72 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	77.2	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	111	Primary:	20 <sup>A</sup>
		Secondary:	35 <sup>A</sup>
		Tertiary:	45 <sup>A</sup>
Protected areas	Yes		

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Mineral Water is bottled by the producer in the local factory in the municipality of Manteigas. Bottled water is then sold, mainly, in the nearest municipalities, as the company is very recent. However, the goal is to expand the distribution.

There are 4 rivers that are born in Serra da Estrela: Rio Mondego (Municipality of Gouveia), Rio Zêzere (Municipality of Manteigas), Rio Alva (Municipality of Seia) and Rio Alvôco (Municipality of Seia). These rivers benefit Tagus and Mondego watersheds. Water from Serra da Estrela reaches the taps of thousands of Portuguese citizens.

### **Key local assets**

Almost virgin mineral water spring located at 1400 m of altitude in the municipality of Manteigas. The Mineral Water has 0% of nitrates and nitrites, as human presence at the water spring is null. Besides, it is poorly mineralized, and the dominant mineral is silica (42% silica in total mineralization).

### **Challenges**

Reduce plastic use since this Mineral Water reaches consumers in plastic bottles.

### **Innovation**

Mineral water from natural springs is a traditional product at Serra da Estrela. Although, a new bottled water company is innovating by introducing in the market the first Portuguese water bottled in 100% recycled plastic (RPET).

Mountain areas are important sources of mineral water springs. This Mineral Water has been internationally distinguished for its high quality, as it is one of the least mineralized waters in the world.



## Traditional sheep's milk cheese

Milk from two autochthonous sheep breeds is used to produce the traditional Serra da Estrela Cheese, which is the oldest Portuguese cheese and is highly connected to territorial identity. Product with PDO certification.

With stunning landscapes, Manteigas is a municipality with 4 parishes, in the district of Guarda in the Centre region of Portugal. Manteigas shares with the municipalities of Seia and Covilhã, the highest point in mainland Portugal at 1993 meters of altitude. The main village of Manteigas is in the Zêzere Glacier Valley, which is a great example of landscape modelling by glaciers, with its 'U' shape. Historically, the most important economic activities in Manteigas are related to pastoralism, sheep's cheese production and wool industry.

### Reference mountain landscape statistics (A: Data from NUTS3 TP16J)

Reference mountain chain	Cordilheira Central (RR08)		
Reference mountain landscape	Manteigas		
Size of the area (km <sup>2</sup> )	123.28	Average per capita income (€)/year	13122.6 <sup>A</sup>
Altimetry (m; min-max)	496-1993	Total Gross Value Added (GVA) (€ million)/year	2534.7 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	24.7	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.15%	Primary:	4 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	403	Secondary:	24 <sup>A</sup>
		Tertiary:	72 <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	77.2	Primary:	20 <sup>A</sup>
Number of agricultural holdings	111	Secondary:	35 <sup>A</sup>
		Tertiary:	45 <sup>A</sup>
		Protected areas	Yes

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Sheep of Bordaleira Serra da Estrela and/or Churra Mondegueira breeds feed on pastures exclusively from the geographical production area of Serra da Estrela. However, simple or compound food can be used to reinforce the diet, especially at the beginning and end of pregnancy

and at the peak of lactation, with authorization from the producers group. Their milk is used to produce Serra da Estrela Cheese PDO in a traditional manner, using only two more ingredients - salt and thistle (*Cynara cardunculus*) flower. The minimum maturation time is 30 days. Currently, there are 27 cheese fabrics with PDO seal, 125 shepherds and a producer's cooperative which is mainly dedicated to technical assistance to members and to the defence of the Protected Designation of Origin - Serra da Estrela.

The geographical production area of Serra da Estrela Cheese PDO includes the municipalities of Carregal do Sal, Celorico da Beira, Fornos de Algodres, Gouveia, Mangualde, Manteigas, Nelas, Oliveira do Hospital, Penalva do Castelo, Seia, Aguiar da Beira, Arganil, Covilhã, Guarda, Tábua, Tondela, Trancoso and Viseu.

### **Key local assets**

Bordaleira Serra da Estrela sheep breed has a medium stature and is white or black in colour. It has horns curled forward and females have a well-developed udder. It has, predominantly, dairy aptitude. Churra Mondegueira sheep breed is of medium stature and is white in colour. Traditional knowledge passed down from generation to generation, on cheese manufacture techniques from sheep's milk, salt, and thistle (*Cynara cardunculus*) flower.

### **Challenges**

Reduced number of shepherds, as this job is often seen as unattractive, due to being physically demanding, in sometimes harsh weather conditions, and low wages.

### **Innovation**

The innovation in this VC is represented by the following characteristics:

- Product highly characteristic of the MRL.
- Product highly connected to land use and landscape management.
- Product internationally recognized for its organoleptic characteristics.

## Traditional sheep's milk cottage cheese

Milk from two autochthonous sheep breeds is used to produce the traditional Serra da Estrela Cottage Cheese. Product with PDO certification.

With stunning landscapes, Manteigas is a municipality with 4 parishes, in the district of Guarda in the Centre region of Portugal. Manteigas shares with the municipalities of Seia and Covilhã, the highest point in mainland Portugal at 1993 meters of altitude. The main village of Manteigas is in the Zêzere Glacier Valley, which is a great example of landscape modelling by glaciers, with its 'U' shape. Historically, the most important economic activities in Manteigas are related to pastoralism, sheep's cheese production and wool industry.

### Reference mountain landscape statistics (A: Data from NUTS3 TP16J)

Reference mountain chain		Cordilheira Central (RR08)	
Reference mountain landscape		Manteigas	
Size of the area (km <sup>2</sup> )	123.28	Average per capita income (€)/year	13122.6 <sup>A</sup>
Altimetry (m; min-max)	496-1993	Total Gross Value Added (GVA) (€ million)/year	2534.7 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	24.7	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.15%	Primary:	4 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	403	Secondary:	24 <sup>A</sup>
		Tertiary:	72 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	77.2	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	111	Primary:	20 <sup>A</sup>
		Secondary:	35 <sup>A</sup>
		Tertiary:	45 <sup>A</sup>
Protected areas	Yes		

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Sheep of Bordaleira Serra da Estrela and/or Churra Mondegueira breeds feed on pastures exclusively from the geographical production area of Serra da Estrela. However, simple or compound food can be used to reinforce the diet, especially at the beginning and end of pregnancy and at the peak of lactation, with authorization from the producers group.

Serra da Estrela Cottage Cheese PDO is obtained from the whey resulting from the production of Serra da Estrela Cheese PDO (VC\_02\_PT2), to which can be added raw sheep's milk, from Bordaleira Serra da Estrela and/or Churra Mondegueira breeds and water. Sometimes, under very particular and duly authorized conditions, Serrana goat breed milk can also be used.

A producer's cooperative is mainly dedicated to technical assistance to members and to the defense of the Protected Designation of Origin - Serra da Estrela.

The geographical production area of Serra da Estrela Cottage Cheese PDO includes the municipalities of Carregal do Sal, Celorico da Beira, Fornos de Algodres, Gouveia, Mangualde, Manteigas, Nelas, Oliveira do Hospital, Penalva do Castelo, Seia, Aguiar da Beira, Arganil, Covilhã, Guarda, Tábua, Tondela, Trancoso and Viseu.

### **Key local assets**

Bordaleira Serra da Estrela sheep breed has a medium stature and is white or black in colour. It has horns curled forward and females have a well-developed udder. It has, predominantly, dairy aptitude. Churra Mondegueira sheep breed is of medium stature and is white in colour.

Traditional knowledge passed down from generation to generation, on cheese manufacture techniques from sheep's milk.

### **Challenges**

Reduced number of shepherds, as this job is sometimes seen as unattractive, due to being physically demanding, in sometimes harsh weather conditions, and low wages.

### **Innovation**

The innovation in this VC is represented by the following characteristics:

- Product highly characteristic of the MRL.
- Product highly connected to land use and landscape management.

## Lamb meat from an autochthonous sheep breed

Lamb meat from an autochthonous sheep breed, namely, Bordaleira Serra da Estrela. Serra da Estrela Lamb DPO is associated with the production of Serra da Estrela Cheese PDO (VC\_02\_PT2) and the interest of cheese producers in milking the sheep as early as possible. Product with PDO certification.

With stunning landscapes, Manteigas is a municipality with 4 parishes, in the district of Guarda in the Centre region of Portugal. Manteigas shares with the municipalities of Seia and Covilhã, the highest point in mainland Portugal at 1993 meters of altitude. The main village of Manteigas is in the Zêzere Glacier Valley, which is a great example of landscape modelling by glaciers, with its 'U' shape. Historically, the most important economic activities in Manteigas are related to pastoralism, sheep's cheese production and wool industry.

### Reference mountain landscape statistics (A: Data from NUTS3 TP16J)

Reference mountain chain		Cordilheira Central (RR08)	
Reference mountain landscape		Manteigas	
Size of the area (km <sup>2</sup> )	123.28	Average per capita income (€)/year	13122.6 <sup>A</sup>
Altimetry (m; min-max)	496-1993	Total Gross Value Added (GVA) (€ million)/year	2534.7 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	24.7	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.15%	Primary:	4 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	403	Secondary:	24 <sup>A</sup>
		Tertiary:	72 <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	77.2	Primary:	20 <sup>A</sup>
Number of agricultural holdings	111	Secondary:	35 <sup>A</sup>
		Tertiary:	45 <sup>A</sup>
		Protected areas	Yes

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Serra da Estrela Lamb PDO meat comes from lambs of Bordaleira Serra da Estrela breed that are fed only with breast milk.

At slaughter, they have a live weight of up to 12 kg and an age of up to 30 days. Carcasses weigh up to 7 kg. This product is sold locally and in large urban centres, especially during festive seasons. It is, also, cooked and served in local restaurants.

The geographical production area of Serra da Estrela Lamb PDO includes the municipalities of Carregal do Sal, Celorico da Beira, Fornos de Algodres, Gouveia, Mangualde, Manteigas, Nelas, Oliveira do Hospital, Penalva do Castelo, Seia, Aguiar da Beira, Arganil, Covilhã, Guarda, Tábua, Tondela, Trancoso and Viseu.

### **Key local assets**

Bordaleira Serra da Estrela sheep breed has a medium stature and is white or black in colour. It has horns curled forward and females have a well-developed udder. It has, predominantly, dairy aptitude.

### **Challenges**

Reduced number of shepherds, as this job is sometimes seen as unattractive, due to being physically demanding, in sometimes harsh weather conditions, and low wages.

### **Innovation**

The innovation in this VC is represented by the following characteristics:

- Product highly characteristic of the MRL.
- Product highly connected to land use and landscape management.

## Goatling meat

Goatling meat from an autochthonous goat breed, namely Serrana, or from Charnequeira goat breed and, also, resultant of crosses between these two breeds. Product with PGI certification.

Located on the western slope of Serra da Estrela, Seia is a municipality with 21 parishes, in the district of Guarda in the Centre region of Portugal. Seia shares with the municipalities of Covilhã and Manteigas, the highest point in mainland Portugal at 1993 meters of altitude. Seia has a strong industrial tradition, mainly related to textiles and the distribution of electricity. The production of sheep's cheese is also a tradition.

### Reference mountain landscape statistics (A: Data from NUTS3 TP16J)

Reference mountain chain		Cordilheira Central (RR08)	
Reference mountain landscape		Seia	
Size of the area (km <sup>2</sup> )	435.41	Average per capita income (€)/year	13122.6 <sup>A</sup>
Altimetry (m; min-max)	159-1993	Total Gross Value Added (GVA) (€ million)/year	2534.7 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	51.0	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.11%	Primary:	4 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	1245	Secondary:	24 <sup>A</sup>
		Tertiary:	72 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	64.2	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	1728	Primary:	20 <sup>A</sup>
		Secondary:	35 <sup>A</sup>
Protected areas	Yes	Tertiary:	45 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Beira Goatling PGI meat comes from goatlings of Serrana and Charnequeira goat breeds and, also, resultant of crosses between these two breeds. Goatlings are mainly fed with breast milk. At slaughter, they have a live weight of up to 15 kg and an age between 40 and 45 days. Carcasses

weight, on average, 5 kg. This product is sold locally and in large urban centers. It is, also, cooked and served in local restaurants.

The geographical area corresponding to the production of Beira Goatling PGI includes the municipalities of Meda, Figueira de Castelo Rodrigo, Pinhel, Guarda, Fornos de Algodres, Trancoso, Celorico da Beira, Seia, Gouveia, Manteigas, Covilhã, Almeida, Sabugal, Belmonte, Fundão, Penamacor, Idanha-a-Nova, Castelo Branco, Vila Velha de Ródão, Proença-a-Nova, Oleiros, Sertã, Vila de Rei and Mação.

### **Key local assets**

Serrana goat breed is of medium stature and has, predominantly, dairy aptitude.

### **Challenges**

Reduced number of shepherds, as this job is sometimes seen as unattractive, due to being physically demanding, in sometimes harsh weather conditions, and low wages.

### **Innovation**

The innovation in this VC is represented by the following characteristics:

- Product highly characteristic of the MRL.
- Product highly connected to land use and landscape management.



## Smoked Sausages

Products connected to territorial identity. Smoked Sausages are traditionally homemade products, made by family members at the time of the slaughter of their own pig. Nowadays, the production of this products has been industrialized.

Located on the western slope of Serra da Estrela, Seia is a municipality with 21 parishes, in the district of Guarda in the Centre region of Portugal. Seia shares with the municipalities of Covilhã and Manteigas, the highest point in mainland Portugal at 1993 meters of altitude. Seia has a strong industrial tradition, mainly related to textiles and the distribution of electricity. The production of sheep's cheese is also a tradition.

### Reference mountain landscape statistics (A: Data from NUTS3 TP16J)

Reference mountain chain		Cordilheira Central (RR08)	
Reference mountain landscape		Seia	
Size of the area (km <sup>2</sup> )	435.41	Average per capita income (€)/year	13122.6 <sup>A</sup>
Altimetry (m; min-max)	159-1993	Total Gross Value Added (GVA) (€ million)/year	2534.7 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	51.0	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.11%	Primary:	4 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	1245	Secondary:	24 <sup>A</sup>
		Tertiary:	72 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	64.2	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	1728	Primary:	20 <sup>A</sup>
Protected areas	Yes	Secondary:	35 <sup>A</sup>
		Tertiary:	45 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Smoked Sausages ingredients may include pig meat, fat and blood, bread, onions, wine, and spices, among others. The sausage is smoked with oak and chestnut wood, among others, for different

time periods, depending on the type of Smoked Sausage. These products are sold locally, in large urban centres and, also, exported.

Different types of Smoked Sausages, with different types of meats and seasonings, are produced in several parts of Portugal.

### **Key local assets**

Traditional knowledge passed down from generation to generation, on Smoked Sausages manufacture techniques.

### **Challenges**

Preserve traditional knowledge on Smoked Sausages manufacture.

### **Innovation**

The innovation in this VC is represented by the following characteristics:

- Product highly characteristic of the MRL.

## Rye Bread made from cereals grown at the mountain.

Product connected to territorial identity. Rye was traditionally used to produce bread because it is more resistant than other cereal crops to the conditions of the mountain region, where the soils are poorer and thinner, and the winter is very cold.

With stunning landscapes, Manteigas is a municipality with 4 parishes, in the district of Guarda in the Centre region of Portugal. Manteigas shares with the municipalities of Seia and Covilhã, the highest point in mainland Portugal at 1993 meters of altitude. The main village of Manteigas is in the Zêzere Glacier Valley, which is a great example of landscape modelling by glaciers, with its 'U' shape. Historically, the most important economic activities in Manteigas are related to pastoralism, sheep's cheese production and wool industry.

### Reference mountain landscape statistics (A: Data from NUTS3 TP16J)

Reference mountain chain		Cordilheira Central (RR08)	
Reference mountain landscape		Manteigas	
Size of the area (km <sup>2</sup> )	123.34	Average per capita income (€)/year	13122.6 <sup>A</sup>
Altimetry (m; min-max)	496-1993	Total Gross Value Added (GVA) (€ million)/year	2534.7 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	24.0	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.15%	Primary:	4 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	403	Secondary:	24 <sup>A</sup>
		Tertiary:	72 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	77.2	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	111	Primary:	20 <sup>A</sup>
Protected areas	Yes	Secondary:	35 <sup>A</sup>
		Tertiary:	45 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Rye is cultivated in the mountain area and, after harvesting, it is transformed into flour in the water mills that still in operation in the region. The rye flour is then used to produce the Rye Bread. Nowadays, there are small bakeries with wood ovens where the Rye Bread is cooked, imitating the



community wood ovens of the past. This product may be produced in different municipalities at Serra da Estrela.

### **Key local assets**

Rye is a cereal grain used for flour and bread that grows well in poor soils and under very low temperatures.

### **Challenges**

Is land abandonment an issue to this value chain? Local production on Rye is diminishing. Can this VC be maintained, or will Rye Bread production depend more and more on imported cereals?

### **Innovation**

The innovation in this VC is represented by the following characteristics:

- Product highly characteristic of the MRL.
- Product highly connected to land use and landscape management.

## High mountain honey from heatherlands

Heather is a characteristic bush of the highlands of Serra da Estrela. Product available through e-commerce.

Located on the western slope of Serra da Estrela, Seia is a municipality with 21 parishes, in the district of Guarda in the Centre region of Portugal. Seia shares with the municipalities of Covilhã and Manteigas, the highest point in mainland Portugal at 1993 meters of altitude. Seia has a strong industrial tradition, mainly related to textiles and the distribution of electricity. The production of sheep's cheese is also a tradition.

### Reference mountain landscape statistics (A: Data from NUTS3 TP16J)

Reference mountain chain		Cordilheira Central (RR08)	
Reference mountain landscape		Seia	
Size of the area (km <sup>2</sup> )	435.41	Average per capita income (€)/year	13122.6 <sup>A</sup>
Altimetry (m; min-max)	159-1993	Total Gross Value Added (GVA) (€ million)/year	2534.7 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	51.0	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.11	Primary:	4 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	1245	Secondary:	24 <sup>A</sup>
		Tertiary:	72 <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	64.2	Primary:	20 <sup>A</sup>
Number of agricultural holdings	1728	Secondary:	35 <sup>A</sup>
		Tertiary:	45 <sup>A</sup>
		Protected areas	Yes

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Heather Honey is collected from hives located at Serra da Estrela highlands. Product sold locally and nationally. This product may be produced in different municipalities at Serra da Estrela.

## Key local assets

At Serra da Estrela, heatherlands of *Erica* sp. and *Calluna vulgaris* appear above 800/900 meters of altitude.

### **Challenges**

Are pesticides and the Asian wasp threatening bee's survival at Serra da Estrela? Will climate change affect heatherlands distribution?

### **Innovation**

The innovation in this VC is represented by the following characteristics:

- Product highly characteristic of the MRL.
- Product highly connected to local natural asset.

## Chestnut (seed) from chestnut groves at mountain hillsides and surroundings

Product connected to territorial identity as chestnut (seed) production is a traditional activity in Serra da Estrela with several hectares of chestnut groves on the mountain hillsides and surroundings. Chestnut (seed) call visitors interested in gastronomic autumn tourism to local annual Chestnut (seed) festivals.

Located on the western slope of Serra da Estrela, Seia is a municipality with 21 parishes, in the district of Guarda in the Centre region of Portugal. Seia shares with the municipalities of Covilhã and Manteigas, the highest point in mainland Portugal at 1993 meters of altitude. Seia has a strong industrial tradition, mainly related to textiles and the distribution of electricity. The production of sheep's cheese is also a tradition.

### Reference mountain landscape statistics (A: Data from NUTS3 TP16J)

Reference mountain chain		Cordilheira Central (RR08)	
Reference mountain landscape		Seia	
Size of the area (km <sup>2</sup> )	435.41	Average per capita income (€)/year	13122.6 <sup>A</sup>
Altimetry (m; min-max)	159-1993	Total Gross Value Added (GVA) (€ million)/year	2534.7 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	51.0	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.11	Primary:	4 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	1245	Secondary:	24 <sup>A</sup>
		Tertiary:	72 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	64.2	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	1728	Primary:	20 <sup>A</sup>
		Secondary:	35 <sup>A</sup>
		Tertiary:	45 <sup>A</sup>
Protected areas	Yes		

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

At Serra da Estrela hillsides and surroundings there are several hectares of chestnut groves. Chestnuts (seeds) are harvested and sold locally and nationally. Products made from Chestnuts (seeds) area also produced and sold locally.

Chestnuts (seeds) are produced in different municipalities intersecting or surrounding Serra da Estrela.

### **Key local assets**

Chestnut tree (*Castanea sativa*) is a deciduous plant that can reach 20 or 30 m in height and usually occupies mountainous or cool regions. It is monoecious and flowering occurs from May to June. Fruit maturation occurs in October.

### **Challenges**

Will climate change affect chestnuts grooves distribution and chestnuts (seeds) quality?

### **Innovation**

The innovation in this VC is represented by the following characteristics:

- Product highly characteristic of the MRL.
- Product highly connected to land use and landscape management.



## Local bean variety from Manteigas municipality

Feijoca de Manteigas is a local bean variety from the municipality of Manteigas, thus it is a product connected to territorial identity.

With stunning landscapes, Manteigas is a municipality with 4 parishes, in the district of Guarda in the Centre region of Portugal. Manteigas shares with the municipalities of Seia and Covilhã, the highest point in mainland Portugal at 1993 meters of altitude. The main village of Manteigas is in the Zêzere Glacier Valley, which is a great example of landscape modelling by glaciers, with its 'U' shape. Historically, the most important economic activities in Manteigas are related to pastoralism, sheep's cheese production and wool industry.

### Reference mountain landscape statistics (A: Data from NUTS3 TP16J)

Reference mountain chain		Cordilheira Central (RR08)	
Reference mountain landscape		Manteigas	
Size of the area (km <sup>2</sup> )	123.28	Average per capita income (€)/year	13122.6 <sup>A</sup>
Altimetry (m; min-max)	496-1993	Total Gross Value Added (GVA) (€ million)/year	2534.7 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	24.7	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.15	Primary:	4 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	403	Secondary:	24 <sup>A</sup>
		Tertiary:	72 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	77.2	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	111	Primary:	20 <sup>A</sup>
		Secondary:	35 <sup>A</sup>
Protected areas	Yes	Tertiary:	45 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

Several local producers grow Feijoca de Manteigas in croplands with areas from 150 m<sup>2</sup> to 1200 m<sup>2</sup>. After harvested, this product is sold in local markets and beyond. Given its unique quality and gastronomic potential, it is cooked and served in local restaurants.

### **Key local assets**

Feijoca de Manteigas consists in a variety of big beans that, when grown at altitude, acquires a unique flavour and a velvety texture.

### **Challenges**

Is land abandonment an issue to this value chain? Will climate change affect bean crops and quality?

### **Innovation**

The innovation in this VC is represented by the following characteristics:

- Local specific agricultural product that benefits from local conditions.
- Product highly characteristic of the MRL.
- Product highly connected to land use and landscape management.

## Wine from Serra da Estrela

Product connected to territorial identity. The Dão Demarcated Region was delimited in 1908, becoming the second demarcated wine region in Portugal. Particularly threatened land use system - Vineyards. Product with PDO certification. Product available through e-commerce.

Located on the western slope of Serra da Estrela, Seia is a municipality with 21 parishes, in the district of Guarda in the Centre region of Portugal. Seia shares with the municipalities of Covilhã and Manteigas, the highest point in mainland Portugal at 1993 meters of altitude. Seia has a strong industrial tradition, mainly related to textiles and the distribution of electricity. The production of sheep's cheese is also a tradition.

### Reference mountain landscape statistics (A: Data from NUTS3 TP16J)

Reference mountain chain		Cordilheira Central (RR08)	
Reference mountain landscape		Seia	
Size of the area (km <sup>2</sup> )	435.41	Average per capita income (€)/year	13122.6 <sup>A</sup>
Altimetry (m; min-max)	159-1993	Total Gross Value Added (GVA) (€ million)/year	2534.7 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	51.0	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.11	Primary:	4 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	1245	Secondary:	24 <sup>A</sup>
		Tertiary:	72 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	64.2	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	1728	Primary:	20 <sup>A</sup>
Protected areas	Yes	Secondary:	35 <sup>A</sup>
		Tertiary:	45 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

In the Dão Demarcated Region the geographical conditions are excellent to produce wines. At Serra da Estrela, there are several hectares of vineyards of different varieties and ages, that produce the grapes that originate Dão Wine PDO of Serra da Estrela Subregion. This wine is sold

at national level. Dão Wine DOP - Serra da Estrela subregion can be produced at some parishes of the municipalities of Seia and Gouveia.

### **Key local assets**

Serra da Estrela subregion that extends over the municipalities of Gouveia and Seia, along the west slope of the mountain, is one of the most distinctive terroirs in Dão. It has granitic soils, and its climate is marked by cold, snowy, very rainy winters and hot, dry summers. The vineyards are located between 400 m and 700 m of altitude and the oldest ones are over 100 years old. Of the main grape varieties of the Dão Wine, the following stand out: Touriga Nacional, Encruzado, Alfrocheiro Preto and Jaen.

### **Challenges**

Land abandonment. Despite having enormous potential to produce great red and white wines, it is also a region that has been destroying its heritage of old vineyards of native grape varieties, as vineyards are disappearing. Will climate change affect vineyards and wine quality?

### **Innovation**

The innovation in this VC is represented by the following characteristics:

- Product highly characteristic of the MRL.
- Product highly connected to land use and landscape management.

## Brandy made from *Juniperus communis* from Serra da Estrela.

Product connected to territorial identity as *Juniperus communis* is a characteristic bush of the highlands of Serra da Estrela. Zimbro Brandy is available through e-commerce.

Located on the southwest slope of Serra da Estrela, Covilhã is a municipality with 21 parishes, in the district of Guarda in the Centre region of Portugal. Covilhã shares with the municipalities of Seia and Manteigas, the highest point in mainland Portugal at 1993 meters of altitude. Nowadays, the city of Covilhã is one of the main European centres for wool production. Traditional economic activities in Covilhã include wool industry and production of dairy products from sheep's milk.

### Reference mountain landscape statistics (A: Data from NUTS3 TP16J)

Reference mountain chain		Cordilheira Central (RR08)	
Reference mountain landscape		Covilhã	
Size of the area (km <sup>2</sup> )	554.26	Average per capita income (€)/year	13122.6 <sup>A</sup>
Altimetry (m; min-max)	353-1993	Total Gross Value Added (GVA) (€ million)/year	2534.7 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	84.2	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.10	Primary:	4 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	2167	Secondary:	24 <sup>A</sup>
		Tertiary:	72 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	77.6	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	1686	Primary:	20 <sup>A</sup>
		Secondary:	35 <sup>A</sup>
Protected areas	No	Tertiary:	45 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Wild Zimbro from Serra da Estrela is harvested by shepherds. It is then fermented and distilled in traditional alembics. Zimbro Brandy is sold at national and international levels.

### Key local assets

Above 1600/1800 meters of altitude, the dominant shrub formation is Zimbro (*Juniperus communis*), an autochthonous species that grows between mountain meadows, rupicolous and lake communities. Zimbro is a dioecious plant, flowering in March and April, with a persistent leaf, slow growth and with a longevity between 100 and 200 years. The fruits take 18 months to ripen. At Serra da Estrela, it often has a height of up to 1 m.

### **Challenges**

Will climate change affect *Juniperus communis* distribution and quality?

### **Innovation**

The innovation in this VC is represented by the following characteristics:

- Creation of a new type of brandy from an autochthonous species.
- Innovative product.
- Product highly connected to local natural asset.

## Liqueur from Sambucus nigra flower from Serra da Estrela

Internationally distinguished product. Elderberry Flower Liqueur is available through e-commerce.

Located on the southwest slope of Serra da Estrela, Covilhã is a municipality with 21 parishes, in the district of Guarda in the Centre region of Portugal. Covilhã shares with the municipalities of Seia and Manteigas, the highest point in mainland Portugal at 1993 meters of altitude. Nowadays, the city of Covilhã is one of the main European centres for wool production. Traditional economic activities in Covilhã include wool industry and production of dairy products from sheep's milk.

Reference mountain landscape statistics  
(A: Data from NUTS3 TP16J)

Reference mountain chain		Cordilheira Central (RR08)	
Reference mountain landscape		Covilhã	
Size of the area (km <sup>2</sup> )	554.26	Average per capita income (€)/year	13122.6 <sup>A</sup>
Altimetry (m; min-max)	353-1993	Total Gross Value Added (GVA) (€ million)/year	2534.7 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	84.2	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.10	Primary:	4 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	2167	Secondary:	24 <sup>A</sup>
		Tertiary:	72 <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	77.6	Primary:	20 <sup>A</sup>
Number of agricultural holdings	1686	Secondary:	35 <sup>A</sup>
Protected areas	No	Tertiary:	45 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Elderberry flowers are harvested at Serra da Estrela and used to produce Elderberry Flower Liqueur. This product is then sold at national and international levels.

### Key local assets

Elderberry is an autochthonous shrub, distributed mainly in the northern half of Portugal and that grows at Serra da Estrela above 800 m of altitude. It is a deciduous plant, from 2 m to 5 m in height, with white flowers and black berries. It is monoecious and flowering occurs from March to June.

### **Challenges**

Will climate change affect *Juniperus communis* distribution and quality?

### **Innovation**

The innovation in this VC is represented by the following characteristics:

- Creation of a new type of brandy from an autochthonous species.
- Innovative product.
- Product highly connected to local natural asset.



## Arbutus unedo tree fruit from mountain hillsides and surroundings

Strawberry tree grows spontaneously at mountain hillsides and surroundings. More recently, strawberry tree orchards have, also, appeared in the area, as its fruit is increasingly valued. Strawberry tree may have various applications, namely the production of brandy from its fruits, the production of honey from its flowers and its use as an ornamental plant.

Located on the western slope of Serra da Estrela, Seia is a municipality with 21 parishes, in the district of Guarda in the Centre region of Portugal. Seia shares with the municipalities of Covilhã and Manteigas, the highest point in mainland Portugal at 1993 meters of altitude. Seia has a strong industrial tradition, mainly related to textiles and the distribution of electricity. The production of sheep's cheese is also a tradition.

### Reference mountain landscape statistics (A: Data from NUTS3 TP16J)

Reference mountain chain		Cordilheira Central (RR08)	
Reference mountain landscape		Seia	
Size of the area (km <sup>2</sup> )	435.41	Average per capita income (€)/year	13122.6 <sup>A</sup>
Altimetry (m; min-max)	159-1993	Total Gross Value Added (GVA) (€ million)/year	2534.7 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	51.0	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.11	Primary:	4 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	1245	Secondary:	24 <sup>A</sup>
		Tertiary:	72 <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	64.2	Primary:	20 <sup>A</sup>
Number of agricultural holdings	1728	Secondary:	35 <sup>A</sup>
		Tertiary:	45 <sup>A</sup>
		Protected areas	Yes

\*1 Nearest settlement with population > 100,000

\*2 share of total GVA/year

\*3 share of total employment)/year

At Serra da Estrela hillsides and surroundings, Strawberry tree occurs spontaneously and in planted orchards. Strawberry tree is exploited mainly because of its fruit, that is harvested and used to

produce brandy. Strawberry tree fruit is used locally or sold to other regions in Portugal. Strawberry tree fruit brandy is sold at national and international levels. Strawberry tree appears in different municipalities intersecting Serra da Estrela.

### **Key local assets**

Strawberry tree (*Arbutus unedo*) is an evergreen plant that normally does not exceed 3 to 5 m in height. It is hermaphrodite and flowering occur from October to February. Fruit maturation occurs in October. The same plant may have flower and fruit at the same time because the flowering season begins when the fruits of the previous year are ripe. Fruit production may be quite irregular among years.

### **Challenges**

Will climate change affect strawberry trees distribution and Strawberry tree fruit quality?

### **Innovation**

The innovation in this VC is represented by the following characteristics:

- Product highly connected to land use and landscape management.

## Liqueur made from sour cherry from Serra da Estrela.

Sour Cherry Liqueur is available through e-commerce.

Located on the southwest slope of Serra da Estrela, Covilhã is a municipality with 21 parishes, in the district of Guarda in the Centre region of Portugal. Covilhã shares with the municipalities of Seia and Manteigas, the highest point in mainland Portugal at 1993 meters of altitude. Nowadays, the city of Covilhã is one of the main European centres for wool production. Traditional economic activities in Covilhã include wool industry and production of dairy products from sheep's milk.

Reference mountain landscape statistics  
(A: Data from NUTS3 TP16J)

Reference mountain chain		Cordilheira Central (RR08)	
Reference mountain landscape		Covilhã	
Size of the area (km <sup>2</sup> )	554.26	Average per capita income (€)/year	13122.6 <sup>A</sup>
Altimetry (m; min-max)	353-1993	Total Gross Value Added (GVA) (€ million)/year	2534.7 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	84.2	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.10	Primary:	4 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	2167	Secondary:	24 <sup>A</sup>
		Tertiary:	72 <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	77.6	Primary:	20 <sup>A</sup>
Number of agricultural holdings	1686	Secondary:	35 <sup>A</sup>
Protected areas	Yes	Tertiary:	45 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Sour cherries are harvested at the hillsides of Serra da Estrela. Sour Cherry Liqueur is produced according to the traditional steeping process of the fruit. This product is sold at national and international levels.

### Key local assets



Sour cherry tree (*Prunus cerasus*) is a deciduous plant with about 4.5 to 6 m high and more resistant to cold than cherry tree (*Prunus avium*). Flowering occurs from March to May.

### **Challenges**

Will climate change affect sour cherry trees distribution and sour cherries quality?

### **Innovation**

The innovation in this VC is represented by the following characteristics:

- Traditional product.
- Product highly connected to land use and landscape management.

## Wool Products from Bordaleira Serra da Estrela autochthonous sheep breed

Wool from an autochthonous sheep breed (Bordaleira Serra da Estrela) is used to produce Wool Products. Wool is highly connected to territorial identity as, at Serra da Estrela, there is an ancient tradition in artisanal wool weaving industry.

With stunning landscapes, Manteigas is a municipality with 4 parishes, in the district of Guarda in the Centre region of Portugal. Manteigas shares with the municipalities of Seia and Covilhã, the highest point in mainland Portugal at 1993 meters of altitude. The main village of Manteigas is in the Zêzere Glacier Valley, which is a great example of landscape modelling by glaciers, with its 'U' shape. Historically, the most important economic activities in Manteigas are related to pastoralism, sheep's cheese production and wool industry.

### Reference mountain landscape statistics (A: Data from NUTS3 TP16J)

Reference mountain chain		Cordilheira Central (RR08)	
Reference mountain landscape		Manteigas	
Size of the area (km <sup>2</sup> )	123.28	Average per capita income (€)/year	13122.6 <sup>A</sup>
Altimetry (m; min-max)	496-1993	Total Gross Value Added (GVA) (€ million)/year	2534.7 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	24.7	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.15	Primary:	4 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	403	Secondary:	24 <sup>A</sup>
		Tertiary:	72 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	77.2	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	111	Primary:	20 <sup>A</sup>
		Secondary:	35 <sup>A</sup>
Protected areas	Yes	Tertiary:	45 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Wool comes from Bordaleira Serra da Estrela autochthonous sheep breed. The sheep are shorn in spring and only the best quality wool is used for textile purposes. The spinning allows the

transformation of wool into yarn with the desired thickness, which is then used in weaving. Different Wool Products, such as blankets and clothing items, are produced and then sold locally and in big urban centres. At Serra da Estrela, Wool Products are also produced using wool from other sheep breeds, namely Churra Mondegueira and Portuguese Merino breeds.

### **Key local assets**

Bordaleira Serra da Estrela sheep breed has a medium stature and is white or black in color. It has horns curled forward and females have a well-developed udder. It has, predominantly, dairy aptitude.

### **Challenges**

Reduced number of shepherds, as this job is sometimes seen as unattractive, due to being physically demanding, in sometimes harsh weather conditions, and low wages.

### **Innovation**

The innovation in this VC is represented by the following characteristics:

- Wool is highly characteristic of the MRL.
- Wool is highly connected to land use and landscape management.
- Wool is 100% natural, biodegradable, and renewable.

## Products made from Burel, a specific wool fabric.

Wool from two autochthonous sheep breeds (Bordaleira Serra da Estrela and Churra Mondegueira) is used to produce Burel Products. Burel is highly connected to territorial identity as it is the traditional material used to make the shepherds' cloaks. Burel products are available through e-commerce.

With stunning landscapes, Manteigas is a municipality with 4 parishes, in the district of Guarda in the Centre region of Portugal. Manteigas shares with the municipalities of Seia and Covilhã, the highest point in mainland Portugal at 1993 meters of altitude. The main village of Manteigas is in the Zêzere Glacier Valley, which is a great example of landscape modelling by glaciers, with its 'U' shape. Historically, the most important economic activities in Manteigas are related to pastoralism, sheep's cheese production and wool industry.

### Reference mountain landscape statistics (A: Data from NUTS3 TP16J)

Reference mountain chain		Cordilheira Central (RR08)	
Reference mountain landscape		Manteigas	
Size of the area (km <sup>2</sup> )	123.28	Average per capita income (€)/year	13122.6 <sup>A</sup>
Altimetry (m; min-max)	496-1993	Total Gross Value Added (GVA) (€ million)/year	2534.7 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	24.7	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.15	Primary:	4 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	403	Secondary:	24 <sup>A</sup>
		Tertiary:	72 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	77.2	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	111	Primary:	20 <sup>A</sup>
Protected areas	Yes	Secondary:	35 <sup>A</sup>
		Tertiary:	45 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Wool used in the production of Burel comes from Bordaleira Serra da Estrela and Churra Mondegueira autochthonous sheep breeds and from Portuguese Merino breed. The sheep are

shorn and only the best quality wool is used for textile purposes. The spinning allows the transformation of wool into yarn with the desired thickness, which is then used in weaving. After weaving, the wool fabric is beaten and scalded in a machine called Pisão, which causes it to shrink by about 30% to 40% and transforms it into Burel. Burel is more resistant than wool fabric. Different Burel Products such as wall panels, carpets, curtains, cushion covers, poufs and benches, suitcases, backpacks, footwear, and clothing items are produced and then sold locally, nationally, and internationally.

### **Key local assets**

Bordaleira Serra da Estrela sheep breed has a medium stature and is white or black in colour. It has horns curled forward and females have a well-developed udder. It has, predominantly, dairy aptitude. Churra Mondegueira sheep breed is of medium stature and is white in colour.

### **Challenges**

Reduced number of shepherds, as this job is sometimes seen as unattractive, due to being physically demanding, in sometimes harsh weather conditions, and low wages.

### **Innovation**

Burel is a sheep's wool fabric of medieval origin, often associated with shepherds' cloaks. Nowadays, it has reinvented with new colours and new purposes giving rise to new products with very distinct functions. These products take advantage of burel characteristics: abrasion-resistant, water-resistant, acoustic, and thermal insulation, hygroscopic, anti-electrostatic, among others.

- Burel is highly characteristic of the MRL.
- Burel is highly connected to land use and landscape management.
- Burel is produced from wool which is 100% natural, biodegradable, and renewable.

### **References:**



## Tourism based on thermal water from thermal springs at Serra da Estrela.

Value chain connected to territorial identity.

With stunning landscapes, Manteigas is a municipality with 4 parishes, in the district of Guarda in the Centre region of Portugal. Manteigas shares with the municipalities of Seia and Covilhã, the highest point in mainland Portugal at 1993 meters of altitude. The main village of Manteigas is in the Zêzere Glacier Valley, which is a great example of landscape modelling by glaciers, with its 'U' shape. Historically, the most important economic activities in Manteigas are related to pastoralism, sheep's cheese production and wool industry.

Reference mountain landscape statistics  
(A: Data from NUTS3 TP16J)

Reference mountain chain		Cordilheira Central (RR08)	
Reference mountain landscape		Manteigas	
Size of the area (km <sup>2</sup> )	123.28	Average per capita income (€)/year	13122.6 <sup>A</sup>
Altimetry (m; min-max)	496-1993	Total Gross Value Added (GVA) (€ million)/year	2534.7 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	24.7	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.15	Primary:	4 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	403	Secondary:	24 <sup>A</sup>
		Tertiary:	72 <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	77.2	Primary:	20 <sup>A</sup>
Number of agricultural holdings	111	Secondary:	35 <sup>A</sup>
		Tertiary:	45 <sup>A</sup>
		Protected areas	Yes

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Thermal mineral water is collected at about 100 meters in depth, which guarantees bacteriological purity and physical-chemical stability. These waters reach temperatures of 48 °C, which makes them excellent for curing respiratory system, rheumatic, and musculoskeletal diseases. Various

thermal treatments are offered. The thermal season starts in March and ends in November and the thermae are visited by national and international tourists.

### **Key local assets**

Key local assets for this VC are:

- Thermal springs are in the Hydrothermal Mountain Region.
- Water features: frankly mineralized.
- Chemistry: sulphurous, bicarbonate, sodium, and fluoridated water.

### **Challenges**

Not identified.

### **Innovation**

The innovation in this VC is represented by the following characteristics:

- Value chain characteristic of the MRL.
- Value chain highly connected to local natural assets.

### **References:**

## Such as Hiking, Mountain Biking, Birdwatching and Fishing

Serra da Estrela is very popular among national and international nature tourists due to its outstanding natural and landscape beauty.

With stunning landscapes, Manteigas is a municipality with 4 parishes, in the district of Guarda in the Centre region of Portugal. Manteigas shares with the municipalities of Seia and Covilhã, the highest point in mainland Portugal at 1993 meters of altitude. The main village of Manteigas is in the Zêzere Glacier Valley, which is a great example of landscape modelling by glaciers, with its 'U' shape. Historically, the most important economic activities in Manteigas are related to pastoralism, sheep's cheese production and wool industry.

### Reference mountain landscape statistics (A: Data from NUTS3 TP16J)

Reference mountain chain		Cordilheira Central (RR08)	
Reference mountain landscape		Manteigas	
Size of the area (km <sup>2</sup> )	123.28	Average per capita income (€)/year	13122.6 <sup>A</sup>
Altimetry (m; min-max)	496-1993	Total Gross Value Added (GVA) (€ million)/year	2534.7 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	24.7	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.15	Primary:	4 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	403	Secondary:	24 <sup>A</sup>
		Tertiary:	72 <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	77.2	Primary:	20 <sup>A</sup>
Number of agricultural holdings	111	Secondary:	35 <sup>A</sup>
		Tertiary:	45 <sup>A</sup>
		Protected areas	Yes

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

At Serra da Estrela, Nature Tourism activities include:

- Hiking and Biking - There are hundreds of kilometres of marked trails with various levels of difficulty.

- Birdwatching - Serra da Estrela is home to some species characteristic of high-altitude areas, such as *Anthus campestris*, *Monticola saxatilis*, *Cinclus cinclus* and *Emberiza hortulana*. Above 1000 meters of altitude, about 100 species are present during the annual cycle.
- Fishing - In some places at Serra da Estrela fishing is allowed.

### **Key local assets**

Stunning glacial valleys with more than 20 thousand years old, springs of important Portuguese rivers, fauna and flora biodiversity, several river beaches, lagoons and waterfalls, impressive mountain slopes and amazing natural rock formations are some of the most important attractions in this region.

### **Challenges**

Will climate change affect Serra da Estrela fauna and flora biodiversity, landscape dynamics and land use systems?

### **Innovation**

The innovation in this VC is represented by the following characteristics:

- Value chain highly characteristic of the MRL.
- Value chain highly connected to natural local assets.
- Value chain highly connected to land use and landscape management.

## Energy production from Hydroelectric Power Plants at Serra da Estrela

Nowadays, there are eight hydroelectric power plants at Serra da Estrela, the first of which started operating more than a century ago (1909), when local industrialists realized the energetic potential in the hydraulic characteristics of the mountain.

With stunning landscapes, Manteigas is a municipality with 4 parishes, in the district of Guarda in the Centre region of Portugal. Manteigas shares with the municipalities of Seia and Covilhã, the highest point in mainland Portugal at 1993 meters of altitude. The main village of Manteigas is in the Zêzere Glacier Valley, which is a great example of landscape modeling by glaciers, with its 'U' shape. Historically, the most important economic activities in Manteigas are related to pastoralism, sheep's cheese production and wool industry.

### Reference mountain landscape statistics (A: Data from NUTS3 TP16J)

Reference mountain chain		Cordilheira Central (RR08)	
Reference mountain landscape		Manteigas	
Size of the area (km <sup>2</sup> )	123.28	Average per capita income (€)/year	13122.6 <sup>A</sup>
Altimetry (m; min-max)	496-1993	Total Gross Value Added (GVA) (€ million)/year	2534.7 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	24.7	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.15	Primary:	4 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	403	Secondary:	24 <sup>A</sup>
		Tertiary:	72 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	77.2	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	111	Primary:	20 <sup>A</sup>
Protected areas	Yes	Secondary:	35 <sup>A</sup>
		Tertiary:	45 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

There are 8 Hydroelectric Power Plants at the municipalities of Manteigas and Seia at Serra da Estrela:

- Vila Cova: entered service in 2001 and has an installed power of 23.4 MW,

- Ponte Jugais: entered service in 1923 and has an installed power of 20.3 MW,
- Senhora do Desterro: entered service in 1909 and has an installed power of 13.2 MW,
- Sabugueiro I: entered service in 1947 and has an installed power of 12.8 MW,
- Sabugueiro II: entered service in 1993 and has an installed power of 10 MW,
- Caldas de Manteigas: entered service in 2000 and has an installed power of 7 MW,
- Lagoa Comprida: entered service in 2003 and has an installed power of 0.6 MW,
- Vale de Amoreira: entered service in 2004 and has an installed power of 0.3 MW.

### **Key local assets**

This VC relies on the availability of local natural resources, in particular water.

### **Challenges**

Not identified.

### **Innovation**

The innovation in this VC is represented by the following characteristics:

- Value chain characteristic of the MRLs.
- Value chain highly connected to local natural assets.

## DO Douro Wine

High quality and internationally renowned product. The characteristics of the territory such as soil, climate, altitude, slope, precipitation give the wines unique characteristics. Territory with a striking historical past in viticulture and classified by UNESCO as a World Heritage Site (Alto Douro Wine Region and Coa Valley Archaeological Park

The geographical area of the Côa basin is delimited to the south by the Central Cordillera, being inserted in one of the main structural units of the Iberian Peninsula, the Hespérico Massif, more specifically, in the morpho-structural unit defined as Zona Centro Ibérica.

Reference mountain landscape statistics  
(A: Data from the NUTS2 PT11)

Reference mountain chain	Iberian Mountains - Massif Hespérico		
Reference mountain landscape	Vila Nova de Foz Côa		
Size of the area (km <sup>2</sup> )	398.2	Average per capita income (€)/year	9,315
Altimetry (m; min-max)	108-800	Total Gross Value Added (GVA) (€ million)/year	2,336 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	18	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-1.65	Primary:	12.9% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	194,386	Secondary:	28.2% <sup>A</sup>
		Tertiary:	58.9% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	83	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	20	Primary:	9.1% <sup>A</sup>
Protected areas	Yes	Secondary:	28.2% <sup>A</sup>
		Tertiary:	58.9% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Among the main activities in the municipality of Vila Nova de Foz Côa, we highlight the production of wine, olive oil, almonds and tourism related to archeology, landscape, leisure, and wine. As some of the main protagonists of the chain, we highlight the presence of wineries of national and

international renown. Enhance an environmental and viticultural conduct recognized due to the companies that integrate concerns with nature and biodiversity in their activity, where organic farming and "Sustainable Wine Tourism Practices" are practiced. The wines that are produced here can be submitted to the DO Porto and DO Douro appellations for approval. Highlighting in this region the production of the mythical Barca Velha.

### **Key local assets**

The region produces the world-famous Port Wine, which has been around for three centuries in commercialization, in the international market, main vector of dynamizing the culture, traditions and economy. Port wine opened doors to the "Douro wine" which, with only two decades of existence, is increasingly referenced in the specialty's bibliography, revealing great potential and growing notoriety. As for complementary products from mountain regions, such as olive oil and almonds, these contribute to the preservation of the diversity of cultures, sustainability and the ecological balance and landscape of the Douro.

### **Challenges**

The municipality of Vila Nova de Foz Côa is characterized by having a dispersed population, for which the existence of agricultural soils (vines, almond, and olive trees) is decisive, in an association of smallholdings with significant extensions of vineyards, where this is assumed as the predominant culture. Road accessibility has improved a lot in recent years, but it is still "difficult" to get there. The impact of climate change in the Vila Nova de Foz Côa region have been like the environmental changes occurred in the rest of the Douro region. High temperatures Summers, heat waves, prolonged and intense droughts have been experienced throughout the region. These changes call into question the survival of some crops, including vines. The adaptation of the production methods and agricultural crops is essential.

### **Innovation**

Rural tourism/wine tourism is a rapidly growing sector in the region, with an increase in the number of guests, overnight stays, and hotel establishments. The promotion of creative and nature tourism in the villages of the municipality can effectively constitute an opportunity to keep the dynamism of these places active, constituted by a small number of inhabitants, bringing new business opportunities and differentiation of the existing products. We highlight the environmental conduct of some companies in the municipality. Some companies currently integrate concerns with nature, biodiversity, and sustainability in their activity.



## 7. Italy

### Parmigiano Reggiano -Emilia-Romagna-

Parmigiano Reggiano is a hard cheese of ancient tradition.

Palanzano is a municipality in the Province of Parma, Emilia-Romagna region, found about 55 kilometres south of chief city Parma. It is in the Parma Apennines, on the slopes of Faggeto Mount, in the upper Cedra valley, between meadows and chestnut woods.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITC34)

Reference mountain chain	Northern Apennines - Tuscan-Emilian Apennines		
Reference mountain landscape	Palanzano		
Size of the area (km <sup>2</sup> )	69,8	Average per capita income (€)/year	38,700
Altimetry (m; min-max)	351-1550	Total Gross Value Added (GVA) (€ million)/year	15,648
Population density (Inhabitants/km <sup>2</sup> )	15,55	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0,11	Primary:	2%
Total bed places (BPs) in tourist accommodations/year:	24	Secondary:	36%
		Tertiary:	61%
Road distance from Urban Poles* <sup>1</sup> (km)	56	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	55	Primary:	3%
Protected areas	Yes	Secondary:	31%
		Tertiary:	67%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

In 1901, the Chamber of Commerce of Reggio Emilia proposed to establish a trade union between producers and traders of cheese. In 1937 was define the territory of production. In 1963 was introduce the mark of origin of the dotted inscription "Parmigiano-Reggiano" encircling the wheels,

thereby conferring to the cheese its current external appearance. In 1996, Parmigiano Reggiano was recognized as a European PDO and only in 2014 the farm located in mountain start to use the certification "Mountain Product" Reg. (UE) n.1151/2012 and Reg. (UE) n.665/2014.

### Key local assets

Parmigiano Reggiano POD mountain product, is stepped in the tradition and history of a small, thought abundantly diverse territory. Everything takes places on a specific area of Apennines mountain range, from the growing of animal fodder to the breeding of the cows that produce the milk used to make the cheese. The meadows are self-regenerating fields, because they have not been ploughed, in some cases, not even centuries. They protected the land and are a place of biodiversity, yielding up more than 60 different fodder types that are the key aspect for the cheese quality.

### Challenges

The cheese is produced in mountain area with a strong trait of rurality which is affected by ageing population and depopulation. The selection of Parmigiano Reggiano "product in mountain" want to valorise a product and the territories of production and reduce the abandon of mountain land.

### Innovation

"Mountain product" represents a quality of Parmigiano Reggiano that must be subject to additional rules concerning not only the geographical origin, but also the diet, the breeding of the cows and the aging of the cheese.

For certification as a Mountain Product, i.e., produced in the Apennine areas:

- 100% milk from stables in mountain areas.
- More than 60% of the cows' feed grown in the mountain area.
- Dairy and maturing up to 12 months minimum, in the mountain area.

## Chestnut flour –Tuscany-

Italy is among the world's leading producers and exporters of chestnuts (*Castanea sativa*). The chestnut represents 7.53% of the forest one, for a total of about 780,000 ha. Chestnut flour is produced by secular chestnut trees planted from 500 meters to 1000 meter, that usually represents the highest altitude.

Stazzema is a comune (municipality) in the Province of Lucca in the Italian region Tuscany, located about 80 kilometres (50 miles) northwest of Florence and about 25 km (16 mi) northwest of Lucca. Stazzema is composed of 17 hamlets.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 IT12)

Reference mountain chain	Apuan Alps		
Reference mountain landscape	Stazzema		
Size of the area (km <sup>2</sup> )	80.08	Average per capita income (€)/year	28,400
Altimetry (m; min-max)	200–1858	Total Gross Value Added (GVA) (€ million)/year	9,919.9
Population density (Inhabitants/km <sup>2</sup> )	36.5	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.12	Primary:	1.16%
Total bed places (BPs) in tourist accommodations/year:	233	Secondary:	29.68%
		Tertiary:	69.17%
Road distance from Urban Poles* <sup>1</sup> (km)	55.4	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	111	Primary:	1.70%
Protected areas	Yes	Secondary:	27.77%
		Tertiary:	70.53%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The interest for chestnut flour is come back after several years of total abandonment of chestnut tree. In the area there is a general lack of professionalism. There is a very small supply compared with a high demand at very high prices. There is some local business association that try to

change the local situation. Climate change and chestnuts tree abandonment are increasing the risks of disease emergencies from harmful organisms and microorganisms from other geographical areas.

### Key local assets

Chestnuts are collected by small farm that process the fruit in small productions which have a high identity value. The chestnut tree performs various functions: productive, protective, naturalistic, landscape, recreational, didactic. The altitude, chestnut varieties, and the traditional roasting process, give to these chestnut flours a lot of character, that it was noticed into the main chestnut flour awards done in Tuscany.

### Challenges

The challenge for this value chain is to increase the production of chestnut flour, starting from the reduction of abandon of chestnut tree, and by a more professional management of the process, whit out to loss the traditional taste.

The community interaction is one of the main aspects that characterise this value chain. The harvest of chestnuts is an activity done by each family farm member, while the roasting and peeling processes are done by a small group of farms, with specific rules.

### Innovation

The production of chestnut flour is done in a traditional way but in the last ten years some innovations have interested the roasting and peeling processes, the marketing strategies (e.g., new packaging, use of social network) and the organization system.

## POD Honey production and social farm -Liguria-

Il Pungiglione is a highly specialized centre in beekeeping (honey production, wax production, carpentry). They are a member of The POD consortium “Miele della Lunigiana” that was the first consortium, in Italy, to obtain the POD recognition from the European Union.

Mulazzo is a municipality in the Province of Massa-Carrara in Tuscany region, and found about 60 Km North of chief city Massa. The municipality is situated in a mountainous area.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 IT111)

Reference mountain chain	Northen Apennines		
Reference mountain landscape	Mulazzo		
Size of the area (km <sup>2</sup> )	62.51	Average per capita income (€)/year	24,800
Altimetry (m; min-max)	76-1,112	Total Gross Value Added (GVA) (€ million)/year	4,369
Population density (Inhabitants/km <sup>2</sup> )	36.93	GVA by sector*2	
Population changes in the last 10 years	-0.10%	Primary:	1%
Total bed places (BPs) in tourist accommodations/year	314	Secondary:	23%
		Tertiary:	76%
Road distance from Urban Poles*1 (km)	96	Employment by sector*3	
Number of agricultural holdings	85	Primary:	2%
Protected areas	Yes	Secondary:	23%
		Tertiary:	76%

\*1 Nearest settlement with population > 100,000

\*2 share of total GVA/year

\*3 share of total employment)/year

### Key local assets

In Lunigiana, the low degree of industrialization, determines, an environment suitable for carrying out quality beekeeping. In the last ten years the POD Consortium have double the number of beekeepers in Lunigiana.

Honeybees are crucial for maintaining biodiversity because they pollinate numerous plant species that require an obligatory pollinator for fertilisation, and they are useful to maintain a diversified landscape. The POD Honey production area done in a typically mountain landscape with a very varied vegetation with a particular diffusion acacia and chestnut.

### Challenge

The main challenge is related to climate change, where plant phenology will be modified, especially during the flowering period. The change in climatic conditions could have an impact on honeybee species that are closely associated with their environment. Related to the climate change, the PDO Consortium honey total production, have had a very high reduction with a decrease of economic income. Only diversification activities, as done by Pungiglione, can yield stable income.

### Innovation

The social cooperative il Pungiglione is very innovative. With more than 800 hives have diversified the main activity, become a specialized pole able to provide complex services to farmers, and above all it is a village that welcomes disadvantaged people.

## Melise, apple cultivation -Molise-

The company “Melise” is a result of a successful collaboration process among local actors and an external one that established a profitable local value chain on growing, processing, and selling organic apples cultivated in abandoned lands.

Castel del Giudice is a tiny mountain municipality (Province of Isernia) in Molise Region, Southern Italy. It is a town located in Italy's inner area, distant around 50 minutes from cities, that can offer essential services in the education, health, and mobility sectors. This municipality is a member of the "Borghi Autentici d'Italia" association that brings together small and medium-sized municipalities to promote a sustainable local development model to rediscover Italian villages as places to live, support and preserve.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITF21)

Reference mountain chain	Apennines	
Reference mountain landscape	Castel del Giudice	
Size of the area (km <sup>2</sup> )	14.81	Average per capita income (€)/year 20400
Altimetry (m; min-max)	700-1,225	Total Gross Value Added (GVA) (€ million)/year 1551.2
Population density (Inhabitants/km <sup>2</sup> )	21.3	GVA by sector* <sup>2</sup>
Population changes in the last 10 years	-13.9%	Primary: 4.8%
Total bed places (BPs) in tourist accommodations/year:	30	Secondary: 20.5%
Road distance from Urban Poles* <sup>1</sup> (km)	104	Tertiary: 74.7%
Number of agricultural holdings	5	Employment by sector* <sup>3</sup>
Protected areas	YES	Primary: 5.4%
		Secondary: 24.2%
		Tertiary: 70.4%

\*1 Nearest settlement with population > 100,000

\*2 share of total GVA/year

\*3 share of total employment/year

In this VC, the positive environmental (e.g., reduction of soil erosion), economic (like job opportunities) and social (e.g., chance to not emigrate) aspects are evident. “Melise” is also

involved in other projects on honey production, "agricultural" beer, and rural tourism. "Melise" has involved the local administration, 50 local farmers and an extra-regional entrepreneur. Lands and climate "collaborated" to innovate local agricultural production (apples). Local processing industries are also involved in the value chain as tourist actors. A sort of territorial quality brand (Prodotto a Castel del Giudice) has been also designed to promote the socio-environmental context. The value chain(s) activated by "Melise" has been diversified and tended to continue to innovate (i.e., there is a project to recover traditional livestock productions). "Melise" has developed into a broader social innovation process promoted by cooperation between public and private actors.

### Key local assets

The abandoned lands and the socio-cultural context have been involved in a new value chain through a cooperation process that has extensively exploited an uncommon fruit production for the area.

### Challenge

The competition on the organic and local products market is high and the company aims to grow the commitment in food processing and for recover the traditional biotypes of apple trees. This requires new skills and business models.

### Innovation

Organic farming was a novelty in the local context and apple cultivation. The connection between local administration and farmers allowed for valorising natural and cultural local resources (in the agricultural, in future livestock initiatives as well as tourism sectors). In this case the VC(s) involves several local actors. New products are marketed (apples, also indigenous varieties, as fruit, jams, fruit juices, etc.) and a new production process is implemented (organic farming), and the territory, as a natural and socio-cultural context, is enhanced as a quality brand.



## Cheese production “Di Nucci” -Molise-

The “Di Nucci” dairy is a very old family company (dated 1662) that produce typical local cheese (e.g., Caciocavallo cheese). The production cycle is performed using only local raw materials establishing fair economic collaboration with local breeders (who supply the milk according to high quality and environmental sustainability standards).

Agnone is a little mountain municipality (Province of Isernia) in the region of Molise, Southern Italy. It is a town located in an inner area of Italy, distant around 50 minutes from centres that can offer essential services on education, health, and mobility sectors. Agnone has a old tradition of craftsmanship linked to the steel industry (i.e., “Fonderia Martinelli”, production of bells) and confectionery (the “Confetto riccio di Agnone”)

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITF21)

Reference mountain chain	Central Appennines – Molise		
Reference mountain landscape	Agnone		
Size of the area (km <sup>2</sup> )	96.9	Average per capita income (EUR)/year	20400
Altimetry (m; min-max)	387-1386	Total Gross Value Added (GVA) (EUR million)/year	1551.2
Population density (Inhabitants/km <sup>2</sup> )	51.3	GVA by sector*2	
Population changes in the last 10 years	-9.7%	Primary:	4.8%
Total bed places (BPs) in tourist accommodations/year:	233	Secondary:	20.5%
		Tertiary:	74.7%
Road distance from Urban Poles*1 (km)	109	Employment by sector*3	
Number of agricultural holdings	415	Primary:	5.4%
Protected areas	Yes	Secondary:	24.2%
		Tertiary:	70.4%

\*1 Nearest settlement with population > 100,000

\*2 share of total GVA/year

\*3 share of total employment)/year

The marketing strategy also stresses the link between the Di Nucci dairy with Alto Molise's cultural and rural tradition (like the practice of transhumance) and supporting sustainable development

initiatives. The company has a clear vocation for internationalization, oriented towards the haute cuisine sector and experiential tourism (e.g., dairy crafts museum). The company has a quality certification about its milk supply chain, and it has won several awards for its products and its innovation strategy.

### Key local assets

Here a social value exchange where a form of cooperation prevails between the different actors involved in the VCs. A new marketing strategy emphasises the family and territorial tradition that makes the product 'unique'. At the same time, the Di Nucci promoted collaboration with local actors, both farmers and institutions, playing a relevant (or even pivotal) role in local development strategy.

### Challenge

The vocation to internationalization can compromise the "artisanal" dairy tradition, and the increased request for milk may stress the local environment. The development of the tourism dimension also depends on local institutions and collaboration among local actors.

### Innovation

An artisanal product (Caciocavallo cheese) is transformed into a high quality good, and it is firmly cultural defined. The relations between the milk producers and the cheese factory are not only economical but based on a common value and perspective to favour the economic development and environmental quality of the territory. The Di Nucci family itself promotes this innovation, and it continues with the young owner generation.

## “Naturavicina” – vegetables & olive oil-Molise-

The promoters of "Naturavicina" designed an ICT solution for consumers who want to buy organic products (vegetables and olive oil) renting a portion of land and participating remotely or in-person in the cultivation process.

Macchiagodena is a municipality in the province of Isernia located high in the Central Apennines mountains in the region of Molise. Macchiagodena has a gastronomic and cultural identity linked to the pastoral tradition. In addition to specialities for meat and cheese, this little municipality is known for truffle excellence. Macchiagodena is also a member of the "Borghi Autentici d'Italia" association that brings together small and medium-sized municipalities to promote a sustainable local development model and to rediscover Italian villages as places to live, support and preserve.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITF21)

Reference mountain chain	Central Apennines – Molise		
Reference mountain landscape	Macchiagodena		
Size of the area (km <sup>2</sup> )	34.35	Average per capita income (EUR)/year	20,400
Altimetry (m; min-max)	499-1,361	Total Gross Value Added (GVA) (EUR million)/year	1,551.2
Population density (Inhabitants/km <sup>2</sup> )	50.1	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-5.05%	Primary:	4.8%
Total bed places (BPs) in tourist accommodations/year:		Secondary:	20.5%
	54	Tertiary:	74.7%
Road distance from Urban Poles* <sup>1</sup> (km)	123	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	233	Primary:	5%
Protected areas	Yes	Secondary:	24%
		Tertiary:	70%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The vegetable products are grown in greenhouses, and the consumer can monitor with cameras the state of the plants and irrigating the vegetable garden remotely. In the case of the olive grove,

the consumer can decide if to carry out treatments, check the state of the plants and participate in-person to the harvest. Products are sent to costumes, and collective purchasing is suggested to reduce prices (e.g., solidarity purchase groups).

#### Key local assets

The main actors are the three partners who established the 'Naturavicina' company. The socio-ecological system is marginally involved, as it concerns the agricultural land and the varieties of olive trees. Overall, the VC develops locally and finishes to the consumers, who can live very far from the farm due to the "collaboration" of digital prosumers. The VC, the territorial dimension is relevant in terms of the unspoilt countryside area where organic products are grown. In this scenario, a relevant aspect is the farmers' competence, which enables realising the purpose of "Naturavicina".

#### Challenge

Increasing market competition by similar experiences can reduce the profitability of "Naturavicina". Moreover, organic productions and participation principle are stressed in "Naturavicina", but the peculiarity of the territorial context is absent. For this reason, it can make the offer interesting but not unique for customers.

#### Innovation

To gain market share, 'Naturavicina' uses digital technologies that allow consumers to control and monitoring some agricultural activities. Also, a marketing strategy emphasises consumers' participation (who are a sort of "prosumers") and organic production. In this sense, there is both a process and a marketing innovation.

## Potatoes and cookies – Centre of Sardinia-

In Sardinia, the used agricultural area for potato production is about 3000 ha (source MIPAAF), which represents only 4% of national surface. Potatoes from Sardinia has a relevant quality, and it is specialised in early potatoes that are sold on market before other potatoes varieties.

Buddusò, a municipality in the province of Sassari in the centre of Sardinia, located about 77 kilometres (50 miles) to Sassari and about 62 km (16 mi) to Nuoro. Buddusò is composed of 17 hamlets.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITG25)

Reference mountain chain	Budduso plateau	
Reference mountain landscape	Budduso	
Size of the area (km <sup>2</sup> )	176.84	Average per capita income (€)/year 19,300
Altimetry (m; min-max)	525-1,003	Total Gross Value Added (GVA) (€ million)/year 5,732
Population density (Inhabitants/km <sup>2</sup> )	21.17	GVA by sector*2
Population changes in the last 10 years	-5.52%	Primary: 3%
Total bed places (BPs) in tourist accommodations/year:	116	Secondary: 13%
		Tertiary: 84%
Road distance from Urban Poles*1 (km)	77	Employment by sector*3
Number of agricultural holdings	172	Primary: 5%
Protected areas	No	Secondary: 13%
		Tertiary: 82%

\*1 Nearest settlement with population > 100,000

\*2 share of total GVA/year

\*3 share of total employment)/year

This farm produces potatoes in the Sardinian mountains. In the recent years, the owners have start to process potatoes using an innovative recipe to produce cookies called "cioccoterra". The

farm took the opportunity offered by Reg. (UE) n.1151/2012 and Reg. (UE) n.665/2014 to use the label " Mountain Product". MP Sardinia core business is still the potatoes productions, while the "cioccoderra" cookies are produce only during Christmas and Easter. It is used to increase the visibility of this farm located in the centre of Sardinia. The communication used in the web site is very friendly and different potato types are called with Sardinian names, considering the colour and not the variety to simplify the communications. Great effort is given to the territories' characteristics, where these potatoes are produced.

### Key local assets

"Coltiviamo nel granito" we grow in granite, is how MP Sardinia describe their productions. This short sentence describes the key local asset of the farm very link with the land and tradition centre Sardinia.

### Challenge

In Italy, fresh potato consumption is about 44.7 kg per capita (source: INEA 2008); which means a national consumption of about 2.9 million tonnes. In the last decade, per capita consumption of potatoes is decreasing across Europe. The challenge for this mountain production is to show consumers that fresh potatoes are rightfully included in diets of our current and modern lifestyle, and to present it as an easy, practical, healthy, and a fresh ingredient.

### Innovation

Innovation starts to spread also in this very traditional mountain value chain. A new product (the cookie) is used to increase value of the traditional potatoes. It is a smart way to use the Sardinian tradition (granite stone, language, history) to promote for potato production. The recipes (<https://www.mpsardinia.it/ricette/>) found on the web site are very innovative presenting potatoes as a fresh ingredient, easy and practical to prepare and healthy.

## “La Concordia” dairy cooperative –Sardinia-

“La Concordia” uses only local sheep’s milk produced in a sustainable way (organic milk) by 400 cooperative members. The cooperative company developed its production on the local tradition of dairy (the “Pecorino Romano POD cheese - protected designation of origin – and other mountain cheeses) and traditional sheep farming (non-stall breeding). Notably, “La Concordia” exports to the US a large part of its “Pecorino Romano POD” cheese.

Pattada is a little municipality in the Province of Sassari in the Italian region of Sardinia (the second large island of Mediterranean Sea). The town is located about 50 km Southeast of Sassari, the second large city of Sardinia. In the area of Pattada is peculiar to produce “Pecorino Romano DOP” cheese and the surrounding countryside is largely pasture. Sheep are raised for milk, and the milk is made into cheese at the local cooperative company.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITG25)

Reference mountain chain	Sardinian Mountains		
Reference mountain landscape	Pattada		
Size of the area (km <sup>2</sup> )	164.88	Average per capita income (EUR)/year	19,300
Altimetry (m; min-max)	221-1,093	Total Gross Value Added (GVA) (EUR million)/year	5,732
Population density (Inhabitants/km <sup>2</sup> )	18.18	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-10.97%	Primary:	3%
Total bed places (BPs) in tourist accommodations/year:		Secondary:	13%
	104	Tertiary:	84%
Road distance from Urban Poles* <sup>1</sup> (km)	66	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	176	Primary:	5%
Protected areas	No	Secondary:	13%
		Tertiary:	82%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The VC is not dependent on other SES for its production process, but it is strongly oriented towards the foreign market (90% of production). Relevant actors are sheep farmers who produce milk traditionally and sustainably and local institutions. The PDO (protected designation of origin) label is adopted for the "Pecorino Romano" cheese.

#### Key local assets

The local tradition of sheep farming has enabled the development of sustainable milk production. The common social culture between farmers and political-institutional actors allowed the realisation of the dairy.

#### Challenge

Although "La Concordia" has a strong outlet market (mainly the United States), its productions seem to lack a more precise socio-cultural and environmental connotation. This situation may compromise its competitiveness in the medium term due to international concurrency.

#### Innovation

In the social context in which the "La Concordia" dairy is developed, establishing a "cooperative company" was a novelty for the sector. The market now appreciates traditional forms of milk production (mainly if made in a sustainable way) and peculiar local cheese. The collaboration between 400 sheep farmers to produce traditional local cheeses has been made possible thanks to a new form of governance for the social context of Northern Sardinia.



## Garlic and Herbs –Basilicata-

In this VC, farmers adopt the label "Prodotto di Montagna (mountain product) to emphasise their products' quality (white garlic and herbs). They also stress the quality of the (unpolluted) mountain air and soil, which adds more aromaticity to their products. Specific attention is paid to packaging, following the food market trend, which appreciates packaging that recalls both rural culture and modern style. E-commerce is also implemented.

Bella is a very old mountain town surrounded by Apennines, high hills, and very dense woods. The municipality is situated 43 kms North-West of Potenza, the main city of Basilicata region, Southern Italy. There is a train station till opened and this railway is recently used for high-speed train service of the Italian national train operator.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITF51)

Reference mountain chain	Apennines		
Reference mountain landscape	Bella		
Size of the area (km <sup>2</sup> )	99.71	Average per capita income (€)/year	25300
Altimetry (m; min-max)	324-1407	Total Gross Value Added (GVA) (€ million)/year	8327
Population density (Inhabitants/km <sup>2</sup> )	48.8	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-7.5%	Primary:	4%
Total bed places (BPs) in tourist accommodations/year:		Secondary:	39%
	18	Tertiary:	57%
Road distance from Urban Poles* <sup>1</sup> (km)	101	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	593	Primary:	8%
Protected areas	No	Secondary:	25%
		Tertiary:	67%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

### Key local assets

In the VC, the natural context is engaged as characterizing by production and products. Mountain unpolluted air and lands are considered as an add-value to the VC.

### Challenge

The VC is relatively small, and it does not involve local institutions or other farmers. The socio-environmental elements of the SES engaged in the VC are the farmer skills and the natural territorial aspects of the area (mountain characteristics and no polluted context). The VC is not culturally connoted, and there is no clear focus on sustainability or health issues related to the products.

### Innovation

VC promoters use their skills acquired outside their home context (e.g., during university studies and previous work experiences). These competencies are applied to the cultivation of typical local products using marketing and commercialization strategies in line with market trends (e-commerce and attractive packaging).

## “Pepper” -Basilicata-

This farm closes the production chain of a typical traditional local product ('pepperoni cruschi') with the processing and sale to the final consumer. The dried fried sweet peppers are the flagship product, but the farm also produces and sells other products, such as aubergines in oil, and there is a cattle farm. The farmer Arleo was nominated the best 2020 Guardian Farmer ('Contadino custode') because its activities are oriented to preserve the local agro-biodiversity. The Masseria Casa Arleo products are also certified by 'Prodotti di montagna' label (Mountain products)

Senise is a mountain municipality located at 123 Km south from the city of Potenza, the chief city of Basilicata region, in the South of Italy.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITF51)

Reference mountain chain	Apennines		
Reference mountain landscape	Senise		
Size of the area (km <sup>2</sup> )	97.31	Average per capita income (€)/year	25300
Altimetry (m; min-max)	172-650	Total Gross Value Added (GVA) (€ million)/year	8327
Population density (Inhabitants/km <sup>2</sup> )	69.85	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-6.28%	Primary:	4%
Total bed places (BPs) in tourist accommodations/year:		Secondary:	39%
	127	Tertiary:	57%
Road distance from Urban Poles* <sup>1</sup> (km)	117	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	672	Primary:	8%
Protected areas	Yes	Secondary:	25%
		Tertiary:	67%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The VC is not dependent on other SES for its production process. The relevant actor is the farmer who produces and processes peppers. The products are labelled 'Mountain product ('Prodotto di

Montagna'), and the farmer is a partner of some agriculture associations. It was the best 2020 Guardian Farmer ('contadino custode') of the Basilicata region.

### Key local assets

The dried fried sweet peppers ('peperoni cruschi') are a typical product of the Basilicata region's food culture that the farmer tries to exploit in an innovative way combining the preservation of the rural tradition and the enhancement of local excellence also using digital platforms to sell.

### Challenge

The VC is relatively tiny. Farmer is involved in regional farmer associations, but its VC does not include other local farmers. The socio-environmental elements of the SES engaged in the VC are the farmer skills, traditional local vegetables, and local culture. The farmer production seems not well market-oriented and not very connoted in term of both local culture and sustainable production.

### Innovation

The farmer closes the local product's production cycle, and he is personally involved in preserving the local food culture and biodiversity.

## Milk and cheese - Marche-

This livestock farm, with its dairy, produces high-quality milk and cheese following strictly quality production standards and animal well-being principles. Some certifications attest to the link between the farm and the local context.

Amandola is a mediaeval town in the Province of Fermo (Marche region, Central Italy) in the 'Monti Sibillini' natural park. This municipality is located between Tenna river and Bora stream, about 35 kilometres West of the chief city of Fermo. Amandola has numerous historical monuments and many culinary specialities. Here there is a tradition of craftsmanship in wrought iron and woodworking. The Italian Touring Club has also awarded the city the 'Bandiera arancione' (the Orange Flag) for its historical and cultural beauty and significant landscape.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITI35)

Reference mountain chain	Central Apennines - Marche		
Reference mountain landscape	Amandola		
Size of the area (km <sup>2</sup> )	69.5	Average per capita income (€)/year	24800
Altimetry (m; min-max)	305-1887	Total Gross Value Added (GVA) (€ million)/year	3877
Population density (Inhabitants/km <sup>2</sup> )	49.53	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-7.6%	Primary:	2%
Total bed places (BPs) in tourist accommodations/year:		Secondary:	36%
	282	Tertiary:	62%
Road distance from Urban Poles* <sup>1</sup> (km)	118	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	222	Primary:	3%
Protected areas	Yes	Secondary:	41%
		Tertiary:	56%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The VC is not dependent on other SES for its production process. The relevant actor is the farmer who produces high quality milk and cheese. The company established good relations with farmer associations and local institutions. Their productions are certified with several label of quality like QM ('Qualità Marche'), Mountain product ('Prodotto di Montagna') and Sibillini Mountain ('Monti Sibillini').

### Key local assets

The Sibillini area belongs to the local culture as a place of traditions of the mountain and agricultural economy of the Marche region. The site is mentioned by the well-known romantic poet Giacomo Leopardi (who calls them the 'blue mountains'). Livestock production is typical of the area, as the share-cropping farm management (the 'mezzadria'). These SES elements are involved in the VC of the farm 'Angolo di Paradiso.'

### Challenge

VC needs to focus on the quality and quantity of local production to compete in the high-quality and traditional cheese market. In this sense, the company participates in a European project to improve the production of dairy cows (called 'I-Milka 2'). It is also necessary to guarantee good job skills and employment, especially after the 2016 earthquake in central Italy. For this reason, the company participates in funding promoted by the committee 'Comitato Sisma del Centro Italia' for vocational training.

### Innovation

The livestock farm owner is of non-regional origin (Sicily), and he has dairy and livestock breeding skills acquired from traditional family background and school and vocational training. He introduces the 'red spotted' breed in a context characterised by meat breeds (e.g., Marche cattle breed). Products are sold both on the farm and at specific sales points, like little supermarkets, in the area.

## “Honey production” -Marche-

A young farmer's son decides to produce high quality, organic honey by partly innovating his production with barrel-aged honey and distilling mead. Most of the honey production is done in the mountain area. The beekeeper establishes commercial collaborations with local activities or located in neighbouring regions, like dairy and catering activities.

Fabriano is a municipality in the Province of Ancona, Marche region, in the Center of Italy. It is in the middle of several mountains, about 75 Km Southwest of main regional city, Ancona. Fabriano is considered as a very important industrial pole in Marche region. Fabriano is known for the paper manufacturing sector (there is an historical local tradition of paper mills) and for the household appliance industry of important Italian brands. The town was also designated a UNESCO creative city in 2013, for its rich crafts stemming from a very old tradition and great savoir-faire.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITI32)

Reference mountain chain	Central Apennines - Marche		
Reference mountain landscape	Fabriano		
Size of the area (km <sup>2</sup> )	272.08	Average per capita income (€)/year	30300
Altimetry (m; min-max)	170-1411	Total Gross Value Added (GVA) (€ million)/year	12840
Population density (Inhabitants/km <sup>2</sup> )	111.46	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-2.49%	Primary:	2%
Total bed places (BPs) in tourist accommodations/year:		Secondary:	29%
	1590	Tertiary:	69%
Road distance from Urban Poles* <sup>1</sup> (km)	60	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	572	Primary:	2%
Protected areas	Yes	Secondary:	28%
		Tertiary:	70%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

## Key local assets

The farmlands are used to produce peculiar honey (e.g., sunflower honey), while forest areas are used for traditional honey (Acacia honey). The beekeeper's knowledge is applied to improve quality production, invent new products and marketing initiatives.

### Challenge

Climate change is a significant challenge for honey production because of its adverse effects on plants' biological cycles and drought. Climate change also including the need to move hives in higher areas to find certain plant varieties. This practice and put a strain on the bees' ability to resist in colder mountain zones.

### Innovation

The beekeeper wanted to improve his honey with the production of unique honey. He devised the process of ageing the honey in barrels to obtain a product with a special, intense aroma. He also adopted a marketing strategy involving other local agricultural producers (such as dairy farmers) or those in the tourism sector (restaurants) to combine his product with other excellent products and services. The products are also sold online, and the beekeeper has engaged in innovative promotion campaigns on YouTube.



## Chestnut flour -Calabria-

This family farm enhances the value of a typical mountain product, the chestnut. The chestnut groves are cultivated organically. The farm owners follow the processing stages to offer customers both fresh and dried products and processed products such as pasta, flour, bread, jams, and cakes with chestnut. Some of the processed products are made by local companies that use the Scalise farm's flour chestnut. The farm has a sales point in the town centre of Patilia Policastro. They also use other local products to enlarge their production, such as dessert sauce made by figs (called 'vincotto di fichi').

Petilia Policastro is a mountain municipality settled in the Byzantine era. It is located 46 km east to Crotona, one of the larger towns of the Calabria region, Southern Italy. The town relies on the production of olive oil, wine, cereals, citrus, and the breeding of cattle. The municipality is in the National Park of Sila mountain.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITF62)

Reference mountain chain	Southern Apennines - Calabria		
Reference mountain landscape	Petilia Policastro		
Size of the area (km <sup>2</sup> )	98.35	Average per capita income (€)/year	17700
Altimetry (m; min-max)	39-1714	Total Gross Value Added (GVA) (€ million)/year	2770
Population density (Inhabitants/km <sup>2</sup> )	90.24	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-2.65%	Primary:	9%
Total bed places (BPs) in tourist accommodations/year:		Secondary:	23%
	55	Tertiary:	68%
Road distance from Urban Poles* <sup>1</sup> (km)	73	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	1370	Primary:	15%
Protected areas	Yes	Secondary:	17%
		Tertiary:	69%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

VC is partially dependent on other local VCs if we consider transformed products. For example, pasta and bread made from chestnut flour need to be mixed with wheat flour. The VC is also connected with the catering sector. Thus, the main actors are the farmers who cultivate the chestnut groves, the other actors in the processing and catering sectors, including the natural park authority, which define limits and opportunity for quality organic productions. Except for organic product certification, there is no certification of quality or origin of the products.

### Key local assets

Chestnut groves have always been an element of the landscape of the socio-ecological system and they are cultivated in a sustainable way. The owner of the farm has innovated the family's agricultural activity by revitalising chestnut products in a modern way. Traditional products, partially forgotten, are proposed as an element of cultural heritage to valorise.

### Challenge

. Chestnuts are a product with a not large market, and it is necessary to devise new ways to use them (or recovering old use of chestnuts) that the market can appreciate. This entails an increased market risk for the farm. It is also necessary to establish commercial collaboration with other local players, particularly for processing and sales business activities. Moreover, climate change may affect the quality production of chestnut trees. Furthermore, this VC has no peculiar certification to characterize it as a local and traditional high-quality production.

### Innovation

A traditional product with a reduced market, the chestnut, is cultivated organically and processed into flour, then used to prepare various products that belong to the mountain tradition (such as chestnut flour bread). The farm owner recovered these productions for a market that appreciates local food and wine traditions and environmental sustainability. Knowledge and skills used are developed locally by the family farm and belonging to the local tradition.

## PDO Cheese –Sicily-

The company has large relevance for the Sicilian economy. It produces both traditional and PDO-certified cheeses as well as standard products in the cheese sector, like mozzarella cheese. It uses local milk (sheep and cow milk) for high quality products and, if necessary, it is also using extra-regional milk for standard productions. Milk comes from selected farms. The company is certified with various production quality labels (like BRC and IFS certificates) and it is active in the large-scale retail trade and the Ho.re.ca. sector for the local market.

Zafferana Etnea is a municipality in the Metropolitan City of Catania in the Italian region Sicily, located about 20 kilometres North of Catania. It is part of the Etna national park, which allows it to be a good destiny for winter tourists from 1900's. The town has many typical hot dishes and sweets.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITG17)

Reference mountain chain	Sicilian Mountains		
Reference mountain landscape	Zafferana Etnea		
Size of the area (km <sup>2</sup> )	76.87	Average per capita income (€)/year	18400
Altimetry (m; min-max)	340-3300	Total Gross Value Added (GVA) (€ million)/year	18239
Population density (Inhabitants/km <sup>2</sup> )	122.8	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	4.03%	Primary:	3%
Total bed places (BPs) in tourist accommodations/year:		Secondary:	14%
	698	Tertiary:	83%
Road distance from Urban Poles* <sup>1</sup> (km)	33	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	219	Primary:	5%
Protected areas	Yes	Secondary:	15%
		Tertiary:	80%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

In the VC, the Zappalà company is the main actor. Zappalà embeds the cultural elements linked to the tradition of cheese making and the milk produced from the SES. With economic actors in

the SES seem established only commercial relationships. At the same time, other SES are often linked to the VC for the extra-milk supply. Large-scale retail trading and the Ho.re.ca. sector enlarging the VC connections.

#### Key local assets

The company has a commercial relevance for the whole Sicilian dairy sector due to its large production. The cultural elements linked to the dairy tradition are incorporated into the industrial process to offer PDO cheeses and other local products.

#### Challenge

Zappalà offers a wide selection of cheese to satisfy different types of consumers, both looking for high quality and certified products and those less interested in these aspects. The milk is collected in the entire regional territory and, if necessary, comes from the extra-regional areas. In this sense, several SES are concerned by the VC. The milk and cheese market is quite competitive, and it requires both a continuous proposal of new products and to enlarge the selling market. For these reasons, some doubts were arisen on the non-transparency on milk's origin, specifically for traditional cheese production, like the Provola cheese of Nebrodi. It shows a difficult connection between the large-scale retail trade, dairy industrial production, and traditional local high quality food request by the market.

#### Innovation

The innovation refers to both Sicilian PDO products and special cheeses like low-fat or lactose-free cheeses. Products like the Provola cheese of Nebrodi is used in the marketing strategy to characterize the company as a producer of traditional Sicilian cheeses.

## “Honey” -Lazio-

A beekeeping farm that adopts the honey certificate of origin established by the Municipality of Amatrice.

Amatrice is a municipality of the province of Rieti (Lazio region) central Italy. It is located about 65 km North-East of chief city of Rieti and close to the Abruzzo region. It is considered as the centre of the Agri-food system at the National park of Gran Sasso e Monti della Laga and one of the nine municipalities of the 'Montana del Velino' community (an association of local municipalities for common policies). From 2015 it is associated to the Club of 'Borghi più belli d'Italia' (the most beautiful villages in Italy). In this town was created a well know Italian dish: spaghetti amatriciana.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3)

Reference mountain chain	Central Apennines - Lazio		
Reference mountain landscape	Amatrice		
Size of the area (km <sup>2</sup> )	174.4	Average per capita income (€)/year	19200
Altimetry (m; min-max)	749-2458	Total Gross Value Added (GVA) (€ million)/year	2704
Population density (Inhabitants/km <sup>2</sup> )	13.52	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-10.93%	Primary:	5%
Total bed places (BPs) in tourist accommodations/year:	6	Secondary:	16%
Road distance from Urban Poles* <sup>1</sup> (km)	85	Tertiary:	79%
Number of agricultural holdings	181	Employment by sector* <sup>3</sup>	
Protected areas	Yes	Primary:	6%
		Secondary:	16%
		Tertiary:	78%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

### Key local assets

The Amatrice area, with its woods and organic or integrated agriculture production (due to the ecological constraints of the nature park), is engaged in the high-quality production of organic

honey. Honey is also a historical and cultural traditional food in this mountain area. Both of those aspects allowing the VC to be characterised by natural and cultural elements.

### Challenge

First, climate change is a significant challenge for honey production (both adverse effects on plants' biological cycles and the bees' ability to resist colder/warmer zones). Second, the honey market is quite competitive, and certification of origin or organic label can be insufficient without an appropriate marketing strategy designed by the farmer and promoter of certificate of origin (in this case, the Municipality of Amatrice).

### Innovation

The innovation consists mainly in adhering to the 'Miele di Amatrice' label, a certification of origin and craftsmanship of production promoted by the municipality of Amatrice. The intent is to allow greater competitiveness of local mountain farms by preserving and promoting a historical local food (the honey) to attract consumers interested in the local cultural tradition on wine and food productions.

## Pork Meat -Tuscany-

In 1985 the Savigni started a butcher's shop and after a short time they realized that it was necessary to open a farm to have quality meat. In 2004 a cured meat factory was also created with the idea of having a controlled supply chain.

Sambuca Pistoiese is a town of Pistoia province in the Italian region of Tuscany. It is located 26 km North of chief city of Pistoia.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITI13)

Reference mountain chain	Northern Apennines - Tuscany		
Reference mountain landscape	Sambuca Pistoiese		
Size of the area (km <sup>2</sup> )	77.25	Average per capita income (€)/year	26500
Altimetry (m; min-max)	372-1318	Total Gross Value Added (GVA) (€ million)/year	6931
Population density (Inhabitants/km <sup>2</sup> )	19.59	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-14.81%	Primary:	8%
Total bed places (BPs) in tourist accommodations/year:		Secondary:	23%
	31	Tertiary:	69%
Road distance from Urban Poles* <sup>1</sup> (km)	45	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	130	Primary:	4%
Protected areas	Yes	Secondary:	26%
		Tertiary:	70%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

### Key local assets

The environment is essential. The Savigni family works in an authentic setting: the passing of the seasons, the good water of Porretta and the clear one of the Suviana Lake. The closed cycle of production of the Savigni takes place mainly outdoors, because those animals put out to pastures in a wild state are healthier and guarantee a better quality of meat. Savigni family has help the

birth of a close collaboration with other companies in the territory. In the 16 hectares of the farm the animals are reproduced and then transferred to other farms between Emilia and Tuscany

### Challenge

The main challenge is to maintain a high quality supply, using only local animal, with an increasing international market demand

### Innovation

The innovation was to believe in the organic farm when nobody take care to it and to consider the certification not just as a sort of brand but as the possibility to enter in new and qualified market. The certificates obtained by Savigni family are the following: Certifications: Bollo IT 9-3467/L IT R152E CE ANAS (National Association Pig Farmers) – Japan Export (Ministry of Health) – BioAgriCert (Certification Body / Organic Control) – Products Guarantee AIAB (Certification Body / Organic Control) – INEQ (Quality North-East Institute / Body – PDO Control Cinta Senese) – TUV (German Certification Body ISO 9001/08) – quality consortium Consorzio Tutela of Cinta Senese – Quality Consortium Consorzio Tutela Finocchiona PGI – Finocchiona PGI (Certification Body INeQ – Quality North-East Institute) – Vitellone Bianco dell’Appennino Centrale PGI “Chianina beef” (Certification Body 3A-PTA – Umbria Agri-food Technology Park).



## Chestnut flour -Tuscany-

The farm is certificated as organic farm and with the label "Mountain Product" (Reg. (UE) n.1151/2012 and Reg. (UE) n.665/2014). The chestnut flour was considered one of the best in Italy by a National concourse.

Caprese Michelangelo is a village and municipality of Arezzo Province, Tuscany Region - Italy. It is located about 40 Km North of Arezzo and 100 Km East for Florence. Caprese Michelangelo is situated in the Valtiberina or High Tiber Valley. It has a prestigious cultural value for being the birthplace of the renaissance artist Michelangelo.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 IT118)

Reference mountain chain	Apennines		
Reference mountain landscape	Caprese Michelanagelo		
Size of the area (km2)	66.53	Average per capita income (€)/year	28600
Altimetry (m; min-max)	393-1404	Total Gross Value Added (GVA) (€ million)/year	8824
Population density (Inhabitants/km2)	21.5	GVA by sector*2	
Population changes in the last 10 years	-13.6%	Primary:	4%
Total bed places (BPs) in tourist accommodations/year:		Secondary:	34%
	543	Tertiary:	63%
Road distance from Urban Poles*1 (km)	90	Employment by sector*3	
Number of agricultural holdings	169	Primary:	5%
Protected areas	No	Secondary:	34%
		Tertiary:	61%

\*1 Nearest settlement with population > 100,000

\*2 share of total GVA/year

\*3 share of total employment)/year

The valorisation of Pistolese chestnuth and the traditional roasted process, give to chestnut flours a lot of character. The product is sold in Tuscany, Emilia Romagna but also in the north part of Italy to "Ethical purchasing group" (GAS). The Baccanella products are sold direct in the farm and in different on-line shops.

### Key local assets

The fields used by the farm are located between 500 and 1000 meters, in an environment far from sources of industrial pollution. Forests provide a huge range of goods and services, but their true economic potential to Europe remains underestimated. Non-wood forest products (NWFPs) present an untapped opportunity for many rural communities.

### Challenge

The choice done by Baccanella farm to cultivate in a mountain context requires a greater commitment to primary activity and exposes the farm to the risk of natural alternation in production, but all this is to the advantage of the quality of products.

### Innovation

The innovation starts to spread also in this very traditional value chain thanks to new marketing strategies. The farm has had a relevant importance in the valorisation of Pistolese chestnut and in the reduction of abandon of chestnut tree.

## Aromatic herbs -Tuscany-

Pontepietra is a small organic farm that cultivates medicinal and aromatic herbs and practices the collection of wild herbs. This farm that takes care to communicate that most of the work is done by hand without machinery, “why the herbal teas and herb salt preserve the flavours and properties that nature has given them”. This small farm has understood that their weakness point could be a strength point with a good communication strategy. Pontepietra want to bring the: "uncontaminated nature, the flavours and smells of the Apennines to the city, respecting the values of quality, genuineness and sustainability.”

Anghiari is a hill town and municipality of Arezzo Province, Tuscany Region - Italy. It is located about 30 Km East of Arezzo near the borders with Umbria region. Anghiari is considered as one of the most beautiful villages of Italy. It has a record of multiple typical products (agricultural and others).

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 IT118)

Reference mountain chain	Northern Apennines - Tuscany		
Reference mountain landscape	Anghiari		
Size of the area (km2)	130.92	Average per capita income (€)/year	28600
Altimetry (m; min-max)	298-1379	Total Gross Value Added (GVA) (€ million)/year	8824
Population density (Inhabitants/km2)	41.88	GVA by sector*2	
Population changes in the last 10 years	-6.09%	Primary:	4%
Total bed places (BPs) in tourist accommodations/year:		Secondary:	34%
	757	Tertiary:	63%
Road distance from Urban Poles*1 (km)	75	Employment by sector*3	
Number of agricultural holdings	453	Primary:	5%
Protected areas	Yes	Secondary:	34%
		Tertiary:	61%

\*1 Nearest settlement with population > 100,000

\*2 share of total GVA/year

\*3 share of total employment)/year

## Key local assets



An organic production of aromatic herbs and honey production. With this to simply products this small farm tries to find an equilibrium between to be a small and produce very specific product as infusion herbs. They follow all the life cycle of the product from the seeds to the final infusion herbs box.

### Challenge

The brother Steinbruck want to see their hills bloom with a thousand different colours and scents thanks to the organic and natural cultivation of medicinal and aromatic herbs and make known the goodness of the wild herbs of the Apennines all over the world.

### Innovation

New products and a communication based on: Nature, sustainability, and quality.

## Landscape and Potatoes – Aosta valley

Paysage à Manger is passion and research for cultivation at high altitudes, with the aim of putting the link between the quality of agricultural products, ancient peasant knowledge and the preservation of the landscape at the center of production. The farm is member of Pro Specie Rara Swiss foundation that for 40 years has represented a point of reference in the research and protection of ancient Alpine varieties and breeds. They were selected by ReStartAlp, as one of the best projects of the year.

Gressoney San Jaun is a town and municipality in the Aosta Valley region in north-west Italy. It is 80 Km of chief city Aosta and 60 Km North of Biella in Piedmont. Famous for its fairytale castle, this small village in the Aosta Valley is a renowned summer and winter holiday resort, located at the foot of Monte Rosa, in the Lys Valley.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITC20)

Reference mountain chain	Alps		
Reference mountain landscape	Gressoney San Jaun		
Size of the area (km <sup>2</sup> )	69.66	Average per capita income (€)/year	38300
Altimetry (m; min-max)	1173-3305	Total Gross Value Added (GVA) (€ million)/year	4331
Population density (Inhabitants/km <sup>2</sup> )	11.66	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	1.81%	Primary:	1%
Total bed places (BPs) in tourist accommodations/year:		Secondary:	19%
	2098	Tertiary:	80%
Road distance from Urban Poles* <sup>1</sup> (km)	102	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	27	Primary:	4%
Protected areas	NO	Secondary:	18%
		Tertiary:	79%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year



Paysage à Manger is a project of "edible culture", an innovative and radical experiment at high altitude in which crops, and cultures try to recover their inextricable and millennial bond, of which agricultural production is the apex and point of balance. respect and enhancement of the great cultural and culinary heritage bequeathed to us by the rural communities that have inhabited these territories for centuries.

### Key local assets

Paysage à Manger means "landscape to eat". It is the opportunity to taste healthy products, grown by hand, of which to discover the history through the human and cultural ties that have intertwined with the territory. Paysage à Manger is passion and research for cultivation at high altitudes, with the aim of putting the link between the quality of agricultural products, ancient peasant knowledge and the preservation of the landscape at the centre of production.

### Challenge

The Challenge are to produce enough potatoes in the high land considering the climate change and to transform a commodity product as potatoes in a specialty one.

### Innovation

The innovation starts in 2014 with the idea of giving value and dignity to one of the humblest agricultural products in our kitchen (potatoes).

## A close supply chain to produce bread - Aosta Valley-

Bio-bakery of Saint-Pierre, a company founded in 1994, with a brand focused on promoting knowledge and consumption of spontaneous leavening bread. An organic production of cereals and a bakery done following the dictates of bio-architecture, and using solar energy combined with a heat pump to produce the energy necessary for the process.

Saint-Pierre is a town and municipality in the Aosta Valley region in north-west Italy. It is just 10 Km west of chief city Aosta and 110 Km North-West of Turin.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITC20)

Reference mountain chain	Alps		
Reference mountain landscape	Saint-Pierre		
Size of the area (km <sup>2</sup> )	26.18	Average per capita income (€)/year	38300
Altimetry (m; min-max)	617-3061	Total Gross Value Added (GVA) (€ million)/year	4331
Population density (Inhabitants/km <sup>2</sup> )	122.03	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	7.21%	Primary:	1%
Total bed places (BPs) in tourist accommodations/year:		Secondary:	19%
	315	Tertiary:	80%
Road distance from Urban Poles* <sup>1</sup> (km)	125	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	106	Primary:	4%
Protected areas	No	Secondary:	18%
		Tertiary:	79%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

### Key local assets

In the Bio-Bakery they deal directly with the entire production cycle of the product: cultivation of rye and wheat, milling of flour, production of bread and distribution of the product in the Aosta Valley.



### Challenge

To have change a classic bakery into a farm that have close the supply chain, starting from the production of cereals to the processing of breads. The main challenge is to guarantee the quality and quantity of the product over time.

### Innovation

The production of bread is done mixing an innovative process with traditional products. To improve the innovative process the owner has visited different bakeries in France and Germany with the idea to produce bread with self-made grains and sourdough. The innovative idea was to close the supply chain.



## Apple cider - Aosta valley-

The 'Docendo Discitur' farm combines the owner's agronomic and enological skills of his educational and professional training with family traditions in the cultivation of quality apples, protecting the local environment and with respect for the territory traditions.

Villeneuve is a mountain municipality in the Aosta Valley region, North-Western Italy. It lies on the Dora Baltea river, located about 10 Km West of Aosta. It is the gate of 'Gran Paradiso' National Park, the oldest Italian national park.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITC20)

Reference mountain chain	Alps		
Reference mountain landscape	Villeneuve		
Size of the area (km <sup>2</sup> )	8.8	Average per capita income (€)/year	38300
Altimetry (m; min-max)	634-2218	Total Gross Value Added (GVA) (€ million)/year	4331
Population density (Inhabitants/km <sup>2</sup> )	143.06	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	2.23%	Primary:	1%
Total bed places (BPs) in tourist accommodations/year:		Secondary:	19%
	338	Tertiary:	80%
Road distance from Urban Poles* <sup>1</sup> (km)	126	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	57	Primary:	4%
Protected areas	Yes	Secondary:	18%
		Tertiary:	79%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

In 2020 the 'Docendo Discitur' obtained the silver medal at the Cider World Award competition in Frankfurt (Germany) for the category 'Sparkling Cider Apfelschaumwein'. In the same competition, the farm obtained in 2019 the second place. This farm is also partner of the network

of agricultural producers called 'l'Alveare che dice Sì' that promotes local farmers with a fair and direct connection with costumers by a digital platform. Using apples for sparkling cider is quite an innovation in the sector and the SES. The e-commerce developed by 'l'Alveare che dice Sì' (for fair and sustainable agriculture) is an uncommon marketing strategy that offers higher commercial opportunity because it meets customers' demand for quality, healthy, traditional, and eco-sustainable products.

### Key local assets

In the SES, apple cultivation is so common that they are one of the 'Traditional Agricultural Products' (TAP); apples characterize a large part of the SES landscape. Apples are also an element of the cultural and gastronomic tradition of the SES. The owner combined his professional and academic skills with the SES's territorial and socio-cultural features with product and marketing innovations.

### Challenge

Climate change can be a significant challenge for apple's biological cycles and drought, affecting the VC negatively. The cider market is a niche one, and to be competitive, product innovation and marketing strategy can be pivotal for success. For these reasons, scientific knowledge and traditional know-how need to be combined to develop intriguing novelties for the customers and market.

### Innovation

Based on the owner's professional skills and educational training (knowledge) on winemaking combined with local tradition on apple cultivation and processing, the VC is innovative because 'Docendo Discitur' developed new products (e.g., sparkling apple cider). The farm is also part of an e-commerce platform focused on fair and sustainable agricultural production (promoting short supply chain or zero-km products).

## Didactic farm -Emilia Romagna-

The farm is registered under the organic scheme. They produce the traditional products of mountain: Berries, red and purple potatoes, honey, jams, seasonal fruit and vegetables, herbal teas, liqueurs, mustard, essential oils, hay and wild fruit and they offer very important services as "didactic farm" and agritourism.

Tizzano Val Parma is a municipality in the Province of Parma in the Italian region Emilia-Romagna, located about 35 kilometres southwest of Parma. The town is located on the upper side of a hill.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITH52)

Reference mountain chain	Apennines		
Reference mountain landscape	Tizzano Val Parma		
Size of the area (km2)	78.39	Average per capita income (€)/year	38700
Altimetry (m; min-max)	333-1575	Total Gross Value Added (GVA) (€ million)/year	15649
Population density (Inhabitants/km2)	26.99	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.56%	Primary:	2%
Total bed places (BPs) in tourist accommodations/year:		Secondary:	36%
	397	Tertiary:	61%
Road distance from Urban Poles* <sup>1</sup> (km)	35	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	124	Primary:	3%
Protected areas	NO	Secondary:	31%
		Tertiary:	67%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

### Key local assets

This VC is deeper linked with the SES. They produce mountain products and offer essential services in their farm while suggest to the tourists to find the other services as: swimming pools, fitness centre, riding stables, tennis courts, volleyball, football, ice rink in the village and its



surrounding. The farm “Casanuova” performs several educational activities in a serene and highly stimulating place. They give to their mountain production products an added value doing formation and information.

#### Challenge

This farm shows a very high flexibility and openness to all the innovations. The main challenge is to maintain the deeper relation with the local communities and to be as a centre of formation and information on rural life.

#### Innovation

The farm is in mountain but have a very good network with the local town. The activity of didactic farm offers different typologies of courses for children but also for specific categories of people with some disabilities.

## Potatoes – Emilia Romagna-

Emilia Romagna is the region with the high production of potatoes in Italy, following by Campania and Tuscany. The main production is done in flat and irrigated land, but some producers have start to introduce some innovation also in mountain area help by specific PEI measure of Rural Development Programme (Regional) - Emilia Romagna

Montese is a municipality in the province of Modena, Emilia-Romagna region - Italy. It is located about 55 Km South of chief city Modena and 60 km southwest of Bologna. Montese has many woods over its territory, particularly centuries-old chestnut woods, it is also rich in terms of forage areas and for the typical Montese potatoes production.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITH54)

Reference mountain chain	Apennines		
Reference mountain landscape	Montese		
Size of the area (km <sup>2</sup> )	81.01	Average per capita income (€)/year	39100
Altimetry (m; min-max)	254-1126	Total Gross Value Added (GVA) (€ million)/year	24664
Population density (Inhabitants/km <sup>2</sup> )	40.42	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-2.55%	Primary:	2%
Total bed places (BPs) in tourist accommodations/year:		Secondary:	40%
	523	Tertiary:	58%
Road distance from Urban Poles* <sup>1</sup> (km)	60	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	305	Primary:	3%
Protected areas	Yes	Secondary:	35%
		Tertiary:	63%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The farm located in mountain area that use the label "Mountain Product" (Reg. (UE) n.1151/2012 and Reg. (UE) n.665/2014) are: Azienda Agricola Terrasanta, Azienda Agricola Veranatura, Azienda Agricola Belvedere and Azienda Agricola Farini d'Olmo, while other farm as: Azienda

Agricola Palazzino have decide to use a specific label done by the local Chamber of Commerce "Patata di montese" to valorise the product.

#### Key local assets

This VC have high connection with the SES. During the last programming period 2014-2020 was carry out a research project that have analysed the "Montese Potato" value chain with some useful tools with the aim to improve the perceived value of their mountain product. In fact, with the adoption of the European brand "Mountain Product" in conjunction with the "Patata di Montese" brand, producers have improved the brand awareness of their customers and therefore the perceived value of their products. Other studies have analysed the product packaging and distribution phase, to increase the penetration of distribution in the points of sale and support producers in the development of appropriate marketing activities.

#### Challenge

For many years potatoes were considered as a commodity product with a basic price. Only the last years, to mitigate the reduction of per capita consumption, were introduce new marketing strategies based on the traceability of the product thanks to the valorisation of local productions. By improving the profitability conditions of mountain agri-food production it is possible to generate positive effects on the mountain territory by reducing its depopulation.

#### Innovation

The enhancement of the Montese potato was carried out through the redefinition of the organization of the production chain and the definition of a targeted promotion, as well as through an effective process of improving the quality and sustainability of the production process, the traceability and identification of the mountain products.

## Hazel nuts – Campania-

The production of hazel nuts in Campania has its origins in the mists of time. Nowadays these excellent productions are still less known compared to the hazel nuts of other Italian regions.

Piastornina is a municipality of Avellino province, Campania, southern Italy. Located 17 Km North to the chief city Avellino and 65 Km to the East of Naples. Its territory is found mainly on the Partenio regional park which is a site of Community Importance.

### Reference mountain landscape statistics

(First column data at municipality level second column data from NUTS3 ITF34)

Reference mountain chain	Southern Apennines		
Reference mountain landscape	Piastrornina		
Size of the area (km <sup>2</sup> )	15.73	Average per capita income (€)/year	18800
Altimetry (m; min-max)	223-1550	Total Gross Value Added (GVA) (€ million)/year	7094
Population density (Inhabitants/km <sup>2</sup> )	93.13	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-5.91%	Primary:	3%
Total bed places (BPs) in tourist accommodations/year:		Secondary:	23%
	70	Tertiary:	74%
Road distance from Urban Poles* <sup>1</sup> (km)	65	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	111	Primary:	5%
Protected areas	NO	Secondary:	24%
		Tertiary:	70%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The Campania hazel nut supply chain is very fragment but in the recent years are born some Organiser Producer group (OP) as "Il Guscio OP of Visciano", in support of the hazelnut supply chain in Campania and for the benefit of the associated. Mortarella, Camponica and San

Giovanni, are recognized by the Ministry of Agricultural Policies "traditional Italian agri-food products", while "Giffoni" have PGI certification.

#### Key local assets

The key local asset of this VC is mainly related to the use in traditional receipts, hazel nuts are used in many cookies or other typical food products.

#### Challenge

The increase interest in the hazel nuts is changing the traditional location of these plants, once a time cultivated in mountain and in marginal area, the new implantation is made in flat irrigated land where it is possible have a mechanisation process. The mountain productions need to close the supply chain to be more competitive and to give added value to an excellent product.

#### Innovation

Usually, in Irpinia the hazel nut is sold after harvest, but in some case some farms (es. Noccioro) have close the supply chain and the products obtained are: Toasted Hazelnuts, Hazelnut Grains, Hazelnut Flour, Hazelnut Paste and Spreadable Creams. They are marketed as raw material in the confectionery sector (pastry shops, ice cream shops, biscuit factories, etc.)



## Traditional Italian Nougat -Campania-

Federico Di Iorio' produces high quality confectioneries using traditional recipes but also adding, in some cases, new ingredients. This artisanal factory received several prestigious awards in international trade fairs since the early 1900s (Milan, 1911; Belgium 1923; London, 1925; Brussels, 1939).

Pietraderusi is an old Italian municipality in Avellino province, in the Southern Italian region of Campania. Apparently, the area has been inhabited since the 5th century BC. Here is the house of the Mountain Community of 'Medio Calore' (an institution coordinating policies of mountain municipalities). The town is located about 75 Km Eastern of Naples and 20 Km North of chief city Avellino. The Northern part of the municipality is made up of the 'Piana di Vertecchia' where there are many farms.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITF34)

Reference mountain chain	Southern Apennines - Campania		
Reference mountain landscape	Pietraderusi		
Size of the area (km <sup>2</sup> )	9.24	Average per capita income (€)/year	18800
Altimetry (m; min-max)	245-582	Total Gross Value Added (GVA) (€ million)/year	7094
Population density (Inhabitants/km <sup>2</sup> )	229.65	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-10.12%	Primary:	3%
Total bed places (BPs) in tourist accommodations/year:		Secondary:	23%
	60	Tertiary:	74%
Road distance from Urban Poles* <sup>1</sup> (km)	73	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	152	Primary:	5%
Protected areas	NO	Secondary:	24%
		Tertiary:	70%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

In 2021 the 'Federico Di Iorio' company won the silver medal in the 'Innovative Easter Dove Bread' category at the national competition 'Miglior colomba d'Italia 2021'. In that occasion, it was

proposed an Easter dove bread made with a dough of 8 cereal flour types and filled with pineapple and chocolate. 'Di lorio' produces different kinds of confectioneries, and the line 'Vecchia maniera' (the old-fashioned way production) is made with the traditional recipes and only Italian root materials (almonds, sugar, flour, butter, etc.).

### Key local assets

In this case 'Di lorio' experiments with confectionery innovations by combining local and non-local products. Local confectionery production embeds traditional skills and culture with gastronomy and confectionery sciences. They also invested in e-commerce for direct sale and opened social profile for direct communication with customers.

### Challenge

In the high-quality traditional confectionery sector, innovation and the origin of raw materials are competitive factors. In the case of 'Di lorio', innovation crosses local (i.e., nougat) and national (panettone, Easter eggs, dove bread, etc.) gastronomic culture. However, the origin of the raw materials is not always local. Although this is not in contradiction with the local tradition (since the Romans time, the SES is connected by trades with distant areas), it may pose a problem in communication strategies. For example, in the case of nougat, traditionally, almonds come from the Apulia region while honey is local. At the same time, in the business communication lacks a link with the local social context and environment settings.

### Innovation

'Di lorio' experiments with confectionery innovations by combining local and non-local products. Local confectionery production embeds traditional skills and culture with gastronomy and confectionery sciences. They also invested in e-commerce for direct sale and opened social profile for direct communication with customers.

## “Caciocavallo” cheese form southern “Dauni” mountains

The “Caciocavallo” cheese holds the national label of “Traditional Food Italian Product,” and it can be considered a territorial identity of the area. The product valorises a cow breeding (“Podolica”) typical of Southern Italy and it is produced valorising local traditions and cultural know-how. The connection with the land use system is strong, since the cheese can only be produced by “Podolica” cows bred through the wild or semi-wild systems.

Monteleone di Puglia is a hill municipality located in the Sub-Apennines Dauno, it is in the province of Foggia (Puglia) in an area at the cross-border between Puglia, Basilicata, and Campania. The town is located on top of the plateau of eastern “Irpinia”, a district of the Southern Italian Apennines.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITF46)

Reference mountain chain	Southern Apennines		
Reference mountain landscape	Monteleone di Puglia		
Size of the area (km <sup>2</sup> )	36.41	Average per capita income (€)/year	18.2
Altimetry (m; min-max)	496–978	Total Gross Value Added (GVA) (€ million)/year	10,181.
Population density (Inhabitants/km <sup>2</sup> )	27.27	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.16%	Primary:	9.7%
Total bed places (BPs) in tourist accommodations/year	26	Secondary:	16.7%
		Tertiary:	73.5%
Road distance from Urban Poles* <sup>1</sup> (km)	59	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	201	Primary:	14.4%
Protected areas	No	Secondary:	16.7%
		Tertiary:	68.7%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The cheese is produced only with milk from the “Podolica” cow which is a local breed. The processing relies on traditional activities which are mostly performed at the farm. Thus, farmers are the main actors of the VC. The product is mainly sold on-farm or in local markets.

"Caciocavallo dei Monti Dauni" holds the label of "Traditional Food Italian Product". For such products, a production specification scheme needs to be followed and it dictates that milk only from wild and semi-wild breed Podolica cows must be used to produce the cheese only using traditional production techniques.

### **Key local assets**

The area is characterised by a highly mixed land use system, where forests and natural grassland are the dominant land use systems in the interplay with agricultural land. The "Podolica" cow breed is a traditional asset of the Southern Italian regions, characterized by lower milk production compared with intensive cow breed (e.g., Frisona, Pezzata Rossa), but very much suited for breeding through in wild and semi-wild systems.

### **Challenges**

The cheese is produced in a very remote mountain area with a strong trait of rurality which is affected by ageing population and depopulation. The remoteness of the area makes it difficult for the active part of the population to share formal and informal knowledges and experiences that can promote the valorisation of local natural (bushes, woods, and natural grass land) and human (traditional know-how) resources. Additionally, intensive agriculture production drastically reduced the areas dedicated to natural land, natural grassland, and thus, the activities connected with traditional livestock activities such as the "transumanza". For all these reasons, the product is considered an identity of the area. The VC is present within the two mountain areas present in the Province of Foggia (NUTS3) ("Gargano" and "Monti Dauni").

### **Innovation**

The cheese is mainly produced on farm with very few numbers of larger processors in the territory and thus a limited amount of product available for the broader market. For these reasons, producers are exploring alternative marketing strategies besides local markets, such as e-commerce and on farm selling (usually coupled with agritourism activities).

## Apple – Friuli Venezia Giulia-

In the Natisone Valley the agricultural once a time was the main economic sector. The Specogna family farm was specialized in cattles breeding, but they converted the farm for the imposition given by the dairy produce quota, and other constrain connected to the dairy milk production. Today the company have the core business in the apple production but are also grown (potatoes, onions, courgettes, basil, tomatoes, aubergines ...), and cereals, and other types of fruits such as walnuts, peanuts, plums, persimmons.

Pulfero is a small town of Udine province. It is located 36 Km from Udine and 6 Km from Slovenia.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITH42)

Reference mountain chain	Alps		
Reference mountain landscape	Pulfero		
Size of the area (km <sup>2</sup> )	48.68	Average per capita income (€)/year	31200
Altimetry (m; min-max)	170-1641	Total Gross Value Added (GVA) (€ million)/year	14844
Population density (Inhabitants/km <sup>2</sup> )	17.91	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-18.44%	Primary:	2%
Total bed places (BPs) in tourist accommodations/year:		Secondary:	29%
	178	Tertiary:	69%
Road distance from Urban Poles* <sup>1</sup> (km)	36	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	40	Primary:	3%
Protected areas	NO	Secondary:	27%
		Tertiary:	70%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

### Key local assets



The new generation of this family farm have decided to stay in this mountain valley and to introduce some innovation to increase the income. The key local asset is related to farm family value.

#### Challenge

No challenges have been identified for this VC.

#### Innovation

This farm has decided to convert the production from dairy milk to fruits production. The main innovation is related to the processing of fruit and vegetables (juice, dried and oiled products, jams, and creams)

## Cheese – Friuli Venezia Giulia-

The dairy, owned by a local cooperative of farmers, collects, and processes the milk produced by 24 local farmers to produce Italian and local cheeses. To produce the traditional Friulian cheese called 'Montasio', the dairy obtained in 2011 the certification 'denomination product of origin (DPO) and 'mountain product' (MP) label. In this case, the VC is strongly linked to the natural (pasture, mountain, cows, etc.) and cultural (cheese production, mountain culture, etc.) elements of the socio-ecological system.

Malborghetto Valbruna is a municipality in the Italian Province of Udine in Friuli-Venezia Giulia region. It is in in the mountainous region of the Julian Alps, about 50 kilometres Northeast of the regional capital Udine, on the border with Austria.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITH42)

Reference mountain chain	Alps		
Reference mountain landscape	Malborghetto Valbruna		
Size of the area (km <sup>2</sup> )	124.21	Average per capita income (EUR)/year	31200
Altimetry (m; min-max)	624-2680	Total Gross Value Added (GVA) (EUR million)/year	14844
Population density (Inhabitants/km <sup>2</sup> )	7.31	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-6.59%	Primary:	2%
Total bed places (BPs) in tourist accommodations/year:		Secondary:	29%
	806	Tertiary:	69%
Road distance from Urban Poles* <sup>1</sup> (km)	82	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	42	Primary:	3%
Protected areas	NO	Secondary:	27%
		Tertiary:	70%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

### Key local assets

The SES is involved in the VC for several reasons. The grasslands and cultivated land are used for foraging dairy cattle (exclusively Italian Red Fleckvieh cattle). The cultural dimension is involved in the production skills related to traditional cheese making in the Friuli region. From a social viewpoint, cooperative organisational forms to face economic problems are common. The main actors are the breeders and farmers who collaborate in the cooperative company to produce milk and cheeses. Quality certifications are used limited to the traditional productions of Friuli. The number of VC participants and the type of economic activity linked to the territory has a positive impact on the SES and the adoption of environmentally friendly production and processing methods.

### Challenge

The market of dairy products is very competitive due to the presence of a wide variety of cheese. Product and process innovation is relevant for competitiveness, but this VC innovation appears limited to the acquisition of quality certificates (e.g., DPO and MP). Moreover, the dairy's reference market is local (the cooperative has its point of sale in Malborghetto Valbruna), where other typical products of the Friuli Venezia Giulia region are also proposed. Recently, home delivery sales have been adopted for a limited area. These elements could compromise the VC in the long term.

### Innovation

The innovations are two: first, acquiring certification that guarantees their cheeses as typical and quality products; second, the home sales practice.



## Porks meat -Pidmont-

The farm is in the village Lauro under the community of Rossana at an altimetry of 700 m. The farm took the opportunity offered by Reg. (UE) n.1151/2012 and Reg. (UE) n.665/2014 to use the label " Mountain Product".

Rossana is a municipality of Cuneo province, Piemonte, Northwestern Italy. Located about 25 Km North to the chief city Cuneo and 88 Km to the South of Turin. In Rossana, agricultural production is not very significant, while there are some manufactories offering jobs for locals in automobile industry.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITC16)

Reference mountain chain	Alps		
Reference mountain landscape	Rossana		
Size of the area (km2)	19.92	Average per capita income (€)/year	32700
Altimetry (m; min-max)	475-1370	Total Gross Value Added (GVA) (€ million)/year	17191
Population density (Inhabitants/km2)	41.81	GVA by sector*2	
Population changes in the last 10 years	-12.68%	Primary:	5%
Total bed places (BPs) in tourist accommodations/year:		Secondary:	34%
	26	Tertiary:	61%
Road distance from Urban Poles*1 (km)	88	Employment by sector*3	
Number of agricultural holdings	71	Primary:	8%
Protected areas	No	Secondary:	31%
		Tertiary:	61%

\*1 Nearest settlement with population > 100,000

\*2 share of total GVA/year

\*3 share of total employment)/year

The family Giolitti have done for century mountain agricultural in the traditional way. The son Flavio have done different jobs for several years, but when the Giolitti farm ran the risk of being

abandoned for the ageing of parents, the son has decided to quit the job and use the barn and land for pig farming. Immediately building the laboratory to transform the slaughtered meats and the cold rooms to store them. And starting to sell finished products in the markets.

#### Key local assets

The key local assets are mainly cultural. During an Interview Flavio try to explain the motivations to live in mountain "I have always lived in this farmhouse and I don't know what means to stay in the city all day. I like live in mountain because when I leave the house, I see flowers, meadows, woods, nature. It fills my heart with emotions. Certainly, there are difficulties as to maintenance the private road from the municipality of Rossana to the village of Lauro, with high costs, or other problems related to the distance from local market.

#### Challenge

The farm raises about 120 Duroc pigs on open air and process the meat into cured meats which sells at local markets. The quality of production has caused a surplus of demand compared to the farm supply. In the recent years to guaranteeing the production of healthy processed products have established a collaboration with other breeders' farmers in the community of Vottignasco.

#### Innovation

The pigs put out to pastures in a wild state are healthier and guarantee a better quality of meat. In the farm, everything that derives from the processing of pigs is sold, without gluten and chemical additives.

## Mila, Dairy industry -Trentino alto adige-

A large family of 2,300 mountain farmers and 470. Mila is a cooperative that is spread years after years from the 1962. The Mila pickup trucks deliver the mountain fresh milk from the farms daily to our plants in Bolzano and Brunico, where it is quickly processed into high-quality products and sold in the region of Trentino-Südtirol, the rest of Italy and internationally. Each factory has its own production specialty and seeks to develop additional high-quality products, even brand-new ones.

Bolzano is an Italian municipality, capital of the autonomous province of the same name in Trentino-Alto Adige region in the extreme North of Italy. The town is surrounded by three mountains and crossed by a stream. Bolzano has a good industrial activity; in the countryside of the periphery there is a high-quality agricultural activity (apples, grapes). In addition to tourism (cultural, business and excursion) which is also very important.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITH10)

Reference mountain chain	Alps		
Reference mountain landscape	Bolzano		
Size of the area (km <sup>2</sup> )	52.29	Average per capita income (€)/year	47100
Altimetry (m; min-max)	232-1616	Total Gross Value Added (GVA) (€ million)/year	22401
Population density (Inhabitants/km <sup>2</sup> )	2062.4	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	6.44%	Primary:	5%
Total bed places (BPs) in tourist accommodations/year:		Secondary:	22%
	3976	Tertiary:	72%
Road distance from Urban Poles* <sup>1</sup> (km)	0	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	480	Primary:	7%
Protected areas	NO	Secondary:	20%
		Tertiary:	73%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

### Key local assets

The name MILA stems from the two first letters of "Milk" and "Latte" an easy name full of cultural significant born to join two different cultural and language that are in South Tirol.

### Challenge

The market of dairy products is very competitive due to the presence of a wide number of producers. Product and process innovation is relevant for competitiveness.

### Innovation

The cooperative Mila was the first producer of SKYR in Italy. The recipe for SKYR stems originally from Iceland. SKYR is a dairy specialty, made with selected ingredients and 100% hay milk from the South Tyrolean mountains, full of proteins and low in fat.

## Organic Eggs -Piedmont-

The Tavernola farm is a specialised farm in different typologies of eggs production. The farm produces also organic eggs and takes the opportunity offered by Reg. (UE) n.1151/2012 and Reg. (UE) n.665/2014 to use the label " Mountain Product".

Dronero is a municipality of Cuneo province, Piemonte, Northwestern Italy. Located about 20 Km Northwest to the chief city Cuneo and 100 Km to the South of Turin. Dronero has an expanding industrial area, and a fervent agricultural activity specialized in breeding and cultivating crops: apples, peaches, and kiwis.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITC16)

Reference mountain chain	Alps		
Reference mountain landscape	Dronero		
Size of the area (km <sup>2</sup> )	58.96	Average per capita income (€)/year	32700
Altimetry (m; min-max)	539-2006	Total Gross Value Added (GVA) (€ million)/year	17191
Population density (Inhabitants/km <sup>2</sup> )	119.48	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-4.02%	Primary:	5%
Total bed places (BPs) in tourist accommodations/year:		Secondary:	34%
	305	Tertiary:	61%
Road distance from Urban Poles* <sup>1</sup> (km)	104	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	242	Primary:	8%
Protected areas	No	Secondary:	31%
		Tertiary:	61%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

### Key local assets

The farm has about 30 workers used in the different phases of the process. This is the main aspect that have a deeper relationship with the local asset. For a small mountain community, a farm with 30 employees is very important for the local economies.

### Challenge

The market of eggs is very competitive, but this farm has decided to follow all the change in the market demand. The high innovation technologies use to collect the eggs and the high knowledge in the sector can help to increase the productivities and remain competitive.

### Innovation

A close supply chain with the production of different qualities of eggs following the market demand. It takes care of the animals from the first day of life. They produce by themselves the feed mill, useful to satisfy the needs of all the animals. The eggs are daily collected in all the different typologies (traditional, on land and BIO) of production system, and transported to the market.

## Milk from Lessinia park -Veneto-

The farmer produces milk, dairy products (from cheese to yoghurt) and confectionery (e.g., parfaits and ice cream) in the 'Lessinia' regional park, in a mountainous area.

Bosco Chiesanuova is a municipality in Verona's Province in the Italian region Veneto, located about 140 Km West of Venice and about 31 Km North of chief city Verona to the borders with Trento province. It represents the first ski centre of the Lessinia plateau, where winter sports can be practised. Here is also spoken the Cimbrian language (German idiom).

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITH31)

Reference mountain chain	Alps		
Reference mountain landscape	Bosco Chiesanuova		
Size of the area (km <sup>2</sup> )	64.81	Average per capita income (EUR)/year	34300
Altimetry (m; min-max)	419-1865	Total Gross Value Added (GVA) (EUR million)/year	28435
Population density (Inhabitants/km <sup>2</sup> )	54.48	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-2.06%	Primary:	3%
Total bed places (BPs) in tourist accommodations/year:		Secondary:	26%
	1245	Tertiary:	71%
Road distance from Urban Poles* <sup>1</sup> (km)	31	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	89	Primary:	4%
Protected areas	Yes	Secondary:	25%
		Tertiary:	70%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Cows are for seven months in open-air grazing. The production is certificated 'mountain product' (MP) and labelled as 'Product in the Lessinia Regional Park'. In the farm shop, there is an area equipped with benches and a play area for children. The farm shop is also a tourist info point for the nature park. The farmer organizes educational workshops for schools. This VC is strictly linked to the natural settings of SES and its cultural dairy tradition.

### Key local assets

The VC intersects different sectors (i.e., confectionery) to enhance the milk and the naturalistic context. The complexity of productions and services could make the VC less competitive because milk and cheese are not certified as organic. Moreover, the production's territorial and historical identification is reported in a limited way. 'Latte del Parco' does not use all the potentialities of e-commerce. No links with other breeders are reported. The 'Latte del Parco' farm is strongly linked to the natural and cultural context of the mountains (i.e., the socio-ecological system) for its natural resources (e.g., mountain pastures) and cultural aspects (mountain milk production, cheeses, etc.). VC intersects different sectors but not different SES. It has some certifications that attest to its mountain productions. The farmer collaborates with the nature park authority by being one of the Info Points for tourists. 'Latte del Parco' also has relations with schools in the area (educational workshops). The VC has positive impacts on the SES, but not collaboration with other breeders is reported.

### Challenge

The VC intersects different sectors (i.e., confectionery) to enhance the milk and the naturalistic context. The complexity of productions and services could make the VC less competitive because milk and cheese are not certified as organic. Moreover, the production's territorial and historical identification is reported in a limited way. 'Latte del Parco' does not use all the potentialities of e-commerce. No links with other breeders are reported.

### Innovation

The VC includes several processed products beyond the local dairy tradition (such as ice creams and parfais from farm milk), and the farmer offers informative tourist services.



## Bovine Cheese – Lombardia-

The farm has 35 cows in production, of the Grigio Alpina breed and the Original Brouw breed; the main products are "Formai de' Ceresegn "cheese, aged from one to three years, Formagella, with variable seasoning from 20-90 days, and butter.

Vobarno is a municipality in the Italian province of Brescia, Lombardy. Located about 38 km Northeast of chief city Brescia and 10 Km West of Garda lake. Vobarno belongs to the mountain community "Valle Sabbia"

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITC47)

Reference mountain chain	Alps		
Reference mountain landscape	Vobarno		
Size of the area (km <sup>2</sup> )	53.22	Average per capita income (€)/year	34200
Altimetry (m; min-max)	201-1506	Total Gross Value Added (GVA) (€ million)/year	38866
Population density (Inhabitants/km <sup>2</sup> )	153.88	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	1.72%	Primary:	2%
Total bed places (BPs) in tourist accommodations/year:		Secondary:	33%
	58	Tertiary:	65%
Road distance from Urban Poles* <sup>1</sup> (km)	38	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	67	Primary:	3%
Protected areas	No	Secondary:	35%
		Tertiary:	63%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

### Key local assets

Key assets for this VC are grasslands and meadows naturally growing in the Alps and the traditional knowledge in dairy products production.

### Challenge



Cheese and butter produced in mountains are products with a superior nutritional profile because of the feeding of the animals with spontaneous herbs rich in different bioactive elements, eaten in the pasture.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.

## Limousine beef cattle -Lombardia-

The main activity is the breeding of Limousine beef cattle, a species native to the French Massif Central, and introduced since the 1970s in the valley with the aim of recovering and enhancing the pastures and marginal areas. It also participates in the recovery of “ottofile” corn, an old variety of corn, once widespread but then progressively marginalized and abandoned to more productive and profitable varieties.

Santa Margherita di Staffora is a municipality in the Italian Province of Pavia, Lombardy region. It is located about 80 km south of Milan and about 50 km south of Pavia. It is situated in the mountain area Oltrepo Pavese. Santa Margherita di Staffora contains a diversity of agricultural firms and touristic destinations.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITC48)

Reference mountain chain		Alps	
Reference mountain landscape		Santa Margherita di Staffora	
Size of the area (km <sup>2</sup> )	36.9	Average per capita income (EUR)/year	24900
Altimetry (m; min-max)	510-1691	Total Gross Value Added (GVA) (EUR million)/year	12266
Population density (Inhabitants/km <sup>2</sup> )	12.84	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-18.99%	Primary:	3%
Total bed places (BPs) in tourist accommodations/year:	1008	Secondary:	27%
Road distance from Urban Poles* <sup>1</sup> (km)	64	Tertiary:	70%
Number of agricultural holdings	23	Employment by sector* <sup>3</sup>	
Protected areas	No	Primary:	3%
		Secondary:	25%
		Tertiary:	72%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

### Key local assets



The farm is active on promoting the territory and the mountain products are meat from 15-month-old veal and 18-month-old heifer, and an "otto-file" corn flour.

### Challenge

The farm pursues the development model of "ethical agriculture", according to which the company also assumes a role for the growth of its territory: from an environmental, landscape, social and cultural point of view; also paying particular attention to the relationship with the consumer and the psycho-physical well-being of the animals. In fact, these cows live free on pasture from May to October, while for the remainder of the year they live in the large farm centre feeding on hay from local fields, integrated with a mixture of cereals grown on the farm.

### Innovation

The main innovation relates to the active role assumed by the farm on the growth of the territory.

## Honey – Friuli Venezia Giulia-

The farm and its hives are located at high altitude, on the Maniva pass, where the bees produce many varieties of honey, also awarded in the competition “Grandi mieli d’Italia”. The farm has the following mountain products in production: honey from dandelion, acacia, and chestnut trees, wildflower, and wildflower of alpine flora honey, which received the award “Una goccia d’oro” for the category “ high mountain wildflower “; in addition to these, they produced propolis, royal jelly and jams from various fruits.

Muscoline is a municipality in the Italian province of Brescia, Lombardy. Located about 30 km East of chief city Brescia and 12 Km West of Garda lake.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITC47)

Reference mountain chain	Alps		
Reference mountain landscape	Muscoline		
Size of the area (km <sup>2</sup> )	10.08	Average per capita income (EUR)/year	34200
Altimetry (m; min-max)	178-356	Total Gross Value Added (GVA) (EUR million)/year	38866
Population density (Inhabitants/km <sup>2</sup> )	263.19	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	7.47%	Primary:	2%
Total bed places (BPs) in tourist accommodations/year:		Secondary:	33%
	45	Tertiary:	65%
Road distance from Urban Poles* <sup>1</sup> (km)	31	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	87	Primary:	3%
Protected areas	No	Secondary:	35%
		Tertiary:	63%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

### Key local assets



The key assets for this VC are the plant and tree species growing spontaneously in the area (chestnut tree, wildflowers etc) as well as the beekeepers knowledge.

#### **Challenge**

The main challenge is related to climate change. Today the farm has more than sixty hives with which characteristic honeys of the mountain area are produced, as well as a cultivation of small fruits with which it produces jams.

#### **Innovation**

This VC is a traditional one, where no innovations have been identified.

## Organic district in Val di Vara -Liguria-

It is one of the few cases where land abandonment and misuse was successfully reverted thanks to organizational and agronomic innovation; The most important production is organic beef, produced totally on pasture, processed locally, and sold at regional level. Organic dairy production and sheep breeding are restarting (the used to be common but they were abandoned). The organic management is a tool for landscape management, linked to touristic activities, that integrate the agriculture economy. The whole is ruled as organic district.

Val di Vara is the inner part of La Spezia province. It is about 345 km<sup>2</sup> in 7 municipalities. The high on sea level ranges from 120 m to 1639 m. It is an area very closed to the seaside and very popular touristic destinations but for decades neglected and progressively depopulated. It never benefited from the touristic activity of proximal coast areas. It is scarcely populated (6.239 inhabitants in 2017).

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITC34)

Reference mountain chain	Northern Apennine		
Reference mountain landscape	Varese Ligure		
Size of the area (km <sup>2</sup> )	136,58	Average per capita income (€)/year	12286
Altimetry (m; min-max)	246-1551	Total Gross Value Added (GVA) (€ million)/year	5996
Population density (Inhabitants/km <sup>2</sup> )	13,8	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-13,18%	Primary:	0,6%
Total bed places (BPs) in tourist accommodations/year:	70	Secondary:	18,5%
		Tertiary:	80,8%
Road distance from Urban Poles* <sup>1</sup> (km)	60	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	5962	Primary:	1,3%
Protected areas	Yes	Secondary:	19,8%
		Tertiary:	78,9%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

### Key local assets

Key local assets for this VC relate to:

- Social resources: strong cooperation and engagement from all actors, including policy makers at local and regional level.
- Environmental resources: acknowledged quality of the landscape and organic animal husbandry as a tool to preserve it.

### Challenge

Key challenges for this VC are associate with:

- To avoid the misuse of the fame gained by the valley by external actors, who process in the area agriculture products from other areas.
- The need of continuity in the community facilitation.
- Population aging.

### Innovation

The key is the use of organic animal breeding techniques in beef cattle management. It strongly linked to pasture management and quality and it becomes the basis also of landscape preservation. All these values were acknowledged by the community considering that agriculture (animal husbandry, mainly beef production) is the main activity. Landscape value is very high, and areas are well preserved. Since early 2000s local farmers and associations of the area work for reverting the abandonment using organic practices to add value to the area and in 2013 the organic District was officially acknowledged by the Regional Government. Since then, many activities were started: touristic, educational, agricultural etc.



## Organic wine production for premium wines -Trentino Alto Adige-

This VC shows how private companies can react to climate change, so transforming marginal mountain areas into valuable areas for the future; It shows the potential of investments in local development in mountain areas, by a brand, for marketing strategies and diversification.

Trento is the capital of Trentino Autonomous province. Its territory includes the city but also the surroundings, whose large part is mountains. Agriculture use to play an important role in the province but it is progressively abandoning higher areas (where traditionally animal husbandry was more common) and concentrate on plant production (grape, apples, berries, vegetables.). Tourism is very important and counts on the high environmental and landscape quality. The type of landscape is typically alpine but with the advantage of good infrastructures and a city in proximity.

### Reference mountain landscape statistics

(First column data at LAU municipality second column data from NUTS3 ITH20)

Reference mountain chain	Alp		
Reference mountain landscape	Trento		
Size of the area (km <sup>2</sup> )	158,00	Average per capita income (€)/year	23050
Altimetry (m; min-max)	181-2180	Total Gross Value Added (GVA) (€ million)/year	18734,7
Population density (Inhabitants/km <sup>2</sup> )	764,15	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	4,40%	Primary:	4,3%
Total bed places (BPs) in tourist accommodations/year:	3661	Secondary:	22,8%
		Tertiary:	72,7%
Road distance from Urban Poles* <sup>1</sup> (km)	20	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	5962	Primary:	4,8%
Protected areas	Yes	Secondary:	25,3%
		Tertiary:	70,2%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

The value chain pertains organic production of champions wines by the Ferrari company. The company, historically based in Trento processes the grapes of their own farms, of about 300 small farmers of the area. About 5 years ago they funded a study on the impact of climate change on wine quality and based on the outcome they decided to invest in an area that till now was not considered suitable for vineyards. The vineyard was planted and is now in production, still to be assessed the consequences of quality and the response to climate change (it needs longer periods).

### Key local assets

Valorisation of areas considered as marginal and progressively abandoned. The investments for planting the vineyard changed the area and open to the potential use for touristic activity. The company also started a restaurant and other PR initiatives in the area; 2) they are not far from highly utilized locations and could be put into connection with them, for production purposes but also for touristic purposes.

### Challenge

Wine sector is concerned about climate change, both in terms of vineyards sustainability (increasing water needs, new pests, and diseases) and wine quality (maturation problems, different win characteristics etc.). Therefore, several trials are going on in wine regions to assess the potentials of “going upwards” with the vineyard cultivation and that could be a lever to regain to agriculture what are today considered marginal areas. The main challenge is the cost of the whole operation and related economic sustainability.

### Innovation

The innovative aspects relate to the fact that vineyards have been planted at an altitude higher than usual, based on a previous study on climate change forecast, and to the fact that the whole management is organic.

## Wine and Tourism -Aosta Valley-

The activities of the VC are vine growing and wine production. The vineyard of Aosta Valley consists of just under 23,5 ha of which more than 18 ha belong to the members of the cooperative "Cave Mont Blanc", and other 5,5 ha belong to 3 individual wine producers.

Morgex and La Salle are in the upper Aosta Valley, at the entrance to Valdigne. The municipalities are crossed by the Dora Baltea river and dominated by Mount Paramount (3 300 m) to the south and La Grande Rochère (3 326 m) to the north. The Aosta Valley is a mountainous autonomous region in north-western Italy. Covering an area of 3,263 km<sup>2</sup> and with a population of about 128,000 it is the smallest, least populous, and least densely populated region of Italy. The valley is very attractive for tourist for winter sports and for hiking in summer.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITC20)

Reference mountain chain	Alps		
Reference mountain landscape	Morgex		
Size of the area (km <sup>2</sup> )	127,57	Average per capita income (€)/year	16857,5
Altimetry (m; min-max)	780-3326	Total Gross Value Added (GVA) (€ million)/year	4.331
Population density (Inhabitants/km <sup>2</sup> )	31,3	GVA by sector*2	
Population changes in the last 10 years	3%	Primary:	1,20%
Total bed places (BPs) in tourist accommodations/year:	ND	Secondary:	18,40%
		Tertiary:	80,40%
Road distance from Urban Poles*1 (km)	140	Employment by sector*3	
Number of agricultural holdings	242	Primary:	3%
Protected areas	Yes	Secondary:	21%
		Tertiary:	76%

\*1 Nearest settlement with population > 100,000

\*2 share of total GVA/year

\*3 share of total employment)/year

A peculiarity of local viticulture is the great fragmentation of the cultivated area in small plots of land. Individual wine producers, grape producers, who sell grapes to cooperatives, and the

cooperative winery are the key actors of this small value chain. In the last thirty years the wines of Valle d'Aosta have had a remarkable growth in quality, witnessed by the numerous awards at national and international level both in oenological competitions and by guides and magazines. About 70% of the production is consumed locally, thanks to the presence of a flourishing tourist activity that brings more than three million visitors to Valle d'Aosta every year. A share between 10% and 20% is destined for sale in other Italian regions, while the remaining share is destined for export. If, on the one hand, the oenological offer, very fragmented and small, does not favour large-scale marketing, on the other hand it finds space in a niche market in search of products on which to boast exclusivity.

### Key local assets

The main resource of Valdostan viticulture lies in the local native vine varieties, grown only in the valley. Many native grape varieties, as part of the Valdostan culture, have recently been selected and replanted. The Prié Blanc, the only native, white-berried variety, is one of the rare varieties not grafted onto American vines thanks to special climate conditions that have preserved them from phylloxera. Versatility of this variety allows to produce high quality wines of different types: sparkling wine, dry still wine and sweet dessert wine made from late harvest grapes.

The vines are grown on terraces supported by dry stone walls, on embankments or, where possible, in the direction of the slope. Given the features of the terrain and the low rainfall in the area, it is not necessary to take any measures to channel and control surface water.

### Challenge

One of the main challenges for viticulture in the municipalities of Morgex et la Salle are the extremely high altitude for vines (above 1200 m), which creates constant risk of frost all over the growing season which in one night take away the half harvest in one night. Another important problem to be overcome, particularly for mountain winegrowing, is that of increasing the surface under vineyards to be more present on the market. (At present, the vineyard surface for production of wines with the denomination of origin around 270 ha throughout the region, 24,5 ha belong to the Mountain Reference Landscape of Morgex et La Salle).

### Innovation

This VC is very traditional, the innovation is just in the new market strategies.

## Island Wine from Lipari -Sicily-

The viticultural activity on the island is performed by a small number of individual wine producers mostly concentrated on the production of sweet wine. As this type of wine is not easy to commercialise, an innovative wine producer decides to amplify his production introducing high quality dry wines.

Lipari is the largest of a chain of the Aeolian islands in a volcanic archipelago situated in between Vesuvius and Etna in the Tyrrhenian Sea off the northern coast of Sicily, southern Italy. As a result of its volcanic origin, the island is covered with pumice and obsidian. From April till October the area receives an important touristic flow.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITG13)

Reference mountain chain		Aeolian Islands	
Reference mountain landscape		Lipari	
Size of the area (km <sup>2</sup> )	89,72	Average per capita income (€)/year	9915
Altimetry (m; min-max)	0-602	Total Gross Value Added (GVA) (€ million)/year	10,300.8
Population density (Inhabitants/km <sup>2</sup> )	139,04	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	+10%	Primary:	2,40%
Total bed places (BPs) in tourist accommodations/year:	6203	Secondary:	12,50%
		Tertiary:	85,10%
Road distance from Urban Poles* <sup>1</sup> (km)	84	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	ND	Primary:	5,70%
Protected areas	YES	Secondary:	13,90%
		Tertiary:	80,40%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

At the same time, he implements a new marketing strategy leaning on the huge touristic flow in the area offering a possibility to stay in a modern wine resort and numerous tailor-mades tasting

and gastronomic experiences. The wine is distributed in the following main channels: private clients (tourists), e-commerce and export.

### Key local assets

Key local assets involve mainly specific landscape and scenery, sea resorts and unique geological formations as Kaolin Quarries which are attractive for tourists from Italy and abroad. The main resources for the local viticulture are the autochthonous grape varieties (Malvasia and Corinto Nero) and volcanic soils, having specific characteristics valuable for wine production.

### Challenge

A common challenge for small island viticulture is the isolation from the mainland which causes extremely high cost of production. Steep slopes and traditional type of pruning makes mechanization impractical and requires a lot of manual operations.

### Innovation

First innovation of this VC is the return to using of an abandoned autochthonous variety from the area, recuperated thanks to mass and clonal selection. Second innovation is the implementation of a high-level wine resort in the middle of the vineyards and offering a wide range of tasting and gastronomic activities.

## La Cattedra -Commons farming for social and educational purposes -Veneto-

The Asiago plateau is composed by 7 municipalities with a long historical tradition of cooperation (in 1319 the world most ancient autonomous federation was set up here). They used to manage in a collaborative way also part of the land for pasture, crop cultivation and woods (in form of commons) and in the '900s they, as commons, set up a farm on more than 100ha, with stables for dairy cows and several buildings for milk processing and educational scope.

Asiago plateau is an area of 473 km<sup>2</sup> on the Pre-Alp of Vicenza Province, between the rivers Brenta and Astico developing from 100 till 2341m on sea level, with an average height of 1000m. It used to be an autonomous body (Reggenza dei sette Comuni). 90% of the surface is not private or public property but belongs to the community. This results on one side as a great opportunity for collective and participatory environmental management, but, on the other side, it leads to an increased complication due to bureaucracy and the need of a longer decision-making process.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITH32)

Reference mountain chain	Central Alps		
Reference mountain landscape	Roana		
Size of the area (km <sup>2</sup> )	78,13	Average per capita income (EUR)/year	18240
Altimetry (m; min-max)	850-1300	Total Gross Value Added (GVA) (EUR million)/year	147726
Population density (Inhabitants/km <sup>2</sup> )	54,32	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-4,71%	Primary:	2,0%
Total bed places (BPs) in tourist accommodations/year:	4.726	Secondary:	30,4%
		Tertiary:	67,6%
Road distance from Urban Poles* <sup>1</sup> (km)	60	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	-	Primary:	1,00%
Protected areas	Yes	Secondary:	42,40%
		Tertiary:	56,60%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The farm went through decades of mismanagement and abandonment, since 2017, when the municipalities found an agreement with a large food industry (based in the area) and asked the entrepreneur to take up the farm and its management.

### Key local assets

Key local assets for this VC are associated with:

- Social and cultural assets: strong historical background of cooperation, still perceived and communicated as an asset; education role of the farm towards community and tourist (education as touristic attraction!); public-private partnership to manage commons.
- Environmental assets: acknowledged quality of the landscape; peculiar environments (pre-alps plateau).

### Challenge

Climate change is already and even more will, in short term, modify local touristic patterns and will make evident the need to look for different strategies to maintain the population in loco. Organic innovative farming, local value chain, multifunctionality of the farms are the key aspects the case. The area became an organic district (Biodistretto altipiano) and participate to the AIAB organic district network.

### Innovation

After 2017 the farms were reoriented towards the production of organic vegetables, started an educational and leisure activities, got started with several innovation projects for local production of organic berries and nuts (previously well represented in the plateau but drastically reduced in area in last decades), beer production and other innovative value chains. The overall attempt is to use organic innovative value chains (not only the farming activity) for a better global management of the area, also using the prosperous tourism heading to the Asiago plateau, put at risk by climate change, as snow precipitation are strongly reduced, not allowing usual long skiing seasons.



## Etna wine -Sicily-

. Local producers were able to add value to their products, selling most of their wines to tourists at cellar gate, and constituting a basket of products of the territory that are sold together in winery and local shops.

The municipality of Castiglione di Sicilia is the biggest of the Etna area, where are placed than 70% of the Etna wineries.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITG17)

Reference mountain chain		Etna	
Reference mountain landscape		Castiglione di Sicilia	
Size of the area (km2)	119	Average per capita income (€)/year	7868
Altimetry (m; min-max)	65-3319	Total Gross Value Added (GVA) (€ million)/year	18239
Population density (Inhabitants/km2)	25,79	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-9,40	Primary:	3,20%
Total bed places (BPs) in tourist accommodations/year:	629	Secondary:	14,10%
		Tertiary:	82,70%
Road distance from Urban Poles* <sup>1</sup> (km)	56	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	140 wineries	Primary:	ND
Protected areas	Yes	Secondary:	ND
		Tertiary:	ND

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

## Key local assets

The 3500 altitude Etna volcan - sometimes in active eruption - attract great number of tourists from all over the world. The local farmers were able to hook up on tourism offering visitors a larger and more complete experience of discovery of the territory and its productions.

## Challenge



In the '90ies several well established Sicilian wineries (Franchetti, Tasca d'Almerita, Donna Fugata, Planeta etc.) bought vineyard lots, started producing and promoting the Etna wines on the domestic and international market where they were already present. The increased value and reputation of Etna wines fostered several vinegrowers to produce commercial wine, and farmers to plant vineyard. Nowadays, Etna vineyard is composed by 1100 hectares cultivated by 140 wineries and became an essential component of the Etna economy.

### **Innovation**

The main original innovation was the deepen understand of the agronomical traits of the main local variety Nerello Mascarese, and its adaptation to volcanic soils and mountain climate, thanks to the knowledge brought by the experienced wineries from outside the region. Later, the use of oak wood casks for Nerello fining, was optimizing the intrinsic quality of the red wines. In the last 15 years took place an increasing adoption of organic, biodynamic, natural, and quantic standards for production. An active consortium Vini Etna DOC and an institutional Enoteca Regionale, respectively for control of origin and typicity and for promotion of the appellation wine, synergically support the marketing activities of the private enterprises.

## Wine and Tourism -Liguria-

. The wine produced in the area has 2 appellations: PDO 5terre (a white wine from local varieties Bosco, Albarola, Vermentino), and PDO 5terre schiaccheta (a dessert wine from the same grapes). From the 500 hectares of the 50'ies, the vineyard surface is now reduced at about 80 hectares, divided in small lots with an average surface of 2,500 square meters. The commercial production of wine has 4 actors, three family-owned estates and a cooperative, this last producing 55% of the total volume of wine of the area.

The Cinque Terre is a coastal area within Liguria, in the northwest of Italy. It lies in the west of La Spezia Province, and comprises five villages: Monterosso al Mare, Vernazza, Corniglia, Manarola, and Riomaggiore. The coastline, the five villages, and the surrounding hillsides are all part of the Cinque Terre National Park, a UNESCO World Heritage Site.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITC34)

Reference mountain chain	Northen appennines		
Reference mountain landscape	Riomaggiore		
Size of the area (km2)	10.27	Average per capita income (€)/year	18,362
Altimetry (m; min-max)	0-787	Total Gross Value Added (GVA) (€ million)/year	5996
Population density (Inhabitants/km2)	138.41	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-17%	Primary:	0.60%
Total bed places (BPs) in tourist accommodations/year:	231	Secondary:	18.50%
		Tertiary:	80.87%
Road distance from Urban Poles* <sup>1</sup> (km)	131	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	-	Primary:	-
Protected areas	Yes	Secondary:	-
		Tertiary:	-

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Most wine is sold through the HORECA channel (Hotel, Restaurants, Caterings) and usually has is totally absorbed by local clients. The limited volume of wine of the region do not require the introduction in other domestic or export markets. Nevertheless, the high cost of production and the ecosystem service provided to the landscape would require much higher selling prices, that the local community is not open to accept therefore, instead of promoting the local wine together with other products of the territory, restaurants of the region tend to propose cheaper wines from other regions. The insufficient income and the increase of average age of the grape growers make questionable the sustainability of this value chain.

### Key local assets

Cinque Terre landscape attracts every year more than 3 million tourists from all over the world. The cooperative winery absorbs 55% of the local grape production (in total 80 hectares of vineyard), the rest is split into only 2 commercial wineries. Cooperative has 200 members, with an average contribution of 800 kgs of grape each. Through the cooperative affiliation, the tiny grape grower can afford investments like the monorail to reach the sloping terraces, the water aqueduct to have water available for plant treatments, the reconstitution of traditional stone walls to keep the soil into terraces.

### Challenge

High level of land fractionation, extremely steep slope, vine cultivation in terraces of 2-3 row, 100% manual work, increase of farmer average age, are the main causes of a progressive reduction of agriculture activity in the Cinque Terre region. Viticulture is in practice the sole culture that still has some commercial dimension but facing important obstacles in the lack of regulation tailored on heroic viticulture, scarce support by local institutions, scarce availability, and high cost of productive factors, mainly labour.

Even if Cinque Terre is one of the most famous international tourist destinations, rarely it was found a synergy between territorial products (essentially wine and some olive oil) and local commerce. Several initiatives to maintain viticulture in the region failed for lack of adherents: i) land bank, with lots of agricultural land offered for free to new farmers, and ii) public contributions to land consolidation. Excess of bureaucracy makes ineffective most of public initiatives to support present and future grape growers.

### Innovation

Introduction of monorails for transportation of material and people in the steep slope vineyard parcels. Installation of a water supply system to allow wet plant protection treatments in small vineyard plots; reconstitution of traditional cement-free stone walls, with landscape significance.

## Grape wine on terraces -Valtellina in Lombardia-

. Individual winegrowers and small cooperatives are producing high quality red wines of two typologies: classic red wines under the denominations Valtellina Superiore DOCG Sassella and the wines made from dried grapes under the Sforzato denominations.

Castione Andevenno is a municipality in the Province of Sondrio in the Italian region Lombardy. Located on the sunny and sheltered Rhaetic slope, it has very favourable microclimate climate for winegrowing. Castione Andevenno is one of the municipalities producing Valtellina wines under prestigious Sassella cru.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITC44)

Reference mountain chain		Central Eastern Alps	
Reference mountain landscape		Castione Andevenno	
Size of the area (km <sup>2</sup> )	17.03	Average per capita income (€)/year	15117
Altimetry (m; min-max)	273-2477	Total Gross Value Added (GVA) (€ million)/year	4.824.2
Population density (Inhabitants/km <sup>2</sup> )	92.5	GVA by sector*2	
Population changes in the last 10 years	+2.70%	Primary:	1.90%
Total bed places (BPs) in tourist accommodations/year:	6	Secondary:	27.20%
		Tertiary:	70.90%
Road distance from Urban Poles*1 (km)	124	Employment by sector*3	
Number of agricultural holdings		Primary:	3.10%
Protected areas	No	Secondary:	24.70%
		Tertiary:	72.20%

\*1 Nearest settlement with population > 100,000

\*2 share of total GVA/year

\*3 share of total employment)/year

Both typologies had gained an important reputation worldwide and are successfully distributed in Italy and abroad. The Region of Lombardy is making contributions available for restoring and preserving dry stone walls, repairing roads, and adapting water conveyance systems to protect the terraced landscape for the benefit of viticulture and the safety of the walls. The area forms the part of touristic itinerary Valtellina Wine Road.

### Key local assets

The terraced layout of the Valtellina vineyard is the element that most characterises the area. Traditional know-how of building the dry-stone walls was transmitted through the generations of winegrowers. First, the terracing made it possible to reclaim the foothills for agricultural use and then it also became an important contribution to the mountain scenery. The other important asset is the Nebbiolo grapevine variety, famous also in other Italian regions (Piemonte), but giving wines with different characteristics when grown in mountains.

### Challenge

Highly fragmented vineyard plots are all located on a difficult terrain (altitude and steep slopes), construction and maintenance of dry-stone walls is needed to support the vineyards. All these factors lead to very high production costs.

### Innovation

This VC is done in a traditional way. Some innovation is offered by The Consortium for protection of Valtellina Wine that plays an important role, not only in terms of quality protection, but also in marketing and promotional activities.

## Viticulture in the Central Apenninian –Abruzzo-

Viticulture was the principal culture of the mountain area in the past, then almost abandoned and presently we assist to a revival of the VC. Climate change is giving this area some advantages, improving conditions for production of high-quality grapes.

In the Ofena basin and the surrounding areas some hundred hectares of vineyards were recently planted by prestigious wineries of the coastal region (i.e., Masciarelli, Pasetti, Marramiero, Chiusagrande), joining their production to the historical properties like Cataldi Madonna and Gentili (now InAlto owned by the De Cecco pasta manufacturer). The area is raising increasing attention by the local and specialized press.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITF11)

Reference mountain chain	Central Apennines		
Reference mountain landscape	Ofena		
Size of the area (km <sup>2</sup> )	36,9	Average per capita income (€)/year	8142
Altimetry (m; min-max)	349-1756	Total Gross Value Added (GVA) (€ million)/year	6767
Population density (Inhabitants/km <sup>2</sup> )	11,87	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-24%	Primary:	17%
Total bed places (BPs) in tourist accommodations/year:	0	Secondary:	16.66%
		Tertiary:	76.20%
Road distance from Urban Poles* <sup>1</sup> (km)	48	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	0	Primary:	4.67%
Protected areas	Yes	Secondary:	22.90%
		Tertiary:	72.30%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Warmer average temperatures allow perfect maturation of the late harvest red varieties, but mountain environment keeps large temperature day-night excursion, for optimal aroma and colour development. Together with one single producer who did not abandon the area, new vineyard

settlements are observed, from investments of well-established wine brands of the same region or from other sectors. Meanwhile, tourism in the region is increasing.

### Key local assets

The wine area is at the margin of Gran Sasso National Park and on the trekking path of Transumanza (tratturi), with a phenomenon of increasing tourism. Together with wine, the region offers typical products like saffron (di Navelli), the cheese Canestrato di Castel del Monte.

### Challenge

The only technical challenge is same water shortage in the summer, when daily temperatures can overcome 40°C. Some social issues linked to the scarcity of local workforce due to depopulation of the mountain region, brought the main wineries to make use of worker cooperatives, thus reducing the positive impact of the value chain on the local economy.

### Innovation

Alternate row spontaneous cover crop in the vineyard, and reductive winemaking are the main innovative techniques introduced upon the traditional processes. Important investments in visitor reception (wine shop at the winery open every day) and in initiative to increase interest and liability of clients (special events, dinners restricted to best clients ecc.) were able to increase sales at cellar gate to almost 30% for the winery Cataldi Madonna.



## Wines of Mals in Vingschau -South Tyrol

Mals in the Vinschgau Valley is surrounded by mountains. Unique in the Alpine region is the wide agricultural landscape characterised by meadows and grain fields, crossed by old irrigation ditches.

In the west of South Tyrol, the Vinschgau Valley stretches from Naturno near Merano up to the Reschen Pass, where the Etsch River has its source. A valley for holidays could hardly be more diverse - apple orchards and apricot trees on the one hand, rugged peaks and glaciated three-thousand-metre peaks on the other, above all, the "King Ortler" (3,905 m above sea level)

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITH10)

Reference mountain chain		Eastern Alps	
Reference mountain landscape		Malles Venosta	
Size of the area (km <sup>2</sup> )	247.43	Average per capita income (€)/year	47,100
Altimetry (m; min-max)	921-3738	Total Gross Value Added (GVA) (€ million)/year	22,401
Population density (Inhabitants/km <sup>2</sup> )	21.37	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	4.50%	Primary:	5.3%
Total bed places (BPs) in tourist accommodations/year:	2350	Secondary:	22.4%
		Tertiary:	72.3%
Road distance from Urban Poles* <sup>1</sup> (km)	86	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	354	Primary:	6.25%
Protected areas	YES	Secondary:	23.57%
		Tertiary:	70.18%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

### Key local assets

From a tourist point of view, the municipality is also very attractive. In winter, the mountain Watles above Mals is a popular skiing area. In the warmer season, the Oberwaalweg trail near the village is particularly suitable for hikes and walks. The pretty village centres of the Mals villages, the



castles and the widely known Marienberg monastery stand for the cultural wealth of this area rich in tradition.

### Challenge

Comparatively unknown area with a rather low reputation. The elaborate vineyard work in the newly planted transverse terraces is relatively expensive.

### Innovation

It was only in 2013 that a new vineyard was planted at 1340 metres above sea level. Normally, viticulture was never possible in this climate; the vines tend to be in lower valley areas here. At the monastery "Marienberg" is now the site of the same name, which is described as the highest organic vineyard in Europe.

## PEFC certified wood from collective forests management – Friuli Venezia Giulia-

In Friuli Venezia Giulia (FVG) region, forests cover 41% of the total regional surface. 93% of the forest are in mountain areas (324.000ha) and employ about 200 forestry enterprises.

Carnia is the North-Western part of Friuli Venezia Giulia Region. It includes large part of Carniche Alps mountains and valleys, with more than 20 picks above 2000m on sea level and 4 main river valleys, the Natural Park of Friulian Dolomites. The climate is colder than analogous areas (300m lower vegetation limits) and high rainfall. Number of inhabitants dramatically dropped after Second World Word, from 66000 to less than 35000 nowadays, with a high average age and low birth rate. Economy is based on few industries localized in the valleys, agriculture, and forestry (declining) and tourism.

Reference mountain landscape statistics  
(First column data at municipality level second column data from NUTS3 ITH42)

Reference mountain chain		Eastern Alps	
Reference mountain landscape		Sauris-Ampezzo	
Size of the area (km <sup>2</sup> )	115	Average per capita income (€)/year	17887
Altimetry (m; min-max)	450-2120	Total Gross Value Added (GVA) (€ million)/year	34,742
Population density (Inhabitants/km <sup>2</sup> )	13	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-9.3%	Primary:	1.9%
Total bed places (BPs) in tourist accommodations/year:	1152 ( Sauris + Ampezzo)	Secondary:	29.1%
		Tertiary:	68.9%
Road distance from Urban Poles* <sup>1</sup> (km)	60	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	ND	Primary:	2.7%
Protected areas	YES	Secondary:	30.90%
		Tertiary:	66.30%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Large part of forests used to belong to Venice Republic (used for boat construction and city building) and have a traditional common management (now as Consorzio Boschi Carnici) besides

area owned by private companies. In line with the common management the environmental certification process of all Regional forests and woods have been driven by the Regional Government and managed collectively.

### Key local assets

Concerning environmental assets: large part of the forests are protected areas (either under National or Regional protection schemes) and are the basis for the local touristic offer, so also providing an asset in economic terms. In environmental and economic terms another asset is the setting up of value chains, in last 10 years, for products and by products: timber for construction, wood for furniture, by products for energy production (biomass burning) and with some excellence like resonance woods for musical instruments production.

### Challenge

Forest are an asset but very often their economic performance is too low to grant a continuity in their management. This case is an attempt to respond to the challenge of preserving environmental value of the forests but at the same time granting an economic sustainability. A key aspect is the attempt to solve the problem of property fragmentation and increasing age of owners and managers through a cooperative that can provide several services and supports. The cooperative Legnoservizi gathers all public and private actors in the value chain and can be the tool to faced described challenges.

### Innovation

. Quality wood and timber production has historical background (since Venice Republic who owned large part of the forests) but its qualification, in terms of intrinsic quality, environmental certification and by-products valorisation (for energy production) started about 20 years ago. The Regional Government supported the environmental certification scheme implementation with regionally funded projects and facilitated the establishment of a cooperative ([www.Legnoservizi.it](http://www.Legnoservizi.it)) for the management of forests and their products to safeguard the environmental value of the area (with touristic relevance too) and enhance their economic value, a key aspect for maintaining population in mountain areas and attract young people to work in the forest sector.

## 8. Scandinavian Countries

### Organic Farming

This VC develops around organic farming activities that integrate vegetables and grain production together with cattle livestock.

Aurland territory covers the Aurland Fiord and the Nærøyfjorden, which are both branches of the world's largest fiord, the Sognefjorden. The area is dominated by fiords and mountains. The Nærøyfjorden is part of The West Norwegian Fjords of Geirangefjord and Nærøyfjord UNESCO World Heritage Site. Most of the urban settlements are small villages in the shore of the fiords and on small river valleys. Aurland's coat of arms depicts a goat, representing the importance of these animals and the cheese made from their milk for the cultural identity of the MRL.

Reference mountain landscape statistics

(A: Data for the NUTS3 NO052, county of Sogn og Fjordane; B: from the touristic region of Sognefjord)

Reference mountain chain	Scandinavean Mountains - Scandes		
Reference mountain landscape	Aurland		
Size of the area (km <sup>2</sup> )	1,468	Average per capita income (€/year)	53,441 <sup>A</sup>
Altimetry (m; min-max)	0–1,809	Total Gross Value Added (GVA) (€ million)/year	5,2240 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	1.21	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-5.9%	Primary:	7.22% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	5,001 <sup>B</sup>	Secondary (including construction):	35.4% <sup>A</sup>
		Tertiary:	57.3% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	168 <sup>C</sup>	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	2,792 <sup>D</sup>	Primary:	5.15%
Protected areas	Yes	Secondary:	29.2%
		Tertiary:	63.7%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

In this VC, producers, teachers, students, and consumers are involved with different and complementary roles. This college has been boosting organic food production in Norway. All

organic productions and markets must be certified by the national label Debio. The VC depends firstly on the natural ecosystem which offers the conditions for developing specific farming practices and productions. In addition, this VC has a lot to do with the social cohesion, cooperation and communication among farmers, academia, public administration, and consumers. There are several organic farms along the Scandinavian mountains. An additional example of a diversified organic farm is in Stjørdal (NO1714).

### **Key local assets**

Organic production in small scale farms is based on strong values, concerning sustainability with special care for the soil and natural ecological processes. Another important aspect is the knowledge sharing that occurs around this VC and the bridges between academia and practitioners.

### **Challenges**

Key challenges in this VC relate to the needs to scale up and encourage more producers and consumers to engage with organic farming and products.

### **Innovation**

This VC integrates education with organic food production. The Sogn Jord- og Hagebruksskule is a college in organic agriculture. They have a farm and processing installations to produce elaborated products such as cheese, butter, and sour cream. Besides the college and the farm, they also have a store to sell their own products together with other organic products from outside. They have played an important role in developing new knowledge around organic farming, and networking among farmers and local community. In the college they do research, they teach traditional and innovative techniques, and they also cooperate with numerous Norwegian organisations.

## Family-owned forestry

This VC represents one of the main land use systems in Finland, and all along Scandinavia. Besides their natural value and relevance for nature conservation, forests have an important social and cultural value in this area.

Rovaniemi is the capital of the Finnish region of Lapland. It is located near the Arctic Circle. Due to its geographical location and environment, tourism has risen since the end of the last century (the average of visitors per year is 500000) attracted by the northern lights, winter sports, the village of Santa Claus, and reindeer or husky rides. For its importance as capital of the Finish Lapland, Rovaniemi has an international airport. The locality also hosts the Forestry Museum of Lapland where the history of this industry in the region is explained. In addition, in a close municipality, Kemijärvi, a biorefinery works, transforming wood into energy and other transformed and innovative materials.

Reference mountain landscape statistics  
(A: Data at the NUTS3 F11D7 level; B: data at the NUTS2 F11D level)

Reference mountain chain	Scandinavean Mountains - Lapland		
Reference mountain landscape	Rovaniemi		
Size of the area (km <sup>2</sup> )	8,017	Average per capita income (€)/year	37,754
Altimetry (m; min-max)	45–360	Total Gross Value Added (GVA) (€ million)/year	6,018 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	7.92	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	5.7%	Primary:	4.18% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	26,813 <sup>A</sup>	Secondary (including construction):	34.4% <sup>A</sup>
		Tertiary:	61.4% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	205	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	15,630 <sup>B</sup>	Primary:	2.04%
Protected areas	Yes	Secondary:	16.7%
		Tertiary:	81.3%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Family-owned forests in Finland represent between a 50-60% of the forestry land and produce about the 80 percent of the timber needed in industry. The average size of a family-owned forest

in Finland is 30,5 ha and more than a half is transferred by inheritance. The Forest Owner 2020 survey showed that tendencies of owners that live in urban settings are changing, and new generations are willing to stay close to their forests. In fact, over 50% of the owners live in their holdings. The number of owners with higher education is also increasing. The growing season last around 80 days in Finland and in 2018 the average growth per day was of 1.3 million cubic metres. Forest industry is the main export sector in Finland. Besides Finland, where the most productive forest area is in the Eastern region, the VC is also present in Sweden and Norway.

### **Key local assets**

Finland is one of the most heavily forested countries in the world with 4 ha of forest per person. One of each five families in Finland own a piece of forest. However, access to all the forest areas is free. Consequently, there is a strong link and culture related to the forests among the Finnish people. The main tree species in boreal latitudes for forestry are Scott pine, spruce, and birch.

### **Challenges**

Climate change will affect the methods and species in the industry. With warmer temperatures and higher rain rates, an increase in the yields is expected. Conversely, in some areas, the fire risk will grow, new pests and diseases will arrive and difficulties for the logging are also expected due to changes in soil structure. Turning the industry more sustainable is one of the biggest challenges facing Climate Change for which alternative logging methods are gaining attention. Finally, although trends are changing, there are concerns about the ageing of the industry.

### **Innovation**

The increased use of continuous-cover method over clear cutting and the integration of both is an innovation for the sector in Finland, where clear cutting has been the dominant method. In addition, new products such as wood isolation foams and wood-based packaging and textile products among others are breaking into the markets as sustainable alternatives for plastics. Finally, an EU project is aiming to develop a digital twin (virtual model) of forests in Finland, Germany and Romania to model and predict the development of forests and some of their services such as carbon storage. Innovations related to end-products based on wood nanocellulose are being developed. In addition, new processes in forest management are being tested, aiming to adapt to changing conditions, working both in practice with logging techniques and in research and IT (e.g., digital twin).



## Sami Handicraft - Duodji

This VC is based on the cultural heritage of the only indigenous community of Europe. The origin of the materials is mainly the natural ecosystems and the reindeers.

Guovdageaidnu - Kautokeino is one of the two main cultural settlements for the Norwegian Sapmi area. It is the largest municipality in Norway, and it shares a border with Finland in the South. It is in the Finnmarksvidda mountain plateau, covered by birch and sparse pine forests, extensive bogs, and lakes. The key characteristic activity is the reindeer herding. It hosts one of the main Sami festivals, the Easter Festival of Kautokeino, where visitors can learn about Sami culture, experience some traditional activities, and purchase handicrafts.

Reference mountain landscape statistics  
(A: Data from the NUTS3 NO073, county of Finnmark)

Reference mountain chain	Scandinavean Mountains - Scandes		
Reference mountain landscape	Guovdageaidnu - Kautokeino (NO)		
Size of the area (km <sup>2</sup> )	9,707	Average per capita income (€)/year	53,239 <sup>A</sup>
Altimetry (m; min-max)	192–970	Total Gross Value Added (GVA) (€ million)/year	3,607 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	0.29	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-1.3%	Primary:	13.6% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	12,579 <sup>A</sup>	Secondary (including construction):	23.9% <sup>A</sup>
		Tertiary:	62.4% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	414	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	285 <sup>A</sup>	Primary:	0.85%
Protected areas	Yes	Secondary:	13.8%
		Tertiary:	85.3%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

There are two types of handicraft, the soft handicrafts, and the hard ones. The first one consists of clothes, jewellery and baskets of woven birch branches and are traditionally made by women, while the hard ones are knives and cups of reindeer antlers, which are mostly manufactured by

men. Traditional materials are reindeer leather, bones and antlers, natural woods, specially from birch, and silver for clothes and jewellery. Both the Sami handicraft making and souvenir purchase in Sapmi region are also touristic assets. Handicrafts can be found in stores and in Sami markets and festivals. In 1980 the Sami Duodji trademark was established for tracing authentic Sami products and, although different national organisations certify the products within each country's boundaries (Norway, Sweden, Finland, and Russia), the ownership rights correspond to the Sami Council. The VC is present all along Sapmi area in Norway, Sweden (Jokkmokk SE2510 or Kiruna) and Finland.

### **Key local assets**

This VC is highly related to reindeer herding and the nomadic Sami ancient lifestyle. Consequently, they had to craft their own tools and get the materials from nature. Most of them come from reindeer (antlers, skin, and bones) and birch wood from local forests. Knowledge on how to make them has been carried through generations and the style and techniques could vary among the ethnic groups.

### **Challenges**

The challenges of this VC relate to:

- Threat on Sapmi territory driven by extractive industries (mining, logging, energy)
- Maintain the knowledge and interest of Sami people in handcrafting.

### **Innovation**

The VC is innovative as it represents a novel business model for the Sami community to make tools and clothes for commercial purposes. Nonetheless, the assets and means remain traditional. In addition, they are embracing online platforms to promote the VC. An example is the Jokkmokk Market that normally takes place in the locality of Jokkmokk but this year due to COVID-19 Pandemic, it may be carried out online. The innovation is related to the turn into a market-oriented production fostering the development of regional markets and e-commerce strategies to reach more public.

## Sami Tourism Destinations

A VC is based on the cultural heritage of the only indigenous community of Europe. Albeit it has not yet been developed as much as expected, this VC could have a significant role in the livelihoods of Sami people.

Guovdageaidnu - Kautokeino is one of the two main cultural settlements for the Norwegian Sapmi area. It is the largest municipality in Norway, and it shares a border with Finland in the South. It is in the Finnmarksvidda mountain plateau, covered by birch and sparse pine forests, extensive bogs, and lakes. The key characteristic activity is the reindeer herding. It hosts one of the main Sapmi festivals, the Easter Festival of Kautokeino, where visitors can learn about Sami culture, experience some traditional activities, and purchase handicrafts.

Reference mountain landscape statistics  
(A: Data from the NUTS3 NO073, county of Finnmark)

Reference mountain chain	Scandinavean Mountains - Scandes		
Reference mountain landscape	Guovdageaidnu - Kautokeino (NO)		
Size of the area (km <sup>2</sup> )	9,707	Average per capita income (€)/year	53,239 <sup>A</sup>
Altimetry (m; min-max)	192–970	Total Gross Value Added (GVA) (€ million)/year	3,607 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	0.29	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-1.3%	Primary:	13.6% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	12,579 <sup>A</sup>	Secondary (including construction):	23.9% <sup>A</sup>
		Tertiary:	62.4% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	414	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	285 <sup>A</sup>	Primary:	0.85%
Protected areas	Yes	Secondary:	13.8%
		Tertiary:	85.3%

\*1 Nearest settlement with population > 100,000

\*2 share of total GVA/year

\*3 share of total employment)/year

Different types of attractions exist: an authentic experience of joining the Sapmi people in their everyday life and participating in activities such as the reindeer calf earmarking; experiencing the

Sami culture within the indigenous territory, where natural assets such as flora, fauna, and landscape gain high importance; purchasing Sami handicraft and souvenir; participating in Sami markets and festivals, etc. The VC is present all along Sapmi territory in Norway, Sweden (Jokkmokk SE2510) and Finland.

### **Key local assets**

Sami culture cannot be separated from the natural environment where they live. Arctic landscapes, fauna and flora are vital aspects of their worldview. Living in contact with nature has led to a deep rooted traditional ecological knowledge in the area. The main touristic attraction is thus the Sami cultural heritage and its relation to the land they inhabit. For the development of the VC, it is also important to consider the values of the Sami community and the influence of traditional practices such as reindeer herding on this VC. Finally, scholars highlight the importance of cooperation among different Sami companies and non-Sami touristic industries for the VC's development.

### **Challenges**

Key challenges in this VC relate:

- To develop the industry and increase the revenues without compromising the indigenous theme of the product.
- To enhance the cooperation, collaboration, and synergies among Sami promoters and other companies and industries
- To preserve the Sapmi territory and their practices in front of growing industries of Northern regions such as mining, energy, and logging.

### **Innovation**

The VC is innovative as it represents a novel business model for the Sami people. However, the assets and means remain traditional. In addition, they are embracing online platforms to promote the VC. An example is the Jokkmokk Market that normally takes place in the locality of Jokkmokk but this year due to COVID-19 Pandemic, it may be carried out online. For the Sami people, the new product is the touristic offer itself. Besides, e-commerce strategies are being developed to reach more public.

## Nature-based Tourism

It is a developing industry in Scandinavian countries based on their singular natural assets. In addition, it seeks to add value to other VCs of the area.

Trysil is in the boundary with Sweden. It hosts the largest ski resort in Norway. Its economy is mainly based on services and tourism due to the natural assets of the region.

Reference mountain landscape statistics  
(A: Data from the NUTS3 NO021, county of Hedmark; B: Data for Innlandet)

Reference mountain chain	Scandinavean Mountains - Scandes		
Reference mountain landscape	Trysil		
Size of the area (km <sup>2</sup> )	3,014	Average per capita income (€)/year	44,612 <sup>A</sup>
Altimetry (m; min-max)	304–1,208	Total Gross Value Added (GVA) (€ million)/year	7,817 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	2.2	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-2.04%	Primary:	8.4% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	2,477 <sup>B</sup>	Secondary (including construction):	16.4% <sup>A</sup>
		Tertiary:	75.14% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	204	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	3,031 <sup>A</sup>	Primary:	1.8%
Protected areas	Yes	Secondary:	18.9%
		Tertiary:	79.2%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

This VC fosters the integration of outdoor recreations in wild nature with traditional practices and local products. Therefore, the VC seeks a tourism that boosts regional development based on local assets, trying to keep most of the economic benefits of the activity within the region. Many regional organisations work together with local producers and touristic business and ski lodges along Norway. The actual emphasis on sustainable tourism tries to face overtourism and its impacts on natural ecosystems and local social systems due to overcrowding. More examples can be found almost all along Norway in municipalities such as Vadsø and Oppdal, and within the

Hardangervidda National Park (Uvdal, Ullesvang, and others). Similarly, arctic tourism is a developing industry in Lapland Region in Finland and Norbotten in Sweden.

### **Key local assets**

The specificity of this VC is the landscape of the region. The main asset in winter is outdoor recreation based on winter sports such as skiing (cross-country and downhill skiing) or dogsledding. For these sports, Scandinavian mountains offer a great spot with extent routes and resorts during a particularly long season. During summer, other outdoor recreation activities such as fly fishing, hunting, and hiking are combined with the enjoyment of cultural landscapes and their associated practices (mostly extensive grazing) and products (dairies, meat, honey, etc.).

### **Challenges**

Tourism is an industry that relies on external visitors, therefore in times of COVID-19 Pandemic, its resilience has been highly questioned. However, it surely delivers multiple benefits to the localities when it looks for responsible visitors that aim to engage with the places they visit. Climate Change is a challenge as winter season may be shorter in the coming years and thus the arctic and snow based touristic sector will need to look for alternatives. In addition, sustainable tourism face challenges when dealing with the impacts of traveling (e.g., carbon emissions) and over-tourism in specific locations.

### **Innovation**

Innovations are related with new tourism activities and approaches, moving from traditional experiences and offers (such as simple outdoor recreation) towards local initiatives, products and practices that can add value to the touristic experience. The innovation is therefore about looking for these types of synergies. In addition, most of the touristic and accommodation offers are available online, even in the case of small family businesses and farms. The innovation is related to the synergies between cultural and natural assets, looking for a bigger implication and integration of visitors with the area. Websites play an important mechanism as all the touristic assets (from skiing to cow milking) can be found online. Regional associations play a key role in promoting both local products and touristic assets under labelling schemes. Finally, with this place-based turn in tourism, more family businesses and local organisations are gaining importance in the management of tourism.

## Organic and demeter certified herbs

High quality product with long history and Demeter bio-dynamic certification.

Lom is situated at the entrance of the Jotunheim National Park, and the two highest peaks of Norway that are in this territory. Located within a mountainous landscape, farming has traditionally been the main economic driver of the region. Other VCs in the MRL include cured and raw meat, fish, honey, stone milled flour, flatbread, and berries. In addition, tourism is also a growing industry.

### Reference mountain landscape statistics

(A: Data from the NUTS3 NO022, county of Oppland B: Data from the county of Nord-Gudbrandsdal)

Reference mountain chain		Scandinavean Mountains - Scandes	
Reference mountain landscape		Lom	
Size of the area (km <sup>2</sup> )	1,969	Average per capita income (€)/year	44,096 <sup>A</sup>
Altimetry (m; min-max)	365–2,469	Total Gross Value Added (GVA) (€ million)/year	7,448 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	44,096	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-2.04%	Primary:	7.4% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	4,753 <sup>B</sup>	Secondary (including construction):	19.7% <sup>A</sup>
		Tertiary:	72.8% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	279	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	4,271 <sup>B</sup>	Primary:	6.6%
Protected areas	Yes	Secondary:	22.6%
		Tertiary:	70.7%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

This VC is based on a family farm with few employees besides the two owners. They produce herbs and flowers to sell them fresh and dry. They also own a dehumidifier to dry their own grown herbs and flowers and other organic herbs they buy from national producers as well as exotic aromatic plants and teas from abroad. Their product is certified with the Demeter label as organic and bio-dynamic farm. They sell their products directly in the farm and online. In addition, through the cooperative Gudbrandsdalsmat SA, together with other 24 producers they sell their products

to groceries stores and specially the Norwegian HORECA market. More cases of organic herb farms are in Roros (NO1640) and Gloppen (NO1445).

### **Key local assets**

The main natural asset is the climate. This region has one of the driest weathers of the European Northern Countries with high amount of direct sun hours, which makes it adequate for aromatic herbs growing. The social assets start with their values linked to Demeter bio-dynamic philosophy. Besides, through Gudbrandsdalsmat SA they commit to a cooperation among local producers that share a concern about their territory and the practices they perform on it.

### **Challenges**

As they directly sell their products from the farm to the consumers, the restrictions in mobility and lower tourism due to COVID-19 Pandemic may have negatively impacted their activity. In this sense, the important role of the local producers' cooperative should be highlighted for its supporting role in developing an online store.

### **Innovation**

Innovations are related with new tourism activities and approaches, moving from traditional experiences and offers (such as simple outdoor recreation) towards local initiatives, products and practices that can add value to the touristic experience. The innovation is therefore about looking for these types of synergies. In addition, most of the touristic and accommodation offers are available online, even in the case of small family businesses and farms. The innovation is related to the synergies between cultural and natural assets, looking for a bigger implication and integration of visitors with the area. Websites play an important mechanism as all the touristic assets (from skiing to cow milking) can be found online. Regional associations play a key role in promoting both local products and touristic assets under labelling schemes. Finally, with this place-based turn in tourism, more family businesses and local organisations are gaining importance in the management of tourism.



## Organic and demeter certified juices

Demeter certified juices are products of high quality that care for the environment.

Notodden is in a mountainous area with numerous water streams and waterfalls. It has always been linked to diverse industrial activities around the Tinnelva river, such as wood logging and hydropower energy. Simultaneously, the region of Telemark is one of the four major fruit districts in Norway. Besides, Notodden hosts the biggest blues festival in Norway and the only Blues museum.

### Reference mountain landscape statistics

(A: Data from the NUTS3 NO034, county of Telemark B: Data from the tourism region of Øst-Telemark)

Reference mountain chain		Scandinavean Mountains - Scandes	
Reference mountain landscape		Notodden	
Size of the area (km <sup>2</sup> )	984	Average per capita income (€)/year	47,879 <sup>A</sup>
Altimetry (m; min-max)	18–1,290	Total Gross Value Added (GVA) (€ million)/year	7,385 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	13.26	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	5.32%	Primary:	0.8% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	1,573 <sup>B</sup>	Secondary (including construction):	33.1% <sup>A</sup>
		Tertiary:	66.1% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	112	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	1,351 <sup>B</sup>	Primary:	0.3%
Protected areas	Yes	Secondary:	24.7%
		Tertiary:	66.1%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Jønsi Gård on Hjuksebø in Telemark is Norway's largest producer of biodynamic apples and has been Demeter approved since 1991. On the farm there are over 20 different apple varieties with an annual production around 30-50 tons. Besides, they have around 40 beehives to ensure pollination and they consequently produce honey as a by-product. Another case of organic juice production is in Møre og Romsdal (NO053)

## Key local assets



Although the growing season is short in this latitude, the local climate is adequate for apple production. Social assets relate to the values associated with the organic and Demeter certification, putting sustainability and circular system thinking first.

### **Challenges**

The main challenge for this VC relates to the increase the number of customers and the demand for organic products.

### **Innovation**

The local sweet and pastries value chain is a traditional one, where no innovations have been identified.

## Natural-grown berries

This VC relies on the valorisation of unsprayed raspberries of a local variety. Berries grow naturally in this environment, so its market-oriented production is a possibility for local economies to thrive.

Stjørdal is crossed by the Stjørdalselva river until its arrival to the Trondheim fiord. The Eastern part of the municipality belongs to the Skarvan and Roltdalen National Park. Due to its proximity to Trondheim, the municipality is developing an urbanization process. Simultaneously, there are still multiple local VCs within the AUK - SMAKER FRA STJØRDALSFØRET, such as organic vegetable farming, family dairies, beekeeping, eggs, beer brewery, traditional bakery, coffee distillery, and rural touristic accommodation.

### Reference mountain landscape statistics

(A: Data for the NUTS3 NO062, county of Nord-Trøndelag; B; data for the county of Trøndelag)

Reference mountain chain	Scandinavean Mountains - Scandes		
Reference mountain landscape	Stjørdal		
Size of the area (km <sup>2</sup> )	938	Average per capita income (€)/year	43,700 <sup>A</sup>
Altimetry (m; min-max)	0–1,171	Total Gross Value Added (GVA) (€ million)/year	5,313 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	25.74	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	12.9%	Primary:	7.9% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	15,554 <sup>A</sup>	Secondary (including construction):	18.8% <sup>A</sup>
		Tertiary:	66.36% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	33.7	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	3,027 <sup>B</sup>	Primary:	1.1%
Protected areas	Yes	Secondary:	19.3%
		Tertiary:	79.6%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

An example is the Veiseth, a raspberry farm where you can rather pick up your own raspberries, buy a box of fresh or frozen raspberries and buy raspberry juice. The season for fresh raspberries goes from July to September. They also offer walks around the farm where visitors get to know more about the raspberry production. They do not spray pesticides on their raspberries. They belong to the regional brand AUK - SMAKER FRA STJØRDALSFØRET. Besides the on-farm

sell, they also offer their products in the Auk store on Torgkvartalet or through Reko-ringen Trondheim.

### **Key local assets**

The main asset of this VC is the cooperation between producers of the valley under the association AUK - SMAKER FRA STJØRDALSFØRET. They share values of sustainability and care for the valley and for the tastes that come from it. Berries are the natural asset for this VC.

### **Challenges**

The big challenge is to compete with greenhouse berry production, big Norwegian companies, and the import market. Besides, global warming may bring new pathogens and diseases to Nordic latitudes, and thus, production without spraying may become even more challenging.

### **Innovation**

Firstly, the farm offers the possibility of picking up the fruits yourself. This adds a recreative and learning experience to the purchase while strengthening the link between producers and consumers. Secondly, the farm offers a wide diversity of products such as frozen berries and juices to survive during the whole year. The pickup yourself format can be seen as a marketing strategy as they are selling the whole experience of harvesting your own fresh raspberries. The new products relate to the frozen raspberries and the variety of juices they offer. Although these products already have existed out there, it is interesting how they have integrated all those options in a family business.

## Fly fishing in Hemsedal

Fly fishing is a traditional practice in Scandinavia due to the water streams that flow along its mountains and valleys with clean and cold water. These characteristics are important for the VC as trout, and other salmonid fishes find in these waters their natural habitat.

Hemsedal is a mountainous municipality whose economy is focussed on tourism. It has one of the main ski lodges in the country with skiing routes from three peaks above 1000 meters, snow parks, competition infrastructures and routes and off-piste terrain. During summer, the recreative offer turns into fly fishing, hunting, hiking, climbing and summer farm visits.

Reference mountain landscape statistics  
(A: Data for the NUTS3 NO032, county of Buskerud; B: from the tourism region of Hallingdal)

Reference mountain chain	Scandinavean Mountains - Scandes		
Reference mountain landscape	Hemsedal		
Size of the area (km <sup>2</sup> )	754	Average per capita income (€)/year	47,008 <sup>A</sup>
Altimetry (m; min-max)	556–1,900	Total Gross Value Added (GVA) (€ million)/year	11,783 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	3.3	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	19.1%	Primary:	0.9% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	10,283 <sup>B</sup>	Secondary (including construction):	30.2% <sup>A</sup>
		Tertiary:	68.8% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	202	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	2,111 <sup>B</sup>	Primary:	1.0 %
Protected areas	Yes	Secondary:	18.0%
		Tertiary:	80.95%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The fishing season goes from May to September and attracts many recreational anglers to its diverse fishing spots. The Hemsedal Fishing Association holds a joint fishing licence applicable to five rivers (Hemsila, Grøndøla, Bulinåne, Mørkedøla and More Kvam) and 18 lakes. In addition, Tor Grøthe (expert fly fisherman), in collaboration with the tourism office of Hemsedal, offers

various touristic packages of fishing guide plus accommodation in his farm for enthusiasts. Similar VC can be found in Nore og Uvdal (NO0633).

### **Key local assets**

The natural assets are the five rivers and 18 lakes where fly fishing can be practiced in Hemsedal. All of them are healthy ecosystems with high quality waters, which make them ideal habitats for trouts. The social assets are all the values that underpin this activity regarding respect for the animals and their habitats, the use of specific techniques and tools and proper behaviour. Finally, fly fishing represents a traditional practice for many anglers that have learnt it from the previous generations and have been doing it during their whole lives.

### **Challenges**

Climate change may be the main challenge for this VC. Water streams in Nordic areas are expected to suffer more floods and changes in water temperature with the consequent impact on the micro biota and biochemical processes that occur in water. Therefore, water quality and biochemical parameters may change, thus altering the whole water ecosystem. Trout and salmon are the main fish species for fly fishing in this area. Although both are quite sensible to these changes, trout are lower thermal tolerance, hence being more vulnerable under this scenario.

### **Innovation**

Firstly, the farm offers the possibility of picking up the fruits yourself. This adds a recreative and learning experience to the purchase while strengthening the link between producers and consumers. Secondly, the farm offers a wide diversity of products such as frozen berries and juices to survive during the whole year. The pickup yourself format can be seen as a marketing strategy as they are selling the whole experience of harvesting your own fresh raspberries. The new products relate to the frozen raspberries and the variety of juices they offer. Although these products already have existed out there, it is interesting how they have integrated all those options in a family business.

## Fish farming - PDO (Protected Designation of Origin) Rakfish from Valdres

Rakfish has a high reputation and long tradition in the Norwegian cuisine.

Nord-Aurdal is located between the valleys of Hallingdal and Gudbrandsdal. It has some large inland lakes like the Tisleifjorden and Aurdalsfjorden. More than 50% of the area is above 900 masl. The Valres region is one of the most well-known for cross country skiing, hiking and mtb cycling. Fishing is also an important touristic asset of the region, where other activities such as farm visits, cheese making, and cultural activities can be enjoyed by visitors. Livestock farming is also a traditional activity in the area with free ranged animals grazing in the alpine meadows during summer.

### Reference mountain landscape statistics

(A: Data for the NUTS3 NO022, county of Oppland; B: from the Tourism region of Valdres)

Reference mountain chain		Scandinavean Mountains - Scandes	
Reference mountain landscape		Nord-Aurdal	
Size of the area (km <sup>2</sup> )	906	Average per capita income (€)/year	44,096 <sup>A</sup>
Altimetry (m; min-max)	304–1,325	Total Gross Value Added (GVA) (€ million)/year	15,265 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	7.08	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.03%	Primary:	3.6% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	3,704 <sup>B</sup>	Secondary (including construction):	19.7% <sup>A</sup>
		Tertiary:	72.8% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	185	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	4,271 <sup>B</sup>	Primary:	1.2%
Protected areas	Yes	Secondary:	15.4%
		Tertiary:	83.3%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

Rakfish is fermented trout and is one of the most extended traditional products in Norway. Fish is taken from the water and right after putting into buckets with specific salt concentration and temperature to trigger a safe fermentation. In 2006, Rakfisk from Valdres was approved as a protected geographical indication. The fish must come from farms in Valres and be transformed

into rakfish within the region. In 2001, Rakfisk from Valdres was the first rakfish in the country to get the quality Specialty of Food Label. They sell it all along Norway in stores and restaurants and through their website. One of the risks of this VC is the pollution associated with fish introduction into mountain water bodies. If it is not done under high control, it can lead to an increase in organic matter and mercury concentration in water, with dramatic consequences for the microbiome.

### **Key local assets**

The fish farm consists of a series of ponds where fish swim. Water is in continuous renewal from natural streams that flow through the ponds. This generates the best environment to breed fish as they can exercise swimming in fresh and clean water. Water temperature, speed and biochemical characteristics influence the fish quality. The social asset is represented in the PDO that brings producers together. Finally, the rakfish is a traditional product consumed all along Norway and the traditional fermentation method is quite unique in Europe.

### **Challenges**

In the light of climate change, this VC may face a challenge if the natural mountain water streams change their regimes as precipitations are expected to increase while snow cover period is expected to decrease. In addition, a rise in the mean temperatures is also expected, which could threaten the population of trout as they do not have high thermal tolerance. E-commerce and quality and geographical indication labelling to improve marketing.

### **Innovation**

The innovation is the e-commerce platform. Although they do not use anymore the traditional wooden barrels to cure the fish, the method and farm system is quite traditional. Another innovation may be the fact that rakfish from Valdres was the first rakfish to get the Norwegian Specialty of Food Label, and one of the first fish products to get a PDO certification, as before 2003 the regulation did not allow it.



## Organic milk

This VC is centred on the production of organic products from free ranged cows of autochthonous breeds.

Nore og Uvdal is in the upper part of the Numedal valley. The western area is part of the Hardangervidda National Park. The local brand/producer association Uvdalsbonden consists of 5 farms that are all committed with animal well-being, traditional food, and land management of the mountain areas of the MRL to foster a sustainable future for the valley. Together they produce free range lamb and goat, pork, and cow meat, and even lama meat, and offer accommodation and fishing tourism packages.

### Reference mountain landscape statistics

(A: Data for the NUTS3 NO032, county of Buskerud; B: from the tourism region of Hallingdal)

Reference mountain chain	Scandinavean Mountains - Scandes		
Reference mountain landscape	Nore og Uvdal		
Size of the area (km <sup>2</sup> )	2,502	Average per capita income (€)/year	47,008 <sup>A</sup>
Altimetry (m; min-max)	260–1,485	Total Gross Value Added (GVA) (€ million)/year	11,783 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	0.97	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-2.9%	Primary:	0.9% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	1,468 <sup>B</sup>	Secondary (including construction):	30.2% <sup>A</sup>
		Tertiary:	68.8% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	185	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	2,111 <sup>B</sup>	Primary:	1.5%
Protected areas	Yes	Secondary:	29.9%
		Tertiary:	68.49%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Cattle graze in cultivated pastures in the village and in open pastures around the farms in Dagalifjell. The grazing season is from May to October. In winter, the animals are fed with their own produced organic roughage and some organic concentrate and mineral supplements. This farm is part of the Uvdalsbonden local label, a producer's organisation to improve their visibility as a group and to reach more customers. The organic certification is given by Debio, the

Norwegian organic certification entity. The website includes an e-commerce platform. Besides the milk, they produce and sell organic veal meat and free-range organic pig meat.

### **Key local assets**

Cows are fed both with cultivated and natural pastures. They use Norwegian cattle breeds such as Telemarkfe, Sidet Trønder- and Nordlandsfe and Dølafe. The social assets are cooperation and shared values among local producers under the Uvdalsbonden local brand.

### **Challenges**

Key challenges for this VC relate to:

- Market competition with industrial dairies.
- The increase in the number of consumers that choose organic instead of conventional dairies.

### **Innovation**

The local sweet and pastries value chain is a traditional one, where no innovations have been identified.

## Goat cheese/Undredal Brown Cheese - PGI

This is a high-quality product with high reputation nationwide and a result of a long history of connectedness with the natural ecosystem. This cheese is part of the region's cultural heritage and an important aspect of its identity.

Aurland territory covers the Aurland Fiord and the Nærøyfjorden, which are both branches of the world's largest fiord, the Sognefjorden. The area is dominated by fiords and mountains. The Nærøyfjorden is part of The West Norwegian Fjords of Geirangefjord and Nærøyfjord UNESCO World Heritage Site. Most of the urban settlements are small villages in the shore of the fiords and on small river valleys. Aurland's coat of arms depicts a goat, representing the importance of these animals and the cheese made from their milk for the cultural identity of the MRL.

Reference mountain landscape statistics  
(A: Data from the county of Sogn og Fjordane.)

Reference mountain chain	Scandinavean Mountains - Scandes		
Reference mountain landscape	Aurland (NO)		
Size of the area (km <sup>2</sup> )	1,4684	Average per capita income (€)/year	53,441 <sup>A</sup>
Altimetry (m; min-max)	0–1,809	Total Gross Value Added (GVA) (€ million)/year	5,2240 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	1.21	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-5.9%	Primary:	7.22% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	5001 <sup>B</sup>	Secondary (including construction):	35.4% <sup>A</sup>
		Tertiary:	57.3% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	168 <sup>C</sup>	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	2,792 <sup>D</sup>	Primary:	5.15%
Protected areas	Yes	Secondary:	29.2%
		Tertiary:	63.7%

\*1 Nearest settlement with population > 100,000

\*2 share of total GVA/year

\*3 share of total employment)/year

The cheese is made from April to October and has always been made with milk from the local goats. There are three families belonging to the Undredal Stølsysteri SA. Although they do not pasteurize the milk, they have full authorization for production and sale throughout Europe. Since

2005, the Slowfood Foundation for Biodiversity established here the first Norwegian Presidium for the Brimost cheese. The Presidium (Undredal Brown Cheese Presidium) includes 6 cheese makers of the cooperative plus two shopkeepers of the town that sell the local cheese. They sell the cheese online, in the Undredal's local store, in the annual cheese market in Undredal and in other regions' markets. The VC has great influence in the SES, since the activity is of great importance for the maintenance of natural pastures while the end-product is a key asset for the village, attracting many visitors and energising the local economy. A similar example, but with a different cheese making technique, is the Sweden Jämtland Cellar-Matured Goat Cheese (NUTS3 SE322), which is also supported by a Presidium of the Slowfood Foundation for Biodiversity.

### **Key local assets**

The natural assets are the natural pastures and the forage for the winter months. The goats graze in pastures from April till the end of the warm season. In Undredal (town within the municipality of Aureland), goats and the cheese are both considered as cultural assets and they are part of the territorial identity of the inhabitants. It was not until 1986 that they had road communication with other urban settlements, so they used to be completely dependent on their local dairy production. They celebrate an annual cheese market that hosts many visitors. Besides, this VC is part of Norsk Gardsost, an association of traditional dairies in Norway, as well as being endorsed by a Slowfood Presidium where various actors of the locality are involved.

### **Challenges**

To compete with industrial dairies that nowadays are also producing traditional cheeses following industrial methods.

### **Innovation**

The innovation mostly relates to their website and e-commerce marketing. Both the website and the online store aim to access to new consumers.

## Pultost cow cheese

High quality product with high reputation and tradition in the area. It is connected to the natural assets as natural pastures are determinant for the VC.

Lesja is a high mountainous area with an important water body in altitude, the Lesjaskogsvatnet (Lesjas lake). It has two outflows draining the west to the Rauma river and the east to the Gudbrandsdalslågen river. Besides the Lesjas lake, there are more than 400 lakes within the municipality and most of them are above the treeline and they are habitat of the Norwegian trout. Most of the municipality is above 900 masl, and many traditional summer farms are located along the treeline. These farms are very important for extensive traditional livestock systems during the summer months when animals graze in high altitude pastures.

### Reference mountain landscape statistics

(A: Data for the NUTS3 NO022, county of Oppland; B: from the tourism region of Nord-Gudbrandsdal)

Reference mountain chain	Scandinavean Mountains - Scandes		
Reference mountain landscape	Lesja		
Size of the area (km <sup>2</sup> )	2,260	Average per capita income (€)/year	44,096 <sup>A</sup>
Altimetry (m; min-max)	513–2,209	Total Gross Value Added (GVA) (€ million)/year	7,448 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	0.87	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-9.15%	Primary:	7.42% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	4,752 <sup>B</sup>	Secondary (including construction):	19.7% <sup>A</sup>
		Tertiary:	72.8% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	212	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	4,271 <sup>B</sup>	Primary:	3.7%
Protected areas	Yes	Secondary:	19.9%
		Tertiary:	79.2%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Pultost is a sour milk cheese made from cow's milk without the use of rennet. Instead, a self-produced culture of old strains of lactic bacteria is added to start the coagulation. Once the cheese is drained, crumbled, and fermented, salt and caraway seeds are added to stop fermentation,

giving to it a special character. The cheese can be eaten fresh or matured in wooden containers up to one year. The leftover cream is used to produce sour cream or butter. This cheese is endorsed by the Slowfood Foundation for Biodiversity. The VC is also present in other areas such as Etnedal (0541).

### **Key local assets**

The natural assets are the mountain pastures. The social asset relates to the cooperation among Pultost producers under the cooperative Pultosts BA, Pultost Innlandet SA and the Slowfood Foundation. The cultural asset includes the traditional knowledge mostly on cheese and butter production, cattle management, and the ecological system.

### **Challenges**

Key challenges for this VC relate to:

- Maintain and energise the VC under a regime where industrial dairies are proliferating.
- Preserve the artisanal cheese making and strengthen the market at local and national scale.

### **Innovation**

The local sweet and pastries value chain is a traditional one, where no innovations have been identified.

## Barley flour and groats

Ancient crop grown in an area with extreme climate conditions. Farmers grow and mill the grain and sell the flour directly to final customers. They also have an e-commerce platform.

Tynset is in the upper quadrant of Østerdalen, the Norway's longest valley. It is covered by vast areas of forest and mountains where many family farms persist. Although the main traditional activities are farming and forestry, the region has diverse recreational assets as skiing, fishing, hiking, and hunting. It has a subarctic climate, where an annual average precipitation is only 400mm and the mean temperature is 0°C (winter average -13°C and summer average 12°C).

### Reference mountain landscape statistics

(A: Data for the NUTS3 NO021, county of Hedmark; B: from the tourism region of Østerdalen)

Reference mountain chain	Scandinavean Mountains - Scandes		
Reference mountain landscape	Tynset		
Size of the area (km <sup>2</sup> )	1,881	Average per capita income (€)/year	44,612 <sup>A</sup>
Altimetry (m; min-max)	396–1,653	Total Gross Value Added (GVA) (€ million)/year	7,817 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	2.93	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	1.6%	Primary:	8.44% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	2,521 <sup>B</sup>	Secondary (including construction):	16.4% <sup>A</sup>
		Tertiary:	75.1% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	-	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	3,031 <sup>B</sup>	Primary:	2.6%
Protected areas	Yes	Secondary:	18.6%
		Tertiary:	78.8%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Barley is the cereal that needs a shorter time to grow, which makes it suitable for mountain areas with extreme climate conditions like Roros. Nonetheless, it takes 4 months for the barley to ripe in this place. Additionally, cold climate lowers the exposure to diseases like fungi, so they do not need to spray any pesticide in the fields (only three times in ten years). They are part of the Rorosmat, a regional brand to certify products from the area.

## Key local assets

The natural asset is the location and weather that make something special of this product: barley produced at 500masl in Norway. The social asset is related to the local brand Rorosmat, that labels local products, promotes them and sells them on the website. The cultural aspect is related to the use of stone mill that connects this product to the traditional techniques.

## Challenges

Key challenges for this VC relate to:

- Keep improving the growing techniques to decrease the need of fertilizers and pesticides.
- The low consumption of barley by humans in comparison with wheat.
- The challenge to increase the human consumption of barley and its corresponding market due to its great nutritious value.
- Climate Change may enhance the development of plant diseases and pest that are nowadays limited by the cold temperatures.

## Innovation

The innovation is associated with the Rorosmat brand as it promotes and sells the regional products. Apart from the e-commerce of Rorosmat, the mill also has its own website where everyone can make an order. The innovation is fully related with the way they access the markets, keeping the control over the product from the beginning stage of the process to the final customers.



## Organic primitive grain muesli

The granola is made with local cereals. The grain is processed in traditional stone mills. The product is now a good example of innovative entrepreneurship.

Selbu hosts one of the largest lakes in Norway, the Selbusjøen. Complementarily, the land is covered by forests and medium altitude mountains up to 1441 meters. Selbu has a humid continental climate with mild winters due to the close presence of the sea. Besides the natural assets, Selbu is widely known for its traditional knitting.

Reference mountain landscape statistics  
(A: Data for the NUTS3 NO061, county of Sor-Trondelag)

Reference mountain chain	Scandinavean Mountains - Scandes		
Reference mountain landscape	Selbu		
Size of the area (km <sup>2</sup> )	1,236	Average per capita income (€)/year	58,578 <sup>A</sup>
Altimetry (m; min-max)	158–1,441	Total Gross Value Added (GVA) (€ million)/year	16,471 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	3.29	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	1.4%	Primary:	2.59% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	25,069 <sup>A</sup>	Secondary (including construction):	19.2% <sup>A</sup>
		Tertiary:	78.1% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	68.6	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	2,789 <sup>A</sup>	Primary:	2.3%
Protected areas	Yes	Secondary:	27.0%
		Tertiary:	70.6%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

Norway has 1843 hectares of organic wheat and spelt and 1841 ha of organic oats and other spring cereals. In addition, in the region of the municipality of Selbu, there used to be a big industry of stone mill and nowadays there are still stone mills functioning in the area. Together with the use of local organic honey and organic rapeseed oil these are the ingredients in the VC production for the granola making. The transformation is made only by Mia, the owner of the company and

one additional worker. She is part of AUK - TASTE FROM STJØRDALSFØRET, and her products have the Norwegian organic certification.

### **Key local assets**

The organic fields of spelt and oats are the basic natural asset that this VC depends on. However, the VC would not mean the same if the ancient tradition of stone mill in the area did not exist, an aspect that adds cultural value to this VC. In addition, the VC is part of the brand AUK - TASTE FROM STJØRDALSFØRET, a regional brand in which local producers participate and cooperate to promote their products.

### **Challenges**

Competition with industrial products of similar use (sweets, cereals, and other snacks). Also, the hectares dedicated to organic oats and other spring cereals have decreased since 2012 in Norway (Eurostat).

### **Innovation**

This VC is focussed on keeping the nutritional values of cereals as much as possible by doing granola. Granola is nowadays rarely done by hand, and this VC is even more unique as the use only local and organic products. In fact, the activity begun due to the lack of an organic Norwegian granola in the market. The product is sold in the store and is also available on the website (e-commerce). Organic handmade granola is a product that was difficult to find before the start of this VC. In addition, they make great use of the social network platforms and website for the marketing and sales.

## Free ranged animals

Besides having a big cultural component, this VC has an important role in the conservation of mountain pastures.

Selbu is in the region of Valdres. The region is covered by water streams and forests in the lowlands, where also pastures and crops are grown, while the higher areas are dominated by heather and alpine meadows for summer pastures. Its geography is very diverse as it changes with the altitude, which leads to multiple land uses and recreational assets during the four seasons.

### Reference mountain landscape statistics

(A: Data for the NUTS3 NO022, county of Oppland; B: from the Tourism region of Valdres)

Reference mountain chain	Scandinavean Mountains - Scandes		
Reference mountain landscape	Vang		
Size of the area (km <sup>2</sup> )	1,505	Average per capita income (€)/year	44,096 <sup>A</sup>
Altimetry (m; min-max)	363–2,208	Total Gross Value Added (GVA) (€ million)/year	7,448 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	1.05	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.7%	Primary:	7.42% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	3,704 <sup>B</sup>	Secondary (including construction):	19.7% <sup>A</sup>
		Tertiary:	72.8% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	121	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	4,271 <sup>A</sup>	Primary:	3.7%
Protected areas	Yes	Secondary:	19.9%
		Tertiary:	76.2%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

The cattle grazes in open pastures during the summertime, as the rest of the year they are covered by snow. For this reason, another important element is the cultivation and harvest of winter fodder. It is known that free range also delivers ecosystem services such as seed dissemination or fertilization and fire risk reduction besides the ecological benefits of making use of local and sustainable resources and maintenance of pastures (great carbon sequestration rates in soils). Most of the farms of this kind have small-medium size and many of them combine various

animals (cows, goats, and sheep) for meat and dairy production. In addition, in-farm touristic accommodation is getting more and more popular, opening new market opportunities. The VC is also present in other areas such as Nore og Uvdal (NO0633), Øystre Slidre (NO0544).

### **Key local assets**

The mountain pastures and climatic conditions of Norwegian mountain areas demand certain type of management techniques and a great commitment. Practices and knowledge, farm architecture, pasture landscapes and products are part of the cultural heritage of the region. Finally, there is a social component in the cooperation among regional stakeholders fostering the development of the region.

### **Challenges**

Key challenges for this VC can be identified in:

- Competing meat industry, and access to markets
- The need to add value to this VC because of its lower production capacity.
- Climate change will also affect these ecosystems with increasing temperatures and precipitations as well as shorter winter seasons.

### **Innovation**

The innovation is about adding value to the VC with touristic packages. In addition, many of the farmers are now involved in regional projects of rural development, thus gaining attention and support through the website of those projects. In addition, e-commerce is an increasing business also for this traditional VC. The new product is related to the touristic asset of the VC while the marketing strategies are linked to the cooperation and development of regional brands and e-commerce platforms.

## Meat products (dry and cured meat)

High quality product, which is part of the traditional Norwegian food culture. The VC continues in the region because the employees of the former cured meat company have continued with the business, adding new products and new marketing strategies.

Most of the surface of Oppdal is mountainous area, and much of it is above the tree line. There are various lakes and several streams and rivers surrounded by prunes and pines. Nonetheless, the main tree species is the birch. Above the treeline, we can find heathers and alpine meadows, which provide grazing for cattle during summer. In fact, Oppdal region is considered to have exceptionally good grazing land by the Norwegian Institute of Forest and Nature. The average temperatures go from -5 in winter to 11 in summer, with possible snow precipitations until May.

Reference mountain landscape statistics  
(A: Data for the NUTS3 NO061, county of Sor-Trondelag)

Reference mountain chain	Scandinavean Mountains - Scandes		
Reference mountain landscape	Oppdal		
Size of the area (km <sup>2</sup> )	2,274	Average per capita income (€)/year	58,578 <sup>A</sup>
Altimetry (m; min-max)	240–1,985	Total Gross Value Added (GVA) (€ million)/year	16,471 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	4.28	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	6.03%	Primary:	2.6% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	1,626	Secondary (including construction):	19.2% <sup>A</sup>
		Tertiary:	78.1% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	121	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	2,789 <sup>A</sup>	Primary:	2.4%
Protected areas	Yes	Secondary:	27.0%
		Tertiary:	70.6%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

The meat comes mostly and preferably from the same region. The company produces the cured meat in a farm in the mountains, using the dry wind from the mountains for the process. The

products are sold in the region and all along Norway. This VC is part of the regional brand "Oppdal- taste of mountains" that guarantees the local origin of the product.

### **Key local assets**

The natural assets are the animals and the mountain wind to cure the meat. The social asset relates to the regional brand as a way of cooperation among the producers. Finally, the cured meat is a traditional meal in the country and represents part of the food heritage.

### **Challenges**

Key challenges for this VC relate to:

- Market competition with industrial meat corporations.
- Abandonment of farms in the region that can affect the local supply of meat for transformation (in the municipality of Oppdal 40% of the farms stopped their activity between 1999 and 2014).

### **Innovation**

The innovation relates to e-commerce marketing and the participation in regional brands. The case here described is part of Oppdal Smak av Fjeld but in Norway these kinds of regional labels and producers' associations seem quite common. Mostly related to e-commerce.

## Cider from Hardanger (PGI)

Successful registration of the Geographical Indication that has been accompanied by an increase in production and profitability. The area is historically well known for the apple production.

Ullesvang is in the Hardanger valley. The valley is known as the orchard of Norway for the number of fruit trees that cover it. The Hardanger fiord is the third longest one in the world and is surrounded by high mountains. The MRL covers from the shores of the fiord, where most of the farms are located, to the Folgefonna glaciers. In both National Parks, the vegetation is scarce, being covered by rocky surface, heather, grasses, mosses, and lichen. Many streams flow down the mountain to the fiord.

Reference mountain landscape statistics  
(A: Data for the NUTS3 NO051, county of Hordalng)

Reference mountain chain	Scandinavean Mountains - Scandes		
Reference mountain landscape	Ullesvang		
Size of the area (km <sup>2</sup> )	3,237	Average per capita income (€)/year	57,486 <sup>A</sup>
Altimetry (m; min-max)	0–1,721	Total Gross Value Added (GVA) (€ million)/year	5,240 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	3.41	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.04%	Primary:	7.2% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	30,388 <sup>A</sup>	Secondary (including construction):	35.4% <sup>A</sup>
		Tertiary:	57.3% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	151	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	3,080 <sup>A</sup>	Primary:	5.1%
Protected areas	Yes	Secondary:	29.2%
		Tertiary:	63.7%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

This cider is 100% made with local apples. The most common varieties of apples are Discovery, Aroma, Gravenstein and Summerred. The labelling PGI Hardanger cider guarantees the use of local apples and has already proved its quality by winning international cider awards. Fiord is great for apple production due to the combination of milder temperatures in winter compared to other regions of the same latitude, and warm and long days along spring and summer. The milder

winters together with the light reflexion from the water of the fiord make apple trees thrive and flourish properly. Cider from Hardanger covers the 80% of the cider sold by Wine Monopoly (a government owned retailer of alcoholic beverages). Finally, the prosperity of this activity is also an asset for attracting new inhabitants and keeping the locals in the region. This VC is also a touristic asset for the fiord and farmers. Regarding the MRL of the VC, it is present all along the Hardanger fiord.

### **Key local assets**

The Hardanger fiord is a unique location for apple production due to the minerals that flow down from the mountain soils plus the unique climate that the Gulf Stream brings to this region, causing higher temperatures than in other locations of the same latitude. The apple production started back in the 13th century brought by British monks and soon the cider production started.

### **Challenges**

As the specificity of this product comes from the unique climatic conditions of the Hardanger fjord, climate change can affect the quality of the fruits and increase the related pests and diseases.

### **Innovation**

The cider making is a traditional activity of the region, however, here, they have found their way to add value to this product. With the PGI the Hardanger cider upscaled in the markets and became an important asset for Norway, as it is presented as one of the best ciders of the world. In addition, this VC is now an attractor for visitors that enjoy the recreational assets of the fiord together with cider tours. The new products are the touristic tours offered in the area and by the cider brewers. The new marketing strategies are linked to the PGI, as it was the first Norwegian alcoholic drink with a geographical indication.



## Sami reindeer herding

High reputation and quality product linked to ancient traditions. It is the main activity to sustain Sami livelihood and it has been of great importance for Sami people for centuries.

Guovdageaidnu - Kautokeino is one of the two main cultural settlements for the Norwegian Sapmi area. It is the largest municipality in Norway, and it shares a border with Finland in the South. It is in the Finnmarksvidda mountain plateau, covered by birch and sparse pine forests, extensive bogs, and lakes. The key characteristic activity is the reindeer herding. It hosts one of the main Sami festivals, the Easter Festival of Kautokeino, where visitors can learn about Sami culture, experience some traditional activities, and purchase handicrafts.

Reference mountain landscape statistics  
(A: Data for the NUTS3 NO073, county of Finnmark)

Reference mountain chain	Scandinavean Mountains - Scandes		
Reference mountain landscape	Guovdageaidnu - Kautokeino (NO)		
Size of the area (km <sup>2</sup> )	9,707	Average per capita income (€)/year	53,239 <sup>A</sup>
Altimetry (m; min-max)	192–970	Total Gross Value Added (GVA) (€ million)/year	3,607 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	0.29	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-1.3%	Primary:	13.6% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	12,579 <sup>A</sup>	Secondary (including construction):	23.9% <sup>A</sup>
		Tertiary:	62.4% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	414	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	285 <sup>A</sup>	Primary:	0.85%
Protected areas	Yes	Secondary:	13.8%
		Tertiary:	85.3%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

In Scandinavia, about 6500 Sami are engaged in reindeer herding. Overall, in Norway and Sweden only Sami people with ancestors linked to reindeer herding have the right to be recognised as reindeer riders. In Finland, even if that is not mandatory, also Sami people are the

main practitioners of this VC. In June-July, every calve is marked in the ear, indicating who is the owner (each herder has its own mark). Each year the maximum number of reindeers per region is regulated by the managerial organism (the Norwegian Reindeer Husbandry Administration (subordinate to the Ministry of Agriculture of Norway), the County Administrative Board (according to the Swedish reindeer husbandry act) in Sweden, and the Ministry of Agriculture and Forestry in Finland). In Finland, within the declared reindeer husbandry area, reindeers have permission to graze freely regardless of the land ownership. The main product of reindeer herding is both raw meat and cured meat (during spring to let it dry under the sun and cold wind), but also skins and bones are used for handicrafts. Besides, there is also an important touristic industry linked to this VC. The reindeer graze on pastures with an area of approximately 146 thousand km<sup>2</sup> in the provinces of Finnmark, Troms, Nordland and Trøndelag, which is 40% of the mainland part of Norway. In Sweden, reindeer herding is practised almost everywhere in the provinces of Norrbotten, Västerbotten, and Jämtland, and in parts of the provinces of Dalarna, Västernorrland, and Gävleborg. Reindeer pastures occupy about one-third of the territory of Sweden. In Finland, there are 56 districts in the reindeer husbandry area, 41 of which are in the Province of Lapland and the remaining 15 are in the Province of Oulu, covering the reindeer area around the 33% of the country's surface.

### Key local assets

This VC is highly linked to the arctic pastures and conditions. Reindeers are completely adapted to this climate and natural environments. In addition, nowadays the VC operates in a complex network of organisations at regional, national, and international levels (e.g., County Administrative Boards, Ministries of Agriculture and Forestry, Sami Parliament, and the Finish Reindeer Herder's Association). Within each country the VC functions slightly different so the interaction among organisations is quite important to guarantee the rights of Sami people. Finally, this practice represents part of the Sami heritage and means a lot for the Sami's identity.

### Challenges

In some areas an increase of certain industrial land uses (ex. mining, wind energy, logging) threatens the reindeer pastures. In addition, measures must be taken to control the attacks of large carnivores. Finally, climate change is expected to challenge the VC as climate patterns may change with consequences on arctic ecosystems.

### Innovation

The innovation relates to new techniques and mechanization of some processes. Nowadays, snowmobiles and tracking collars are used in reindeer herding in winter. Besides, there is a growing touristic industry based on reindeer herding. There are new products linked to this VC as well as new practices in the herd management. Lastly, the EU granted a Protected Designation of Origin to the Lapland reindeer meat and cold-smoked meat is adding value to this VC.

## Artisanal beer from Stjørdal

High quality product linked to an old tradition in the region.

Stjørdal is crossed by the Stjørdalselva river until its arrival to the Trondheim fiord. The Eastern part of the municipality belongs to the Skarvan and Roltdalen National Park. Due to its proximity to Trondheim, the municipality is developing an urbanization process. Simultaneously, there are still multiple local VCs within the AUK - SMAKER FRA STJØRDALSFØRET, such as organic vegetable farming, family dairies, beekeeping, eggs, beer brewery, traditional bakery, coffee distillery, and rural touristic accommodation.

### Reference mountain landscape statistics

(A: Data for the NUTS3 NO062, county of Nord-Trøndelag; B; data for the county of Trøndelag)

Reference mountain chain		Scandinavean Mountains - Scandes	
Reference mountain landscape		Stjørdal	
Size of the area (km <sup>2</sup> )	938	Average per capita income (€)/year	43,700 <sup>A</sup>
Altimetry (m; min-max)	0–1,171	Total Gross Value Added (GVA) (€ million)/year	5,313 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	25.74	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	12.9%	Primary:	7.9% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	15,554 <sup>A</sup>	Secondary (including construction):	18.8% <sup>A</sup>
		Tertiary:	66.36% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	33.7	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	3,027 <sup>B</sup>	Primary:	1.1%
Protected areas	Yes	Secondary:	19.3%
		Tertiary:	79.6%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

Although there are hundreds of ways to brew the local traditional beer, they all share a common feature, the smoky taste. The general process is as follows. First the grains are soaked and cleaned. Afterwards they are spread on a growing frame and they are moved by hand several times per day to keep the heat evenly distributed among the grains. Four days after, the grains are dried in the traditional Sainna (a fire drier with wooden planks with holes on top of which the grains are spread). Here is where the grains get the smoky flavour. Finally, after around eight

days of hand work with the grains, they are ready to be brewed. Up to 22 beer breweries can be found in this municipality and few malthouses. In addition, there is an annual beer festival where most of those hundreds of small brewers participate and the best Stjørdalsøl brewer is crowned. Another example of small-scale beer brewery exists in the municipality of Vinje.

### **Key local assets**

There is a strong beer brewing tradition in the area. There are up to hundreds of small producers that brew their own beer in groups of friends or family just for their own enjoyment and consumption. Knowledge on the basic steps to make this smoked beer is shared among the brewers to maintain alive the tradition, but each of them keep their own recipes' secret, giving this way a great diversity to the local beers. Normally, they use local malt for the breweries and no hops. Instead, they add juniper seeds to the water to give flavours from local forests.

### **Challenges**

Their key challenge is to get a niche in the market outside of the locality. Being an artisanal production, those who want to make a living with it need to improve their market position. They are already doing so by developing e-commerce and joining regional associations of local producers.

### **Innovation**

The product itself is very traditional. The artisanal making guarantees its uniqueness. However, there are some breweries that are developing their marketing strategies and setting e-commerce and websites. In addition, some are part of the local label AUK SMAKER FRA STJØRDALSFØRET, which also helps to reach new customers and to sell online. Besides, they offer the Growling, a service that allows customers to refill their bottles in the brewery. The innovation is related to the search for new markets beyond the locality, as this VC has traditionally been mostly focused on local scale. In addition, the Growling service is an innovation in the way this product is purchased.

## 9. Slovakia

### Labelled traditional cheese products.

Traditional cheese products are made from sheep or a mixture of sheep and cow milk. Each type of described cheeses (Slovenská bryndza, Slovenská parenica smoked or not smoked and Slovenský oštiepok - smoked or not smoked) is registered as the protected product of the EU at the national level - Slovakia, having the label "Protected Geographical Indication" (PGI). They are produced in the same way throughout the whole defined area.

Zázrivá is in a traditional rural agricultural landscape with scattered settlements throughout the territory resulting from a long-term cultivation by humans. The local landscape is rich in biodiversity and is formed by a mosaic of meadows, pastures, wetlands, and forests.

Reference mountain landscape statistics  
(A: Data for the NUTS3 SK031; B: Data for the NUTS2 SK03)

Reference mountain chain	Slovak Carpathians		
Reference mountain landscape	Zázrivá		
Size of the area (km <sup>2</sup> )	67.25	Average per capita income (€)/year	14,100 <sup>A</sup>
Altimetry (m; min-max)	550–1,392	Total Gross Value Added (GVA) (€ million)/year	8,724 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	39.6	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.04%	Primary:	1% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	1,168 <sup>A</sup>	Secondary (including construction):	50% <sup>A</sup>
		Tertiary:	49% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	103 <sup>A</sup>	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	4,122 <sup>A</sup>	Primary:	4% <sup>B</sup>
Protected areas	Yes	Secondary:	37% <sup>B</sup>
		Tertiary:	59% <sup>B</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

The exact breeds of sheep are grazed in the entire designated area, with the same flora and climatic conditions, which results in the same quality of the basic raw material - sheep's milk. All

cheese types must contain at least 50% of milk from grazed sheep. These products have a high identity value related to Slovak mountains.

Key activities: sheep breeding, cow milk production, cheese production, marketing. Key actors: shepherds, cheese producers, actors in marketing. Labelling: PGI. VC is dependent on mountain sheep breeding which has positive impact on regional SES - maintain traditional land use. Sheep farming is the oldest branch of animal production in Slovakia. It is practically present in all mountain areas in Slovakia. The PGI area associated with "Slovenská bryndza" occupy more than 80% of the total territory of Slovakia.

### **Key local assets**

Sheep and cows' pastures in mountain areas maintain specific land use and landscape scenery. Sheep pasture in Slovak mountains is traditional and thus has also a cultural value.

### **Challenges**

Key challenges for this VC relate to:

- The pasture presence in mountains has been declining mainly due to socio-demographic and economic changes. The pasture decline also impacts land-use changes towards pasture lands' afforestation and, consequently, causes ecological changes in vegetation composition.
- In recent years, globalization has affected even the traditional cheese production in Slovakia. Several producers started to import, especially during the winter, the sheep's milk from other European countries located more in the South of Europe. The cheaper imported sheep milk is not originating from grazed sheep, but sheep fed in the barn for better milk yield.

### **Innovation**

The local sweet and pastries value chain is a traditional one, where no innovations have been.

## Mountain milk labelled products.

Milk production in the mountain area. The raw materials and feed come mainly from mountain areas, and milk is also processed at a set altitude, at least 500 m. Cows and sheep from 73 Slovak farms and mountain huts supply milk exclusively for "Liptov" products. Animals are grazed in the mountain environment of Liptov, Orava, Spiš, and, in the case of sheep's milk, also at Gemer.

The Važec is lined by the highest Slovak mountains, "Vysoké Tatry." The municipality includes a karst cave declared as a National Natural Monument with guided visits for the public; there is also a ski area for winter skiing. Due to the local landscape attractiveness, there are numerous accommodation facilities for visitors. The municipality has good access by train, buses, and nearby highway.

Reference mountain landscape statistics  
(A: Data for the NUTS3 SK031. B: A: Data for the NUTS3 SK032)

Reference mountain chain	Slovak Carpathians		
Reference mountain landscape	Važec		
Size of the area (km <sup>2</sup> )	59.7	Average per capita income (€)/year	14,100 <sup>A</sup>
Altimetry (m; min-max)	788–895	Total Gross Value Added (GVA) (€ million)/year	8,774 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	40.2	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	0.01%	Primary:	1% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	1,168 <sup>B</sup>	Secondary (including construction):	50% <sup>A</sup>
		Tertiary:	49% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	645	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	4,122 <sup>B</sup>	Primary:	4%
Protected areas	Yes	Secondary:	37%
		Tertiary:	59%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Grassland for livestock with milk production, pasture in the mountains represent a cultural landscape identity in Slovakia. This value chain is also present in Stara Lubovna, Spišská Nová

Ves, Poprad, Levoča, Kežmarok, Gelnica, Ružomberok, Liptovský Mikuláš, Dolný Kubín, Námestovo, Tvrdošín, additionally also in Valaská Dubová, Silica, Silická Brezová, Bôrka, Lúčka, Čierna Lehota, Rejdová, Muránska Zdychava, Muránska Huta.

### **Key local assets**

Grassland for livestock with milk production, pasture in the mountains represent a cultural landscape identity in Slovakia.

### **Challenges**

Key challenges for this VC are associated with:

- Climate change may impact environmental quality in the mountains and consequently influence milk quality.
- Consumers may not be aware of the mountain milk quality and nutritional benefits.

### **Innovation**

The local sweet and pastries value chain is a traditional one, where no innovations have been identified.



## Lamb meat

Slovakia produces lamb meat mainly for export to other countries, especially to Italy. The up-to-date offer and Slovak consumer demand for sheep meat were relatively low. The economic crisis in 2008 and the recent restrictions of exports and imports due to the Covid-19 crisis caused the Slovak producers of lamb meat to be successful in the domestic markets.

Dlhé Stráže occupies relatively small area and is located on the southern slopes of the near mountains - Levočské vrchy. The municipality area is mostly covered by permanent grasslands, only a small part of the municipality is covered by spruce forests. There exist agrotourism activity and the village is located close to the touristic hiking trails and winter ski areas. The distance to the main district city is just 4km from the municipality. There are low opportunities to work in the primary sector in agriculture or forestry. The dominant function of the village became the residential function.

Reference mountain landscape statistics  
(A: Data for the NUTS3 SK041)

Reference mountain chain		Slovak Carpathians	
Reference mountain landscape		Dlhé Stráže	
Size of the area (km <sup>2</sup> )	59.7	Average per capita income (€)/year	10,400 <sup>A</sup>
Altimetry (m; min-max)	510–740	Total Gross Value Added (GVA) (€ million)/year	7,679 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	175	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	0.13%	Primary:	3% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	856 <sup>A</sup>	Secondary (including construction):	48% <sup>A</sup>
		Tertiary:	49% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	96	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	3,515 <sup>A</sup>	Primary:	3%
Protected areas	No	Secondary:	34%
		Tertiary:	63%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Sheep farming is the oldest branch of animal production in Slovakia. It is practically present in all mountain areas in Slovakia. This VC relies on the activities of local actors engaged in all steps of the sheep breeding and meat processing, including marketing and selling. It can be described as

a short food VC, which valorise traditional productions and has a positive impact on the local economy.

### **Key local assets**

Key local assets for this VC are associated with grassland or feed for sheep, local sheep breeds, and domestic (Slovak) consumers demanding lamb meat.

### **Challenges**

Key challenges for this VC relate to:

- low demand for lamb meat by domestic consumers
- production issue - Shepherds need to protect sheep against the wolves. Wolves are currently protected by law, but the shepherds cannot always protect the herds against them. Ideally, the shepherds would like to increase production to let sheep on the pastureland also overnights and during winter. However, they do not do it because of danger. This situation creates some tensions between the shepherds and nature protection authorities.

### **Innovation**

Sheep breeding in Slovakia is traditional. Innovation is in the marketing and product distribution to the "new" domestic market. New marketing strategy intends to sell sheep meat in domestic market. It also requires an increase in consumers' demand.

## Processed wool

Sheep's wool processing helps maintain traditional sheep farming in Slovakia; the sheep wool products include home textile products and clothes. Sheep farming is the oldest branch of animal production in Slovakia. The sheep wool is a by-product of sheep breeding. During the last decades, wool was not processed. It was a dangerous waste, possible to destroy only in rendering plants. The shepherds must pay for the destruction of wool. Thus, any solution for wool processing means an innovation (or retro-innovation) in Slovakia. Recently, some processors in Slovakia started to focus on manual wool processing as an innovation of traditions. The national policy also promised to assist farmers with wool sales and industrial processing.

Banská Štiavnica is a completely preserved medieval town. Because of their historical value, the town and its surroundings were proclaimed by the UNESCO to be a World Heritage Site on December 11, 1993. In history, it was an important mining place. The town is surrounded by landscape with high aesthetic value.

Reference mountain landscape statistics  
(A: Data for the NUTS3 SK032)

Reference mountain chain	Slovak Carpathians		
Reference mountain landscape	Banská Štiavnica		
Size of the area (km <sup>2</sup> )	46.38	Average per capita income (€)/year	12,100 <sup>A</sup>
Altimetry (m; min-max)	450–938	Total Gross Value Added (GVA) (€ million)/year	7,012 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	214.4	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.05%	Primary:	5% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	645 <sup>A</sup>	Secondary (including construction):	47% <sup>A</sup>
		Tertiary:	48% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	174	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	4,846 <sup>A</sup>	Primary:	4%
Protected areas	Yes	Secondary:	37%
		Tertiary:	59%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

This VC relies on the activities of local actors engaged in all steps of the sheep breeding and wool processing, including marketing and selling. Additionally, Positive impact on local and regional SES through retro innovation of wool processing and products. Moreover, it helps to use the otherwise waste product.

### **Key local assets**

Key local assets for this VC are associated with grassland or feed for sheep, sheep breeds, and knowledge about wool processing.

### **Challenges**

Key challenges for this VC are identified with:

- Slovak sheep farmers have a long-term problem with the sales of sheep wool. Often, the income from the wool sale does not even cover the cost of shearing sheep. Thus, the wool ends up in rendering plants buried or burned. Only a tiny percentage of it is sold - primarily for foreign markets. A significant drop in prices was caused by cheap sheep wool imported from abroad.
- Currently, there is not industrial wool processor in Slovakia.

### **Innovation**

A tradition of manual wool processing has been rediscovered again. New products from otherwise hazardous waste material (retro innovation). There are also sheep wool processing workshops. Today, people are returning to old crafts, including the traditional processing of sheep's wool.

## Beef breeding

Beef cattle breeding is together with sheep breeding the main activity on pastureland in mountain areas in Slovakia. Thus, it contributes to pasture maintenance. There is an increasing number of farms converting their conventional production to an organic one. However, beef cattle breeding in the Slovak mountains is also facing numerous challenges.

The Važec is lined by the highest Slovak mountains, "Vysoké Tatry." The municipality includes a karst cave declared as a National Natural Monument with guided visits for the public; there is also a ski area for winter skiing. Due to the local landscape attractiveness, there are numerous accommodation facilities for visitors. The municipality has good access by train, buses, and nearby highway.

Reference mountain landscape statistics  
(A: Data for the NUTS3 SK031. B: Data for the NUTS2 SK03)

Reference mountain chain	Slovak Carpathians		
Reference mountain landscape	Važec		
Size of the area (km <sup>2</sup> )	59.7	Average per capita income (€)/year	14,100 <sup>A</sup>
Altimetry (m; min-max)	788–895	Total Gross Value Added (GVA) (€ million)/year	8,774 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	40.2	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	0.01%	Primary:	1% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	1,168 <sup>A</sup>	Secondary (including construction):	50% <sup>A</sup>
		Tertiary:	49% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	645	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	4,122 <sup>A</sup>	Primary:	4% <sup>B</sup>
Protected areas	Yes	Secondary:	37% <sup>B</sup>
		Tertiary:	59% <sup>B</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Beef cattle breeding is to some extent present in all mountain areas in Slovakia. This VC relies on the activities of local actors engaged in all steps of the cattle breeding and meat processing. Additionally, it supports the maintenance of pastureland.

## Key local assets

Key local assets for this VC are associated with are agricultural land uses – grassland and farmers’ skills.

### **Challenges**

Key challenges for this VC relate to:

- import of livestock products from other countries.
- lack of young farmers who would ensure continuity from one generation to the next
- low salary for field workers
- relatively low per capita consumption of beef meat in Slovakia

### **Innovation**

The local sweet and pastries value chain is a traditional one, where no innovations have been identified.

## Agritourism

The VC represents an example of diversification of farming in the mountains according to current consumers' demand. It usually includes producing high-quality food products, sometimes with bio certification, and provides accommodation for visitors. Family farms with both production and recreational possibilities for visitors.

In a beautiful place near Kremnické Bane, central Slovakia, a stone is erected next to an ancient church of John Baptist. It reminds the passers-by that it is exactly here that the geographical centre of Europe is situated. The Slovak geographical centre of Europe is situated in Kremnické Vrchy mountain range. It lies off the main road from Kremnica to Martin, next to the gothic Church of John Baptist. The important geographical point is marked by a small monument next to the defence wall of the church. The monument has the shape of a big oval stone reminding the rugby ball erected upwards. The foundation stone of the Slovak state was also laid here on establishment of the Slovak Republic.

Reference mountain landscape statistics  
(A: Data for the NUTS3 SK032. B: Data for the NUTS2 SK03)

Reference mountain chain	Slovak Carpathians		
Reference mountain landscape	Kremnické bane		
Size of the area (km <sup>2</sup> )	7.74	Average per capita income (€)/year	12,100 <sup>A</sup>
Altimetry (m; min-max)	700–800	Total Gross Value Added (GVA) (€ million)/year	7,012 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	34.2	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	0.02%	Primary:	5% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	1,168 <sup>A</sup>	Secondary (including construction):	47% <sup>A</sup>
		Tertiary:	48% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	193	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	4,846 <sup>A</sup>	Primary:	4% <sup>B</sup>
		Secondary:	37% <sup>B</sup>
		Tertiary:	59% <sup>B</sup>
Protected areas	Yes		

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

This VC relies on the activities of local actors engaged in farm production, accommodation, food provision and it is strongly supported by local authorities because of its significant local and regional impacts in terms of farm income diversification, added economic value, local identity support. This VC is also present in Zázrivá, Ždiar, Spišské Hanušovce, Liptovská Teplička, Harichovce.

### **Key local assets**

Key local assets for this VC are associated with agricultural land - crop production, pasture, orchards - and farmers' skills to diversify their farming activities and prepare accommodation possibilities and services to the public.

### **Challenges**

Key challenges of this VC relate to:

- Lack of a tradition in agrotourism in Slovakia - the collectivization of agricultural holdings during the communist regime caused family farms decompositions. Thus, up to date agrotourism in the Slovak mountains is not very common.
- Agrotourism means an additional activity to farm (a set of goods and services offered to tourists, e.g., accommodation, meals, outdoor and indoor recreational activities organization) requiring other skills than farming.
- Like every business, agrotourism also needs an initial investment at its start.

### **Innovation**

Farming is a traditional component and associated tourism is an innovation on a farm. New services on a farm



## Medicinal herbs production

Quality certificates about ecological production, organic farming, and quality marks for herbs, fruits, and tea mixtures. The farm also received various awards, e. g. Award for the most beautiful farm up to 500ha; Award for a company with a turnover of up to 2 million €. One of the local assets is the clean environment in mountain areas. Thee-commerce is also related to this VC. Organic production requires more handwork. Thus, this kind of production contributes to local employment. Organic production and packaging of medicinal herbs in mountains

Plavnica is small village located in and undulating terrain and close to the district city Stará Ľubovňa. The district has numerous touristic possibilities, including spa, ski areas, historic monuments, and hiking trails.

Reference mountain landscape statistics  
(A: Data for the NUTS3 SK041; B: Data for the NUTS2 SK04)

Reference mountain chain	Slovak Carpathians		
Reference mountain landscape	Plavnica		
Size of the area (km <sup>2</sup> )	19.6	Average per capita income (€)/year	10,400 <sup>A</sup>
Altimetry (m; min-max)	490–845	Total Gross Value Added (GVA) (€ million)/year	7,679 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	84	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	0.03%	Primary:	3% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	856 <sup>A</sup>	Secondary (including construction):	48% <sup>A</sup>
		Tertiary:	49% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	204	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	3,515 <sup>A</sup>	Primary:	3% <sup>B</sup>
		Secondary:	34% <sup>B</sup>
Protected areas	Yes	Tertiary:	63% <sup>B</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Activities: herbs production, collection of wild herbs and forest fruits. Key actors: managers, workers, consumers. Positive impact on local and regional SES is a contribution to employment, added value to local economy, environmental quality. No similar VC in Slovak mountains were

found. Other municipalities in mountains where medicinal herbs produced are: Batizovce, and Poľanovce.

### **Key local assets**

Key local assets involved in this VC are:

- Natural assets: cropland with herbs production, meadows for local herbs collection, and forests for berries collection.
- Social assets: the social recognition of organic farming's importance and willingness to pay higher prices for bio-quality products.
- Cultural asset: the traditional knowledge about the health effects of local plant species and agricultural production in a local biophysical context without chemicals.

### **Challenges**

Key challenges of this VC relate to:

- climate change and related environmental quality changes can influence the quality of producing herbs and fruits.
- organic production requires more handwork (e.g., hand skinning, hand-harvesting), but the herbs' production is seasonal.
- Due to the processing and storage of organic food without chemicals, their storage life is shorter. It requires more frequent processing, packaging, distribution, etc. At the same time, the organic food needs to be controlled at all production and processing stages.

### **Innovation**

Production and processing of endogenous species of herbs and fruits in a bio quality, using the environmental quality in mountains. It is a good example of crop production in mountain areas rendering a good quality of mountain environment and respecting natural conditions.

## High quality oils for food and cosmetics

Specialized small-scale farming producing high-quality products. It is an adaptation of small farmers to the market by products. They cannot compete on the market with prominent producers and/or with productions located in better natural conditions for agriculture. One farm produces cold-pressed oils from Silybum marianum, Rapeseed oil, Hemp oil, Flax, and Poppy seeds. Another farm produces EU-certified organic hemp (in Východná, 775 m above sea), including manual harvesting and processing tincture. The farms have an e-shop, and products are sold in Slovakia.

Hozelec is a small municipality located between two small villages Gánovce and Švábovce. There is a direct view on the High Tatras (the highest mountains in Slovakia). The district city Poprad is located 5km away.

Reference mountain landscape statistics  
(A: Data for the NUTS3 SK041; B: Data for the NUTS2 SK04)

Reference mountain chain	Slovak Carpathians		
Reference mountain landscape	Hozelec		
Size of the area (km <sup>2</sup> )	4	Average per capita income (€)/year	10,400 <sup>A</sup>
Altimetry (m; min-max)	683–805	Total Gross Value Added (GVA) (€ million)/year	7,679 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	194.1	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.09%	Primary:	3% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	856 <sup>A</sup>	Secondary (including construction):	48% <sup>A</sup>
		Tertiary:	49% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	204	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	3,515 <sup>A</sup>	Primary:	3% <sup>B</sup>
Protected areas	Yes	Secondary:	34% <sup>B</sup>
		Tertiary:	63% <sup>B</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

This VC relies on the activities of local actors engaged in farm production, products processing, marketing, selling: The contribution of this VC to face the land abandonment trend by keeping

crop production and farming activities on marginal mountain lands is highly significant. This VC is also present in Východná, Levoča.

### **Key local assets**

Key local assets of this VC are associated with cropland for production.

### **Challenges**

Key challenges for this VC are associated with:

- the reliance on niche products without long establishment on the market
- the small-scale production which may be less resilient to economic stability

### **Innovation**

New products coming from regional plant species. Produced for commercial purposes. An online shop is used mainly for commerce. Production of new products in Slovak mountains is rare.

## Horse breeding

Horse breeding in the mountains contributes to the maintenance of pastureland and is associated with society's activities. Farms offer horses for walks in the surrounding landscapes, and some horses have their owner. The farms' offer includes horse walks for riders with different levels of experience, carriage, and sleigh rides. Farms also offer some accommodation, horse driving courses, and horse training. Some farms focus on endangered species of horse breeds supported by European funds, try to be self-sufficient in feed, and organize exhibitions and horse races.

Polichno in the shallow valley of a small river. Marble is mined in a small part of the municipality area. The unfavorable demographic development of the village caused that several buildings are empty. However, a development of cottages in the village is appearing, which is determined by its good location (17 km) from Lučenec city and presence of a natural landscape.

Reference mountain landscape statistics  
(A: Data for the NUTS3 SK032; B: Data for the NUTS2 SK03)

Reference mountain chain		Slovak Carpathians	
Reference mountain landscape		Polichno	
Size of the area (km <sup>2</sup> )	11.07	Average per capita income (€)/year	12,100 <sup>A</sup>
Altimetry (m; min-max)	480–817	Total Gross Value Added (GVA) (€ million)/year	7,012 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	12.9	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.1%	Primary:	5% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	645	Secondary (including construction):	47% <sup>A</sup>
		Tertiary:	48% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	204	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	4,846 <sup>A</sup>	Primary:	4% <sup>B</sup>
Protected areas	No	Secondary:	37% <sup>B</sup>
		Tertiary:	59% <sup>B</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

This VC relies on the activities of local actors engaged in horse breeding, horse feed production, horse training, activities with public, agrotourism. and it generates positive impact on local and

regional socio-ecological systems through job provisioning and pastureland maintenance in mountain areas. This VC is also present in Východná, Kaľamenová, Novot', Jalovec, Ábelová, Veľká Lúka.

### Key local assets

Key local assets involved in this VC are:

- Natural assets: pasture and meadow land use systems.
- Social assets: experts in horse breeding, horse owners, landowners, society members practicing horse riding.

### Challenges

Key challenges for this VC relate to the following elements:

- imported horses demanded by Slovak customers.
- work with horses is demanding in time and physical strain.
- the problematic qualification of breeders. Knowledge transfer from generation to generation has been interrupted during the last decades. This is reflected in the level of horse breeding, horse training, and the quality of work with horses.

### Innovation

Innovation is in reaction to the current trend of horse breeding. Horse breeding existed in the past and now it is reintroduced again but with adaptation to current societal demand. Horse breeding is an expanding activity in Slovakia.

## Domestic timber production.

Forests cover over 40% of the Slovakian territory. Timber production is an essential element of forest management. For timber production is dedicated specific forest category "Commercial forests" covering approximately 2/3 of the forest area.

In Liptovský Ján surroundings, there are numerous wood houses for renting to tourists around the whole year. The municipality is in a hot spring area on the Jánská valley's edge below the Low Tatras. In winter, there are possibilities for skiing and cross-country skiing. The municipality also involves numerous caves.

Reference mountain landscape statistics  
(A: Data for the NUTS3 SK031; B: Data for the NUTS2 SK03)

Reference mountain chain		Slovak Carpathians	
Reference mountain landscape		Liptovský Ján	
Size of the area (km <sup>2</sup> )	65	Average per capita income (€)/year	14,100 <sup>A</sup>
Altimetry (m; min-max)	620–2,043	Total Gross Value Added (GVA) (€ million)/year	8,774 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	16.2	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	0.2%	Primary:	1% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	1,168	Secondary (including construction):	50% <sup>A</sup>
		Tertiary:	49% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	162	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	4,122 <sup>A</sup>	Primary:	4% <sup>B</sup>
Protected areas	Yes	Secondary:	37% <sup>B</sup>
		Tertiary:	59% <sup>B</sup>

\*1 Nearest settlement with population > 100,000

\*2 share of total GVA/year

\*3 share of total employment)/year

This VC relies on the activities of local actors engaged in the management of private and public owned forests and it generates positive impact on local and regional socio-ecological systems through job provisioning, added value creation for the local and regional economy, landscape value, and – in synergy with tourism – enhancing biodiversity. This VC is present in all mountain areas in Slovakia.

### **Key local assets**

Key assets for this VC are associated with forest land dedicated for timber production which are labelled as "commercial forest".

### **Challenges**

Key challenges for this VC are associated with:

- climate change - on the one hand, forests are recognized to have high importance in helping to mitigate climate change. On the other hand, they are threatened by climate changes to which they may not be adapted.
- pests and diseases - the most dangerous is currently the bark-beetle outbreak able to cause large-scale forest destruction.
- society acceptance of landscape visual change after timber harvest.

### **Innovation**

The local sweet and pastries value chain is a traditional one, where no innovations have been identified.



## Processed domestic timber.

Forests cover around forty percent of Slovakia, having mainly wood production function. Processing wood locally contributes to the added value of the Slovak economy and employment.

Makov (Čadca district) includes highlands and mountains, and the local landscape is aesthetically attractive. The municipality is located on the border with the Czech Republic and Poland in the Protected Landscape Area Kysuce. There are multiple touristic accommodations, hiking and cycling trails, three ski areas, and cross-country skiing trails.

Reference mountain landscape statistics  
(A: Data for the NUTS3 SK031; B: Data for the NUTS2 SK03)

Reference mountain chain		Slovak Carpathians	
Reference mountain landscape		Makov	
Size of the area (km <sup>2</sup> )	46.05	Average per capita income (€)/year	14,100 <sup>A</sup>
Altimetry (m; min-max)	583–1,070	Total Gross Value Added (GVA) (€ million)/year	8,774 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	37.3	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.09%	Primary:	1% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	1,168	Secondary (including construction):	50% <sup>A</sup>
		Tertiary:	49% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	70.3	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	4,122 <sup>A</sup>	Primary:	4% <sup>B</sup>
Protected areas	Yes	Secondary:	37% <sup>B</sup>
		Tertiary:	59% <sup>B</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

This VC relies on the activities of local actors engaged in wood supply, wood processing, and processed wood selling. The VC depends on local and regional forests and generates positive impact on local and regional socio-ecological systems through job provisioning and added value creation within the local economy. This VC is present in all mountain areas in Slovakia.

### Key local assets

Key local assets in this VC are associated with:

- Natural asset: forests with wood production function.
- Social assets: interactions between Slovak foresters and wood processors.

## Challenges

Key challenges for this VC are associated with:

- Slovakia currently exports a relatively large amount of unprocessed timber to foreign countries.
- At the processing enterprises, the Slovak wood competes with cheaper imported timber. Moreover, the multinational wood processing companies move from Slovakia to cheaper countries.
- The number of employed people in the sawmills and furniture industry has been decreasing. Employment in the wood processing sector is not attractive for young people.

## Innovation

The processed domestic timber value chain is a traditional one, where no innovations have been identified.

## Wood building.

A new trend in wooden buildings like houses, cottages, restaurants, and guesthouses is rising over the last few years. Wood production for houses is connected to forest land use. The enterprises offering wood constructions use e-commerce. This VC focuses on wood house builders who use wood from national forests.

Zázrivá is in a traditional rural agricultural landscape with scattered settlements throughout the territory resulting from a long-term cultivation by humans. The local landscape is rich in biodiversity and is formed by a mosaic of meadows, pastures, wetlands, and forests.

Reference mountain landscape statistics  
(A: Data for the NUTS3 SK031; B: Data for the NUTS2 SK03)

Reference mountain chain	Slovak Carpathians		
Reference mountain landscape	Zázrivá		
Size of the area (km <sup>2</sup> )	67.25	Average per capita income (€)/year	14,100 <sup>A</sup>
Altimetry (m; min-max)	550– 1,392	Total Gross Value Added (GVA) (€ million)/year	8,724 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	39.6	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.04%	Primary:	1% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	1,168 <sup>A</sup>	Secondary (including construction):	50% <sup>A</sup>
		Tertiary:	49% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	103	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	4,122 <sup>A</sup>	Primary:	4% <sup>B</sup>
Protected areas	Yes	Secondary:	37% <sup>B</sup>
		Tertiary:	59% <sup>B</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

This VC relies on the activities of local actors engaged in wood supply, wood processing, and construction. The VC depends on local and regional forests and it generates impacts on local and regional socio-ecological systems through job provisioning and added value to the local economy. This VC is also present Trstená, Korna, Rajecká Lesná, Rajec, Zázrivá, Námestovo, and Čierny Balog.

## Key local assets

Key local assets for this VC are associated with:

- Natural assets: forests with wood production function.
- Social assets: interactions between Slovak foresters and wood processors, and demand of customers for wooden houses.

## Challenges

According to available information, some builders import completed wood houses from other countries (e.g., Finland) to Slovakia.

## Innovation

Numerous wood processors recently started to provide wooden houses construction as an additional service. Wooden houses are traditional in Slovak mountains. Wooden houses were built in the past in Slovak mountains. Nowadays, the wood houses are a novelty on a market and are gaining popularity. It is an additional use of the wood from the Slovak forests.

## Game meat for domestic consumption

An innovative adaptation of game production during the Corona pandemic crisis. The aim is to sell more Slovak game meat to domestic consumers instead of a meat export to other countries. First, a web application was created for an e-commerce to connect verified hunters or sellers directly with consumers. The consumers can visit the webpage and check meat availability, choose meat type, locality and order the products online. Second, the Slovak government implemented a project entitled "Delicatess from the forest" with aim to promote game meat from the Slovak forests available on a domestic market and support collaboration between hunters, foresters, meat processors and traders.

Zliechov village is located within the Strážov Mountains Protected Landscape Area and near to Strážov Mountain (1,213 m). The surface of the area is formed by highlands and is strongly undulating.

Reference mountain landscape statistics  
(A: Data for the NUTS3 SK022; B: Data for the NUTS2 SK02)

Reference mountain chain		Slovak Carpathians	
Reference mountain landscape		Zliechov	
Size of the area (km <sup>2</sup> )	54.38	Average per capita income (€)/year	13,600 <sup>A</sup>
Altimetry (m; min-max)	211–1,214	Total Gross Value Added (GVA) (€ million)/year	7,162 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	84	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	0.01%	Primary:	2% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	327 <sup>A</sup>	Secondary (including construction):	49% <sup>A</sup>
		Tertiary:	49% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	204	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	1,636 <sup>A</sup>	Primary:	3% <sup>B</sup>
Protected areas	Yes	Secondary:	43% <sup>B</sup>
		Tertiary:	53% <sup>B</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

This VC relies on the activities of local actors engaged in hunting, selling, meat processing, accommodation for hunters. The VC generates positive impacts on local and regional socio-

ecological systems and represents an added value to national economy. This VC is relevant for all mountain areas in Slovakia.

### **Key local assets**

Key local assets for this VC are associated with:

- Natural assets: forests with wild game.
- Social assets: collaboration between hunters, foresters, meat processors and traders.
- Cultural assets: tradition of hunting in Slovak mountains.

### **Challenges**

Key challenges for this VC relate to:

- Pandemic situation causes problems to game supplies. Retail chains require relatively large quantities of the same type of meat in a short time. As the game can only be hunted to a limited extent for pandemic measures, it is not easy to ensure enough game and logistics to retail chains.
- The government's implemented project is only temporal, and a long-term strategy to increase the amount of game meat available for domestic consumption is necessary.

### **Innovation**

The innovation uses two forms of promotion of the product on the domestic market. One is a web application directly connecting hunters and consumers and the second is the government support for product's promotion and availability on domestic market. Hunting is an important activity in Slovak mountain areas. The VC is a good example of market adaptation to the restrictions during a pandemic situation.

## Wilde mushrooms collection

The VC describes popular public activity in Slovak forests relating to mushroom picking for own domestic use. Commercialization of mushrooms and forest fruits is not usual in Slovakia. Some informal selling occurs from individual collectors contributing to family livelihood. A webpage for collectors exists where people can share the actual place of mushrooms grows and their experiences.

Kamienka is located close to the district city Stará Ľubovňa. The district has numerous touristic possibilities, including spa, ski areas, historic monuments, and hiking trails.

Reference mountain landscape statistics  
(A: Data for the NUTS3 SK041; B: Data for the NUTS2 SK04)

Reference mountain chain	Slovak Carpathians		
Reference mountain landscape	Kamienka		
Size of the area (km <sup>2</sup> )	29.17	Average per capita income (€)/year	10,400 <sup>A</sup>
Altimetry (m; min-max)	588–700	Total Gross Value Added (GVA) (€ million)/year	7,679 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	46.75	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.02%	Primary:	3% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	856 <sup>A</sup>	Secondary (including construction):	48% <sup>A</sup>
		Tertiary:	49% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	204	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	3,515 <sup>A</sup>	Primary:	3% <sup>B</sup>
Protected areas	Yes	Secondary:	34% <sup>B</sup>
		Tertiary:	63% <sup>B</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

This VC relies on the activities of local actors engaged in the collection of forest non-wood products, and home processing. and it generates positive impact on local and regional socio-ecological systems through the contribution to food availability. This VC is present in all mountain areas in Slovakia.

## Key local assets

Key local assets for this VC are associated with:

- Natural assets are forests.
- Cultural assets are traditional activity in forest and knowledge about edible mushroom species.

### **Challenges**

Key challenges for this VC can be identified in the following items:

- the collectors are not always aware of restrictions for plant collection in National Parks and National Natural Reserves.
- no rules about the number of mushrooms and forest fruits that individuals can collect.
- the knowledge needed from collectors to recognize edible mushrooms and fruits.

### **Innovation**

The local sweet and pastries value chain is a traditional one, where no innovations have been identified.



## Beekeeping

The trademark "Slovenský med" (Slovak honey) can be used by registered beekeepers in the Slovak Association of beekeepers (SZV) who sell honey from their production. The trademark is registered as n. 214649. Number of registered beekeepers has been increasing over last years in Slovakia. Due to the lack of intensive agriculture in the mountain areas and more forests and meadows, the honey from this area has higher quality. Currently, the government lanced a project promoting a reintroduction of beekeeping in woods.

The Važec is lined by the highest Slovak mountains, "Vysoké Tatry." The municipality includes a karst cave declared as a National Natural Monument with guided visits for the public; there is also a ski area for winter skiing. Due to the local landscape attractiveness, there are numerous accommodation facilities for visitors. The municipality has good access by train, buses, and nearby highway.

Reference mountain landscape statistics  
(A: Data for the NUTS3 SK031. B: A: Data for the NUTS3 SK032)

Reference mountain chain	Slovak Carpathians		
Reference mountain landscape	Važec		
Size of the area (km <sup>2</sup> )	59.7	Average per capita income (€)/year	14,100 <sup>A</sup>
Altimetry (m; min-max)	788–895	Total Gross Value Added (GVA) (€ million)/year	8,774 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	40.2	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	0.01%	Primary:	1% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	1,168 <sup>B</sup>	Secondary (including construction):	50% <sup>A</sup>
		Tertiary:	49% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	645	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	4,122 <sup>B</sup>	Primary:	4%
Protected areas	Yes	Secondary:	37%
		Tertiary:	59%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Key activities: beekeeping, bee products processing, marketing, sale. Key actors: beekeepers, landowners, consumers. Positive impact on local and regional SES is in employment and on

ecological sustainability. The VC depends on local and regional vegetation with low pesticide use. The beekeeping is present in all mountain areas in Slovakia.

### **Key local assets**

Key local assets for this VC are associated with:

- Natural asset: vegetation land use systems.
- Social assets: consumers demand for honey and by-products from national production and cooperation between beekeepers.

### **Challenges**

Key challenges for this VC are associated with:

- The beekeeping challenges are like those in other countries, which is an extensive death of bee colonies due to the sharp temperature fluctuations and pesticides in agriculture. The current losses are also influenced by pollen's weak diversity, caused by single-species cultivation of crops, parasites, or bee diseases.
- Beekeepers have problems getting their products to market. The reason is mainly the import of cheaper and often low-quality honey from abroad. Some websites provide information (address, contacts, products, etc.) about beekeepers who sell their products directly to final consumers.

### **Innovation**

The local sweet and pastries value chain is a traditional one, where no innovations have been identified.

## Beekeeping with agritourism

A family farm combines beekeeping and agrotourism in the mountains. The farm produces various high-quality products such as honey, mead beverage, honey vine, cosmetics with bee products, pollen, propolis, royal jelly. Moreover, the farm provides accommodation and excursions about beekeeping and bee product processing for individuals or small groups. This activity relates to natural land-use systems in the locality.

Polichno in the shallow valley of a small river. Marble is mined in a small part of the municipality area. The unfavorable demographic development of the village caused that several buildings are empty. However, a development of cottages in the village is appearing, which is determined by its good location (17 km) from Lučenec city and presence of a natural landscape.

Reference mountain landscape statistics  
(A: Data for the NUTS3 SK032; B: Data for the NUTS2 SK03)

Reference mountain chain		Slovak Carpathians	
Reference mountain landscape		Polichno	
Size of the area (km <sup>2</sup> )	11.07	Average per capita income (€)/year	12,100 <sup>A</sup>
Altimetry (m; min-max)	480–817	Total Gross Value Added (GVA) (€ million)/year	7,012 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	12.9	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.1%	Primary:	5% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	645	Secondary (including construction):	47% <sup>A</sup>
		Tertiary:	48% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	204	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	4,846 <sup>A</sup>	Primary:	4% <sup>B</sup>
		Secondary:	37% <sup>B</sup>
Protected areas	No	Tertiary:	59% <sup>B</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

This VC relies on the activities of local actors engaged with beekeeping, bee products processing, marketing, sale, agrotourism. The VC depends on local and regional vegetation with low pesticide use and it generates positive impact on local and regional socio-ecological systems through job

provisioning and enforcing ecological sustainability. The VC depends on local and regional vegetation with low pesticide use. The combination of beekeeping activities with agrotourism in mountains is according to available data relatively unique in the country.

### **Key local assets**

Key local assets for this VC are associated with:

- Natural asset are vegetation land use systems.
- Social assets are consumers demanding bee products, visitors willing to stay at the bee farm, people interested in learning about beekeeping and bee products processing.

### **Challenges**

The beekeeping challenges are like those in other countries, which is an extensive death of bee colonies due to the sharp temperature fluctuations and pesticides in agriculture. The current losses are also influenced by pollen's weak diversity, caused by single-species cultivation of crops, parasites, or bee diseases.

### **Innovation**

Innovation is in a combination of production functions of beekeeping with society involvement by agrotourism. A family farm which diversifies its activities towards society involvement. It also uses e-commerce.

## Spirit drinks from juniper

Three trademarks are registered in EU as protected geographical products located in mountain areas: “Špišská Borovička,” “Slovenská Borovička Juniperus,” “Liptovská Borovička.” The beverages are produced by the unique fermentation of the juniper fruit. The pure juniper distillate is relatively expensive and has an intensive flavor. For that reason, it is diluted with neutral alcohol and water. The detailed recipe is known only for producers.

Spišská Nová Ves is a district city, currently an industrial and transport centre of the region. In the past, it was a mining city. While the city center lies at an altitude of 463 m above sea level, the forested areas of the municipality in the southern part reaches an altitude of 1266 m above sea level. Many hiking trails to the Slovak Paradise mountains begin in this municipality.

Reference mountain landscape statistics  
(A: Data for the NUTS3 SK042; B: Data for the NUTS2 SK04)

Reference mountain chain	Slovak Carpathians		
Reference mountain landscape	Spišská Nová Ves		
Size of the area (km <sup>2</sup> )	66.67	Average per capita income (€)/year	13,300 <sup>A</sup>
Altimetry (m; min-max)	463–1,266	Total Gross Value Added (GVA) (€ million)/year	9,522 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	556.47	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.03%	Primary:	2% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	389	Secondary (including construction):	50% <sup>A</sup>
		Tertiary:	48% <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	204	Primary:	3% <sup>B</sup>
Number of agricultural holdings	3,379 <sup>A</sup>	Secondary:	34% <sup>B</sup>
Protected areas	Yes	Tertiary:	63% <sup>B</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Activities: collection of juniper berries, drink preparation, marketing. Key actors: forest owners, drink producers, consumers. Positive impact on local and regional SES is a local product processing, identity maintenance. This VC is also present in Stara Lubovna, Spišská Nová Ves,

Poprad, Levoča, Kežmarok, Gelnica, Ružomberok, Liptovský Mikuláš, Ilava, Trenčín, Považská Bystrica, Žilina. and Súľov,

### **Key local assets**

Natural assets are forests and meadows for juniper (*Juniperus communis* L) and cropland with cereals for gin part of the spirit. Juniper is an evergreen shrub found in dry, rocky soil in the Slovakian mountains. Especially the shrub fruits and branches from *Juniperus communis* are used. Cultural assets are related to traditional products and knowledge about the recipe for this drink.

### **Challenges**

Key challenges associated with this VC are associated with:

- imitation of this beverage by substituting juniper fruits with artificial aroma. The consumer does not need to be aware of the protection sign.
- another challenge is the import of juniper berries from other countries (e.g., Albania).

### **Innovation**

The local sweet and pastries value chain is a traditional one, where no innovations have been identified.

## Spring and mineral water

Slovakia has several mineral water springs in the mountains, which are commercialized for drinking water. Currently, there are 14 brands of mineral waters and numerous spring waters in Slovakia. These waters have been existing on the market for several decades. They are considered to have a high reputation for domestic consumers or even in the Czech Republic. Some waters are recently flavoured with local herbs with bio quality.

Liptovská osada, where the mineral spring is located, is part of the National Parc Nízke Tatry. The mineral water was in the past also used for the bath therapies in the spa area. The village has numerous accommodation facilities for visitors, some of which are provided in private houses. The local landscape also has numerous hiking and biking trails.

Reference mountain landscape statistics  
(A: Data for the NUTS3 SK031; B: Data for the NUTS2 SK03)

Reference mountain chain	Slovak Carpathians		
Reference mountain landscape	Liptovská osada		
Size of the area (km <sup>2</sup> )	50.2	Average per capita income (€)/year	14,100 <sup>A</sup>
Altimetry (m; min-max)	500–700	Total Gross Value Added (GVA) (€ million)/year	8,774 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	32.42	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	0.001%	Primary:	1% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	1,168 <sup>A</sup>	Secondary (including construction):	50% <sup>A</sup>
		Tertiary:	49% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	142	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	4,122 <sup>A</sup>	Primary:	4% <sup>B</sup>
		Secondary:	37% <sup>B</sup>
Protected areas	No	Tertiary:	59% <sup>B</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The brands of spring and mineral waters in Slovakia have been established over the last decades. Producers currently focus on keeping the consumers by modifying sold waters regarding varieties of packaging, flavour, and CO<sub>2</sub> content. Key activities relate to packaging and marketing. Key

actors: producers, actors in marketing. Labelling: waters with a certain amount of minerals can be labelled as "mineral water". Slovakia is in number and quality of mineral springs among the richest countries in the world. VC is present in all Slovakian mountain areas.

### **Key local assets**

Key local assets for this VC are associated with local water spring and wild herbs - Raspberry, Blackthorn, Red currant, Gooseberry, Rosehip, Elderberry flower, Dandelion, Chamomile.

### **Challenges**

The key challenge of this VC is associated with the presence of numerous different mineral water brands and their numerous modifications on the Slovak food market. The environmental challenge is the material of packaging. Most of the waters are sold in plastic non-recyclable bottles and rarely in larger volumes than 1,5l. This causes a relatively massive amount of plastic waste. Climate change, especially drought and reduced water quality, can cause a reduction of the amount and quality of infiltrated precipitation waters in a hydrogeological structure which are necessary for mineral waters' formation. Moreover, weather extremes as windstorms can destroy the forest cover across large areas. Consequently, it causes changing the groundwater circulation pattern on a local scale.

### **Innovation**

Innovative is the mixture of local resources - water and local wild herbs. New processes include a combination of mountain water and local wild herbs. The marketing strategies focus not so much on new brands, but on the modification of the products - packaging varieties, flavour, and CO2 content.



## Winter ski recreation

Skiing in winter is specifically connected with mountains and it is a very popular activity in Slovak mountains.

The Štrba is only one of the areas relevant for this VC. It is situated in the Sub-Tatra Basin, which separates the High Tatras and Low Tatras mountains. Štrba municipality includes ski, tourist, and health resort near to a famous lake Štrbské Pleso. It is a popular place for visitors and a starting point for hikers.

Reference mountain landscape statistics  
(A: Data for the NUTS3 SK041; B: Data for the NUTS2 SK04)

Reference mountain chain	Slovak Carpathians		
Reference mountain landscape	Štrba		
Size of the area (km <sup>2</sup> )	43.46	Average per capita income (€)/year	10,400 <sup>A</sup>
Altimetry (m; min-max)	850–900	Total Gross Value Added (GVA) (€ million)/year	7,679 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	55.35	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.04%	Primary:	3% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	856 <sup>A</sup>	Secondary (including construction):	48% <sup>A</sup>
		Tertiary:	49% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	204	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	3,515 <sup>A</sup>	Primary:	3% <sup>B</sup>
Protected areas	Yes	Secondary:	34% <sup>B</sup>
		Tertiary:	63% <sup>B</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

This VC relies on the activities of local actors engaged in ski resort services, marketing, and the provision of food catering and tourists' accommodations. The VC positively impacts local infrastructure and services development contributing to local and regional economy. Winter ski areas are present in all mountain areas in Slovakia.

## Key local assets

Key local assets for this VC are associated with the presence of large grasslands on slopes and touristic accommodation and catering services. Cultural asset is a tradition of winter skiing in Slovak mountains.

### **Challenges**

Key challenges for this VC are associated with:

- Climate change causing increase of temperature and consequent decrease in amount and area of natural snow availability.
- Energy requirement for functioning of ski resorts - technical snow production, amount of electric energy needed for running ski lifts and related greenhouse gas emission.
- The construction and maintenance of ski runs may negatively impact ecosystems and cause soil erosion.

### **Innovation**

The local sweet and pastries value chain is a traditional one, where no innovations have been identified.

## Climatic Spa

Special air quality in high mountains; tradition of spa resorts in Slovak mountains and related territorial identity of high mountains with healing recreational stays for people with respiratory problems. In the past, mining, and metallurgical companies from all over Czechoslovakia built sanatoriums for their employees in high mountains in Slovakia.

Vysoké Tatry, is a town at the feet of the Slovak part of High Tatras in Slovakia including all the major resorts in that region. It is a conglomerate of separate settlements (originally separate villages). They are the main tourist resorts in the Slovak High Tatras and are connected through a common railway network. After the country's capital, the town is Slovakia's major tourist destination. The High Tatra Mountains are a mountain range along the border with Poland and the highest peak is Gerlachovský štít, at 2,655 metres. The whole municipality is in a national parc- The Tatra National Park - and is the oldest protected landscape in the country. Most of the LAU2 related to this VC are located near to High Tatras where forests and natural areas dominate.

Reference mountain landscape statistics  
(A: Data for the NUTS3 SK041; B: Data for the NUTS2 SK04)

Reference mountain chain		Slovak Carpathians	
Reference mountain landscape		Vysoké Tatry	
Size of the area (km <sup>2</sup> )	360.22	Average per capita income (€)/year	10,400 <sup>A</sup>
Altimetry (m; min-max)	760– 1,060	Total Gross Value Added (GVA) (€ million)/year	7,679 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	11.19	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.12%	Primary:	3% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	856 <sup>A</sup>	Secondary (including construction):	48% <sup>A</sup>
		Tertiary:	49% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	204	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	3,515 <sup>A</sup>	Primary:	3% <sup>B</sup>
Protected areas	Yes	Secondary:	34% <sup>B</sup>
		Tertiary:	63% <sup>B</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The healing method is basically an outdoor stay at the fresh air and walks or some physical exercise. Land use systems related to this use are natural areas and forests.

Activities: accommodation and healing procedures Key actors: managers, workers in spa resorts, visitors. Positive impact on local and regional SES is an added value to national economy, use of local resources. This VC is also present in Štrba, Štós, and Vyšné Ružbachy.

### Key local assets

Key assets in this VC are represented by:

- Natural assets: natural areas and forests.
- Social assets: increasing society demand for visiting high mountain areas.
- Cultural assets: tradition of visiting high mountain areas for healing and recreation.

### Challenges

Key challenges for this VC are associated with:

- Climate change and environmental quality may decrease air quality in the mountains.
- Society demand: In the future, there is expected that a society's demand for healing stays in the mountains will increase due to numerous reasons: the health system supporting prevention, increase in health awareness of the people, increase in respiratory diseases, etc. Additionally, as Slovakia is an inland country, with mountains being the main areas for holidays and recreation, the accessible areas in the Slovak mountains were often crowded during last years. It causes less privacy for visitors and may harm vulnerable mountains' environment.
- Increasing urbanization and construction (sometimes illegal) in protected mountain areas.

### Innovation

The local sweet and pastries value chain is a traditional one, where no innovations have been identified.

## 10. Serbia

### Fresh lamb meat produced from Sjenica sheep.

Pester plateau is a Special nature reserve area. Family farming is prevailing, sheep are grazed at natural pastures. Sjenica lamb meat, dry meat products and sheep Sjenica cheese have reputation of high quality. Sjenica sheep cheese is also PDO.

Pester plateau which is spread on the territory of Sjenica municipality, and parts of Tutin and Novi Pazar. It spreads over 2 NUTS3 regions - Zlatibor and Raska districts. This area is highland landscape of meadows and pastures, with karst structure. This area has very harsh climate – very cold winters (with temperatures to -42°C) and hot and dry summers. Very small percentage of the land is cultivated, because farmers usually graze animals on natural pastures, using very little or no fertilisation. Due to its beauty and uniqueness, and good quality food, this area is interesting for tourism, mostly rural tourism, and adventure tourism. Proximity of Uvac lake (nature reservat) is of a great importance for touristic offer of the area.

Reference mountain landscape statistics  
(A: Data for the NUTS3 RS211)

Reference mountain chain	Dinaric Alps region		
Reference mountain landscape	Sjenica		
Size of the area (km <sup>2</sup> )	1,059	Average per capita income (€)/year	-
Altimetry (m; min-max)	900–1,300	Total Gross Value Added (GVA) (€ million)/year	1,057 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	24.25	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-2.73%	Primary:	10.1% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	-	Secondary (including construction):	41.5% <sup>A</sup>
		Tertiary:	48.4% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	176	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	5,225	Primary:	4.7% <sup>A</sup>
Protected areas	Yes	Secondary:	41% <sup>A</sup>
		Tertiary:	55% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Livestock husbandry is the main agricultural activity in Pester plateau. Lamb meat (Sjenica lamb) production is at the basis of the VC, having sheep farms solely for meat, where farmers sell them as live animals to the middleman (usually at very low prices). There were about 28.433 sheep at Sjenica municipality in 2018, but this number is declining. Animals are grazed on natural pastures, with lot of specific wild herbs and plants, which leads to high quality of sheep meat. As a part of the production systems, farmers produce Sjenica sheep cheese, which is also protected as a PDO product. Traditional sheep meat products like Sjenica stelja (dried sheep meat / specific as drying the whole animal) is also protected as PDO product. Farm processing is traditional, and there is an increasing trend in small house processing units' registration (Serbia adopted regulative for small processing unit registration). Regional rural development centre exists in the area, providing advisory support and services to farmers. The VC is present in Montenegro, since there are farmers in both bordering regions that have pastures in both countries. Additionally, the tradition and cultural heritage is strongly connected to the cross-border region (Serbia and Montenegro, as well as Serbia and Albania). The same type of product / Dry sheep meat (Sjenica stelja) is protected in Montenegro as Montenegrin stelja.

### Key local assets

Key local assets are:

- The multi-cultural area, with strong connections to the neighbouring countries – Montenegro, Bosnia and Herzegovina and Albania.
- Traditional knowledge on livestock farming and production of traditional products (cheese, dry meat) is kept in large multi-generational families.
- Strong connection to the cultural and national heritage.
- Specific grazing systems (Highland mountains grazing systems - nomadic). Emerging small and middle size farms are registering processing due to new regulation that are set for small farms and processing units.

### Challenges

Farm gate prices of sheep were very low in 2020, due to the lock down in the season of sheep selling. Many farmers sold parts of their herds and had problems with feeding of animals due to dry season and heavy rains in the summer. Ecosystems are endangered by pollution and climate change. Family farming is endangered, and their sustainability is fragile. Special nature reserve area is endangered too, together with the grazing system for cattle and sheep. Farmers are not well organised, lack of farmers organisations and problems in the summertime with shepherds.

### Innovation

Grazing of livestock on natural pastures is already major production system; therefore, the transition to organic production is not requiring large investments, nor change in animal breeding. There are initiatives for organised organic production / entrepreneurial individuals are organising interested farmers to start collective transition to organic farming. Existing natural conditions offer possibilities for developing other high-quality production systems, including agroecological production, etc. There are initiatives for starting e-commerce of the products from this area. There



are potentials to protect PDO product at the EU level and have direct export with the label. Additionally, connecting the products with sustainable tourism (rural tourism) and other channels for selling these products (e-commerce) creates potential for avoiding low prices and selling animals. Rising interest of young people to be involved in the livestock production creates possibilities for new approaches to traditional farming and product marketing.

## Sjenica dry sheep meat - PDO.

Pester plateau is a Special nature reserve area. Family farming is prevailing, sheep are grazed at natural pastures. Sjenica lamb meat, dry meat products and sheep Sjenica cheese have reputation of high quality. Sjenica sheep cheese is also PDO.

Pester plateau which is spread on the territory of Sjenica municipality, and parts of Tutin and Novi Pazar. It spreads over 2 NUTS3 regions - Zlatibor and Raska districts. This area is highland landscape of meadows and pastures, with karst structure. This area has very harsh climate – very cold winters (with temperatures to -42°C) and hot and dry summers. Very small percentage of the land is cultivated, because farmers usually graze animals on natural pastures, using very little or no fertilisation. Due to its beauty and uniqueness, and good quality food, this area is interesting for tourism, mostly rural tourism, and adventure tourism. Proximity of Uvac lake (nature reservat) is of a great importance for touristic offer of the area.

### Reference mountain landscape statistics (A: Data for the NUTS3 RS211)

Reference mountain chain		Dinaric Alps region	
Reference mountain landscape		Sjenica	
Size of the area (km <sup>2</sup> )	1,059	Average per capita income (€)/year	-
Altimetry (m; min-max)	900– 1,300	Total Gross Value Added (GVA) (€ million)/year	1,057 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	24.25	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-2.73%	Primary:	10.1% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	-	Secondary (including construction):	41.5% <sup>A</sup>
		Tertiary:	48.4% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	176	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	5,225	Primary:	4.7% <sup>A</sup>
Protected areas	Yes	Secondary:	41% <sup>A</sup>
		Tertiary:	55% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Livestock husbandry is the main agricultural activity in Pester plateau. Lamb meat (Sjenica lamb) production is at the basis of the VC, having sheep farms solely for meat, where farmers sell them



as live animals to the middleman (usually at very low prices). There were about 28.433 sheep at Sjenica municipality in 2018, but this number is declining. Animals are grazed on natural pastures, with lot of specific wild herbs and plants, which leads to high quality of sheep meat. As a part of the production systems, farmers produce Sjenica sheep cheese, which is also protected as a PDO product. Traditional sheep meat products like Sjenica stelja (dried sheep meat / specific as drying the whole animal) is also protected as PDO product. Farm processing is traditional, and there is an increasing trend in small house processing units' registration (Serbia adopted regulative for small processing unit registration). Regional rural development centre exists in the area, providing advisory support and services to farmers. The VC is present in Montenegro, since there are farmers in both bordering regions that have pastures in both countries. Additionally, the tradition and cultural heritage is strongly connected to the cross-border region (Serbia and Montenegro, as well as Serbia and Albania). The same type of product / Dry sheep meat (Sjenica stelja) is protected in Montenegro as Montenegrin stelja.

### Key local assets

Key local assets are:

The multi-cultural area, with strong connections to the neighbouring countries – Montenegro, Bosnia and Herzegovina and Albania.

- Traditional knowledge on livestock farming and production of traditional products (cheese, dry meat) is kept in large multi-generational families.
- Specific grazing systems (Highland mountains grazing systems - nomadic).
- Emerging small and middle size farms are registering processing due to new regulation that are set for small farms and processing units.

### Challenges

Farm gate prices of sheep were very low in 2020, due to the lock down in the season of sheep selling. Many farmers sold parts of their herds and had problems with feeding of animals due to dry season and heavy rains in the summer. Ecosystems are endangered by pollution and climate change. Family farming is endangered, and their sustainability is fragile. Special nature reserve area is endangered too, together with the grazing system for cattle and sheep. Farmers are not well organised, lack of farmers organisations and problems in the summertime with shepherds.

### Innovation

Grazing of livestock on natural pastures is already major production system; therefore, the transition to organic production is not requiring large investments, nor change in animal breeding. There are initiatives for organised organic production / entrepreneurial individuals are organising interested farmers to start collective transition to organic farming. Existing natural conditions offer possibilities for developing other high-quality production systems, including agroecological production, etc. There are initiatives for starting e-commerce of the products from this area. Sjenica dry meat need better marketing strategies and governance of the VC to be more present in the niche markets and create demand for this high-quality product. There are potentials to protect PDO Sjenica stelja at the EU level and have direct export with the PDO label. Additionally,



connecting the products with sustainable tourism (rural tourism) and other channels for selling these products (e-commerce) creates potential for avoiding low prices and low demand. Rising interest of young people to be involved in the livestock production creates possibilities for new approaches to traditional farming and product marketing. Sjenica and Tutin areas have higher percentage of young people than other mountainous regions.

## Zlatar cheese - PDO.

Full fat cheese in brine made from cow milk, matured for one month. Zlatar Mountain is in Western Serbia, and it is well known for its nature, air (mix of Mediterranean and continental air), lakes and beautiful landscapes.

Zlatar Mountain is in the territory of Nova Varos municipality, and partially Sjenica municipality in the NUTS 3 region of Zlatibor. This mountain has very good climate, with mixture of Mediterranean and mountainous climate, creating very good combination and popular touristic "air spa". Forests are spread on over 30% of its territory, while agricultural land is a mixture of natural pastures and meadows and arable land. Besides livestock production, important is fruit production, NTFP and beekeeping. here are three lakes and three rivers that are very attractive for tourists. They are also creating beautiful landscapes. Special nature reserve Uvac is habitat of the endangered Griffon vulture, with one of the biggest vulture population in Europe.

### Reference mountain landscape statistics (A: Data for the NUTS3 RS211)

Reference mountain chain		Dinaric Alps region	
Reference mountain landscape		Nova Varos	
Size of the area (km <sup>2</sup> )	581	Average per capita income (€)/year	-
Altimetry (m; min-max)	760–1,625	Total Gross Value Added (GVA) (€ million)/year	1,057 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	24.64	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-16.1%	Primary:	10.1% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	-	Secondary (including construction):	41.5% <sup>A</sup>
		Tertiary:	48.4% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	178	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	3,453	Primary:	4.7% <sup>A</sup>
Protected areas	Yes	Secondary:	41% <sup>A</sup>
		Tertiary:	55% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Cows are grazed in natural meadows and pastures with very little concentrate food feeding. Family farming is prevailing with small dairies and on-farm processing. Zlata cheese is highly rated in traditional restaurants and is present in restaurants in the area, as well as in Belgrade.

Livestock husbandry is the main agricultural activity in Zlata Mountain. Cattle breeding is at the basis of the VC, the biggest number of the farmer households is with 1-2 and 3-9 animals. Animals are grazed on natural pastures, with lot of specific wild herbs and plants (also medical plants), which leads to high quality of cow milk. As a part of the production systems, farmers produce Zlata cow cheese in brine, which is protected as a PDO product at Serbian level. Farms are mostly owned by farmers and registered as agriculture households, and there are a couple of milk processing units registered (on-farm processing registered) and small dairies. Farm processing is traditional, and there is a possibility to have small house processing units' registration (Serbia adopted regulative for small processing unit registration). PDO registration and the ongoing certification process will allow producers of Zlata cheese to add value to their product, have specific marketing and labelling. The VC is present in Montenegro, since there are farmers in both bordering regions that have pastures in both countries. Additionally, the tradition and cultural heritage is strongly connected to the cross-border region (Serbia and Montenegro, as well as Serbia and Albania). The same type of product / Dry sheep meat (Sjenica stelja) is protected in Montenegro as Montenegrin stelja.

### Key local assets

Key local assets are:

- The multi-cultural area, with connections to the neighbouring countries – Bosnia and Herzegovina and Montenegro.
- Traditional knowledge on livestock farming and production of traditional products (cheese) is kept in families.
- Beautiful landscapes and forests are specific asset of the area.

### Challenges

Cheese production is mostly done on-farm, and there are few small processing units registered on farms. There are a few small dairies in the area. Number of cattle is reducing, as well as number of people in rural areas who are keeping animals. In the last couple of years there have been some attempts to organise farmers and create farmer organisations for managing PDO Zlata cheese, increase its visibility and prevent misuse of the name by other cheese producers outside of Zlata area. Parts of Zlata Mountain are rapidly being urbanised. Natural assets are protected, but there are some incidents that are endangering the wildlife and protected species (big vultures in the park). Certification and legal protection of the Zlata cheese in the market are priorities for the Local self-government and farmers from the area. There are initial actions for organising farmers in associations for certification of the cheese and PDO management and marketing. Pollution and climate change are also threatening the area (waste management, river pollution, etc).

### Innovation



There are initiatives for organised organic production / entrepreneurial individuals are organising interested farmers to start collective transition to organic farming. Existing natural conditions offer possibilities for developing other high-quality production systems, including agroecological production, etc. There are initiatives for starting e-commerce of the products from this area. Sjenica dry meat need better marketing strategies and governance of the VC to be more present in the niche markets and create demand for this high-quality product. The reputation of the product is high, but the form of selling the product (the whole or half dried sheep is a piece) makes marketing more complex. There are potentials to protect PDO Sjenica stelja at the EU level and have direct export with the PDO label. Additionally, connecting the products with sustainable tourism (rural tourism) and other channels for selling these products (e-commerce) creates potential for avoiding low prices and low demand.

## Potato from Ivanjica - PDO.

Ivanjica potatoes (Ivanjiski krompir) are PDO registered product at Serbian level (Protected Designation of Origin). This potato has a long tradition of production and very high reputation in Serbia, as well as in the region. Family farming is prevailing. According to the last Agricultural census conducted in 2012 in Serbia, 4.356,67 ha, this makes around 17% of the total production of the potatoes in Serbia. The municipality of Ivanjica is part of Golija Mountain, which is protected as Natural Park (IUCN Ib protection), with its highest peak at 1.833m. Additionally at the territory of Ivanjica there is also protected Landscape of outstanding feature Mali Rzav (spring of river Rzav).

Ivanjica is mountainous municipality with the highest pick at 1833m. The area is part of the Mountain Golija (Dinaric mountains) which is protected Natural Park. Almost 50% of the area is under the forests, from deciduous forest to conifer forests. The area is rich in rivers and water. Rivers are mountainous rivers with habitat of many different river fish / interesting for sport fishing. Many wild animals live in Ivanjica/Golija mountain forests, some of them endangered.

### Reference mountain landscape statistics (A: Data for the NUTS3 RS214)

Reference mountain chain		Dinaric Alps region	
Reference mountain landscape		Ivanjica	
Size of the area (km <sup>2</sup> )	1,090	Average per capita income (€)/year	-
Altimetry (m; min-max)	468– 1,833	Total Gross Value Added (GVA) (€ million)/year	906 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	27	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-8.4%	Primary:	12.9% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	-	Secondary (including construction):	34% <sup>A</sup>
		Tertiary:	53.1% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	123	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	6,697	Primary:	4.6% <sup>A</sup>
Protected areas	Yes	Secondary:	31.5% <sup>A</sup>
		Tertiary:	63.8% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Potatoes are grown mostly by small farmer households. The land plots are small (parcelling was not implemented), growing is extensive, therefore yields are small (up to 10t/ha). There are several bigger companies that are subcontracting farmers for production, but many individual households also produce potatoes and sell them on the green markets or through the direct sale. Companies sell potatoes at the retailer stores, and/or export them to the region. Potatoes are produced in other mountain regions too, but Ivanjica potatoes have the highest reputation among customers, due to its high quality and taste.

### **Key local assets**

Due to specific climate conditions, Ivanjica is exclusive European climate spa, with Institute for specific rehabilitation. The area is rich in mountainous rivers full of fish, making the area interesting for sport fishing. Landscapes and scenery are beautiful, attracting tourists, and that should be preserved. The area is full of minerals and possibilities for mining (antimony, craft stones, specific stones used for roofs, etc.). Almost 50% of the area is under forests, rich in non-forest products and wild animals, some of them are endangered species.

### **Challenges**

Prices of potatoes were very low in 2020, causing big quantities of potatoes in stock at the end of the season. Producers are facing problems due to the bad year, with additional burden of this remaining stocks. Areas under potatoes are reducing, and it can be expected that this trend will continue.

### **Innovation**

Certification of the Ivanjica potatoes as protected designation origin, and marketing under this label should bring added value and differentiation on the markets, both on national and international (especially if the product would be protected at EU level at the later stage). Ivanjica potatoes are very important for the area, as they are mainly produced by family farming households. Current situation is not favourable for the production, and it affect the quantities produced for a longer period. Import of potatoes from other countries brings the necessity to differentiate this product from the imported ones. This can be done by new marketing strategies, labelling, initiating organic production, etc.

## Buckwheat flower and shells.

Buckwheat has a long tradition of growing in Nova Varos, some legends say since 14th century. It used to be considered "poor people" food, but at the beginning of 2013, buckwheat was reintroduced in the region of Zlatar.

Zlatar Mountain is in the territory of Nova Varos municipality, and partially Sjenica municipality in the NUTS 3 region of Zlatibor. This mountain has very good climate, with mixture of Mediterranean and mountainous climate, creating very good combination and popular touristic "air spa". Forests are spread on over 30% of its territory, while agricultural land is a mixture of natural pastures and meadows and arable land. Besides livestock production, important is fruit production, NTFP and beekeeping. here are three lakes and three rivers that are very attractive for tourists. They are also creating beautiful landscapes. Special nature reserve Uvac is habitat of the endangered Griffon vulture, with one of the biggest vulture population in Europe.

### Reference mountain landscape statistics (A: Data for the NUTS3 RS211)

Reference mountain chain		Dinaric Alps region	
Reference mountain landscape		Nova Varos	
Size of the area (km <sup>2</sup> )	581	Average per capita income (€)/year	-
Altimetry (m; min-max)	760–1,625	Total Gross Value Added (GVA) (€ million)/year	1,057 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	24.64	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-16.1%	Primary:	10.1% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	-	Secondary (including construction):	41.5% <sup>A</sup>
		Tertiary:	48.4% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	178	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	3,453	Primary:	4.7% <sup>A</sup>
Protected areas	Yes	Secondary:	41% <sup>A</sup>
		Tertiary:	55% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year



It started in the areas of couple of villages, where it is grown without using pesticides. Buckwheat became very popular as healthy food, especially coming from the Zlatar area, which is considered as clean and ecological. Buckwheat is also grown as organic product (certified).

Buckwheat is produced by individual farmers, mostly farmers who also started to grow other old types of grains (spelt, barley, etc.). It is grown almost without herbicides and pesticide, but it has good yields due to the favourable climate and land. It is also very good honey plant, especially since there are beekeepers in Zlatar. Buckwheat is milled in stone mills and packed. It is sold in healthy food stores, as well as in retail stores. Additionally, buckwheat shells are used for making pillows or other products. Besides flower, buckwheat is sold in a format of crusts for human consumption too. Buckwheat is produced in other mountain areas in Serbia, as well as in plains (Vojvodina). Raska region and Pirot district are also regions where buckwheat is produced.

### Key local assets

Key local assets are multi-cultural area, with connections to the neighbouring countries – Bosnia and Herzegovina and Montenegro. Agriculture is mostly extensive, using natural pastures and feeding, and growing buckwheat and other grains/fruits and vegetables with minimum, or no pesticide. Potentials for rural tourism with low carbon print is high. Lakes (three artificial lakes, but of a great beauty) Zlatarsko, Uvačko and Radoinjsko play important role in tourism, as well as in landscape preservation. Beautiful landscapes and forests are specific asset of the area. Production of buckwheat is again becoming important part of image of the Zlatar mountain as healthy, clean, and ecological area.

### Challenges

No major challenges are present in the VC. However, popularity of the product creates much larger demand, and therefore wider growing of this grain. Growing conditions are favourable, but also in some years, if the temperature is too high in the flowering season, yields are very small / bringing insecurity in the market.

### Innovation

Buckwheat was grown in Nova Varos for a very long time, but it was abandoned after the II World War, as it was considered as "food for poor". New tendencies and re-introduction of old grains" as healthy food in the diet grown without pesticides, made this grain popular again. Buckwheat flower is produced in the old mills (stone mills) and the shells are sold for pillows and other products. No part of buckwheat is wasted. Buckwheat, together with other autochthonous grains like spelt (*Triticum spelta*) returned as healthy food into people's diets. Buckwheat is grown in mountainous areas, especially in Zlatar region, but instead of being food for poor, now it brings much higher income to the farmers. Additionally, preparation for market ((milling and packaging) and marketing of the product are creating mixture of traditional and innovative approach. Buckwheat flower is also used for preparing Zlatar speciality / buckwheat pie with Zlatar cheese.

## Vaccinium Myrtillus from National Park Kopaonik

"Wild blueberry" and other NWF products are collected and used for domestic products and local specialities in Kopaonik mountain / very well-known touristic area. Many products are also exported / cold pressed juices, lyophilised fruits, etc.

Kopaonik National park and its vicinity have been a polygon of mass winter sports tourism in the last decades. Being the highest peak in Serbia, there has always been a lot of pressure of visitors and even increased lately. Kopaonik owes its name to its abundance of mineral resources. To this day, ores of iron, lead, and zinc, as well as silver and gold, can be found in the bottom of the mountain. Today, Mt. Kopaonik is the number one ski resort in Serbia and the wider region, still with lots of construction and tourism that are seen as the best development opportunity.

Reference mountain landscape statistics  
(A: Data for the NUTS3 RS216)

Reference mountain chain	Dinaric Alps region		
Reference mountain landscape	Nova Varos		
Size of the area (km <sup>2</sup> )	606	Average per capita income (€)/year	-
Altimetry (m; min-max)	500– 2,017	Total Gross Value Added (GVA) (€ million)/year	729 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	24.1	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-11.7%	Primary:	16.7% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	-	Secondary (including construction):	33.4% <sup>A</sup>
		Tertiary:	49.8% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	97.2	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	4,547	Primary:	11.6% <sup>A</sup>
Protected areas	Yes	Secondary:	37.7% <sup>A</sup>
		Tertiary:	50.7% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Opposed to cultivation of blue berry in the region, these berries grow in the wild, are handpicked by locals and offered to the same processing VC as the cultivated ones with the added attribute

of being wild. Amounts that can be picked is determined by government regulations via permits for the sustainable use of this resource.

Local wild berries picked by local people to supplement their incomes. Pure natural product dependent on the state of the natural system. Local knowledge of the terrain and growing conditions is required to find the berries and pick them at the right moment. Since pickers are usually the poor local people, their bargaining and negotiating power is most likely reduced and they depend on what the purchasing stations are willing to pay them. Most producers/processors further down the VC adhere to at least one quality scheme such as the HACCP standard.

### **Key local assets**

People that pick the wild berries are local people that supplement their incomes with picking the wild berries. They sell them to local purchasing stations that then pass them on to the same processing facilities that serve the cultivated berries.

### **Challenges**

Since the wild berries are sold to purchasing stations and from there find its way further through the VC, the same challenges regarding underused capacity, lack of effective marketing strategies, etc. apply. On top of that come the problems posed by the effects of climate change such as drought, late season frost, etc. In addition, while for the cultivation of blue berries stable production and quality via applying cultivation techniques can be assured, this does not apply for wild berry picking which is dependent on local climatic and soil conditions. Wild berries are not always easy to find and do not have the same characteristics over various season thereby not guaranteeing stable quality. Other challenges could lie in picking at the wrong moment (too soon or too late) or over picking thereby damaging the sustainable use of this resource.

### **Innovation**

There is no innovation in the picking of wild berries. Hand picking is done by traditional means. The only "innovation" would be that the berries can be labelled as wild and "from Nature" as opposed to their cultivated cousins. No information about this labelling further down the VC with especially marketing techniques targeting specific segments of the consumer market could be ascertained at this moment. This product is potentially a niche market for more health and ecological oriented consumers who would prefer wild berries over cultivated ones. For this, the VC down the line would have to devise new marketing strategies and create new markets for instance in health shops, green markets, pharmacies.

## Trout fish

Fresh water trout is a high valued mountain product for premium local and national markets (mostly HORECA). The mountain streams and river flows are diverted as natural habitats of freshwater trout and often promoted as a business idea for income diversification in the area with favourable natural conditions and waterflows.

Pester plateau which is spread on the territory of Sjenica municipality, and parts of Tutin and Novi Pazar. It spreads over 2 NUTS3 regions - Zlatibor and Raska districts. This area is highland landscape of meadows and pastures, with karst structure. This area has very harsh climate – very cold winters (with temperatures to -42°C) and hot and dry summers. Very small percentage of the land is cultivated, because farmers usually graze animals on natural pastures, using very little or no fertilisation. Due to its beauty and uniqueness, and good quality food, this area is interesting for tourism, mostly rural tourism, and adventure tourism. Proximity of Uvac lake (nature reservat) is of a great importance for touristic offer of the area.

Reference mountain landscape statistics  
(A: Data for the NUTS3 RS211)

Reference mountain chain		Dinaric Alps region	
Reference mountain landscape		Sjenica	
Size of the area (km <sup>2</sup> )	1,059	Average per capita income (€)/year	-
Altimetry (m; min-max)	900– 1,300	Total Gross Value Added (GVA) (€ million)/year	1,057 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	24.25	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-2.73%	Primary:	10.1% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	-	Secondary (including construction):	41.5% <sup>A</sup>
		Tertiary:	48.4% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	176	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	5,225	Primary:	4.7% <sup>A</sup>
Protected areas	Yes	Secondary:	41% <sup>A</sup>
		Tertiary:	55% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Mountain trout value chain is nationally fragmented and dominated by small actors, with capacity of up to 1000m<sup>2</sup>. Out of this number many are not even registered. Their production ranges from very extensive to semi-intensive, and intensive, from lack of any mechanisation and treatment to fully organised fishpond productions. Fresh fish is sold usually locally and through HORECA sector, while bigger facilities are starting processing and packaging for more remote markets, as demand is increasing. The organic production is underdeveloped though an interesting niche market. Linkages with tourism are strong not only outlets for the final product, but also in promotion of sport fishery in the mountain regions which are in case of Bajina Basta protected as Natural Park and cross border regions of Drina river watershed. Some companies are even having their operations in both countries (Bosnia and Hercegovina and Serbia) using the best locations for the production. VC is present in Montenegro, Bosnia, and Hercegovina, but also other mountain regions in Western Balkans, rich with clear waters.

### Key local assets

The key asset are the mountain water systems and watersheds. There is a strong competition in their use with the small hydro power plants that have been constructed or approved for construction all over Serbia. The demonstration of another concept of use is very valuable also as a diversification of the rural economy in small scale establishments in mountain areas. Though very dispersed, the similar fishponds are organised all over the mountain areas not only in Serbia but in Bosnia and Herzegovina and Montenegro. Being a border area, there is strong influence on cross border water management of such water flows.

### Challenges

Water management of mountain streams and waterflows becomes an issue of increased interest and value. There are different sectors competing, from energy through small hydro power plants, which present huge threat to mountain ecosystems and right to water. Use of mountain streams for fish production is linked to clear and not polluted waters and springs. The environmental impacts need to be monitored and considered due to challenges in water supply over summer months, possible pressures in releasing organic waste or intensive fish breeding. The production is situated within and in vicinity of protected areas, there are many small operators, often not registered, with trend of expansion and production increase. The environmental and landscape pressures are to be considered within future expansion to respond to the increased market demands.

### Innovation

Trout production is upscaling in vicinity of mountain streams, with introduction of the invasive trout species that are more productive and resilient. There is growing focus to processing, smoking, finalisation through better packaging and cleaning (fish fillet). Organic production though interesting is still in rudimentary phases. Linkages to tourism are strong, and apart from intensive breeding, there are free water fishing opportunities of mountain trout that are increasingly popular. Water management and monitoring of water quality ting natural conditions offer possibilities for developing other high-quality production systems, including agroecological production, etc. There are initiatives for starting e-commerce of the products from this area. As fish consumption per



capita increases, there is an increased interest for mountain trout both from local markets, and HORECA but also retail. There are more investments in facilities, still the overall production is small both by volume and number of operators. Often perceived as a solid business idea in the mountain areas rich with fresh springs and water, this expansion trend is limited by natural capacities, that are still significant and not valorised enough. As the production will grow, also will the pressures to mountain water flows and ecosystems. Trout production VC is fragmented and localized, with short channels linked to retail or restaurants.

## Tourism in Zlatibor mountain

Zlatibor Mountain is one of the most popular touristic places in Serbia. Health tourism, skiing, hiking, adventurous, and other types of tourism are very much present in the area. Due to its popularity, some of the processes are not fully in line with environment protection, and there is a tendency of over-urbanisation. The municipality of Čajetina where Zlatibor is located also started some positive changes - projects for waste management and recycling, together with programmes of education for school children on environment protection.

Zlatibor mountain is rich in natural, cultural, and historical assets. Its climate and high number of sunny hours per year is making this area suitable for health tourism (air spa), as well as other types of tourism. Main economic activities, besides tourism are agriculture, processing industry (meat, dairy etc.) and wood processing. The area is rich in waters, with two artificial lakes, used for water supply. Flora and fauna are also very rich, with many medical herbs and wild animals like wolfs. The area is very popular for living, and there is very small reduction in population numbers.

### Reference mountain landscape statistics (A: Data for the NUTS3 RS211)

Reference mountain chain	Dinaric Alps region		
Reference mountain landscape	Čajetina		
Size of the area (km <sup>2</sup> )	647	Average per capita income (€)/year	-
Altimetry (m; min-max)	750–1,496	Total Gross Value Added (GVA) (€ million)/year	1,057 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	22.5	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.95%	Primary:	10.1% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	-	Secondary (including construction):	41.5% <sup>A</sup>
		Tertiary:	48.4% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	176	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	5,225	Primary:	4.7% <sup>A</sup>
Protected areas	Yes	Secondary:	41% <sup>A</sup>
		Tertiary:	55% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Zlatibor is very popular touristic place with many natural characteristics that make it suitable for different types of tourism - health tourism (air-spa), congress tourism, and individual tourism with many opportunities for adventure tourism, sport tourism, rural tourism, etc. The touristic offer is very wide, from leisure, natural beauty, recreation opportunities, mountainous sport preparation for teams, rural experiences with offer of participating in field works, etc. There are different types of accommodation, from rural houses to high ranked hotels. The centre of the Zlatibor Mountain - Zlatibor settlement, is becoming over-urbanised, creating different problems for local socio-ecological system. Local food products are also creating an important part of the offer, giving the opportunity to local producers and processors to have short VC for their products. The municipality Cajetina is one of the most developed municipalities in Serbia due to the high touristic potential of the area. Mountain tourism is developed also in Kopaonik, Stara Planina, and Zajecar.

### Key local assets

Key local assets are:

- The specific climate - sub-alpine climate / wind rose is specific in this area, winter and summer are mild, and the number of sunny days is very high - more than 2000 sunny hours per year. This creates good conditions for air - spa, where many people come to recover after respiratory infections, anaemia and if having problems with thyroid.
- Landscape is unique, and the area is rich in waters, rivers, and beautiful and rich caves. Additionally, the flora and fauna are rich, with high content of medical herbs on meadows and different wild animals and species. There are many wolves in the area, as well as boars, foxes, squirrels, rabbits, etc.
- Culture and history are very rich in the area. Zlatibor became touristic place long time ago - at the end of XIX century, and it was known as "trendy place" where kings also used to come for holidays and recover.

### Challenges

Over-urbanisation of the area is one of the biggest challenges of Zlatibor as a touristic destination. This brings other problems to the scene, like waste management, water treatment, air pollution, etc. Initial steps were taken by the municipality of Cajetina, but there is a lot of space for improvements. Deforestation is also becoming important challenge, especially because the mountain was named according to its beautiful pine forests (Zlatibor - golden pine, *Pinus Silvestris Variegata Zlatiborica* which can only be found in the village Negbini, and is under state protection)

### Innovation

Beside commercial and urban tourism, Zlatibor is developing other interesting touristic offers / rural tourism - offering tourists to participate in field works and other on-farm activities; Health tourism - very clean air, combined with favourable winds and high number of sunny days, provide conditions for rehabilitation of respiratory diseases, anaemia, and problems with thyroid. In the areas of Zlatibor Mountain which are not so close to the urban part, new types of tourism are also developing - hiking and Nordic skiing. The area is well known for its natural values, as well as for the quality products. Beauty and natural values of the Zlatibor Mountain are endangered if there





is no deep understanding of the effects of the current touristic expansion. Support to the actors trying to initiate some positive changes is needed. The investment planning takes place now over sustainable development planning. New strategies and governance systems need to be developed, and some good initiative need to be supported and expanded (waste management, protecting cultural and touristic assets).

## Vlasina honey - PDO

Vlasina honey is recently registered as a PDO and one of the five honeys in Serbia with this status. The area where it is produced, Vlasina plateau and Vlasina lake are very known by its specific ecosystems, floating peat-islands, and preserved nature. Beekeepers in the area mainly deal with stationary beekeeping in beekeeping directly at this area. They produce high quality multifloral honey which is highly valued and associated with floral and landscape uniqueness. Though protected, it is at the same time in constant threat of the untransparent investments that might have negative impact on the local resources. Strong depopulation of the area and lack of economic opportunities brings also unrealistic expectations of this developments for local people mostly searching for employment and income.

Currently the region is very much visited by locals and nature lovers, the population density is small and declining. There is news on the alarming projects that intend to convert the area in more intensive touristic destination. Honey production is one of the activities that could strengthen the relation to natural capital and benefit from it.

### Reference mountain landscape statistics (A: Data for the NUTS3 RS228)

Reference mountain chain	Dinaric Alps region		
Reference mountain landscape	Surdulica		
Size of the area (km <sup>2</sup> )	628	Average per capita income (€)/year	-
Altimetry (m; min-max)	475– 1,875	Total Gross Value Added (GVA) (€ million)/year	489 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	29	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-8.56 %	Primary:	6.7% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	-	Secondary (including construction):	34.4% <sup>A</sup>
		Tertiary:	58.8% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	93	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	2,232	Primary:	1.8% <sup>A</sup>
Protected areas	Yes	Secondary:	41.3% <sup>A</sup>
		Tertiary:	57% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

There are around 100 beekeepers gathered in three beekeeper associations that coordinate and support by advice and quality certification of the production. The sale is mostly direct, by producers themselves, though a portion is labelled and sold through Serbian Beekeeper Association SPOS. The beekeepers from three municipalities are included in production of Vlasina honey, but for most of them these are hobby activities, that supplement their family budget. Total yearly production of Vlasina honey is estimated at 15-20 tons which is a third of all honey produced in this area.

### **Key local assets**

Vlasina plateau and Vlasina lake are protected as a landscape of outstanding features and categorized as a natural resource of great importance. Its signature is diversity and specificity of biotopes causing a high diversity of flora, vegetation, fauna, and ecosystems that are characterized by high degree of origins and authenticity of natural features. One of the lake's most famous features are the floating islands. It is estimated that the peat chunks took 5,000 years to form. There are up to 30 floating islands at the time. Driven by the wind, they float from one shore of the lake to another, carrying the flora and fauna, and serving as shelter and a food source for fish. For that reason, they are an attractive target for fishermen, however it is forbidden to visit them or disturb them because of the unique animal and plant ecosystems, though walking on them is practically impossible since they do not have solid ground.

### **Challenges**

Vlasina area is under pressures of misuse from many aspects. This part of Serbia has one of the largest migration rates, and strong disbalance in regional development, comparing to the most developed areas. The natural values are reason for also very strong and not enough transparent plans for conversion of the area in tourism centre. In the meantime, there are issues that affect the local ecosystems and activities leaning on them. Artificial by origin, this lake and the watershed face issues of water use and water management. In 2018, sudden water discharge at the dam threatened to destroy the part of the plan and animal life in the lake. Numerous boats and barges were stranded, so as the "Moby-Dick", the largest floating island on the lake.

### **Innovation**

Quality governance, certification and new packaging and labelling are part of the new strategies to communicate the quality of this product. Vlasina honey and the territory from which it comes from, are example of insufficiently valorised unique areas of mountains and mountain ecosystems. The contrasts of high natural value and tendencies of misuse in construction of small hydropower plants and water management (currently) and investments in large tourism capacities, raise attention to look and promote more sustainable ways of gaining economic benefits.

## Pirot hard cheese from sheep and cow milk

On of prominent GI products, using the original recipe, which is more than two centuries old, skilled artisans make Pirotski kackavalj (Hard cheese from Pirot), a very famous Serbian delicacy. Pirotski kackavalj made it to the list of intangible cultural heritage of Serbia. Pure milk from Stara planina and salt are the basic ingredients. It holds reputation for its soft but recognisable taste deriving from the high-quality mild from the mountain pastures, and traditional manual process. The decline of livestock production makes it particularly fragile when it comes to the quantities on the market and know how.

Pirot area is part of the of the Stara Planina National park and area of great natural value. Specific traits of traditional manufacturing of Pirot kachkaval derive from climatic conditions, characteristic grass habitat and the specific mountain region and milk from autochthonous populations (Pirot sheep). There is strong pressure of touristic investments and use of waterstreams that put pressures on enviornmental values. Traditinal know how and skills are embedded in the production process.

### Reference mountain landscape statistics (A: Data for the NUTS3 RS226)

Reference mountain chain	Dinaric Alps region		
Reference mountain landscape	Pirot		
Size of the area (km <sup>2</sup> )	1,232	Average per capita income (€)/year	-
Altimetry (m; min-max)	368– 2,169	Total Gross Value Added (GVA) (€ million)/year	370.5 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	44	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-6.71 %	Primary:	5.6% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	-	Secondary (including construction):	58.4% <sup>A</sup>
		Tertiary:	35.9% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	75	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	4,557	Primary:	1.8% <sup>A</sup>
Protected areas	Yes	Secondary:	45.4% <sup>A</sup>
		Tertiary:	53% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The VC is dominated by the production of single dairy, Secondary dairy school in Pirot that is the guardian of the tradition and know how. There are around 13000 sheep produced by small scale farmers and the main milking season is May to October, while the rest of the year entails more use of cow milk in the cheese composition. The Dairy school is selling directly to consumers, through own shop to local market and through retail network. There is little readiness for further innovation in this moment, and the initiative to work on further quality distinction between PDO cheese are not taken yet. The same cheese production is present in Bulgaria.

### **Key local assets**

The natural properties of Stara planina natural park and its slopes and vicinity are initial condition for high quality product. Grazing areas, biodiversity and traditional know how the strongest pillars for production of Pirot cheese are. Social and cultural aspects are also strong, with equipment (weaving basket) used for cheese production. That made the whole cheese making skill part of the Serbian immaterial cultural heritage.

### **Challenges**

Depopulation and change of lifestyle from pasture grazing system to stationary are the main reasons for decline in number of sheep and milk shortage. There are 13760 sheep now, and they are the aging and uninhabited villages cannot sustain the needed production. Apart from these, the management of natural resources becomes an issue with increased vulnerability and threat of investments in small hydro power plants that deprive population from fresh water and destroy watershed and scenery.

### **Innovation**

The VC is rather traditional with innovated marketing strategies and promotion processes. The PDO registration is placed within Dairy secondary school in Pirot and that makes a good locus for spreading knowledge and know how. In the Serbian part of Balkan Mountains, Stara planina mt. there is a long tradition of livestock sheep production. Products such as Pirot kackavalj (yellow mixed or sheep cheese) and Pirot lamb are highly valued and recognized and protected as PDO. However, the region is under many threats from depopulation and economic deprivation to pressures from tourism and environmental degradation. The Pirot cheese PDO does not live to its potential of bringing benefits to producers which are often invisible. The pastoral lifestyle is becoming rare.

## Mixed milk (cow and sheep) white cheese in brine

Pirot white cheese in brine is a high-quality product usually made of mixed cow and sheep milk. Also, it can be only cow, or only sheep cheese. The sheep and mixed cheese can be made only in the sheep milking season, while the cow cheese is made during the whole year. Sheep and cows, during the season, usually are in the mountains, outside, grazing on natural pastures, with variety of plants. The quality of pastures is influencing high quality of the cheeses. The cheese is kept in brine and can be sold throughout the year.

Pirot area is part of the of the Stara Planina National park and area of great natural value. Specific traits of traditional manufacturing of Pirot kachkaval derive from climatic conditions, characteristic grass habitat and the specific mountain region and milk from autochthonous populations (Pirot sheep). There is strong pressure of touristic investments and use of waterstreams that put pressures on enviornmental values. Traditinal know how and skills are embedded in the production process.

Reference mountain landscape statistics  
(A: Data for the NUTS3 RS226)

Reference mountain chain	Dinaric Alps region		
Reference mountain landscape	Pirot		
Size of the area (km <sup>2</sup> )	1,232	Average per capita income (€)/year	-
Altimetry (m; min-max)	368– 2,169	Total Gross Value Added (GVA) (€ million)/year	370.5 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	44	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-6.71 %	Primary:	5.6% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	-	Secondary (including construction):	58.4% <sup>A</sup>
		Tertiary:	35.9% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	75	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	4,557	Primary:	1.8% <sup>A</sup>
Protected areas	Yes	Secondary:	45.4% <sup>A</sup>
		Tertiary:	53% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Pirot white cheese in brine produced in Pirot/Old Mountain area can be made of sheep, cow, and mixed milk. Sheep and mixed cheeses are with higher reputation amongst customers. Sheep and mixed cheese are made during the milking sheep season (April-October), when sheep are usually living in the mountains (bacija - summer place for sheep, usually also joint herds from several farmers). Sheep and cow milk is of high quality, due to very good quality animal grazing on natural pastures of high quality (big variety of plant species). The cheese is sold directly to the customers, to restaurants and to the delicatessen stores, if the farm is registered for cheese production.

### Key local assets

The Old Mountain has been placed under protection, in order to preserve: exceptional value of flora and fauna, places that express exceptional geological diversity of the area, such as certain landforms, special occurrences of surface and groundwater and rock formations, beauty and diversity of landscapes, cultural values represented by medieval monasteries and other immovable cultural goods, objects of folk architecture, traditional tools, objects, occupations and customs of local population. Local food and food products play very significant role and represent valuable assets of cultural and gastronomy heritage of the area.

### Challenges

Old Mountain and Pirot district are bordering region with Bulgaria, with very high level of depopulation. Many villages in the most beautiful parts of the mountains are becoming abandoned, or with few old inhabitants. Infrastructure to the villages is not good, creating even bigger problems for the remaining population. Sheep and cattle herds are reducing, especially sheep, due to the limited capacities of the farmers to have sheep outside. There is a big problem with finding professional shepherds; even the conditions offered are very favourable. For this reason, there is a lack of sheep milk, which is why more of cow cheese is produced. Reduction of sheep herds, which are autochthonous Pirot and Karakachan sheep, is negative for the area (grazing is reduced), as well as for losing important genetic material of very good sheep breed (used both for meat and milk, with very high reputation). Demographics of the area is also very negative, many villages are with only few old people still living there, while young people move to Pirot and/or bigger Serbian cities.

### Innovation

Pirot white cheese is mostly produced in small processing on-farm units. There is a Dairy school in the city of Pirot, which is one of the few bigger producers of the white cheese in brine and Pirot hard cheese. This school is good tradition keeper, but at the same time, trying to introduce new ways of cheese marketing and promotion. Online marketing and selling in delicatessen stores are new ways of farmers' access to customers, and they need improvement in this sense - packaging, labelling, creating promotional campaigns, etc. Restaurants and rural tourism direct connection, and creation of offers "from the region" are also new ideas how to improve this product's positioning. Tourism is in expansion in this area, especially rural and sustainable tourism, therefore, it is of a great importance to protect and preserve traditional products from the area, as well as to incorporate them into the new strategies for development of the area. Since this is the bordering area with Bulgaria, there is a big interest from both countries in this matter. The area of



Old Mountain close to Bulgaria is also multi-national, with majority of Bulgarian and Serbian nationalities.



## Donkey milk and rural tourism

Since 2005, in Dimitrovgrad municipality (LAU1) some farmers started with breeding donkeys. They chose to keep Balkan donkey to preserve this autochthonous breed. Donkeys are kept for donkey milk that can be taken from the farm in fresh or frozen condition throughout the year.

Stara Planina is in eastern Serbia, on the border with Bulgaria, and is part of the vast Balkans. As a morphological unit, it is bordered by the valleys of Beli and Trgoviški Timok, and Visočica, and in the east by the state border. This nature park is a treasury of sediments of different ages, from the Paleozoic to the Cenozoic, documented faunistically and floristically, which is why the profiles or entire zones that represent the geological heritage of universal value have been singled out. The relief of the area is extremely morpho-hydrologically intersected, and numerous mountain streams enrich the landscape features. The peculiarity of the area is reflected in the exceptional richness of cultural and historical monuments dating from the pre-Christian period to the 19th century, among which numerous Serbian Orthodox churches stand out for their beauty.

Reference mountain landscape statistics  
(A: Data for the NUTS3 RS226)

Reference mountain chain		Dinaric Alps region	
Reference mountain landscape		Dimitrovgrad	
Size of the area (km <sup>2</sup> )	483	Average per capita income (€)/year	-
Altimetry (m; min-max)	368–2,169	Total Gross Value Added (GVA) (€ million)/year	370.5 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	18.8	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-11.14 %	Primary:	5.6% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	-	Secondary (including construction):	58.4% <sup>A</sup>
		Tertiary:	35.9% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	97	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	747	Primary:	1.8% <sup>A</sup>
Protected areas	Yes	Secondary:	45.4% <sup>A</sup>
		Tertiary:	53% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Since 2009 donkeys are kept according to the principles of organic production. The farm is open for visits and there is a plan to incorporate this VC within rural tourism in near future. The farm is buying donkeys from the whole Serbia and region to protect them and keep the breed alive. Donkeys are kept in natural environment, grazing in natural pastures, or fed with hay, with some addition of oat (when needed). Principles of organic production are applied. They are milked daily, and milk is directly cooled or freezes as fresh, to be able to transport it to the customers. Customers are buying it through ordering (social media or direct order). Surplus of donkey milk is used for soaps made of natural oils, medical herbs from the area and 20% of donkey milk. These soaps are sold through e-commerce or in direct selling in fairs, and specialised shops.

### **Key local assets**

The Old Mountain has been placed under protection, in order to preserve: exceptional value of flora and fauna, places that express exceptional geological diversity of the area, such as certain landforms, special occurrences of surface and groundwater and rock formations, beauty and diversity of landscapes, cultural values represented by medieval monasteries and other immovable cultural goods, objects of folk architecture, traditional tools, objects, occupations and customs of local population. Local food and food products play very significant role and represent valuable assets of cultural and gastronomy heritage of the area.

### **Challenges**

Old Mountain and Pirot district (especially Dimitrovgrad municipality / LAU1) are bordering region with Bulgaria, with very high level of depopulation. Many villages in the most beautiful parts of the mountains are becoming abandoned, or with few old inhabitants. The area is full of pastures, natural lands; different types of herbs (good for free grazing) and water, therefore, animals are kept most of the year outside, in free grazing. Donkeys, as well as other autochthonous breeds of cattle (Busha), sheep and goats, as well as wild horses are of interest of few dedicated farmers and their families, who are dedicated to their preservation, and to enlargement of their numbers. The area characteristics are favourable for organic production, but there are few certified organic producers, due to high expenses of certification. Nevertheless, many farms are following all principles of organic production. Demographics of the area is very negative, many villages are with only few old people still living there, while young people move to Pirot and/or bigger Serbian cities. Growing interest for rural tourism should be carefully directed towards sustainable development.

### **Innovation**

This VC is of interest because it incorporates tradition of keeping donkeys with innovative products that are produced from the milk. Besides this, it serves to preservation of endangered breed Balkan donkey. Products are recognised as nutritious and healthy, while the whole VC provides additional value to the area which is depopulated and is in danger of massive migration. Rural tourism paired with sustainable development and biodiversity protection is in the focus of this farmer and his cooperants.

## Arilje raspberry - PDO

High quality product. Serbia is the biggest producer and biggest exporter of frozen raspberries in the world. The raspberries from Arilje, Serbia, with its Protected Designation of Origin (PDO), are a synonym for quality and refined taste which can be attributed to the rich and fertile soil, favourable climatic conditions but also to them being grown in small family farms.

Šumadija and Western Serbia, Dinaric Arc. Founded in 1880, Arilje is a town and municipality located in the Zlatibor District of southwestern Serbia. The population of the town is 6.763, while the municipality has 18.792 inhabitants, distributed over 22 settlements. Arilje town itself covers 3.94 km<sup>2</sup>, while the whole municipality is 349.06 km<sup>2</sup>. The town is famous for having large raspberry plantations in which many locals are employed. The municipality of Arilje is in western Serbia in the river basins of the clear mountain rivers of the Rzav and Moravica. Near to Zlatibor, Arilje is “cut” by the Moravica, Veliki Rzav and Mali Rzav rivers. It has a hilly-mountainous area at an altitude of 330 to 1.382 meters. Soils are fertile and the climate is humid continental with warm summers and mild winters with potential fair amounts of snow.

### Reference mountain landscape statistics (A: Data for the NUTS3 RS211)

Reference mountain chain		Dinaric Alps region	
Reference mountain landscape		Arilje	
Size of the area (km <sup>2</sup> )	673	Average per capita income (€)/year	-
Altimetry (m; min-max)	330–1,328	Total Gross Value Added (GVA) (€ million)/year	1,057 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	17.7	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-5.55%	Primary:	10.1% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	-	Secondary (including construction):	41.5% <sup>A</sup>
		Tertiary:	48.4% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	172	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	4,306	Primary:	4.7% <sup>A</sup>
Protected areas	No	Secondary:	41% <sup>A</sup>
		Tertiary:	55% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Arilje is the location with the biggest concentration of farms, the highest revenue, the biggest cold storage, the best quality raspberries, and the special culture of raspberry farming including methods to continuously remove sprouts. Arilje raspberries are immediately frozen after picking and cleaning to conserve their freshness and ready them for further processing while increasingly raspberries are also produced to be sold as fresh or dried products, adding more value. Arilje raspberry region covers Arilje and the villages of several bordering municipalities. It is in the southwest of Serbia, fenced by the slopes of Zlatibor and Javor mountains and Požega and Dragačevo valleys. PDO and highly sought-after product. Small producers with expert knowledge on how to cultivate and process the berries. VC dependence on the local and natural conditions which are amply available but under threat of the effects of climate change, predominantly drought, excessive rain, late season frost and hailstorms. Strongly connected to local cultural traditions and important contributor to local culture. Important contributor to fruit production in Serbia and to export to other countries. New marketing strategies as well as innovative production and processing facilities could potentially contribute strongly to increased production and export.

### **Key local assets**

Good soil and climate conditions. Strong local knowledge on how to cultivate and process the production. Connection with other berry producing areas in the region such as Bosnia-Herzegovina.

### **Challenges**

Fruit production is a major provider of employment but fruit production in Serbia faces several problems ranging from outmigration of workers due to socio-economic conditions to problems posed by the effects of climate change. The biggest challenges production of all fruits in Serbia due to climate change faces are drought, excessive rain and flash floods, late season frost and hailstorms. Often these extreme weather events follow each other in short succession thereby exacerbating the problems. While increasing temperatures can improve growth and quality of the fruits, water shortages pose serious problems for fruit growers. In addition, there are increased chances of pests due to existing ones or in the form of invasive species that are on the move due to climate change. Measures such as early warning systems, hail rockets, hail nets and irrigation systems are applied to combat these hazards but require substantial investments.

### **Innovation**

With its substantial production volume and the fact that Serbia's fruit industry is one of the leading sectors of the Serbian economy, as well as a contributor to Serbian export, integration with EU and global markets is the logical next step. With growing investments in hi-tech orchards, climate change adaptation measures and logistics infrastructure, Serbia's modernised fruit production is on the rise and expected to increase in both volume and export. Important contributor so local employment and socio-economic development. Serbia is one of the biggest producers and exporter of raspberries. The Arilje PDO is grown under favourable soil and climatic conditions on small farms, handpicked and with special methods for treatment and processing. It is a highly sought-after product with much potential for expansion and improvement, contributing to improved local and regional socioeconomic conditions and quality of life. Main threats are related to climate



change but also VC organisation that is transparent, representative and allows for acknowledged fair contribution of all players. New marketing strategies are needed to expand capacities to improve existing markets and to create and reach new ones.

## Herbal tea - Saturejea Montana

Rtanj tea (*Satureja montana*/Winter Savory) is one of the most known medical herbs that are collected in the mountain of Rtanj. This mountain is rich in different medical species that are of high quality. Collected and dried, medical herbs are used as tisanes, and are very important domestic and exporting product. The area of Rtanj Mountain is given mystical power from people, and there are many fantast stories and folk believe that this is magical mountain.

Sokobanja is one of the most popular tourist resorts in Serbia. It is situated in the southern part of Sokobanja valley, surrounded by mountains Ozren, Devica, Janior, Rtanj, and Bukovik. The Moravica River runs through Sokobanja. It creates a canyon just 2 km before entering the town. Remains of the Roman and later medieval Serbian fortress Sokograd stand today near the canyon of Moravica. Sokobanja is thermal and air spa, and still has Turkish bath building for inhalation for asthmatic people. Spa dates since Roman times.

Reference mountain landscape statistics  
(A: Data for the NUTS3 RS223)

Reference mountain chain		Dinaric Alps region	
Reference mountain landscape		Sokobanja	
Size of the area (km <sup>2</sup> )	525	Average per capita income (€)/year	-
Altimetry (m; min-max)	369– 1,565	Total Gross Value Added (GVA) (€ million)/year	292.09 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	17.7	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-5.55%	Primary:	15.5% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	-	Secondary (including construction):	28.4% <sup>A</sup>
		Tertiary:	56.0% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	51	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	2,884	Primary:	8.6% <sup>A</sup>
Protected areas	Yes	Secondary:	31.2% <sup>A</sup>
		Tertiary:	60.2% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

There are several big buyers and processors of medical herbs in South-East Serbia. In the area of Sokobanja, there is one big buyer and processor (Adonis) who is also educating collectors how to collect herbs and respect steps for their renewal and habitat protection. Medicinal and aromatic wildy grown herbs picked on the Rtanj and the mountain Ozren (second mountain of the Sokobanja area), which is on the opposite, southern side of Sokobanja, account for most of the Serbian export of these commodities, which in 2018 reached €3.3 million. Herbs are collected manually, dried and packed in different unfloral or multifloral artisans. Adonis made an innovation in packaging tisanes, and they have developed e-commerce for people to buy their products. Tisanes are sold in different healthy food stores, small shops, restaurants, as well as big retail stores. There is a growing trend to cultivate medical herbs in organised groups of farmers, especially in the areas that are known as "clean and healthy" areas. All mountain regions have the same VC, and very often herbs are collected in one region, and then packed and/or processed in other.

### Key local assets

Sokobanja municipality is a very popular and well-known spa in Serbia, focusing on respiratory problems, asthma (especially children asthma), as well as problems with eyes. Rtanj Mountain brings additional value to this context, due to its high content of medical herbs. This value is also connected to hiking tours, festival of medical herbs, and beekeeping that is performed in Sokobanja and Rtanj Mountain.

### Challenges

Medical herbs from Rtanja Mountain (as well as from other mountains), are mostly collected by individual collectors that are not always following procedures for sustainable herb collection. This is, very often, job for people who have low income, or do not have other source of income. Therefore, the herb buyers are making big efforts to organise educational workshop for collectors to have them collect herbs, but also do not destroy their natural habitats. In addition to this, free range grazing of animals is in collision with herb preservation, since animals also like to eat these herbs due to their pleasant smell, and their good taste. Other anthropogenic influences on these herbs are illegal construction and environment pollution.

### Innovation

Medical herbs are important source of income for many people, and Serbia is well known for high quality herbs. In old Yugoslavia there were many collection points, while herbs were used for consumption as tisanes, as well as for medicine, as etheric oils, natural cosmetics, etc. This inheritance is still present, but now processing is done mostly in collection, or in other parts of Serbia, while in previous times, this added value activities were performed outside the borders. Many different new products are created in last couple of decades - from high quality oils, cosmetics, aromatherapy products, food products (honey with different medical herbs), etc. Medical herbs are very important resource of Serbia. These herbs are available in mature, and many of them are on the list of protected and/or endangered plants. In previous years (especially during 90's, and high economic crisis) many people freely started to collect them and sell to the buyers, to obtain some income. This caused losing some habitats of medical herbs. On the other



hand, buyers are making strong efforts to educate collectors to make medical herbs collection sustainable. Therefore, there is a strong need for wider understanding of the situation and support to the different groups, and ensuring habitats are protected and enlarged.



## Berries cultivated in Kopaonik Mountain National park

Next to being an important producer and exporter of raspberries, Serbia also produces and exports a substantial volume of other berries such as blueberries, blackberries, and chokeberry.

Stretching for 75 km in the north-south direction, between the rivers of Lab and Sitnica on the south and Jošanica on the north, Kopaonik is one of the largest and longest mountains in Serbia. It belongs to the administrative region of Raška. The Kopaonik mountain massif includes the mountains of Kopaonik, Željina, Goč and Stolovi. Kopaonik has high biodiversity value and an abundance of plant and animal life with many species being autochthonous and endemic. In total, there are 1,600 plant species in the park, out of which 200 grow only on Kopaonik. It also includes over 200 species of fungi. Special value of Kopaonik in terms of biological diversity is that 11.9% of the high mountain endemic species in the Balkans inhabits the mountain. Kopaonik has 175 species of birds, including the protected ones.

### Reference mountain landscape statistics (A: Data for the NUTS3 RS216)

Reference mountain chain	Dinaric Alps region		
Reference mountain landscape	Brus		
Size of the area (km <sup>2</sup> )	606	Average per capita income (€)/year	-
Altimetry (m; min-max)	500–2,017	Total Gross Value Added (GVA) (€ million)/year	728.9 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	24.1	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-11.75%	Primary:	16.7% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	-	Secondary (including construction):	33.4% <sup>A</sup>
		Tertiary:	56.0% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	97	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	4,547	Primary:	11.6% <sup>A</sup>
Protected areas	Yes	Secondary:	37.7% <sup>A</sup>
		Tertiary:	50.7% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

These are sold fresh on the markets all around Serbia; exported; and further processed to be frozen or as jams, jellies, and fruit juices. The cultivation of these berries takes place all over Serbia. However, whereas raspberry production sites are of a relatively small size, blueberry

production is made up of large, intensive farms with modern technologies. Cultivation of blueberry and black berries takes place on Kopaonik Mountain. From there, products are processed (cleaned, frozen, dried, stored, packaged) and sold on to the whole sale market eventually reaching consumer via retail (markets, supermarkets, restaurants, catering) and export.

Key actors are suppliers (pickers), purchase stations, producers (enterprises), wholesale distributors, middlemen and retailers. Small producers with expert knowledge on how to cultivate and process the berries. VC dependent on the local and natural conditions which are amply available but under threat of the effects of climate change, predominantly drought, excessive rain, late season frost and hailstorms. Strongly connected to local cultural traditions and important contributor to local culture. Important contributor to fruit production in Serbia and to export to other countries. New marketing strategies as well as innovative production and processing facilities could potentially contribute strongly to increased production and export. Most producers/processors adhere to at least one quality scheme such as the HACCP standard.

### **Key local assets**

Reasonably good soil and climate conditions. Strong local knowledge on how to cultivate and process the production.

### **Challenges**

Main challenges and threats are related to underutilised production capacity, lack of qualified staff, lack of effective marketing strategies, lack of investment opportunities and climate change. Other external factors negatively influencing business are unfair competition, undeveloped market and lack of favourable loans and subsidies. Other challenges are posed by the effects of climate change. The biggest challenges production of all fruits in Serbia due to climate change faces are drought, excessive rain and flash floods, late season frost and hailstorms. Often these extreme weather events follow each other in short succession thereby exacerbating the problems. Water shortages pose serious problems for fruit growers. In addition, there are increased chances of pests due to invasive species. Measures such as early warning systems, hail rockets, hail nets and irrigation systems are applied to combat these hazards but require substantial investments.

### **Innovation**

The innovation potential lies with designing and implementing new marketing strategies, improving access to markets -both national and international- and investment in better storage and processing capacity in order to make better use of underused capacity at processing plants. Innovation potential also lies with growing investments in hi-tech orchards, climate change adaptation measures and logistics infrastructure. Serbia is the one biggest producers and exporters of blueberries, blackberries, and chokeberry. Considerable hurdles however exist that prevent these products from reaching their full potential. Cultivation and picking are very much connected to local mountain conditions and an important source for employment.

## Wild mushrooms

In Serbia, wild mushroom picking is an age-old tradition. Most of it is collected to be sold on and processed further down the VC which is longer and more complicated than that of berries. People also pick them however for their own consumption.

Stretching for 75 km in the north-south direction, between the rivers of Lab and Sitnica on the south and Jošanica on the north, Kopaonik is one of the largest and longest mountains in Serbia. It belongs to the administrative region of Raška. The Kopaonik mountain massif includes the mountains of Kopaonik, Željina, Goč and Stolovi. Kopaonik has high biodiversity value and an abundance of plant and animal life with many species being autochthonous and endemic. In total, there are 1,600 plant species in the park, out of which 200 grow only on Kopaonik. It also includes over 200 species of fungi. Special value of Kopaonik in terms of biological diversity is that 11.9% of the high mountain endemic species in the Balkans inhabits the mountain. Kopaonik has 175 species of birds, including the protected ones.

### Reference mountain landscape statistics (A: Data for the NUTS3 RS216)

Reference mountain chain	Dinaric Alps region		
Reference mountain landscape	Brus		
Size of the area (km <sup>2</sup> )	606	Average per capita income (€)/year	-
Altimetry (m; min-max)	500–2,017	Total Gross Value Added (GVA) (€ million)/year	728.9 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	24.1	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-11.75%	Primary:	16.7% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	-	Secondary (including construction):	33.4% <sup>A</sup>
		Tertiary:	56.0% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	97	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	4,547	Primary:	11.6% <sup>A</sup>
Protected areas	Yes	Secondary:	37.7% <sup>A</sup>
		Tertiary:	50.7% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Permits were issued for the mushroom's boletus (*Boletus edulis*), chanterelle (*Cantharellus cibarius*), black trumpet (*Cantharellus cornucopioides*), milk cup (*Lactarius deliciosus*), scotch bonnet (*Marasmius oreades*) and black summer truffle (*Tuber aestivum*). Yields especially for chanterelles have shown a steady increase over the years. Overall, the growth in trade of fresh mushrooms increased by 65% per annum.

This VC relies on the activities of local pickers, purchasing stations, processors, wholesale, retail, and end consumers (markets, supermarkets, restaurants, health shops). Under used potential has led to the need to supplement local production with imports from Ukraine, Poland, and other countries. Most producers/processors adhere to at least one quality scheme such as the HACCP standard. This is a long and complicated VC which covers also other mountain reference landscapes. To serve the national and international market, produce from other mountain reference landscapes are also purchased and processed.

### **Key local assets**

Local pickers (65% of local pickers pick to sell the mushroom to the purchasing stations; the other 35% pick for own consumption). Local purchasing stations that sell on to processors further down the VC. This product is very much dependent on ecological and environmental conditions (soil quality, climate, shady conditions, etc.).

### **Challenges**

Underused capacity mostly due environmental factors such as the impacts of climate change, mostly drought.

### **Innovation**

There is not much innovation. There is however potential to increase production and to come up with new marketing strategies to market this product to consumers who appreciate natural values, health, and high-quality food. This is an underutilised VC. There is room for growth in production. New marketing strategies could help to position the mushroom to more nature and health aware niche consumer market segments with a specific notation that these are mushrooms from Kopaonik mountain. The VC faces potential threats from climate change, mostly notably drought so awareness and adaptation measures should be directed to protecting this VC from that perspective.

## Beef fresh and dry meat and sausages

Pester plateau is a Special nature reserve area. Family farming is prevailing, cattle is grazed at natural pastures. Beef meat, meat products (Sjenica sudzuk), and milk products have reputation of high quality. Sjenica cheese is a PDO.

Pester plateau which is spread on the territory of Sjenica municipality, and parts of Tutin and Novi Pazar. It spreads over 2 NUTS3 regions - Zlatibor and Raska districts. This area is highland landscape of meadows and pastures, with karst structure. This area has very harsh climate – very cold winters (with temperatures to -42°C) and hot and dry summers. Very small percentage of the land is cultivated, because farmers usually graze animals on natural pastures, using very little or no fertilisation. Due to its beauty and uniqueness, and good quality food, this area is interesting for tourism, mostly rural tourism, and adventure tourism. Proximity of Uvac lake (nature reservat) is of a great importance for touristic offer of the area.

Reference mountain landscape statistics  
(A: Data for the NUTS3 RS211)

Reference mountain chain		Dinaric Alps region	
Reference mountain landscape		Sjenica	
Size of the area (km <sup>2</sup> )	1,059	Average per capita income (€)/year	-
Altimetry (m; min-max)	900– 1,300	Total Gross Value Added (GVA) (€ million)/year	1,057 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	24.25	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-2.73%	Primary:	10.1% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	-	Secondary (including construction):	41.5% <sup>A</sup>
		Tertiary:	48.4% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	176	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	5,225	Primary:	4.7% <sup>A</sup>
Protected areas	Yes	Secondary:	41% <sup>A</sup>
		Tertiary:	55% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Livestock husbandry is the main agricultural activity in Pester plateau. Beef meat production is at the basis of the VC, having cattle farms solely for beef meat, where farmers sell them as live animals to the middleman (usually at very low prices). There are about 33.000 cattle at Sjenica municipality, but this number is declining. Animals are grazed on natural pastures, with lot of specific wild herbs and plants, which leads to high quality of beef meat. Traditional meat products like Sjenica sudzuk (sausage) and dry beef meat are in the process to become GI products. Farms are mostly owned by farmers and registered as agriculture households, and there are a couple of meat processing units (companies) and small dairies. Farm processing is traditional, and there is increasing trend in small house processing units' registration (Serbia adopted regulative for small processing unit registration). Products are sold at national market, with rising interest for their export. Regional rural development centre exists in the area, providing advisory support and services to farmers. This VC is present in Montenegro, since there are farmers in both bordering regions that have pastures in both countries. Additionally, the tradition and cultural heritage is strongly connected to the cross-border region (Serbia and Montenegro, as well as Serbia and Albania)

### Key local assets

Key local assets are:

- The multi-cultural area, with strong connections to the neighbouring countries – Montenegro, Bosnia and Herzegovina and Albania.
- Traditional knowledge on livestock farming and production of traditional products (cheese, dry meat) is kept in large multi-generational families.
- Strong connection to the cultural and national heritage.

### Challenges

Farm gate prices were very low in 2020, there was a lack of food for animals due to dry season and heavy rains in the summer. Ecosystems are endangered by pollution and climate change. Family farming is endangered, and migration is increasing. Special nature reserve area is endangered too, together with the grazing system for cattle and sheep. Farmers are not well organised, lack of farmers organisations. Multi-cultural region, with many connections with Montenegro, Bosnia, and Albania

### Innovation

Grazing of livestock on natural pastures is already major production system; therefore, the transition to organic production is not requiring large investments, nor change in animal breeding. There are initiatives for organised organic production / entrepreneurial individuals are organising interested farmers to start collective transition to organic farming. Existing natural conditions offer possibilities for developing other high-quality production systems, including agroecological production, etc. There are initiatives for starting e-commerce of the products from this area. Adding value to the products by certifying organic production, and/or other certificates that are in line with nature protection are of a great potential. Additionally, connecting the products with sustainable tourism (rural tourism) and other channels for selling these products (e-commerce)



creates potential for avoiding low prices and selling animals.. Rising interest of young people to be involved in the livestock production creates possibilities for new approaches to traditional farming and product marketing.

## Adventure Travel Network

Adventure Network is a non-profit organization dedicated to the promotion of adventure and rural development in (SE) Serbia, primarily in the Pirot district. They create programmes for individual and family activities that are based on sustainability, responsible travel and interaction with local people, food, and culture.

Pirot area is part of the of the Stara Planina National park and area of great natural value. Specific traits of traditional manufacturing of Pirot kachkaval derive from climatic conditions, characteristic grass habitat and the specific mountain region and milk from autochthonous populations (Pirot sheep). There is strong pressure of touristic investments and use of waterstreams that put pressures on enviornmental values. Traditinal know how and skills are embedded in the production process.

Reference mountain landscape statistics  
(A: Data for the NUTS3 RS226)

Reference mountain chain	Dinaric Alps region		
Reference mountain landscape	Pirot		
Size of the area (km <sup>2</sup> )	1,232	Average per capita income (€)/year	-
Altimetry (m; min-max)	368– 2,169	Total Gross Value Added (GVA) (€ million)/year	370.5 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	44	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-6.71 %	Primary:	5.6% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	-	Secondary (including construction):	58.4% <sup>A</sup>
		Tertiary:	35.9% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	75	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	4,557	Primary:	1.8% <sup>A</sup>
Protected areas	Yes	Secondary:	45.4% <sup>A</sup>
		Tertiary:	53% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

They create content to improve the quality of life and strengthen the adventure community in some of the most beautiful parts of Serbia, mainly in Stara Planina and Jerma river canyon.



Besides creating programmes for adventure tourism, they conduct research of flora and fauna in the area, as well as promote local products and create income for people living in the area.

Main activities are different types of tours and touristic offers created by the Adventure Network, including outdoor festivals, hiking tours, sky running, yoga retreats, free climbing, mountain biking, bird watching, introduction to the flora and fauna of the area, interaction with other similar organisations and individuals to create special programmes for individuals, families, and groups. Low footprint of all activities, interaction with local food producers, rural tourism, and valorisation of cultural and historical assets are the main objectives of this VC. Most of the activities are advertised online and through social media, using personal recommendation about experiences as one of the main marketing tools. Positive impact on local population, offering channels for on-farm selling, or through rural tourism. Initiative is also connecting with other similar initiatives in other regions, creating network of people who care about nature, at the same time defining and organising unique experiences for the ones who want to live in harmony with nature. This VC is present in other mountain regions, as well as in other protected areas in Serbia.

### **Key local assets**

The Old Mountain has been placed under protection, in order to preserve: exceptional value of flora and fauna, places that express exceptional geological diversity of the area, such as certain landforms, special occurrences of surface and groundwater and rock formations, beauty and diversity of landscapes, cultural values represented by medieval monasteries and other immovable cultural goods, objects of folk architecture, traditional tools, objects, occupations and customs of local population. Local food and food products play very significant role and represent asset of cultural and gastronomy heritage of the area.

### **Challenges**

Old Mountain and Pirot district are bordering region with Bulgaria, with very high level of depopulation. Many villages in the most beautiful parts of the mountains are becoming abandoned, or with few old inhabitants. Infrastructure to the villages is not good, creating even bigger problems for the remaining population. On the other hand, the touristic interest is rising, as well as interest for exploiting natural resources of the mountain, such as building mini-hydro plants at mountain rivers and streams, endangering living ecosystems in and around rivers and right to water. Use of mountain streams for fish production is linked to clear and not pollute waters and springs. The environmental impacts of current economic activities in the area are high, including poor waste management, construction in the protected areas, pollution of rivers and lake Zavoj (water supply lake), etc.

### **Innovation**

Adventure network is creating new types of touristic offers for individuals and families that are in line with sustainability, nature protection and protection of the local identity as well as cultural and historical assets. Low footprint of touristic offers and programmes they create, build awareness of people about importance of nature preservation. Inclusion of local potentials, products, and people, create additional value for the area, supporting people to stay in the area instead of



migrating to bigger cities, or other countries. Mountain tourism in Serbia is very well developed. Nevertheless, mass mountain tourism with big infrastructure is massively impacting some of the most beautiful areas in Serbia. The Adventure Network is dedicated to creating different type of touristic offers, respecting nature, and enhancing people's dedication to environment protection, at the same time offering full experience of the area, food, and culture and people interaction. There is a rising interest for this type of touristic offers, especially with people who live in the cities, but would like to stay connected to the nature.

## Pirot carpet - POD

Pirot carpet is a living tradition of this area, "a part of DNA of local people", it contains both the mystical and natural properties involved in the motives. The patterns that give Pirot carpets a mystical allure, represent ancient symbols which carry magical meanings and can be read as an image alphabet. There are 95 varieties which weavers must memorize.

Pirot area is part of the of the Stara Planina National park and area of great natural value. Specific traits of traditional manufacturing of Pirot kachkaval derive from climatic conditions, characteristic grass habitat and the specific mountain region and milk from autochthonous populations (Pirot sheep). There is strong pressure of touristic investments and use of waterstreams that put pressures on environmental values. Traditional know how and skills are embedded in the production process.

Reference mountain landscape statistics  
(A: Data for the NUTS3 RS226)

Reference mountain chain		Dinaric Alps region	
Reference mountain landscape		Pirot	
Size of the area (km <sup>2</sup> )	1,232	Average per capita income (€)/year	-
Altimetry (m; min-max)	368– 2,169	Total Gross Value Added (GVA) (€ million)/year	370.5 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	44	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-6.71 %	Primary:	5.6% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	-	Secondary (including construction):	58.4% <sup>A</sup>
		Tertiary:	35.9% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	75	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	4,557	Primary:	1.8% <sup>A</sup>
Protected areas	Yes	Secondary:	45.4% <sup>A</sup>
		Tertiary:	53% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The raw material is locally produced wool from the sheep raised on the local pastures and in Nature park Stara planina Mt. It is one of the most famous traditional handcrafts. Very labour and

skill intensive, it takes a full month of whole day work to weave 80cm of the carpet, therefore it takes months for a single weaver to make one item.

There are only around 30 weavers, and it takes 5 years to train a professional weaver to make a high-quality carpet. Pirot carpets are very thin but extremely dense and are said to last more than a century. They have two identical sides and are geographically protected, which means that they can only be made in the Pirot area, and out of Pirot sheep.

### **Key local assets**

The weaving skills are passed from generation to generation, and mostly to the women. Girls used to learn this skill from older sisters, or mother and grandmother when they turn 7. The wool used for weaving comes from the local sheep from the villages surrounding the town of Pirot, and from the nearby Stara Planina Nature Reserve. Such shape has a specific meaning deriving from tradition and socio-cultural linkages. Some kilims symbolize good health, wellbeing, good fortune in love, business, and success and a unique combination sends a strong magical protection.

### **Challenges**

Carpets or kilim made in Pirot represent a unique piece of traditional decoration. The tradition of handweaving is more than 500 years old in Pirot and surrounding villages. Currently, in Pirot there are only 30 women who are still actively weaving. Considering that this number was around 2.500 during the last century, it is a bit saddening that the cool and unique tradition like this is slowly disappearing. There is no public program that supports knowledge transfer and training for the weavers, and most women find other employment easier and more profitable.

### **Innovation**

The carpets are marketed online and by order. There is an initiative to continue development of motives as they tell the contemporary story, but this has still not catch on.

## Dried sausage from locally produced livestock - POD

Pirot pressed sausages is premium product, manufactured from the best quality of different kind of meat, mixed with spices. It is assumed that dates to the time of the Ottoman empire and it truly reflects the diversity of livestock production in the Serbian part of Balkan Mountains (Stara planina Mt) which is a natural park.

Pirot area is part of the of the Stara Planina National park and area of great natural value. Specific traits of traditional manufacturing of Pirot kachkaval derive from climatic conditions, characteristic grass habitat and the specific mountain region and milk from autochthonous populations (Pirot sheep). There is strong pressure of touristic investments and use of water streams that put pressures on environmental values. Traditional know how and skills are embedded in the production process.

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Road distance from Urban Poles* <sup>1</sup> (km)	75	Employment by sector* <sup>3</sup>	
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Protected areas	Yes	Secondary:	45.4% <sup>A</sup>
		Tertiary:	53% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

For making Peglana sausages carefully selected pieces of goat, sheep and beef meat are used, though some use even donkey meat. Though present for centuries, this product has been revived and only in the last decade has gained much reputation and popularity as high-quality typical

product of mountain areas. It is naturally and slowly dried, no smoking or preservatives and know for a particular process of pressing, that has been traditional know how of local people.

There have been registered several operators in the last few year, while the number is probably in dozens of small homemade processing workshops. The processing is almost never linked to farming, so the raw material is bought locally from farmers. Direct sale on food events and festivals, linkage to HORECA sector and lately specialized food shops and retail, have been the main marketing channel. This is one of the most expensive meat products, however the demand is still high due to very different nature of processing (most of the dried meat is usually smoked and pressed sausage is not). This increased demand also threatens the quality of the product, as many are now trying to raise volumes at any costs.

### Key local assets

High quality meat locally raised on the pastures with strong floral biodiversity, is being transformed through unique process of pressing and drying to obtain a valuable and high protein content product. There are also cultural and social assets over nutritional and even medicinal values of this product which is considered very potent and concentrated "super food" according to local criteria.

### Challenges

Depopulation and change of lifestyle from pasture grazing system to stationary are the main reasons for decline in number of sheep and milk shortage. There are 13760 sheep now, and they are the aging and uninhabited villages cannot sustain the needed production. Apart from these, the management of natural resources becomes an issue with increased vulnerability and threat of investments in small hydro power plants that deprive population from fresh water and destroy watershed and scenery.

### Innovation

A traditional product where the traditional process has been taken over by the processing facilities of modern times. There is quite some new design of the small-scale processing machinery that can replicate the old school of pressing with a bottle or similar round and smooth object. The development of the product could be lately attributed to a sequence of local festivals, where forgotten product has been revived and reintroduced to the community, so that commercial production has started. Now it is on the way of protection of geographical name and has many new alterations in packaging, meat mixture (goat, sheep, cow, or donkey) and spices. Linkages to Balkan Mountains Natural park Stara planina and its livestock breeding systems as well as traditional know how of producing a durable meat product that is naturally dried, make Pirotka pressed sausage one of the very recognizable brands of South Eastn Serbia. Also, this region is very much in focus for aspirations for use of natural resources in many ways, for small hydro power plants which puts at risk much of the local rural population that lose access to fresh water, to tourism pressures which are not always moderate and controlled.

## 11. France

### Brocciu Corse - PDO

High reputation products, coexistence between mountainous area and plains, legitimacy to produce between dairies and on-farm cheese makers, competing access to land use, vulnerability of ecosystems (fire, loss of biodiversity, erosion of heritage), resources linked to pastoral breeding (breeds, feeding species) and their associated know-how are diminishing.

Corsica is an island in the sea. It presents a great diversity of landscapes: plains, hillsides, deep and steep valleys. Small ruminant farming has long been a transhumant activity, occupying all the region. For the past decades, farmers have settled, in the plains and hillsides. Some of them keep on using mountain pastures during Summer. They are scattered within the region, with no remarkable specialised sub-region. The area of production of PDO Brocciu is Corsica.

Reference mountain landscape statistics (NUTS: FRM0)

Reference mountain chain		Corsica mountains	
Reference mountain landscape		Corsica	
Size of the area (km <sup>2</sup> )	8,722	Average per capita income (€)/year	25,400
Altimetry (m; min-max)	0–2,706	Total Gross Value Added (GVA) (€ million)/year	8,034
Population density (Inhabitants/km <sup>2</sup> )	38.6	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	10%	Primary:	1%
Total bed places (BPs) in tourist accommodations/year	-	Secondary (including construction):	19.8%
		Tertiary:	79.1%
Road distance from Urban Poles* <sup>1</sup> (km)	333	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	2,662	Primary:	3.6%
Protected areas	Yes	Secondary:	16.2%
		Tertiary:	80.2%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

Brocciu is a whey cheese from ewes and goats' milk, obtained after making cheese. It depends on other VCS, dairy cheese production and on-farm cheese production. In its code of practice,

PDO Brocciu is dependent on pastoral ecosystems, shrubs, summer pastures, etc. animals (of local breeds) must be fed with local fodder (grazing or hay). The current production of Brocciu knows a disembodiment process: it might be less intertwined with the local socioecological system, that is local population on one hand, natural resources on the other hand. Dairy husbandry and production of Cheese is observable in every other MRLs. Recognition of GIs is also a common feature of those areas.

### **Key local assets**

Pastoral systems benefit from a long history using natural resources and leaving traces in the landscape. Somehow, Nature is considered without husbandry, especially in Corsica. It has been competing with other uses of landscape (tourism, natural parks, leisure...).

### **Challenges**

To (re)assemble resources that have been built and transmitted in the territory (breeds, feeding species...) and to be able to address the issues raised by the agroecological transition. To ensure sustainable coexistence between different stakeholders with divergent strategies and interests. to address issues of common heritage (food, local culture).

### **Innovation**

There is no noticeable innovation in this VC. Brocciu Corse is recognized as a PDO since 1998. Since then, production and cheese processing are regulated by a code of practice. It has been managed by a syndicate that gathers farmers and dairies.

PDO Brocciu is currently the only GI for Corsican cheeses. It benefits of a strong reputation, but issues have been raised about how it is used. A part of Corsican on-farm cheese makers does not adhere to it as they do not feel recognized within it and they do not want their reputation to be associated with dairy processing. the PDO is mainly used by Corsican dairies. There are strong doubts about the origin of milk which is used and potential fraud. For the past years, the syndicate has frequently derogated to the code of practice and allowed more intensive practices.



## On-farm processed cheeses

high reputation products, competing access to land use, vulnerability of ecosystems (fire, loss of biodiversity, erosion of heritage), resources linked to pastoral breeding (breeds, feeding species) and their associated know-how are diminishing.

Corsica is an island in the sea. It presents a great diversity of landscapes: plains, hillsides, deep and steep valleys. Small ruminant farming has long been a transhumant activity, occupying all the region. For the past decades, farmers have settled, in the plains and hillsides. Some of them keep on using mountain pastures during Summer. They are scattered within the region, with no remarkable specialised sub-region.

### Reference mountain landscape statistics (NUTS: FRM0)

Reference mountain chain		Corsica mountains	
Reference mountain landscape		Corsica	
Size of the area (km <sup>2</sup> )	8,722	Average per capita income (€)/year	25,400
Altimetry (m; min-max)	0–2,706	Total Gross Value Added (GVA) (€ million)/year	8,034
Population density (Inhabitants/km <sup>2</sup> )	38.6	GVA by sector* <sup>2</sup>	
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Number of agricultural holdings	2,662	Primary:	3.6%
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\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

In Corsica, on-farm cheese making is defended by an association of farmers (of dairy goats and dairy ewes), Casgiu Casanu, which has existed since 1998 and has been locally and nationally active. It defends farmers' interests regarding the evolution of European and national regulations. It provides specific training (hygiene, different processes for transformation of milk) and it has developed an efficient structure for cheeses' transport, in Corsica and in the French Continent.

As on-farm cheese making often plays a key role in preserving traditional know-how, it is recognized in a geographical indication (PDO Brocciu) and plays a central role in the on-going labelling project (5 different projects regarding different types of local cheeses: venachese, sartinese, calinzanincu, niolincu, bastelicacciu). Off-farm cheese making is particularly present in mountainous areas where it is one of the remaining (agricultural) activities. It contributes to the villages' vividness. In its traditional form, this type of husbandry contributes to land management near those villages. New forms of husbandry have developed more recently, which are more intensive (use of foreign breeds, indoors husbandry) and less interconnected to the local ecosystem. Dairy husbandry and production of Cheese is observable in every other MRLs. On-farm cheese making is not a specificity of Corsica, but its anteriority is remarkable. Its current expressions give us insight about how tradition and novelty can interact and produce resilience for territories in recession.

### **Key local assets**

Pastoral systems benefit from a long history using natural resources and leaving traces in the landscape. Somehow, Nature is considered without husbandry, especially in Corsica. It has been competing with other uses of landscape (tourism, natural parcs, leisure...)

### **Challenges**

To (re)assemble resources that have been built and transmitted in the territory (breeds, feeding species...) and to be able to address the issues raised by the agroecological transition.

### **Innovation**

Which cheese to produce? How to process milk? How to produce milk? Those are questions that can be answered individually or collectively (common-pool resources such as summer pastures and pastoral surfaces, local breeds, etc.). Those choices can be in continuity with local tradition and know-how, or not.

On-farm production is an activity that has been growing. It matches with new expectations about food: local, organic, etc. This contributes to re-define pastoral systems. This lead consumers, farmers, and others (among which public policies) to reconsider how livestock impacts territories. The requalification of husbandry embarks both products and ecosystems. We consider husbandry as a lever to regulate socioecological systems, rather than a predatory activity.

## Dry cured pork - PDO

Corsica is one of the very rare regions of France to have chosen and obtained a dry charcuterie PDO. These are 3 distinct PDOs corresponding to 3 traditional pieces (coppa, lonzu and prisuttu). Other certifications projects are underway for the protection of other products (sausage, ficatelu, etc.).

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This dynamism is due to the strong originality of the farming system based on slow-growing animals and users of spontaneous resources in an open environment (chestnuts, acorns, beechnuts, etc.) and local breed (nustrale). This dynamism is also due to the existence of a great

variety of farming methods and processing practices derived from old productions (animals of local breeds, chestnuts, dry salt processing - use of imported raw materials which imitated traditional products and intermediate forms, exogenous breeds slaughtered younger (8-10 months) etc.). The activity is organized around actors constituted in several forms of organization which are in relation or not. First, the organization of the PDO which brings together breeders who make charcuterie according to breeding rules (nustrale breed, slaughter age, chestnut / acorn) and manufacturing (dry salt, ripening etc.). Then, the breeders who make charcuterie inspired by tradition and finally the processors who import carcasses of pigs for a generic charcuterie.

The reputation that guides the value chain is not under shared management. Animal feed resources are the captives of increasingly reduced PDO producers (club). How can reputation be a lever for sharing the value and sustainability of local resources? This VC is present in other EU countries Italy (Cinta Senese, Piemonte), Spain (Sierra Morena) and Switzerland (Jura).

### Key local assets

The key assets are the aptitudes of local breed animals to circulate and mobilize the resources of chestnut orchards and oak forests; the know-how of herd management in open breeding; the know-how of transformation into typical charcuterie. The very strong reputation of "Corsican charcuterie" products

### Challenges

The value chain is linked to an organized association of different components. The challenge is to maintain the coupling of farming, processing and reputation of the products and managing the resources of the environment, in particular the chestnut grove and oak trees. And to succeed in the use of collective resources such as the chestnut or oak grove. Chestnut is struck by the cypins disease and threatened with degeneration (old orchards). How to constitute a common chestnut grove between harvest and breeding?

### Innovation

Innovation consisted in defining a breed standard (nustrale), in qualifying strategic breeding periods (slaughter age, finishing feed, slow growth) in adopting new processing techniques (gentle salting of the prisuttu) in defining the products in terms of physiochemistry and taste, to build a distinct market identity for each of the 3 PDOs.

These products are made by small-scale on-farm processors from local pigs (nustrale breed), reared in extensive conditions with chestnuts and acorns. The 3 PDOs are exemplary of the association of domestic animal and plant biodiversity (spontaneous and cultivated resources) and traditional knowledge (processing and tasting). The interest is linked to the coupling between the different human and non-human components on which the market and environmental value is based.

## Dry cold meat

Pork meat products made by big firms with imported raw material from lean pigs, destined to European market. One part of them benefits of PGI since 2019. This value chain is part of a greater value: the reputation of "Corsican charcuterie".

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Can the reputation of a traditional mountain product be the object of a value chain shared with other actors of the large sector (external or internal to the mountain)? What are the conditions of

this sharing? The interest of this value chain is to analyse the coexistence of activities mobilizing a reputation value considered unique but having very different possible and negative impacts on socio-ecological system. A not very active union gathers the firms. Due to a demanding market and the absence of production and trade rules, the activity is governed by the summer and export markets. The "socio-ecological system" is not mobilized as productive resources, but they receive the nuisances of an activity with high emissions and carbon footprint (effluents, transport, etc.) for a variable impact on employment (training, job security, remuneration). The question is how to develop other value chains based on the mountain CV reputation? Which conditions and environmental rules? Possible source of inspiration for farming methods and organization of the coordination of "sectors" between breeders and firms in the sector:

- of the "Suino pesante" type (12-month-old pigs and cereals)
- type "Cerdo de la dehesa estremadura" ("bellota and pienso")

To be considered at the scale of a small island economy.

### Key local assets

The assets are the reputation and the know-how of transformation into specific charcuterie and a strong demand market.

### Challenges

The challenge for the sector is to link up with local breeders who supply meat adapted to the needs of mid-range deli meats and to link this production to local resources (acorns, cereals, other agricultural and agri-food resources). It responds to another issue of controlling costs and prices in an eco-conditionality situation (food inputs, effluents, etc.). Benchmarking issue towards production systems of the Italian "suino pesante" type.

### Innovation

This is a socio-technical innovation absent from Corsica:

- new ways of raising animals ("suino pesante type") to provide meat suitable for dry sausages.
- search for a form of organization and management to extend the sharing of the value resulting from the reputation of mountain productions to other players in the region. learning experiences and "knowledge capital stocks" existing in the area/region

The case expresses the relationships between value chains associated with mountain production and the local economy (non-mountain). Is it possible to design connections and under what conditions? How do you think about sharing a reputation that originates from the mountain areas with other neighbouring areas?

## Miels de Corse - PDO

The fame of Corsican honey is old but its contemporary reputation results from the professionalization of the activity since 1980 and subsequently from a recognition consecrated by obtaining a PDO in 1998. The PDO brings together six honeys, four of which are produced from the spontaneous flora of the maquis.

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### Reference mountain landscape statistics (NUTS: FRM0)

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Reference mountain landscape		Corsica	
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Except in winter, which is the season during which bee colonies rest, there is one honeydew per season. The definition of honey and its controls are based upon its taste and pollen analysis,

reflecting the foraging areas (heather, asphodel, lavender, broom, oaks, anthill, thyme, etc.). The beekeeping activity is guided by the body responsible for managing the PDO. But other organizations bring together other professional and non-professional beekeepers outside the PDO. Which have different visions of the profession and management systems. A major challenge is to design public action addressed to the activity for the services provided by beekeeping to the environment and the damage it suffers due to the weakening of resources and the production of honey. However, the value of Corsican honeys is linked to the range of PDO honeys and therefore to the preservation of the diversity of natural environments today weakened by climate change. This VC is present in other EU countries Austria, Czech Republic, Crete, Hungary, Italy, North Macedonia.

### **Key local assets**

Know-how and control of the management of apiaries within complex and varied ecosystems (vegetation and altitude). Variety of the couple honey / natural production site integrated into the VC. Control of honeydew in spontaneous vegetation by Corsican beekeepers.

### **Challenges**

The weak industrialization of Corsica and the way in which apiaries are managed, which use several layers of vegetation, are the assets. They also show as many dependencies to the local environment as there are types of vegetations/foraging areas, and as many potential vulnerabilities.

### **Innovation**

Global warming is modifying production cycles and honey flow. Beekeepers are forced to practice transhumance and often to breed queens to face new challenges. The sharp drop in production leads beekeepers to borrow breeding techniques, especially breeding queens, and to resort to feeding practices. The challenge is to continue to produce each of the honeys in the PDO range, in particular summer honeys - in decline due to drought and access to the mountains - and chestnut groves affected by cypins disease and drought. The value of honey is very directly linked to the management of apiaries in a set of varied environments exposed to climate change. The location of the apiaries is strategic to produce different honeys, especially those located in the mountains. The value is therefore dependent on the mellifer and pollen potential of the foraging areas and the ability of beekeepers to choose the right locations.



## Unedo arbutus honey - PDO

The fame of Corsican honey is old but its contemporary reputation results from the professionalization of the activity since 1980 and subsequently from a recognition consecrated by obtaining a PDO in 1998. The PDO brings together six honeys, four of which are produced from the spontaneous flora of the maquis.

Corsica is an island in the sea. It presents a great diversity of landscapes: plains, hillsides, deep and steep valleys. Small ruminant farming has long been a transhumant activity, occupying all the region. For the past decades, farmers have settled, in the plains and hillsides. Some of them keep on using mountain pastures during Summer. They are scattered within the region, with no remarkable specialised sub-region. The value chain concerns all the Corsican region because of the mobility of apiaries from littoral to medium and high mountain in the same way. The production of chestnut honey is widespread and requires a stay of 1 to 2 months in mid-mountain areas, often near villages.

### Reference mountain landscape statistics (NUTS: FRM0)

Reference mountain chain		Corsica mountains	
Reference mountain landscape		Corsica	
Size of the area (km <sup>2</sup> )	8,722	Average per capita income (€)/year	25,400
Altimetry (m; min-max)	0–2,706	Total Gross Value Added (GVA) (€ million)/year	8,034
Population density (Inhabitants/km <sup>2</sup> )	38.6	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	10%	Primary:	1%
Total bed places (BPs) in tourist accommodations/year	-	Secondary (including construction):	19.8%
		Tertiary:	79.1%
Road distance from Urban Poles* <sup>1</sup> (km)	333	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	2,662	Primary:	3.6%
Protected areas	Yes	Secondary:	16.2%
		Tertiary:	80.2%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Except in winter, which is the season during which bee colonies rest, there is one honeydew per season. The definition of honey and its controls are based upon its taste and pollen analysis,

reflecting the foraging areas (heather, asphodel, lavender, broom, oaks, anthill, thyme, etc.). Autumn honey is made almost exclusively from arbutus unedo honey. Its strongly bitter taste characteristic distinguishes it very easily from other honeys in the range. Its market value is ambivalent and varies according to the regions of Europe and according to consumption habits. It is very popular in Italy, especially in Sardinia, while it is the least sold of the PDO range in Corsica and France. It is sought after by "connoisseurs" and rejected by irregular consumers. Its consumption with a spoon is also different. Maintaining and stabilizing value is dependent on each arbutus stands and contrasting consumption habits in Europe. This VC is present in other EU countries Austria, Czech Republic, Crete, Hungary, Italy, North Macedonia.

### **Key local assets**

Know-how and control of the management of apiaries within complex and varied ecosystems (vegetation and altitude). Variety of the couple honey / natural production site integrated into the VC. Control of honeydew in spontaneous vegetation by Corsican beekeepers.

### **Challenges**

The challenge is to continue producing this honey and to promote it to preserve both the enhancement and balance of the PDO range and the preservation of arbutus unedo stands subject to fires and particularly vulnerable to increasing drought linked to global warming.

### **Innovation**

The innovation consists of designing a marketing strategy aimed at associating the promotion of honey with a public of European connoisseurs and the preservation of unedo arbutus stands for which there has been a decrease in the Mediterranean areas due to fires and increasing drought.

## Corsican chestnut flour - PDO

Omnipresent in mountain. Its productions are a pillar in the traditional Corsican diet. Its relaunch was made from chestnut flour which obtained a PDO in 2010. All AOP productions adhere to Organic Agriculture (AB). The flour comes from the regeneration of a very small part of the existing orchards which mostly suffer from fungal diseases (phytophthora and Cryphonectria).

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### Reference mountain landscape statistics (NUTS: FRM0)

Reference mountain chain		Corsica mountains	
Reference mountain landscape		Corsica	
Size of the area (km <sup>2</sup> )	8,722	Average per capita income (€)/year	25,400
Altimetry (m; min-max)	0–2,706	Total Gross Value Added (GVA) (€ million)/year	8,034
Population density (Inhabitants/km <sup>2</sup> )	38.6	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	10%	Primary:	1%
Total bed places (BPs) in tourist accommodations/year	-	Secondary (including construction):	19.8%
Road distance from Urban Poles* <sup>1</sup> (km)	333	Tertiary:	79.1%
Number of agricultural holdings	2,662	Employment by sector* <sup>3</sup>	
Protected areas	Yes	Primary:	3.6%
		Secondary:	16.2%
		Tertiary:	80.2%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The health situation worsened sharply with the arrival of the Cynips (*Dryocosmus kuriphilus*) which called into question the existence of the trade of chestnut farmer. The interest of the Corsican chestnut grove stems from the high valuation of the flour obtained thanks to the PDO of

a mountain activity in a context of high vulnerability (diseases, degeneration of orchards, global warming) and loss of control of the Peri village area. The activity is organized mainly around the Defense and Management Organization of the PDO. The diseases of orchards and the local uses of flour (pulenta) leads to the situation where farmers cannot reach all the demand. Maintaining brushless ecosystems around villages is a new challenge. The value of the chestnut can no longer be examined solely from the point of view of chestnut production but also from the point of view of issues linked to a complex resource environment, a common that involves other categories of actors (municipality, community associations, amateurs, and professionals). This VC is also present in other EU countries Greece, Portugal, Spain, Swiss, Italy (production of chestnut flour too) and Turkey (high value product under GI).

### **Key local assets**

Productive domestic forest in the process of degradation and loss of vegetation.

### **Challenges**

Maintain orchards currently in production, plant replacement trees by constituting village communes: subsistence purpose, additional income, and control of space.

### **Innovation**

The innovation lies in the control of the sanitary state of the trees associated with the constitution of the chestnut grove as a common resource of the villages of Corsica. The chestnut grove is based on a heritage value which can today be reinforced by the new food and spatial challenges. The final value is the result of a combination of values of different natures: the culture of the nourishing tree, constitution of income, maintenance of ecosystems and management of space.

## Aromatic plant: Immortelle de Corse

The valuation of essential oils by distillery is recent in Corsica. Helicrysum is emblematic of the dynamics of the aromatic plant sector and enjoys a high market value for proven therapeutic indications (anti-hematoma, anti-inflammatory, anticoagulant, anti-lebbitic).

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### Reference mountain landscape statistics (NUTS: FRM0)

Reference mountain chain	Corsica mountains		
Reference mountain landscape	Corsica		
Size of the area (km <sup>2</sup> )	8,722	Average per capita income (€)/year	25,400
Altimetry (m; min-max)	0–2,706	Total Gross Value Added (GVA) (€ million)/year	8,034
Population density (Inhabitants/km <sup>2</sup> )	38.6	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	10%	Primary:	1%
Total bed places (BPs) in tourist accommodations/year	-	Secondary (including construction):	19.8%
		Tertiary:	79.1%
Road distance from Urban Poles* <sup>1</sup> (km)	333	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	2,662	Primary:	3.6%
Protected areas	Yes	Secondary:	16.2%
		Tertiary:	80.2%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

At the beginning, samples were taken from spontaneous stands. The risk of resource depletion and the desire to guarantee production has led the institutions to finance plantations. However, the value of the oils obtained from the spontaneous plant seems higher. Elicryse addresses both a question of resilience in terms of market value and sustainability of the environment. Finally, the

most profitable operation is distillation. It is therefore the distiller who benefits most of the value *sensu stricto*. The reputation and the high price level of the essential oil of helichrysum from Corsica are linked to the image of the wild nature of Corsica. The value of production is low relative to the activities of distillation, trading, and prescription of oils. The downstream power runs the risk of disembodiment of the activity and wild harvests to have negative impacts on the environment. What chain of values that are both fair and sustainable? The oil GI certification project was unsuccessful. The GI certification project for the oil failed apart from a few AB oils, no protection, apart from industrial brands (cosmetics, perfumery, aromatherapy, etc.), does not guarantee collective protection. This VC is also present in other regions of France (Drôme) where about 100ha of Curry plant might be produced as well. It was identified in Italy, North Macedonia, Slovakia, Switzerland, and Spain. The activity can join other activities which mobilize in the construction of the value of the species existing in the spontaneous state and where the agricultural possibilities are not yet completely stabilized. PAM but also fruits like acorn can enrich the approach.

### Key local assets

Reputation of helichrysum oil associated with the "wild nature" of Corsica.

### Challenges

The challenge is to maintain the therapeutic qualities of the oils, to stabilize highly profitable production with a strong reputation, to preserve spontaneous stands of uncontrolled harvests and finally to prevent integration by large industrial operators. How to design a fair value chain between operators and maintain value in production areas?

### Innovation

Innovation consists in maintaining a high level of quality and a reputation based on cultivated production on the one hand and in organizing a sector for equitable sharing of value on the other hand. The final value is the result of a combination of values of different natures: the culture of the nourishing tree, constitution of income, maintenance of ecosystems and management of space.

## Corsican milk lamb

High reputation products, coexistence between mountainous area and plains, competing access to milk (for processing or feeding the lamb), strategy of localisation and contribution to villages vividness, resources linked to pastoral breeding (breeds, feeding species) and their associated know-how are diminishing, traditional dishes and local culinary heritage are diminishing as well.

Corsica is an island in the sea. It presents a great diversity of landscapes: plains, hillsides, deep and steep valleys. Small ruminant farming has long been a transhumant activity, occupying all the region. For the past decades, farmers have settled, in the plains and hillsides. Some of them keep on using mountain pastures during Summer. They are scattered within the region, with no remarkable specialised sub-region. The area of production of PDO Brocciu or for the project of PGI on milk lamb is Corsica.

### Reference mountain landscape statistics (NUTS: FRM0)

Reference mountain chain		Corsica mountains	
Reference mountain landscape		Corsica	
Size of the area (km <sup>2</sup> )	8,722	Average per capita income (€)/year	25,400
Altimetry (m; min-max)	0–2,706	Total Gross Value Added (GVA) (€ million)/year	8,034
Population density (Inhabitants/km <sup>2</sup> )	38.6	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	10%	Primary:	1%
Total bed places (BPs) in tourist accommodations/year	-	Secondary (including construction):	19.8%
		Tertiary:	79.1%
Road distance from Urban Poles* <sup>1</sup> (km)	333	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	2,662	Primary:	3.6%
Protected areas	Yes	Secondary:	16.2%
		Tertiary:	80.2%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The reputation and the high price level of the essential oil of helichrysum from Corsica are linked to the image of the wild nature of Corsica. The value of production is low relative to the activities of distillation, trading, and prescription of oils. The downstream power runs the risk of disembodiment of the activity and wild harvests to have negative impacts on the environment. What

chain of values that are both fair and sustainable? The oil GI certification project was unsuccessful. The GI certification project for the oil failed apart from a few AB oils, no protection, apart from industrial brands (cosmetics, perfumery, aromatherapy, etc.), does not guarantee collective protection. This VC is also present in other regions of France (Drôme) where about 100ha of Curry plant might be produced as well. It was identified in Italy, North Macedonia, Slovakia, Switzerland, and Spain. The activity can join other activities which mobilize in the construction of the value of the species existing in the spontaneous state and where the agricultural possibilities are not yet completely stabilized. PAM but also fruits like acorn can enrich the approach.

### **Key local assets**

Pastoral systems benefit from a long history using natural resources and leaving traces in the landscape. Somehow, Nature is considered without husbandry, especially in Corsica. It has been competing with other uses of landscape (tourism, natural parcs, leisure...). Cultural heritage is eroding, and new values have arisen concerning animal welfare, putting animal slaughtering into a new perspective.

### **Challenges**

To (re)assemble resources that have been built and transmitted in the territory (breeds, feeding species...), especially to reconnect intertwined activities (milk lamb and dairy production) that have been set apart with agriculture modernization and specialization. To reconnect food production with food uses (cooking, eating habits, etc.).

### **Innovation**

One large stakeholder (organization of producers, linked to the biggest dairy) implemented a service that collect the milk lambs of most producers to send them to Sardinia where they are slaughtered. They get the carcasses back and freeze a part of them to sell them later in the year when tourist season has begun. They struggle to add value to their product. farmers have had a project of PGI for their Corsican milk lamb for years. They failed yet. They struggle to find durable solutions. With modernization, milk lambs have been a growing issue for dairy producers. They have specialized in producing milk and do not know what to do with lambs. Local culinary uses have been diminishing, contributing to restraining the local markets. Local farmers are looking for levers to improve this situation. local at the SES level and from the point of view of consumers and intermediate profession (butcher shops) could provide new insight.



## Corsican milk kid

High reputation products, coexistence between mountainous area and plains, competing access to milk (for processing or feeding the lamb), strategy of localisation and contribution to villages vividness, resources linked to pastoral breeding (breeds, feeding species) and their associated know-how are diminishing, traditional dishes and local culinary heritage are diminishing as well.

Corsica is an island in the sea. It presents a great diversity of landscapes: plains, hillsides, deep and steep valleys. Small ruminant farming has long been a transhumant activity, occupying all the region. For the past decades, farmers have settled, in the plains and hillsides. Some of them keep on using mountain pastures during Summer. They are scattered within the region, with no remarkable specialised sub-region.

### Reference mountain landscape statistics (NUTS: FRM0)

Reference mountain chain	Corsica mountains		
Reference mountain landscape	Corsica		
Size of the area (km <sup>2</sup> )	8,722	Average per capita income (€)/year	25,400
Altimetry (m; min-max)	0–2,706	Total Gross Value Added (GVA) (€ million)/year	8,034
Population density (Inhabitants/km <sup>2</sup> )	38.6	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	10%	Primary:	1%
Total bed places (BPs) in tourist accommodations/year	-	Secondary (including construction):	19.8%
		Tertiary:	79.1%
Road distance from Urban Poles* <sup>1</sup> (km)	333	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	2,662	Primary:	3.6%
Protected areas	Yes	Secondary:	16.2%
		Tertiary:	80.2%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Milk Kid is seasonally produced, mostly for Christmas, by approximately 200 farmers. An association of farmers intervene for slaughtering the animals and corresponding logistics. There are different circuits for selling the carcasses: direct selling from farmers, butchers' shop, etc. This

VC is also present in other mountains of France (Alps, CCVD) where similar issues have been rising.

### **Key local assets**

Pastoral systems benefit from a long history using natural resources and leaving traces in the landscape. Somehow, Nature is considered without husbandry, especially in Corsica. It has been competing with other uses of landscape (tourism, natural parcs, leisure...). Cultural heritage is eroding, and new values have arisen concerning animal welfare, putting animal slaughtering into a new perspective.

### **Challenges**

To (re)assemble resources that have been built and transmitted in the territory (breeds, feeding species...), especially to reconnect intertwined activities (milk lamb and dairy production) that have been set apart with agriculture modernization and specialization. To reconnect food production with food uses (cooking, eating habits, etc.).

### **Innovation**

The cork value chain is a traditional one, where no innovations have been identified.

## Vitellu Corsu

Low reputation products, negative reputation linked to this activity, coexistence between mountainous area and plains, strategy of localisation and contribution to villages vividness, competing access to land against others animal husbandry (dairy goat and dairy ewe).

Corsica is an island in the sea. It presents a great diversity of landscapes: plains, hillsides, deep and steep valleys. Corsica is an island in the sea. It presents a great diversity of landscapes: plains, hillsides, deep and steep valleys. Cattle farms are scattered within the region, with no remarkable specialised sub-region.

### Reference mountain landscape statistics (NUTS: FRM0)

Reference mountain chain	Corsica mountains		
Reference mountain landscape	Corsica		
Size of the area (km <sup>2</sup> )	8,722	Average per capita income (€)/year	25,400
Altimetry (m; min-max)	0–2,706	Total Gross Value Added (GVA) (€ million)/year	8,034
Population density (Inhabitants/km <sup>2</sup> )	38.6	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	10%	Primary:	1%
Total bed places (BPs) in tourist accommodations/year	-	Secondary (including construction):	19.8%
		Tertiary:	79.1%
Road distance from Urban Poles* <sup>1</sup> (km)	333	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	2,662	Primary:	3.6%
Protected areas	Yes	Secondary:	16.2%
		Tertiary:	80.2%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

There are 1000 cattle farms, owning 60 000 animals among which 35 000 cows. 12 000 animals are slaughtered every year, in 3 slaughtering houses (Ajaccio, Ponte Leccia, Porto Vecchio). The Corsican Breed is recognized since 2013 and managed by an agricultural organisation (Chambre d'agriculture). Farmers have organized locally to improve their marketing strategy: vitellu corsu, Carne Niulinca, etc. The regional association promoting organic agriculture (Interbio) is also a strong stakeholder, contributing to federate 14 farmers for direct selling. Plus, organic farming has

grown from 42 to 83 farms in 2 years (2016-2018). Cattle farming and its interconnexion with organic practices are described in Serbia and Switzerland.

### **Key local assets**

Pastoral systems benefit from a long history using natural resources and leaving traces in the landscape. Somehow, Nature is considered without husbandry, especially in Corsica. It has been competing with other uses of landscape (tourism, natural parcs, leisure...). Cows are largely part of that Nature, being present in shrubs and summer pastures. This leads to permeable representations between domestic animals and wild ones.

### **Challenges**

To organize and to find conditions for durably coexisting with other activities, especially in mountainous areas.

### **Innovation**

Corsican inhabitants have always own cattle for farm labour. With the implementation of the European agricultural policy, more especially subsidies linked to mountainous areas, farmers have bought and declared more and more animals, which has been considered as a deviance mixing accusations of large frauds and issues of animal divagation. For one or two decades, a part of the cattle, farmers have tried to organize their production and to add value to it. They sell young beef, manzu. They mostly act individually or organize at a local level (association of less than 20 farmers) to sell their produce locally. Organic label has been growing as well. Organizing their production, farmers are claiming a right to farm cattle, to gain a revenue from their activity and to exist in rural areas. They are willing to improve cattle farming reputation from extensive and exclusive use of landscape to a legitimate activity, coexisting with more traditional productions such as dairy husbandry or pork-meat production. They struggle in finding an efficient strategy of valorisation: which type of animal to slaughter and sell? Calf, young beef? Moreover, technical references have long been produced on grazing cattle. What about cattle farmed in natural lands like in Corsica?

## Pin Lariccio

This VC is characterized by a high reputation product which represent a territorial identity. However, it is threatened by management issues related to logistics and the organization of the sector.

Corsica is an island in the sea. It presents a great diversity of landscapes: plains, hillsides, deep and steep valleys. Pin Larriccio is present in the highest altitudes, between 900 and 1800 meters.

### Reference mountain landscape statistics (NUTS: FRM0)

Reference mountain chain	Corsica mountains		
Reference mountain landscape	Corsica		
Size of the area (km <sup>2</sup> )	8,722	Average per capita income (€)/year	25,400
Altimetry (m; min-max)	0–2,706	Total Gross Value Added (GVA) (€ million)/year	8,034
Population density (Inhabitants/km <sup>2</sup> )	38.6	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	10%	Primary:	1%
Total bed places (BPs) in tourist accommodations/year	-	Secondary (including construction):	19.8%
		Tertiary:	79.1%
Road distance from Urban Poles* <sup>1</sup> (km)	333	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	2,662	Primary:	3.6%
Protected areas	Yes	Secondary:	16.2%
		Tertiary:	80.2%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

This sector is highly concentrated. It gathers 9 sawmills. 3 units do 75% of regional lumber collection and 70% of wood sawing and wood planning. This interprofessional organisational has been existing since 2010. Public (ONF) and private owners coexist, even though ONF is the most important producers of lamber. Similar VC are present in other countries: Czech Republic, Hungary, North Macedonia, etc.

## Key local assets

pastoral systems benefit from a long history using natural resources and leaving traces in the landscape. Somehow, Nature is considered without husbandry, especially in Corsica. It has been competing with other uses of landscape (tourism, natural parcs, leisure, etc).

### **Challenges**

To organize and to find conditions for existing durably. To provide for local construction (in a context of political will for reducing dependencies)

### **Innovation**

Wood products coming from Pin Lariccio are expensive: they are sold 42€/m<sup>3</sup> which is 70% higher than comparable tree essences (fir). This activity suffers from exogeneous competition, based on exotic essences. The main stakeholders adapt and propose both local essences and foreign ones. Pin Lariccio grows in high altitudes, mostly in lands that are property of the state and managed by the National Office of Forest (ONF in France). This makes this public organization the main producer of Pin Lariccio, along with other missions such as forest management, preservation of the environment and public reception (summer tourism). An interprofessional organization was created in 2010 to organize and promote the sector, which is less developed than elsewhere in France; it federates the activities involved in wood extraction and the ones involved in construction. In 2020, the regional office for agricultural and rural development had a brand recognized for Corsican lumber: Lignum Corsica. There is a political will to promote this sector and to push local stakeholders to use local lumber for construction (public buildings and private ones).

## Boar hunting

This VC is characterized by a high reputation product that strongly rely on the persistence of forests and can be categorised into Circular economy domain.

Corsica is an island in the sea. It presents a great diversity of landscapes: plains, hillsides, deep and steep valleys. Boar is equally distributed in Corsica.

### Reference mountain landscape statistics (NUTS: FRM0)

Reference mountain chain	Corsica mountains		
Reference mountain landscape	Corsica		
Size of the area (km <sup>2</sup> )	8,722	Average per capita income (€)/year	25,400
Altimetry (m; min-max)	0–2,706	Total Gross Value Added (GVA) (€ million)/year	8,034
Population density (Inhabitants/km <sup>2</sup> )	38.6	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	10%	Primary:	1%
Total bed places (BPs) in tourist accommodations/year	-	Secondary (including construction):	19.8%
		Tertiary:	79.1%
Road distance from Urban Poles* <sup>1</sup> (km)	333	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	2,662	Primary:	3.6%
Protected areas	Yes	Secondary:	16.2%
		Tertiary:	80.2%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Boar hunting is a common activity. 17 000 individuals have a hunting permit in Corsica, though not all of them hunt boar but other wild animals. About 40 000 boars are killed each year, between august and February. Procuring and cooking wild boar is a domestic activity. Procuring wild boar to local restaurant is currently illegal. Hunting is framed and managed by hunting associations, that are gathered in a federation at the regional level. Only one farm breed boars to produce its own food (canery, paté). The others procure boars in Eastern Countries. As there are sanitary issues, the vet associations and farmers sanitary association interferes with boar hunting too.

## Key local assets

This is a traditional activity that is valorised by locals and enjoyed by tourists: boar is a common produce that we find in restaurants. However, evolution of mentalities leads to other representations of hunting (and hunters), which are more negative. They are based on concerns about how this activity is dangerous, about the well-being for animal and they lay on a change in how death is considered.

### **Challenges**

To manage the population of boars and its interactions with domestic animals.

### **Innovation**

Local stakeholders are working together to manage the sanitary issues associated with the interactions occurring between domestic animals (Cows, Pigs) and the wild. Hunters are part of this type of collective action. With modernization, hunters, villagers, and farmers have been growing apart. The professionalisation and institutionalisation of those activities have led individuals to invest into different collectives and associations. Acting for health issues, they need to work together and find common interest.



## Peri-village vegetable and fruit production

The VC is based on the initiative of the village of Pigna located in a region of olive-growing tradition and revival of Peri-village areas (will have elected officials, associative dynamism). Peri-village productions brings together a set of inseparable market garden and fruit productions which derive their value from their geographical and social situation.

The community of municipalities of L'Île-Rousse-Balagne comprises 22 communes. It is deployed along the territorial road 30 and above the town of L'Île-Rousse with the villages of Haute Balagne. It brought together 10,400 inhabitants in 2015, i.e., a population density lower than the regional average: 27 inhabitants per km<sup>2</sup> against 37. Its two main municipalities, L'Île-Rousse, and Monticello, have half the inhabitants and many services and facilities: seven out of ten are present in the region, including a high school.

Reference mountain landscape statistics  
(A: Data from NUTS FRM0; B: data from NUTS2 FRM02)

Reference mountain chain		Corsica mountains	
Reference mountain landscape		Île-rousse-Balagne	
Size of the area (km <sup>2</sup> )	390	Average per capita income (€)/year	25,400 <sup>A</sup>
Altimetry (m; min-max)	0–2,390	Total Gross Value Added (GVA) (€ million)/year	3,894 <sup>B</sup>
Population density (Inhabitants/km <sup>2</sup> )	26.7	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	1%	Primary:	1.7% <sup>B</sup>
Total bed places (BPs) in tourist accommodations/year	8,000 <sup>A</sup>	Secondary (including construction):	21.1% <sup>B</sup>
		Tertiary:	77.1% <sup>B</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	333	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	160	Primary:	5%
Protected areas	Yes	Secondary:	20%
		Tertiary:	75%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The value of the products does not come from a reputation per se but from the conjunction of several resources adjusted to the food needs of the inhabitants (proximity, soil, irrigation, etc.). These foods, which are not only products, also occupy the strategic space around the mountain

villages. They constitute a useful crown for occupation, spatial planning, firefighting, and village sociability. These food areas also provide additional income and participate in the construction of the landscape. In Balagne, the revival is the result of the inhabitants often accompanied by local elected officials. This is the case of the village of Pigna, where the private initiative to plant gardens and orchards (citrus and fruit trees) is now that of the town hall. The construction of the value chain combines the search for additional income, food for residents, spatial planning, and tourist attractiveness. These social innovation around feeding is also encouraged by local mayors, regional authorities, and national ones through the implementation of public policies.

### **Key local assets**

The strengths are the search for food coupled with well-being. Terracing systems and irrigation networks make this quest accessible. Still, they must compete with other land use, especially construction dedicated to tourism (and second homes) in a region where it is predominant.

### **Challenges**

The conditions and challenges for relaunching peri-village fruit and vegetable production are land release from agricultural terraces, the attractiveness of the activity (help with brush clearing, processing equipment jams, jars, dehydration), the promotion and sale of products as they are and processed, the organization of local networks which connect productions to local demand (culinary uses), to collective catering.

### **Innovation**

Human abandonment has turned "peri-village areas" into wilderness or areas occupied by stray animals. The current crises are leading to the beginning of the reoccupation of these spaces for the food production of the inhabitants. New species, varieties, new techniques, a new organization of trade is being put in place (permaculture, absence of pesticides, etc.). These social and technical innovations build new values (loans, hybridization, coexistence) based on a connection between inhabitants and their immediate environment. The value begins by considering local vulnerabilities and not the market opportunity. Just as resilience depends on local capacities to associate components such as spaces, knowledge (technical route to produce vegetables and fruits), capacities and adjusted public action. The project is not only organized on a supply / demand connection but on a project of a mountain village community considering the food landscape of the village.

## Mountain apple production

The value chain begins with the revival of apple production from two villages (Todda and Bastelica) in the Prunelli region (South Corsica) by small local producers. The population of two villages took part in the project through the organization of market fairs. The revival includes the renovation of old orchards, the study of local varieties, the planting, the processing of fruits (juices and compotes) and the organization of local markets.

The Prunelli Valley is the most important valley of Monte Renosu (2,352 m). Strongly dug, it shelters few villages including those of apple production (Basterga and Todda). The strong human deprivation of the villages is compensated by a relative proximity to the city of Aiacciu. It is the old winter pastoral localities which are today the most populated, in particular because of a very strong urban and tourist attraction (Bastelicaccia and Purtichju).

### Reference mountain landscape statistics

(A: Data from NUTS FRM0; B: data from NUTS2 FRM01)

Reference mountain chain		Corsica mountains	
Reference mountain landscape		Celavu - Prunelli	
Size of the area (km <sup>2</sup> )	381.5	Average per capita income (€)/year	25,400 <sup>A</sup>
Altimetry (m; min-max)	7–2,352	Total Gross Value Added (GVA) (€ million)/year	4,140 <sup>B</sup>
Population density (Inhabitants/km <sup>2</sup> )	22.8	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	2%	Primary:	0.5% <sup>B</sup>
Total bed places (BPs) in tourist accommodations/year	-	Secondary (including construction):	18.6% <sup>B</sup>
		Tertiary:	80.1% <sup>B</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	333	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	2,662	Primary:	9.2%
Protected areas	No	Secondary:	22.5%
		Tertiary:	68.3%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The construction of the value of apples from the Prunelli region results from the revival of several small orchards, the voluntarism of the mayors of the localities and the commitment of the village

community around the annual apple fair organized alternately in Todda and in Bastelica. These social innovation around feeding is also an encouraged by local mayors, officials, and the implementation of public policies.

### **Key local assets**

The participation of the villagers in the revival of production and the support of elected officials in the construction of the value chain, including the market.

### **Challenges**

The stake is to register the collective project which carries the VC in the duration and to give to the orchards a statute of "common" for the benefit of the villagers. the difficulty is to invest human and financial resources (know-how and investments) and to find the legal frameworks (uses and management) which consider the long life of an orchard.

### **Innovation**

VC is a social innovation whose construction is the result of the revival of orchards, public support, and participation of the village community. The apple fair (Todda and Bastelica) constitutes the keystone of the whole by associating the market and non-market value of the VC. Notice a collection of variety of apples in the village of Todda allows the setting up of various experiments. The VC highlights a social innovation oriented towards the participation of the local populations in the reconquest of their supply.

## Corsican olive oil - PDO

The relaunch of olive culture was based on the construction of a geographical indication that promotes local varieties and upright driving tree. The two oils identified (“old-fashioned harvest” and “on the tree”) mobilize original sensory characteristics highlighted by the professional organization that manages the GI. Today, the current dynamism of the sector is threatened by the disease linked to the bacterium *Xilella fastidiosa* and by global warming, which is the cause of increasingly frequent drought. The challenge is to rethink the sensory characteristics of Corsican oils in this new production context.

The value chain concerns the Balagna region emblematic of olive oil production in Corsica. Located in the northwest of the island, it is a tourist region without any significant town and consisting of a Balcony village. It is constituted of 24 municipalities covering an area of 397.92 km<sup>2</sup> grouped in two communities of municipalities.

Reference mountain landscape statistics  
(A: Data from NUTS FRM0; B: data from NUTS2 FRM02)

Reference mountain chain		Corsica mountains	
Reference mountain landscape		île-rousse-Balagne	
Size of the area (km <sup>2</sup> )	390	Average per capita income (€)/year	25,400 <sup>A</sup>
Altimetry (m; min-max)	0–2,390	Total Gross Value Added (GVA) (€ million)/year	3,894 <sup>B</sup>
Population density (Inhabitants/km <sup>2</sup> )	26.7	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	1%	Primary:	1.7% <sup>B</sup>
Total bed places (BPs) in tourist accommodations/year	8,000 <sup>A</sup>	Secondary (including construction):	21.1% <sup>B</sup>
		Tertiary:	77.1% <sup>B</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	333	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	160	Primary:	5%
Protected areas	Yes	Secondary:	20%
		Tertiary:	75%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The olive growing is structured around a GI Oliu di Corsica (Interprofessional Union of Oléiculteurs de Corse). Corsica oil is defined from a double sensory identity: a sweet oil, ripe fruits, harvested with old-fashioned nets, taking advantage of old orchards with erect habit and an oil harvested on the tree from recent orchard plantations: slight acidity and bitterness 200 small to very small farms adhere to the GI.

The threat of *Xilella fastidiosa* strongly impacts the representations that olive growers have of their future. It expresses global warming and globalization. Olive growing (like the chestnut tree) is the agricultural activity with the most impact on areas near mid-mountain villages and therefore a lever for their preservation and revitalization.

### Key local assets

Island oil benefits from a favourable production environment. On one hand lack of large industrial and urban centres and on the other hand high level of touristic activity. Orchards are often located in mid-mountain from 200 to 600 to 700 meters above sea level. The island has a large surface of oleasters, a possible resource for grafting points. But the most important assets are the variety-driving-harvest combination which makes Corsican oil a sweet oil with specific characteristics.

### Challenges

Two directions are considered: to increase the irrigation levels of orchards and / or to orient plantations in mid-mountain areas with the risk of modifying sensory properties which is the base of the value chain. The question is whether orchard management methods and local varieties will be able to face to this new context of production? And downstream, how customers will receive likely changes in taste.

### Innovation

The innovation consisted in enhancing new sensorial characteristics such as "green fruity" while local habit is founded on "ripened fruit" This openness, which is based on harvesting fruit from the tree, (while the traditional harvest is done with a net) is linked to taste standards that are both commercial and due to European norms. The tasting training within the framework of GIs has accompanied innovation. Olive orchards cover a large part of the areas around mid-mountain villages but most often in wild form (oleaster). The revival of olive growing involves both landscaping and development as well as economic issues. The oil is a market product but also a food for the local populations. The current and future crises can accelerate the revival of activity towards the regeneration of old trees or even new plantations in the upper parts of the villages. These transformations towards mountain and domestic production raise the question of coexistence with the current value chain. For which oils (ripe fruit or harvest from the tree), which governance and which space occupations?

## Firewood

The firewood VC is characteristic of the region; it is strongly connected with forests land uses which are prevalent in the area. Additionally, it represents an important VC which guarantees a certain level of energy autonomy to Corsicans.

Corsica is an island in the sea. It presents a great diversity of landscapes: plains, hillsides, deep and steep valleys. The value chain concerns all the Corsican region because of the homogeneity of resources, diseases impact, driving skills, plants varieties and labels.

### Reference mountain landscape statistics (NUTS: FRM0)

Reference mountain chain	Corsica mountains		
Reference mountain landscape	Corsica		
Size of the area (km <sup>2</sup> )	8,722	Average per capita income (€)/year	25,400
Altimetry (m; min-max)	0–2,706	Total Gross Value Added (GVA) (€ million)/year	8,034
Population density (Inhabitants/km <sup>2</sup> )	38.6	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	10%	Primary:	1%
Total bed places (BPs) in tourist accommodations/year	-	Secondary (including construction):	19.8%
		Tertiary:	79.1%
Road distance from Urban Poles* <sup>1</sup> (km)	333	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	2,662	Primary:	3.6%
Protected areas	Yes	Secondary:	16.2%
		Tertiary:	80.2%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Forest represents half of the Corsican land (400 000 ha), which is bigger than the national average (30%). Half of it corresponds to forests of mid-altitude. They are owned by individuals, under small parcels that are generally smaller than 10ha. They are mostly composed of oaks and they have been expanding at an important rate. This corresponds to the finished form of shrub once it has grown on abandoned land. It has a role for heating local households, even though it is not optimized. 280 establishments are involved in the wood sector in Corsica, mostly in extracting firwood, but the professionals are aging, and salaries are less than national average.

### **Key local assets**

Pastoral systems benefit from a long history using natural resources and leaving traces in the landscape. Somehow, Nature is considered without husbandry, especially in Corsica. It has been competing with other uses of landscape (tourism, natural parcs, leisure...). Forests reveal that tension, gathering different essences, domestic and wild.

### **Challenges**

Two directions are considered: to increase the irrigation levels of orchards and / or to orient plantations in mid-mountain areas with the risk of modifying sensory properties which is the base of the value chain. The question is whether orchard management methods and local varieties will be able to face to this new context of production? And downstream, how customers will receive likely changes in taste.

### **Innovation**

The cork value chain is a traditional one, where no innovations have been identified.



## Conventional field crops

Conventional agriculture in irrigated field crops is the main agricultural pattern of Drome down valley. Main productions are wheat, corn, garlic, sunflower, chickpeas, aromatic plants, seeds, which are mainly driven towards animal food or long chain distribution.

Drôme is a very diversified department in terms of geological, natural, and agricultural resources. The North-East of the territory is characterised by middle and high mountains (Pre Alps and Vercors Natural Park): agriculture in this area is mainly livestock and small diversified gardening. The South is characterized by the beginning of the Provence and the Mediterranean climate, we can find there aromatic and yard large cultures. The West of the territory is characterized by plains where the Rhône and the Drôme rivers meet. Agriculture there is mainly large cropland. Within the Drôme department, Biovallée territory gathers 3 associations of municipalities (EPCI) - 95 municipalities in total. It is a very preserved and diversified territory, following the Drôme River, from Pre Alps to large plains of the down valley.

### Reference mountain landscape statistics (A: Data from the NUTS3: FR713)

Reference mountain chain		Drome Valley	
Reference mountain landscape		Biovallée - Eure	
Size of the area (km <sup>2</sup> )	2,200	Average per capita income €/year	25,400 <sup>A</sup>
Altimetry (m; min-max)	50–2,453	Total Gross Value Added (GVA) €/year	14,532 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	79 <sup>A</sup>	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	10% <sup>A</sup>	Primary:	1.7% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	56,167 <sup>A</sup>	Secondary (including construction):	20.3% <sup>A</sup>
		Tertiary:	77.6% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	115 <sup>A</sup>	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	6,400 <sup>A</sup>	Primary:	2.2% <sup>A</sup>
Protected areas	Yes	Secondary:	24.6% <sup>A</sup>
		Tertiary:	71.5% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

Conventional agriculture in irrigated field crops is characteristic of Drôme down valley. The main productions are wheat, corn, garlic, sunflower, seeds, chickpeas, aromatic plants...This value

chain is facing strong pressures: water scarcity, drought, parasitism, installation of new diversified farms, implying a new balance in water sharing. Actors of this VC are developing adaptation and transformation strategies for irrigated field crops in the face of climate change: Diversification strategies; Rationalization of irrigation, especially for high value crops and Crop rotation strategies. A renewed network of cooperation around water resource is also in development.

Besides, due to climatic change, specific cultures from high and middle mountain areas tend to be developed in large fields in the down valley. It is thus interesting to study this phenomenon and its economic and ecological impact on the territory. The question of water scarcity in the Drome Valley is pregnant. Farmers' irrigation system is connected to the river. Water puncture in the river, namely in low water period are problematic. It questions the shared use and protection of the river. Adaption by conventional irrigated culture actors of the Drome Valley is innovative at a national scale.

### Key local assets

Local employment, production of local value, answering actual and future territorial food demand (if adaptation strategies).

Social asset: cooperation, community interactions around water use between farmers, local authorities, local water management associations, environment protection associations.

### Challenges

This value chain is facing strong pressures: water scarcity and pressure on sharing with new actors, drought, parasitism. The interest is to study adaptation and water sharing strategies implemented by irrigated field crops in the face of climate change (Diversification strategies, Rationalization of irrigation, especially for high value crops, Crop rotation strategies)

### Innovation

This VC implements adaptation or transformation strategies anticipating climate change and water scarcity such as diversification and development of adapted high added value cultures (chickpeas, lentil, aromatic), crops rotation, increase of organic matter inputs in soils, use of green fertilizers for carbon stockage and soil protection.

The innovation in this VC is linked to/

- New products thank to diversification strategies: chickpeas, lentil.
- New processes: irrigation dedicated only for high added value culture, crop rotation organic matter inputs, green fertilizers, reservoir.
- New governance systems: cooperation between irrigators, new farmers, water management associations, local authorities

## Extensive livestock farming

Extensive livestock farming is a crucial activity for the local economic and the creation of added value at the local level since it is based on silvopastoralism which shares mountain spaces and provides ecosystem services. Local slaughtering and direct sales either directly to the consumer or with the label "Agneau de Sisteron" allows to produce value on the territory.

Drôme is a very diversified department in terms of geological, natural, and agricultural resources. The North-East of the territory is characterised by middle and high mountains (Pre Alps and Vercors Natural Park): agriculture in this area is mainly livestock and small diversified gardening. The South is characterized by the beginning of the Provence and the Mediterranean climate, we can find there aromatic and yard large cultures. The West of the territory is characterized by plains where the Rhône and the Drôme rivers meet. Agriculture there is mainly large cropland. Within the Drôme department, Biovallée territory gathers 3 associations of municipalities (EPCI) - 95 municipalities in total. It is a very preserved and diversified territory, following the Drôme River, from Pre Alps to large plains of the down valley.

Reference mountain landscape statistics  
(A: Data from the NUTS3: FR713)

Reference mountain chain	Drome Valley		
Reference mountain landscape	Biovallée - Eurre		
Size of the area (km <sup>2</sup> )	2,200	Average per capita income €/year	25,400 <sup>A</sup>
Altimetry (m; min-max)	50–2,453	Total Gross Value Added (GVA) €/year	14,532 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	79 <sup>A</sup>	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	10% <sup>A</sup>	Primary:	1.7% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	56,167 <sup>A</sup>	Secondary (including construction):	20.3% <sup>A</sup>
		Tertiary:	77.6% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	115 <sup>A</sup>	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	6,400 <sup>A</sup>	Primary:	2.2% <sup>A</sup>
Protected areas	Yes	Secondary:	24.6% <sup>A</sup>
		Tertiary:	71.5% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

Extensive sheep farming and pastoralism are characteristic of Drôme valley mountain and mid-mountain areas. Local slaughtering and direct sales either directly to the consumer or with the label "Agneau de Sisteron" allows to produce value on the territory.

However, this value chain is very dependent on financial support from the EU. The VC suffers from strong pressures: predation (wolf), droughts, changes in consumer demand, impact on biodiversity.

There are many local and regional stakeholder organizations (ADEM/PNR/FDO...) requesting support to address these issues through ecological, economic, and social impact assessment of VC and support to change practices.

### Key local assets

Key local assets in this VC are:

- Natural asset: Providing ecosystem services in the mountain: silvo-pastoralism, eco-pasturing.
- Economic asset: Creation of local added value, local employment, answer to territorial food demand
- Cultural asset: contribution of local food heritage, conservation of traditional jobs and know how.
- Social asset: cooperation, community interactions around water use between farmers, local authorities, local water management associations, environment protection associations.

### Challenges

Extensive sheep farming and pastoralism are characteristic of Drôme valley mountain and mid-mountain areas. However, this value chain is very dependent on financial support from the EU. The VC suffers from strong pressures: predation (wolf), droughts, changes in consumer demand, impact on biodiversity. There are many local and regional stakeholder organizations (ADEM/PNR/FDO...) requesting support to address these issues through ecological, economic, and social impact assessment of VC and support to change practices.

### Innovation

The innovation in this VC is associated with:

- New marketing strategies: creation of a local VC of organic sheep meat through direct sale and labels.
- New governance systems: different actors using the mountain space gathers to define a common strategy of use such as "Plan Pastoral Territorial". Depends on a lot of public policies, regional and local.

## Market gardening

Diversified organic market gardening with direct sale or local distribution is representative of the local agri-food landscape of the Drôme Valley.

Drôme is a very diversified department in terms of geological, natural, and agricultural resources. The North-East of the territory is characterised by middle and high mountains (Pre Alps and Vercors Natural Park): agriculture in this area is mainly livestock and small diversified gardening. The South is characterized by the beginning of the Provence and the Mediterranean climate, we can find there aromatic and yard large cultures. The West of the territory is characterized by plains where the Rhône and the Drôme rivers meet. Agriculture there is mainly large cropland. Within the Drôme department, Biovallée territory gathers 3 associations of municipalities (EPCI) - 95 municipalities in total. It is a very preserved and diversified territory, following the Drôme River, from Pre Alps to large plains of the down valley.

Reference mountain landscape statistics  
(A: Data from the NUTS3: FR713)

Reference mountain chain	Drome Valley		
Reference mountain landscape	Biovallée - Eurre		
Size of the area (km <sup>2</sup> )	2,200	Average per capita income €/year	25,400 <sup>A</sup>
Altimetry (m; min-max)	50–2,453	Total Gross Value Added (GVA) €/year	14,532 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	79 <sup>A</sup>	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	10% <sup>A</sup>	Primary:	1.7% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	56,167 <sup>A</sup>	Secondary (including construction):	20.3% <sup>A</sup>
		Tertiary:	77.6% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	115 <sup>A</sup>	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	6,400 <sup>A</sup>	Primary:	2.2% <sup>A</sup>
Protected areas	Yes	Secondary:	24.6% <sup>A</sup>
		Tertiary:	71.5% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

This VC presents the following interests: diversified and productive cultivation on small surfaces, innovative agroecological techniques using less water and land, direct sale and distribution in

local circuit, production of local added value and jobs in the area, meeting local demand for vegetables, fruits, cereals and plants, and contribution to food autonomy at the local and regional level. Diversified organic market gardening with direct sale or local distribution is representative of the local agri-food landscape of the Drôme Valley. It represents 190 producers and 314ha of organic vegetable production which make Drome department the 1st producer of organic vegetal in France. Most of the vegetables produced in the Drôme Valley are distributed locally (except garlic and onions). This VC is characterized by diversified and productive cultivation on small surfaces, innovative agro-ecological techniques using less water and land and preserving biodiversity, direct sale, and distribution in local circuit. This type of production is innovative because it produces local added value and jobs in the area, meets local demand for vegetables, fruits, cereals, and plants and contributes to food autonomy at the local and regional level. Besides, it promotes agroecological and social values.

### Key local assets

Key local assets in this VC are:

- Naturel asset: agroecological practices respectful of biodiversity and water scarcity challenges
- Social asset: response to local food demand, autonomy, cooperation between farmers, promotion of ecological and social values

### Challenges

This VC is challenged by the competition with bigger actors, the restricted access to water resources, marketing technics, and the need to propose a production corresponding to local food demand.

### Innovation

The innovation in this VC is associated with:

- new products: diversification to propose products responding to the local food demand; use ancient variety and farmer seeds.
- new processes: agroecological practices to adapt to water scarcity and to produce quantity in small parcels.
- new marketing strategies: direct sale, distribution in local supply channel.

## Clairette de Die - Wine production

Clairette de Die is a natural sparkling white wine, emblematic of the Drome Valley and recognised as an AOC (appellation d'origine contrôlée) and for its "ancestral process". With more than 300 operators, 71 644 hl of Clairette de Die are produced each year, mostly driven toward long supply circuits and export however 20% of the Clairette de Die AOC in organic.

Drôme is a very diversified department in terms of geological, natural, and agricultural resources. The North-East of the territory is characterised by middle and high mountains (Pre Alps and Vercors Natural Park): agriculture in this area is mainly livestock and small diversified gardening. The South is characterized by the beginning of the Provence and the Mediterranean climate, we can find there aromatic and yard large cultures. The West of the territory is characterized by plains where the Rhône and the Drôme rivers meet. Agriculture there is mainly large cropland. Within the Drôme department, Biovallée territory gathers 3 associations of municipalities (EPCI) - 95 municipalities in total. It is a very preserved and diversified territory, following the Drôme River, from Pre Alps to large plains of the down valley.

### Reference mountain landscape statistics (A: Data from the NUTS3: FR713)

Reference mountain chain	Drome Valley		
Reference mountain landscape	Biovallée - Eure		
Size of the area (km <sup>2</sup> )	2,200	Average per capita income €/year	25,400 <sup>A</sup>
Altimetry (m; min-max)	50–2,453	Total Gross Value Added (GVA) €/year	14,532 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	79 <sup>A</sup>	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	10% <sup>A</sup>	Primary:	1.7% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	56,167 <sup>A</sup>	Secondary (including construction):	20.3% <sup>A</sup>
		Tertiary:	77.6% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	115 <sup>A</sup>	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	6,400 <sup>A</sup>	Primary:	2.2% <sup>A</sup>
Protected areas	Yes	Secondary:	24.6% <sup>A</sup>
		Tertiary:	71.5% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

Clairette de Die is an AOC sparkling white wine in 32 municipalities of the Drome Valley. In 1971, the method of production of Clairette de Die wine was officially recognised as the "ancestral process". Nowadays, Clairette de Die 71 644 hl of Clairette de Die are produced each year by more than 300 operators and through large cooperative.

Clairette de Die production is mainly large conventional monoculture and represents an increasing part of cultivated surfaces which present a challenge in term of biodiversity, water supply, land use and installation of new actors. However, almost 20% of Clairette de Die is organic production today, thanks to a policy of "aid to conversion" proposed by the AOP. Clairette de Die is currently facing a structural crisis: sales decrease and production are still increasing thank to public aid for converting in organic. The crisis has been accelerated by the COVID crisis which generated a great amount of unsold stock, namely organic wine, and grapes.

In terms of marketing strategy, Clairette de Die is mainly driven by large-scale distribution and export. However, it is currently facing a loss of attractiveness, accelerated as well by the COVID crisis. There is a need to develop renewed marketing strategies driven towards local demand and supply chains. However, there is tensions between different visions of Clairette de Die operators.

### **Key local assets**

Key local assets in this VC are:

- Cultural asset: Clairette de Die is an iconic product of the Drome Valley with a strong cultural value (traditional knowledge, branding, touristic asset...)
- Economic asset: local job, touristic activity (wine tourism)

### **Challenges**

Clairette de Die is facing several challenges as sales are drawing (competition with other sparkling wines) while planted surfaces still increase diversification of marketing strategies (wine shops, local grocery stores, restaurants, etc.), promotion of organic vintages, adaptation, and organic conversion, increase of presence on local and regional markets. Due to the climatic crisis, the VC depends on regional public aids.

### **Innovation**

The Clairette de Die value chain is a traditional one, where no innovations have been identified.



## Organic aromatic and medical plants

The Drome department is the first producer of organic, aromatic, and medicinal plants in France with 246 conventional and organic operators. Main productions are lavender (95%), sage and thyme. Most of the time, these are processed into essential oils or other products by local laboratories and distributed in long circuit or exported. Drome lavender is a high reputation product providing high added-value and contributing to the territorial identity.

Drôme is a very diversified department in terms of geological, natural, and agricultural resources. The North-East of the territory is characterised by middle and high mountains (Pre Alps and Vercors Natural Park): agriculture in this area is mainly livestock and small diversified gardening. The South is characterized by the beginning of the Provence and the Mediterranean climate, we can find there aromatic and yard large cultures. The West of the territory is characterized by plains where the Rhône and the Drôme rivers meet. Agriculture there is mainly large cropland. Within the Drôme department, Biovallée territory gathers 3 associations of municipalities (EPCI) - 95 municipalities in total. It is a very preserved and diversified territory, following the Drôme River, from Pre Alps to large plains of the down valley.

Reference mountain landscape statistics  
(A: Data from the NUTS3: FR713)

Reference mountain chain		Drome Valley	
Reference mountain landscape		Biovallée - Eure	
Size of the area (km <sup>2</sup> )	2,200	Average per capita income €/year	25,400 <sup>A</sup>
Altimetry (m; min-max)	50–2,453	Total Gross Value Added (GVA) €/year	14,532 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	79 <sup>A</sup>	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	10% <sup>A</sup>	Primary:	1.7% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	56,167 <sup>A</sup>	Secondary (including construction):	20.3% <sup>A</sup>
		Tertiary:	77.6% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	115 <sup>A</sup>	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	6,400 <sup>A</sup>	Primary:	2.2% <sup>A</sup>
Protected areas	Yes	Secondary:	24.6% <sup>A</sup>
		Tertiary:	71.5% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

This VC is very well organized in the territory from processing, cutting, sifting, drying, distillation, spraying and/or wholesale marketing with important actors: 5 producer groups and 42 processing or distribution companies.

As climatic condition and consumer demand increase, the organic, aromatic, and medicinal plants VC is strongly developing in the recent years.

Climate change providing favourable temperature for this culture and consumer demand is increasing for this type of products. This phenomenon has an impact in term of land use (more and more surface cultivated), agricultural practices (33% of the producers are organic and in term of local added value on the territory as this VC is currently more export oriented).

### **Key local assets**

Key local assets in this VC are:

- Cultural asset: Organic, aromatic, and medicinal plants production and processing are emblematic in Drome providing cultural assets: traditional know-how, touristic attraction (lavender field) and local branding.
- Economic asset: high added value products and creation of local jobs
- Natural asset: attractiveness of lavender landscape

### **Challenges**

Organic, aromatic, and medicinal plants VC is strongly developing in the recent years: number of exploitation and demand for these products is increasing for 2 mains reasons; Climate change providing favourable temperature for this culture and consumer demand is increasing for this type of products. This phenomenon has an impact in term of land use (more and more surface cultivated), agricultural practices (33% of the producers are organic and in term of local added value on the territory as this VC is currently more export oriented).

### **Innovation**

The Organic aromatic and medical plants value chain is a traditional one, where no innovations have been identified.

## Stone fruits: peach and apricot

Stone fruits is representative of Drôme fruit production. Main productions are apricots and peaches, mainly produced in conventional agriculture orchards and driven to large-scale supply or export. One quality scheme is in the process of being acquired (Indication Géographique Protégée) for Abricot des Barronies (south of Drôme).

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\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

Drome stone fruit value chain is a well-established value chain. The main production are peaches and apricots with an average size of the orchard are 15ha. The main cultural system is conventional agriculture in monoculture. Fruits are collected by cooperatives actors (Lorifruit, Rhodacoop), marketers and wholesale. These products are mostly driven to long supply chain distribution and export. Abricot des Baronnies (south of Drome) is currently in the process of obtention of an IGP.

Stone fruits cultures are currently facing strong pressure due to climate change: more and more freezing episodes in the spring, water scarcity as well as invasion of disease and parasites.

To adapt, various strategies are tested: fight against frost with heating technics, fight against disease with treatments, insect nets, diversification of produced variety and fruits. In parallel, an organic production of stone fruits is developing. They are facing the same challenges but using different cultural practices to safeguard biodiversity (introduction of nesting box, chickens in the orchard) and seeking to diversifying (new fruit culture more adapted to climatic conditions). Organic producers are more driven to direct sale and local market channels. Stone fruit is a VC present in all Auvergne Rhones Alpes region but Drôme is the first department in terms of organic production.

### Key local assets

Key local assets in this VC are:

- Natural asset: aesthetic landscape
- Social asset: creation of local job and local value
- Cultural asset: contribution to Drome territorial identity, gastronomy, and attractiveness.

### Challenges

Stone fruit production is strongly threatened by freezing episode. In 2021, 80% of the Drome stone fruit production was frozen. Stone fruit production also faces disease and parasites. The current challenge is to find solutions to fight freezing episodes but also to diversify towards more adapted cultures. Due to the climatic crisis, the VC depends on regional public aids.

### Innovation

The innovation stands in the fact that the stone fruits VC is currently diversifying to face freeing episode challenge: production of new species such as grenade, almonds which are adapted to climate change and responding to new consumer demand.

The innovation in this VC is linked to/

- New products: diversification of species adapted to climate change: more resistant species, grenades, almonds.
- New processes: technics to fight against freezing episode, technics to favour biodiversity protection in orchards, agroforestry.

## Picodon - PDO

Picodon PDO is a goat-milk cheese produced in Drome Prealps and protected by a PDO which provide strict requirement in terms of production practices and marketing. Picodon is a very famous cheese, contributing to Drome territorial identity. Picodon DOP VC is well organized by producers' associations and trade unions and can be either marketed in long distribution channel or local market. Within this VC, one can find organic and farmer Picodon or convention dairy picodon production.

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\*2 share of total GVA/year

Picodon PDO is a goat-milk cheese from the Drome, very representative of middle mountain agriculture. The quality label PDO provides strict requirements in terms of production practices (type of goat, refinements, cultural practices, pasture, animal feeding...) and promotion and marketing in and out of the territory. The VC is well established and structured by farmers unions (Syndicat Caprin, Syndicat PDO Picodon) and dairy cooperatives. It can be either marketed in long distribution channel or local market. In fact, one can find a great diversity of producing practices: organic and farmer Picodon or convention dairy picodon production. In 2017 the marketed production was 532 tons, or nearly 9,000,000 picodons, of which nearly 1,600,000 were produced by the appellation's farm producers and sold at the region's markets.

Pastoralism practices are very well developed in the territory, namely by frame Picodon producers, but suffers from strong pressures: predation (wolf), droughts, pasture's impact on biodiversity. However, the opportunities are to show that pastoralism can provide exosystemic services (silvo-pastoralims, goat pasture prevent from fire starts). This VC is also present in two other departments.

### Key local assets

Key local assets in this VC are:

- Cultural: Picodon is one of the most famous specialities in Drome department which provide cultural asset: touristic attractiveness, ancestral know-how, territorial identity, dedicated events.
- Natural: The AOP requirements guarantees production practices protecting middle mountain agriculture. Organic picodon producers also provide exosystemic services: hampering fires thank to pasture practices, preservation of middle mountain agriculture.

### Challenges

Picodon PDO is a well-structured VC as goat-milk production is one of the top productions in Drome which provide local economic value and territorial identity. However, this VC is very large and gather diverse producers: Farmers' Picodon producers often practice pastoralism and Dairy Picodon producers working in dairy companies. Actors of this VC suffers from pressures: predation (wolf), droughts, impact on biodiversity, disease, and parasite. Another challenge is the valorisation of goat meat to respond to consumer questions as well as the need to diversify for small producers.

### Innovation

The innovation in this VC is associated with:

- New products: Some Picodon producers are working of goat meat valorisation (cabri, chevreau)
- New processes: Farmer Picodon producers are developing practices that provide exosystemic services eco pasture, silvo-pastoralism.

## Fruits with pips

Fruit with pips is a representative production of north of the Drome. The main production are apple and pear and kiwi (minor in terms of volume). This VC is mainly represented by large conventional exploitation, transformation by large cooperatives and driven to long chain distribution or export by marketers. However, some producers are diversifying and developing organic agriculture, with local processing and local distribution through direct sale and local market channels.

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\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

Fruit with pips VC is representative of the North of Drome department and plain regions. The VC is mainly represented by large conventional exploitation, processed by large cooperatives (Lorifruit, Rhodacoop...) and marketed in long distribution chains or export. However, one can also find organic production, more driven to valorisation in local markets.

In general, this VC faces strong climatic pressures: more and more freezing episodes in the spring, water scarcity as well as invasion of disease and parasites.

To adapt, some actors of this VC are trying to diversify their production and to developing more resistant varieties and more adapted productions: almonds, grenades, kiwi. These productions adapt better to high temperature and need less water.

### Key local assets

Key local assets in this VC are:

- Natural asset: aesthetic landscape
- Social asset: creation of local job and local value
- Cultural asset: contribution to Drome territorial identity, gastronomy, and attractiveness.

### Challenges

Fruit with pips production is threatened by freezing episode, disease, and parasites. The current challenge is to find solutions to fight freezing episodes but also to diversify towards more adapted cultures and more resistant cultures. Due to the climatic crisis, the VC depends on regional public aids.

### Innovation

Producers are diversifying with new variety more adapted to current and predicted climatic conditions: almonds, grenade, kiwi.

The innovation in this VC is linked to/

- New products: production of adapted variety or diversification with adapted cultures (almonds, grands, kiwis...)
- New processes: conversion to organic production, introduction of practices to preserve biodiversity in orchard.
- New marketing strategies: better local valorisation of organic production, sale in local market.



## Agritourism

Agritourism is developing in Drome. The VC is organized by farmers, public administrations, and dedicated associations. Agritourism allows to generate new sources of incomes for farmers, valorise the territory and create social link between farmers and consumers. Agritourism also promotes small-diversified farming scheme, direct sale and awareness rising respectful environmental practices.

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\*<sup>2</sup> share of total GVA/year

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Agritourism is an interesting VC as it allows farmers to diversify their activities and gain complementary incomes. Besides, it answers to a local demand of green and rural tourism which has always been developed in the Drôme.

In cultural and social terms, agritourism also allows to promote the local and cultural heritage of the region and to create social link between farmers and tourist.

Besides, agritourist activities can propose public services such as pedagogical activities. In terms of environment, Agri-touristic structures are often small-diversified structures that promotes an agroecological and local supply models.

At the department scale, the VC is organized between different actors such as local authorities (Turism service of Drome department), touristic offices, association working on rural development (CIVAM).

### Key local assets

Key local assets in this VC are:

- Natural asset: exosystemic services, promotion of small diversified agroecological models,
- social asset: pedagogical role, awareness raising for consumers, promotion of agroecology, promotion of direct sale.
- Cultural: promotion of the agricultural territorial identity.

### Challenges

Agritourism VC is developing in Drome. However, it faces some challenges: regulations differ from an activity to another (catering, direct sale, housing, pedagogical activities...), farmers need to develop specific organisation and competences to welcome public and need to find a balance between production and touristic activities.

### Innovation

Agritourism is innovative as it allows farmers to wider diversify and to generate new incomes with welcome and touristic activities.

The innovation in this VC is linked to/

- Marketing strategies: Agritourism and welcome activities allows to diversify activities and generated new incomes for farmers. It also allows to promote the territorial identity.
- Governance systems: Agritourism VC gathers actors coming from the agricultural and the touristic fields.

## Organic still wine

To face Clairette de Die crisis, some vineyards developed a new offer of organic still wine modifying old Clairette de Die vinyard with different vinification processes and local valorisation of the products.

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Organic still wine production is an innovative VC in the Drôme. It was developed in response to Clairette de Die (famous local sparkling wine) crisis. In fact, Drome wine growers were strongly

specialized in the Clairette de Die production while this product's sale is decreasing. To face the crisis, some producers adapted and offer new proposition of still wines. These wines are produced on old converted Clairette de Die vineyards within local grape variety. This VC is mainly represented by organic or biodynamic production practices and vinification process. Drome quiet wines respond national quality label such as: Vigneron Independant, Biodynamic, Agriculture Biologique... This VC is an example of better valorisation of previously cultivated surfaces in the Drome to better respond to local demand and create local value.

### Key local assets

Key local assets in this VC are:

- Natural asset: promotion of organic and agroecological models of production and vinification.
- Social asset: solution to a structural crisis by the creation of new opportunities at local level. Promotion of a different type of local wine. Local valorisation through direct sale and local markets.

### Challenges

This VC is innovative as it was developed as a solution to adapt to the Clairette de Die crisis (decrease of sales). Organic grapes production was used by wine growers to develop new products (organic still wine) and new processes (organic, biodynamic, agroecology), new organisation (out of Clairette de Die unions and cooperatives).

### Innovation

Conversion of vineyards previously dedicated to Clairette de Die into organic still wine production.

The innovation in this VC is linked to/

- New products: new still wines using local grape variety.
  - New processes: new type of vinification according to organic and agroecological models.
  - New marketing strategies: local valorisation in local market or direct sales
  - New governance systems: organisation out of Clairette de Die unions and cooperative.
- New wine growers' group: Cairn

## Garlic

Garlic production is one of the most representative production in the Drôme. Production of white, violet, and pink garlics enables to do rotation with filed crops and produce during the entire year. Drome garlic is represented by a GIE (economic interest group) and protected by quality schemes: IGP Ail Dromois or organic agriculture label.

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Garlic production is very spread in the Drome department. Drome garlic is represented by a GIE (groupement d'intérêt économique) gathering 60 producers for more than 560 ha of culture. Main production are white and purple garlic in autumn and pink garlic and shallots in spring.

The VC respects the environment and is committed to various quality initiatives, such as Global Gap, Organic Agriculture, and the Drôme Garlic PGI. The whole of our production is methodically controlled by rigorous approvals.

The GIE provide farmers with certified plants, share material, production advice, marketing strategies. For a better organization, cooperative services are grouped in premises of more than 1600 m<sup>2</sup>. Based in the town of Eurore (26 - Drôme), the GIE l'Ail Drômois has a packaging line, refrigerated rooms for storage, a space for order preparation and several docks for shipments.

In terms of culture, garlic production enables producers to have an equivalent production during the entire year, ensuring incomes and a better land use.

### Key local assets

Key local assets in this VC are:

- Natural assets: garlic culture is an opportunity for rotation in field crops: better quality soil, better land use.
- Social assets: production organized into a GIE which ensure incomes to the producers and the creation of local value on the territory.
- Cultural assets: production protected by quality scheme label: IGP, Organic Agriculture contributing to French food heritage.

### Challenges

The Garlic culture is a great diversification opportunity and an added value product.

### Innovation

More than an innovation, garlic culture is an opportunity for diversification and rotation in field crops.

The innovation in this VC is linked to/

- New process: opportunity for diversification
- New governance system: Drome garlic is managed by a GIE (economic interest group) which supports 60 producers from production to marketing.

## Small scale poultry farming

The poultry farming in small structures was developed by farmers with no access to water who adapted to water access condition and to answer strong consumer demand for local aviculture products (egg and meat).

Drôme is a very diversified department in terms of geological, natural, and agricultural resources. The North-East of the territory is characterised by middle and high mountains (Pre Alps and Vercors Natural Park): agriculture in this area is mainly livestock and small diversified gardening. The South is characterized by the beginning of the Provence and the Mediterranean climate, we can find there aromatic and yard large cultures. The West of the territory is characterized by plains where the Rhône and the Drôme rivers meet. Agriculture there is mainly large cropland. Within the Drôme department, Biovallée territory gathers 3 associations of municipalities (EPCI) - 95 municipalities in total. It is a very preserved and diversified territory, following the Drôme River, from Pre Alps to large plains of the down valley.

### Reference mountain landscape statistics (NUTS3: FR713)

Reference mountain chain		Drome Valley	
Reference mountain landscape		Biovallée - Eure	
Size of the area (km <sup>2</sup> )	2,200	Average per capita income €/year	25,400 <sup>A</sup>
Altimetry (m; min-max)	50–2,453	Total Gross Value Added (GVA) €/year	14,532 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	79 <sup>A</sup>	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	10% <sup>A</sup>	Primary:	1.7% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	56,167 <sup>A</sup>	Secondary (including construction):	20.3% <sup>A</sup>
		Tertiary:	77.6% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	115 <sup>A</sup>	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	6,400 <sup>A</sup>	Primary:	2.2% <sup>A</sup>
Protected areas	Yes	Secondary:	24.6% <sup>A</sup>
		Tertiary:	71.5% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

The poultry farming VC is developing in the Drome Valley. This production was favoured for farmers who do not have access to water. This production (hen egg and meat) is mainly organic

and respond to local and national demand. It is either produced by diversified or specialized exploitations.

The positive impact of this VC is the adaption to climate condition and poor access to water in the region. It also answers a local and national demand.

In terms of environment, poultry farming in diversified exploitation is a great complement of green manure.

At the Biovallee scale, the VC is structured by the cooperative Val Soleil with 185 adherents in the poultry VC. The cooperative model allows farmers to have a security: guaranteed incomes; shared material; adapted marketing strategies. The cooperative is managed by farmers with a democratic principle "one person, one vote".

The egg VC accounts 120 000 free range hens, 40 000 green label hens and 125 000 organic hens. Eggs are sold under two brands "oeuf de nos villages" and "cocorette". Regarding chicken meat, chickens are raised and slaughtered locally and feed with local food production (139 farms, 2 slaughtered houses). 7 quality labels exist such as red label, organic, 100% vegetal.

### Key local assets

Key local assets in this VC are:

- Natural asset: Organic poultry farming a small scale is complementary with diversified vegetable production: green manure, poor water demand.
- Social asset: local production to answer national and local meat and egg demand, creation of local value in the territory.

### Challenges

The poultry farming VC is a good example of a production adapted to climate change condition (water scarcity). Farmers are currently converting to this production with a local marketing strategy to answer local and national demand for poultry products. This development strategy is carried out by farmers and cooperative actors.

### Innovation

Poultry farming integrated in cooperative model is innovative as it allows farmers to produce with a granted incomes, with shared cultural technics and tools and shared vision of the marketing strategies corresponding to local demand.

The innovation in this VC is linked to/

- New processes: shared cultural technics and tools; adaptation of the production; valorisation of meat of laying hens
- New marketing strategies: development of poultry farming to answer a local and national demand.
- New governance systems: cooperative model gather farmers to market their production at local scale, guarantee steady incomes and shared means of production.



## Savoie - the Reconquest of the winemakers

During the 20th century the surface area of Savoyard vineyards was drastically reduced. In the 2000-s new generations of vine growers started the reconquest, with the reconstruction of vineyards that have disappeared in the mountains and on the steepest slopes.

Jongieux is a commune in the Savoie department in the Auvergne-Rhône-Alpes region in south-eastern France. It is also a named cru of the Vin de Savoie appellation. The village of Jongieux lies 12km east of the town of Belley, on the western slopes of the Mont du Chat mountain ridge, overlooking the Rhône river. The vineyards of the appellation stretch up the mountainside, reaching altitudes as high as 500m above sea level.

### Reference mountain landscape statistics (A: Data from the NUTS3 FRK27)

Reference mountain chain	Savoy Prealps		
Reference mountain landscape	Jongieux		
Size of the area (km <sup>2</sup> )	6,4	Average per capita income (€)/year	20,508
Altimetry (m; min-max)	226-1,128	Total Gross Value Added (GVA) (€ million)/year	13,489 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	45.6	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-2.30	Primary:	0.7% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	194,386	Secondary:	30.1% <sup>A</sup>
		Tertiary:	69.2% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	83	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	20	Primary:	1.6% <sup>A</sup>
Protected areas	Yes	Secondary:	17.8% <sup>A</sup>
		Tertiary:	80.6% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Wine growing is the 2nd largest agricultural activity of Savoyard agriculture, after milk production. In Jongieux are located 6 commercial wine producers, making wine under Vins de Savoie

Jongieux cru and Roussette de Savoie Marestel cru denomination. 5% of wine is exported and this number is growing. From 1999 the Association Coteaux Jongieux et Marestel is helping wine growers to reconstruct historical vineyards on the higher altitudes. Jongieux is attractive for wine and gastronomic tourists, it is the part of official touristic itinerary – Route des Vins de Savoie.

### **Key local assets**

The village high quality produces wines from Altesse (unique local variety existing only on this territory) which are sold under the Roussette de Savoie appellation (specifically under the Marestel cru title). The highest slopes of coteaux Marestel above the village have excellent soil characteristics and mesoclimate for the late-ripening, low-yielding Altesse variety.

### **Challenges**

The main challenge was to reconstruct from zero the 25 ha of vineyard on the steep slope (50-60%) of the coteaux Marestel, historically known as a good spot for high quality wine production, which was abandoned due to the demographic dynamics of the 20Th century and due to the difficulties connected to the mountain wine production (manual work, steep slopes).

### **Innovation**

This VC is a traditional one, where no innovations have been identified.

## 12. Czech Republic

### Mineral water

Mineral water originating in mountain areas is directly linked with ecosystem of the location, it has been traditionally used for centuries, the VC is associated with tourism and spa industry, food production (sold outside the region).

Jesenik is the area with high share of highlands and forests. Its landscape includes the nature protected area, which is the largest in the Czech Republic (555 km<sup>2</sup>). The most relevant asset of the territory is the unique nature, which provides very attractive conditions for tourism. The nature protected area located in the region is considered one of the most valuable locations in Europe. The landscape is historically known for extensive farming in perennial grassland, namely sheep and cattle.

Reference mountain landscape statistics  
(A: Data from NUTS3 CZ071)

Reference mountain chain		Jeseniky mountains	
Reference mountain landscape		Jeseník	
Size of the area (km <sup>2</sup> )	719	Average per capita income €/year	9,184 <sup>A</sup>
Altimetry (m; min-max)	320– 1,423	Total Gross Value Added (GVA) (€ million)/year	9,186 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	52.8	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-7.9%	Primary:	3.3% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	28,371 <sup>A</sup>	Secondary (including construction):	40.4% <sup>A</sup>
		Tertiary:	56.3% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	110	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	2,387	Primary:	4.3% <sup>A</sup>
Protected areas	Yes	Secondary:	42.7% <sup>A</sup>
		Tertiary:	53.0% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The VC is not directly linked to agriculture. However, it is a typical VC that directly relies on ecosystem of the region and creates new synergies with tourism and spa industry, gastronomy,

and food production sector. Some mineral water sources are owned by large corporations (food industry), some of them are owned by local actors (municipalities). These configurations create different combinations of interests and affect the way how regional society and economy benefit from the natural asset. This kind of VC is present on several mountain areas of the Czech Republic.

### **Key local assets**

Key asset is the underground water, marketing of the product and symbolic value of the region that enables to valorise the product.

### **Challenges**

Key challenges for this VC are associated with highly competitive markets, high investment costs, and the heterogenous quality of the product which is based on endogenous factors that cannot be controlled.

### **Innovation**

The VC is not very innovative, it is based on tradition that has started in 19th century, sources of mineral waters are associated with the region spa towns.

## High quality beef

Cattle husbandry on perennial grassland is a part of a typical image associated with agriculture in Sumava mountains. The farms are currently aiming on excellent breeding programs and high-quality meat production, farms implement organic methods that often take place in nature-protected areas and in National Park, this requires farmers to find a good balance between farming technologies and environmental constrains, such setting has become a driver for innovations in provision of ecosystem services and special grazing managements.

Klatovy's landscape is very diverse. This area of the region is covered by 46 % by agricultural land. About 55 % of the agricultural land is arable. Lower areas of the region (LAU 1) are suitable for relatively intense production of crops (including wheat and rape seeds). Upper areas are suitable for potato production. The south-western borders of the region neighbour the Germany. This is the area of the Sumava mountains. Due to the large share of the areas with high altitude there are many areas covered with forests. About 43 % of the region's areas are covered with forests.

### Reference mountain landscape statistics (A: Data from NUTS3 CZ032)

Reference mountain chain		Sumava - Cesky les	
Reference mountain landscape		Klatovy	
Size of the area (km <sup>2</sup> )	1,946	Average per capita income €/year	18,240 <sup>A</sup>
Altimetry (m; min-max)	250– 1,370	Total Gross Value Added (GVA) €/year	10,718 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	44	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-2.6%	Primary:	4.7% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	30,828 <sup>A</sup>	Secondary (including construction):	39.0% <sup>A</sup>
		Tertiary:	56.3% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	85	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	3,183	Primary:	3% <sup>A</sup>
Protected areas	Yes	Secondary:	41.0% <sup>A</sup>
		Tertiary:	56.0% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Beef products from farms are organic certified. Some farms also use the quality schemes associated with the label that refer to "region" or "Czech" origin. This value chain relies on the activities of local actors engaged with cattle breeding, cattle husbandry, grazing, perennial, and grassland management. Farms implement organic farming methods. Many farms process beef and sell either through shops or directly (on farm sale, e-shops, farmers markets). It is likely that the VCs span over the country borders. Similar examples can be thus found in Germany and Austria.

### **Key local assets**

Sumava Mountains provide picturesque landscape and unique natural assets, the region has been partly abandoned during the socialist-era (1950s-1989). In the last 30 years many farms have been renewed based on the pre-WII tradition. The region is highly attractive for tourists in Winter as well summer season.

### **Challenges**

Farms rely on complex subsidy schemes that significantly affect their economic performance, significant changes in the system will impact on their economy, the farms are aiming on high-quality meat production and operate on a very competitive food market, one of the key challenges is associated with marketing, i.e., attract customers and create demand for their products. Another challenge is associated with global climate change. The large cattle farms heavily rely on enough grass. Recent years showed that in certain periods of dry Summer (e.g., in year 2018) there might be a shortage of the feedstuff for animals.

### **Innovation**

The innovation is associated with development of specific grazing managements, meat processing and marketing. Farms are creating new marketing channels for selling their products.

## Cow – Dairy products

Cattle husbandry on perennial grassland is a part of a typical image associated with agriculture in Sumava mountains. The farms are currently aiming on excellent breeding programs and high-quality meat production, farms implement organic methods that often take place in nature-protected areas and in the National Park, this requires farmers to find a good balance between farming technologies and environmental constrains, such setting has become a driver for innovations in provision of ecosystem services and special grazing managements.

Vsetín is an area with high share of highlands and forests. The Reference Landscape includes the nature protected area, which is the largest in the Czech Republic (555 km<sup>2</sup>). The most asset of the area is the unique nature. The Reference Landscape thus provide very attractive conditions for tourism. The nature protected area located in the region is considered one of the most valuable locations in Europe. The landscape is historically known for extensive farming in perennial grassland, namely sheep and cattle.

Reference mountain landscape statistics  
(A: Data from NUTS3 CZ072)

Reference mountain chain	Western Carpathian Mountains		
Reference mountain landscape	Vsetín		
Size of the area (km <sup>2</sup> )	1,143	Average per capita income €/year	9,501 <sup>A</sup>
Altimetry (m; min-max)	173– 1,206	Total Gross Value Added (GVA) €/year	9,253 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	125.4	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.95%	Primary:	2.6% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	29,759 <sup>A</sup>	Secondary (including construction):	50.5% <sup>A</sup>
		Tertiary:	46.9% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	45	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	3,815	Primary:	2.1% <sup>A</sup>
Protected areas	Yes	Secondary:	49.4% <sup>A</sup>
		Tertiary:	48.5% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year



This VC relies on the activities of local actors engaged in cattle breeding, cattle husbandry, grazing, perennial grassland management. Farms implement organic farming methods. Most farms can process their own milk. The VC positively impacts farmers' and regional economies. Cattle farms are important for delivering ecosystem services in the mountain region. Similar VCs can be thus found in Germany and Austria.

### **Key local assets**

Mountain areas provide natural resources that allow implementation of organic methods. The farming methods are adjusted to ecosystems. At the same time the high nature value is reflected in products that are marketed as "pure" and "natural".

### **Challenges**

Reliance on subsidy schemes, effective marketing that allows them to sell quality products with high premiums, provision of ecosystem services in times of global climate change (less rainfalls, not enough grass for animals).

### **Innovation**

The cow-dairy value chain is a traditional one, where no innovations have been identified.



## Goats – Dairy products

Goat husbandry is less common in mountain areas than the cattle husbandry. The VC has become recently popular with the rising interest in alternative food chains. On farming level, the farms located in nature protected areas implement specific grazing management.

Prachatice's landscape mainly consist of submontane highlands (with altitude 600-800 meters). Some settlements are in the altitude around 800 meters. Climate conditions are affected by relatively high altitude of the region. The region is rich of forests, which cover 52 % of the region. Share of agricultural land (due to the high altitude) is above regional average (within NUTS 3 level). The region is highly attractive for tourist during Winter and Summer season due to the unique nature. The region includes two nature protected areas.

Reference mountain landscape statistics  
(A: Data from NUTS3 CZ031)

Reference mountain chain		Sumava - Cesky les	
Reference mountain landscape		Prachatice	
Size of the area (km <sup>2</sup> )	1,377	Average per capita income €/year	9,837 <sup>A</sup>
Altimetry (m; min-max)	410– 1,378	Total Gross Value Added (GVA) €/year	19,459 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	37	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.01%	Primary:	4.0% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	62,533 <sup>A</sup>	Secondary (including construction):	39.3% <sup>A</sup>
		Tertiary:	56.0% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	150	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	4,971	Primary:	5.5% <sup>A</sup>
Protected areas	Yes	Secondary:	40.6% <sup>A</sup>
		Tertiary:	53.9% <sup>A</sup>

\*1 Nearest settlement with population > 100,000

\*2 share of total GVA/year

\*3 share of total employment)/year

Goats are capable to utilize different plants in perennial grassland than cows. This gives them specific function in environmental managements. Vast majority of farms use organic farming methods. A typical business model consists of milk production as well as the processing and

production of dairy products (fresh cheese, yogurt, hard cheese etc. depending on the volume of milk which they produce).

This VC relies on the activities of local farmers engaged in goat breeding, goat husbandry, grazing, perennial grassland management. Vast majority of farms process their own milk, produce dairy products, and sell these products. Most farms operate in organic farming scheme. Typical marketing channels include (sales on farm, farmers markets, farm shops in nearby towns). Regional and other quality labels are not so important. The "goat products" represent a strong brand per se. Demand for such products is high, consumers are willing to pay high premiums for such products. Similar VCs can be thus found in Germany and Austria.

### **Key local assets**

Sumava Mountains provide picturesque landscape and unique natural assets, the region has been partly abandoned during the socialist-era (1950s-1989). In the last 30 years many farms have been renewed based on the pre-WII tradition. The region is highly attractive for tourists in Winter as well summer season. The goat farms and their products are highly attractive for tourists. Some of them also offer services in agrotourism.

### **Challenges**

The goat farms usually manage smaller farmland in comparison to cattle farms. Land market (due to the available subsidies) is highly competitive. It is difficult for relatively smaller farms to increase farm size (if they want to), because the land is not available. Dairy products represent alternative food products in the eyes of consumers because you can usually buy them in conventional supermarkets. Consumers must attend farmers markets, specialized shops or travel directly to farms. The goat farms in this way plays important functions in connecting urban consumers with small-scale farms producing artisan and high-quality food products. The goat farms heavily rely on enough grass. Recent years showed that in certain periods of dry Summer (e.g., in year 2018) there might be a shortage of the feedstuff for animals.

### **Innovation**

Innovation is associated with development of new food products that are not so common in food menu of mainstream consumers. Farms are creating new marketing channels for selling their products.

## Sheep – Dairy products

Sheep husbandry is a typical VC that can be found on numerous mountain areas all over the Czech Republic. The sheep husbandry is very similar to the goat husbandry, however less common in terms of presence. Sheep dairy products represent a specific market niche. The products are highly demanded. The VC is typical of using organic farming methods and creating additional process-based quality of the food products.

Trutnov is the largest district within the NUTS 3 Kralovehradecky. The landscape of the region is very diverse with large differences in altitude. Such landscape makes the region less favourable for agricultural activities. 43,2% of the region covers agricultural land. Approximately a half of the agricultural land is arable land (53%). There is also a high share of perennial grassland in the region (41,6%). Forest land covers 46,9% of the region and this is the highest share within the NUTS2. The region includes the highest mountains of the Czech Republic (Giant Mountains) with the highest peak 1602 meters above s.l. The area of the mountains includes the National Park (with 385 km<sup>2</sup>).

### Reference mountain landscape statistics (A: Data from NUTS3 CZ052)

Reference mountain chain	Sumava - Cesky les		
Reference mountain landscape	Trutnov		
Size of the area (km <sup>2</sup> )	1,147	Average per capita income €/year	10,131 <sup>A</sup>
Altimetry (m; min-max)	263– 1,603	Total Gross Value Added (GVA) €/year	9,173 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	103	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-1.84%	Primary:	4.5% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	55,419 <sup>A</sup>	Secondary (including construction):	40.5% <sup>A</sup>
		Tertiary:	55.1% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	100	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	1,759	Primary:	5.4% <sup>A</sup>
Protected areas	Yes	Secondary:	39.3% <sup>A</sup>
		Tertiary:	55.3% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The mountain areas and symbolic value of the region contributes to valorisation of these food products. Sheep husbandries bring many positive effects in term of ecology, since the farms often employ specific grazing managements. This VC relies on the activities of farmers engaged in sheep breeding, sheep husbandry, grazing, and perennial grassland management. Farms often implement organic farming methods. Most of the farms process their own milk, produce dairy products, and sell these products. Typical marketing channels include (sales on farm, farmers markets, farm shops in nearby towns). Regional and other quality labels are not so important. The "sheep products" are quite unusual a highly demanded by consumers. Demand for such products is high, specific groups of consumers are willing to pay high premiums for such products. The VC is complementary to the VCs describing cattle and goat husbandry.

### **Key local assets**

This VC directly utilizes natural assets of the given locality (grassland, high nature value farming areas). Sheep can use grassland in areas that may not be used by other ruminants (cattle, goats). At the same time farms located in mountain region also utilize the symbolic value of the territory. The mountains are associated with "purity" and "nature" and this association is typically used in the promotion of the food products from the given VC.

### **Challenges**

The sheep dairy products create unique niche market. The assets are very specific. Main challenge for the farms is associated with successful marketing of the products. The farms are in remote areas, but they need to sell their products to urban consumers, who are willing to pay for the premiums. Another challenge is associated with economic pressure. Farms rely on direct payments since much of their farming activities is linked with provision of ecosystem services.

### **Innovation**

The sheep-dairy value chain is a traditional one, where no innovations have been identified.

## Chicken production

Chicken production belongs among examples of small-scale farms located in the mountain region Sumava. Chicken husbandry and chicken meat production creates important linkage with urban areas, because there is a high demand for chicken meat that comes from un-conventional farms. Specialized farms are often detached from plant production, since they buy feedstuff for the chickens.

Klatovy's landscape is very diverse. This area of the region is covered by 46 % by agricultural land. About 55 % of the agricultural land is arable. Lower areas of the region (LAU 1) are suitable for relatively intense production of crops (including wheat and rape seeds). Upper areas are suitable for potato production. The south-western borders of the region neighbour the Germany. This is the area of the Sumava mountains. Due to the large share of the areas with high altitude there are many areas covered with forests. About 43 % of the region's areas are covered with forests.

Reference mountain landscape statistics  
(A: Data from NUTS3 CZ032)

Reference mountain chain	Sumava - Cesky les		
Reference mountain landscape	Klatovy		
Size of the area (km <sup>2</sup> )	1,946	Average per capita income €/year	18,240 <sup>A</sup>
Altimetry (m; min-max)	250– 1,370	Total Gross Value Added (GVA) €/year	10,718 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	44	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-2.6%	Primary:	4.7% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	30,828 <sup>A</sup>	Secondary (including construction):	39.0% <sup>A</sup>
		Tertiary:	56.3% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	85	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	3,183	Primary:	3% <sup>A</sup>
Protected areas	Yes	Secondary:	41.0% <sup>A</sup>
		Tertiary:	56.0% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

Chicken producers develop specific niche that competes with industrial large-scale farms. Some farms are trying to certify their farm process and refer to a specific quality scheme. However,

these examples are quite rare. The small-scale farms of this kind are very important for elaborating local food production that valorises local assets. One of the key challenges for the VC would be the localization of inputs that are used for feeding chickens.

Chicken husbandry is present on many farms located in the mountain region. There are a few farms that directly specialize on chicken meat production. These farms keep chickens and process meat, which they directly sell. The most common marketing channels are e-shops, farmers markets and farmers shops in towns. Some farms also have their own restaurants, where they use the chicken meat, which they produce on their own. Such combination creates many positive synergies for their business. The VC is successful in providing alternative to conventional large-scale chicken husbandry. It makes sense to pay attention to this VC within the MOVING project, because this VC is still underusing the local potential. Improving the ability to utilize the local assets would positively affect the impacts of this VC in terms of ecology and economy.

### **Key local assets**

Sumava Mountains provide picturesque landscape and unique natural assets, the regions have been partly abandoned during the socialist-era (1950s-1989). In the last 30 years many farms have been renewed based on the pre-WII tradition. The region is highly attractive for tourists in Winter as well Summer season. The chicken producers are using the local assets only partly (since the feedstuff for the chickens is often imported to the farm). Operating the farm requires specific social and expert skills. Chicken husbandry is a typical activity that belong among the rural traditions.

### **Challenges**

Chicken production on small-scale farms faces a challenge related to profitability and animal welfare. The examples of small-scale chicken farms play very important role in shifting the food production towards more local food production and consumption. Since the chicken husbandry does not directly rely on land, the farms can be also located in mountain regions where the arable land is scarce.

### **Innovation**

The VC is considered a traditional because it implements established farm practices. Despite the traditional nature of the VC, there is a potential for innovating marketing strategy just like in case of other alternative food networks.

## Herbal tea

Regional label, e-shop, and social enterprise. Local product (with regional label) utilizes the products (herbs) of remote mountain area in Czechia. The employees of social enterprise harvest the herbs and the enterprise developed e-shop to deliver healing herbal teas. The origin of social enterprise was supported by EU funds and employs 3 people from socially disadvantaged groups (ethnic minority of Romans who are typified by high unemployment and who are concentrated in remote areas like this one)

Jesenik is the area with high share of highlands and forests. Its landscape includes the nature protected area, which is the largest in the Czech Republic (555 km<sup>2</sup>). The most relevant asset of the territory is the unique nature, which provides very attractive conditions for tourism. The nature protected area located in the region is considered one of the most valuable locations in Europe. The landscape is historically known for extensive farming in perennial grassland, namely sheep and cattle.

Reference mountain landscape statistics  
(A: Data from NUTS3 CZ071)

Reference mountain chain		Jeseniky mountains	
Reference mountain landscape		Jesenik	
Size of the area (km <sup>2</sup> )	719	Average per capita income €/year	9,184 <sup>A</sup>
Altimetry (m; min-max)	320– 1,423	Total Gross Value Added (GVA) (€ million)/year	9,186 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	52.8	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-7.9%	Primary:	3.3% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	28,371 <sup>A</sup>	Secondary (including construction):	40.4% <sup>A</sup>
		Tertiary:	56.3% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	110	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	2,387	Primary:	4.3% <sup>A</sup>
Protected areas	Yes	Secondary:	42.7% <sup>A</sup>
		Tertiary:	53.0% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

Healing herbs collection considered as the project of social inclusion (done by social enterprise) is done in local meadows. Processing of the herbs is done by another farm in the locality (organic certified farm owned by a woman) or by the facilities of this company (possible to use the area of 100 s.m for drying the herbs but also fruits) and the final product is sold in company shop in Velka Kras or delivered into about 30 other small shops mostly in NUTS 2 region. They have also on-line shop. The company also produces herbs syrups, apple vinegar and baked tea (tea is not local) - it means the small company with 5 employees goes also beyond the locality of Jeseniky/Rychlebske mountains

### Key local assets

Sumava Mountains provide picturesque landscape and unique natural assets, the regions have been partly abandoned during the socialist-era (1950s-1989). In the last 30 years many farms have been renewed based on the pre-WII tradition. The region is highly attractive for tourists in Winter as well Summer season. The chicken producers are using the local assets only partly (since the feedstuff for the chickens is often imported to the farm). Operating the farm requires specific social and expert skills. Chicken husbandry is a typical activity that belong among the rural traditions.

### Challenges

The challenge for this VC is associated with the need to have local meadows with herbs far from any source of pollution.

### Innovation

The innovation turns disadvantages (remoteness, social exclusion - were taken as "business as usual) into advantages (providing the market with demanded natural healing herbs through the involvement of disadvantaged social groups - it is the novelty approach). Products which were used in the past by local people for healing purposes are revitalized now to be utilized under "new concept" of health (a sort of retro-innovation). The chain demonstrates how remote mountain areas which are considered as backward (underdeveloped) benefit from local assets. The founders of VC reflected growing market demands as for natural products which are provided by clean nature of the mountains. They utilize regional label also guaranteeing sustainability principles. VC uses "the past" (herbs were used for centuries for healing) to change practices of "today" toward natural products. The chain is typified by multi-actor-perspective (e.g., municipality of the company is partner).



## Marmalade

Marmalade production represents a specific part of the food production sector. This sector is a typical representative of the alternative food network(s). The production of marmalade is important for valorisation of resources in mountain areas because it (1) utilizes fewer common sources (fruit produced on farms as well as wild berries growing in mountain areas) and (2) put in fore symbolic value of mountain areas that are constructed as "natural" and "pure" regions, (3) contributes to regional economy based on small-scale entrepreneurship and innovate forms of marketing in food areas.

Klatovy's landscape is very diverse. This area of the region is covered by 46 % by agricultural land. About 55 % of the agricultural land is arable. Lower areas of the region (LAU 1) are suitable for relatively intense production of crops (including wheat and rape seeds). Upper areas are suitable for potato production. The south-western borders of the region neighbour the Germany. This is the area of the Sumava mountains. Due to the large share of the areas with high altitude there are many areas covered with forests. About 43 % of the region's areas are covered with forests.

### Reference mountain landscape statistics (A: Data from NUTS3 CZ032)

Reference mountain chain		Sumava - Cesky les	
Reference mountain landscape		Klatovy	
Size of the area (km <sup>2</sup> )	1,946	Average per capita income €/year	18,240 <sup>A</sup>
Altimetry (m; min-max)	250– 1,370	Total Gross Value Added (GVA) €/year	10,718 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	44	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-2.6%	Primary:	4.7% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	30,828 <sup>A</sup>	Secondary (including construction):	39.0% <sup>A</sup>
		Tertiary:	56.3% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	85	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	3,183	Primary:	3% <sup>A</sup>
Protected areas	Yes	Secondary:	41.0% <sup>A</sup>
		Tertiary:	56.0% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Producers are not necessarily located in the mountains. Their businesses can be located outside mountains. However, they purchase and collect products from the mountain region (fruit). The products are processed and valorised. Since the producers operate on niche market, they often use alternative marketing channels (e-shops, farmers markets, farmers shops). Their impact on the regional socio-ecological system is positive. They use - and strengthen - symbolic value associated with the mountain region. This strategy brings many direct and undirect impacts, e.g., for tourism. Similar VCs can be found in Germany and Austria.

### **Key local assets**

Sumava Mountains provide picturesque landscape and unique natural assets, the regions have been partly abandoned during the socialist-era (1950s-1989). In the last 30 years many farms have been renewed based on the pre-WII tradition. The region is highly attractive for tourists in Winter as well Summer season. The producers of the marmalade use these images in names of their products and description. In this way they valorise symbolic resources of the given mountain region.

### **Challenges**

Main challenge for the viability of this VC is economic pressure that comes from the competitive setting. Production of the high-quality marmalade competes with mainstream products that provide low-cost solution for consumers. The VC relies on the "turn-to-quality" and focus on developing a niche market. Most marmalade producers are not fruit growers. They buy it from farms or from traders. Another challenge is the capacity to attract consumers with the use of the alternative marketing channels which directly impacts on profitability of their businesses.

### **Innovation**

Innovation is associated with development of new food products that emphasize food quality in symbolic (process-based) and substantial (product-based) meaning. Producers are creating new marketing channels for selling their products and try to valorise symbolic features of the mountain region (such as "pure nature", "traditions" etc.)

## Valašský frgál (sweet cake)

EU Protected Geographical Indication (PGI) label and regional product label. "Valašský" region refers to Beskydy mountains settled by Italians (Vallachians - valašský). The case is produced on the foothills of Beskydy mountains traditionally about 200 years (mostly using the most typical /most produced in the area/ fruit for topping - pears). The product is well known throughout Czechia because of its territorial identity.

Vsetín is an area with high share of highlands and forests. The Reference Landscape includes the nature protected area, which is the largest in the Czech Republic (555 km<sup>2</sup>). The most valuable asset of the area is the unique nature. The Reference Landscape thus provide very attractive conditions for tourism. The nature protected area located in the region is considered one of the most valuable locations in Europe. The landscape is historically known for extensive farming in perennial grassland, namely sheep and cattle.

Reference mountain landscape statistics  
(A: Data from NUTS3 CZ072)

Reference mountain chain	Western Carpathian Mountains		
Reference mountain landscape	Vsetín		
Size of the area (km <sup>2</sup> )	1,143	Average per capita income €/year	9,501 <sup>A</sup>
Altimetry (m; min-max)	173– 1,206	Total Gross Value Added (GVA) €/year	9,253 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	125.4	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.95%	Primary:	2.6% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	29,759 <sup>A</sup>	Secondary (including construction):	50.5% <sup>A</sup>
		Tertiary:	46.9% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	45	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	3,815	Primary:	2.1% <sup>A</sup>
Protected areas	Yes	Secondary:	49.4% <sup>A</sup>
		Tertiary:	48.5% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The VC uses now EU PGI label. Behind this label there is specific symbol of the region. Albeit located close to heavy industrialised and polluted region of Ostrava, Vallachian region and Beskydy mountains are juxtaposed: clean air and nature. The name of "frgál" is often misused by other producers producing these cakes everywhere throughout Czechia (utilization original VC for fake products).

### **Key local assets**

Key asset for this VC is the whole locality symbolically specified - Vallachian region. The cake is known for 200 years but its popularity is because of the link to this region (the region sells due to the symbol of the territory related to mountains) - region is the symbolic asset.

### **Challenges**

The cake utilises the regional name ("Vallachian"), it means the VC rotates about the name of the territory (not around the process of production or raw materials used) linked with the region of Beskydy mountains. The Beskydy mountains are linked with the name Vallachian (valašský, lašský in Czech). Because of the popularity of this cake (e.g., sold on farm markets throughout Czechia or in supermarkets) it faces problems with fake products of similar type (using name "frgále" but not being from the locality)

### **Innovation**

The cake is not innovative. It was innovative when it originated 200 years ago because the name "frgále" was used by local people for spoiled scone type cake (true name was oven-done cake for those well done, "frgale" referred by local Vallachian people to name spoiled cake. It is innovative VC in term of its marketing using regional name and references to mountain ("traditional cake from Vallachian region in Beskydy).

## Herbal liqueurs

The VC aims on production of herb liqueurs of various flavours. The liqueurs are presented as a regional product. The VC is utilizing symbolic assets of the region. Although this product is not unique of mountain regions, it is a great example of utilizing natural and symbolic values associated with the region. To generate a unique selling proposition, the liquors are often marketing as a special regional product.

Trutnov is the largest district within the NUTS 3 Kralovehradecky. The landscape of the region is very diverse with large differences in altitude. Such landscape makes the region less favourable for agricultural activities. 43,2% of the region covers agricultural land. Approximately a half of the agricultural land is arable land (53%). There is also a high share of perennial grassland in the region (41,6%). Forest land covers 46,9% of the region and this is the highest share within the NUTS2. The region includes the highest mountains of the Czech Republic (Giant Mountains) with the highest peak 1602 meters above s.l. The area of the mountains includes the National Park (with 385 km<sup>2</sup>).

Reference mountain landscape statistics  
(A: Data from NUTS3 CZ052)

Reference mountain chain		Sumava - Cesky les	
Reference mountain landscape		Trutnov	
Size of the area (km <sup>2</sup> )	1,147	Average per capita income €/year	10,131 <sup>A</sup>
Altimetry (m; min-max)	263– 1,603	Total Gross Value Added (GVA) €/year	9,173 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	103	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-1.84%	Primary:	4.5% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	55,419 <sup>A</sup>	Secondary (including construction):	40.5% <sup>A</sup>
		Tertiary:	55.1% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	100	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	1,759	Primary:	5.4% <sup>A</sup>
Protected areas	Yes	Secondary:	39.3% <sup>A</sup>
		Tertiary:	55.3% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Herb liqueurs are not a mainstream product. The producers operate on a niche market. The producers do not have to be in the region, but mostly they are. The herb liqueurs are used for the promotion of the region's identity. Herb liqueurs are sold through e-shops, farmers markets, direct selling, or other specialized shops. The VC is not so important in terms of the use of natural (tangible) resources, but it is a typical example of the VC that is embedded in mountain region.

### **Key local assets**

More important than the natural assets (that can be easily substituted) is the social construction of quality that is used in marketing. For this purpose, the producers refer to traditional knowledge embedded in the region, their product labels refer to cultural traits associated with the mountain area. The symbolic value referring to the mountains is what distinguishes the product from other similar products.

### **Challenges**

Herb liqueurs are sold on mainstream food markets that are highly competitive. Main challenge for the given VC is associated with valorisation of the product and with a marketing strategy.

### **Innovation**

The herbal liqueurs- value chain is a traditional one, where no innovations have been identified.

## Bee products

Bee products are not associated solely with mountain regions but are becoming a visible and important VC that is in mountain regions and that valorises specific resources of mountain regions. Beekeeping does not require land, which makes the main difference from farming.

Klatovy's landscape is very diverse. This area of the region is covered by 46 % by agricultural land. About 55 % of the agricultural land is arable. Lower areas of the region (LAU 1) are suitable for relatively intense production of crops (including wheat and rape seeds). Upper areas are suitable for potato production. The south-western borders of the region neighbour the Germany. This is the area of the Sumava mountains. Due to the large share of the areas with high altitude there are many areas covered with forests. About 43 % of the region's areas are covered with forests.

Reference mountain landscape statistics  
(A: Data from NUTS3 CZ032)

Reference mountain chain		Sumava - Cesky les	
Reference mountain landscape		Klatovy	
Size of the area (km <sup>2</sup> )	1,946	Average per capita income €/year	18,240 <sup>A</sup>
Altimetry (m; min-max)	250– 1,370	Total Gross Value Added (GVA) €/year	10,718 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	44	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-2.6%	Primary:	4.7% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	30,828 <sup>A</sup>	Secondary (including construction):	39.0% <sup>A</sup>
		Tertiary:	56.3% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	85	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	3,183	Primary:	3% <sup>A</sup>
Protected areas	Yes	Secondary:	41.0% <sup>A</sup>
		Tertiary:	56.0% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Beekeeping and quality of bee products is very sensitive to environmental conditions and anthropogenic pollutions. Mountain regions - with low density of human settlements and unique ecology - thus offer rare resources that can be utilized by beekeepers. Quality of bee products

are typical examples of credence goods. Symbolic value of the products' origin is therefore an important preposition for successful marketing of the products. Producers are not necessarily located in the mountains. Their businesses can be located outside mountains. However, they purchase and collect products from the mountain region (fruit). The products are processed and valorised. Since the producers operate on niche market, they often use alternative marketing channels (e-shops, farmers markets, farmers shops). Their impact on the regional socio-ecological system is positive. They use - and strengthen - symbolic value associated with the mountain region. This strategy brings many direct and indirect impacts, e.g., for tourism. Nowadays, beekeeping attracts a lot of attention in the Czech Republic. Beekeeping does not include significant entry barriers that are typical of mainstream agriculture. This activity has got a great potential for attracting new entrants to agriculture. It may contribute to the generational renewal in agriculture/countryside regions.

### Key local assets

Sumava Mountains provide picturesque landscape and unique natural assets, the regions have been partly abandoned during the socialist-era (1950s-1989). In the last 30 years many farms have been renewed based on the pre-WII tradition. The region is highly attractive for tourists in Winter as well summer season. The producers of the beekeepers use local ecosystems. Sumava mountains is thus often use as a brand for the bee products. Beekeepers are in this way valorising symbolic value of the region, as well as the unique ecosystem.

### Challenges

Beekeepers producing honey and other bee products in mountain region face many challenges:

- They compete with mainstream, large-scale beekeepers who implement intensive methods of production, or import honey from abroad, they compete with low price, which creates a significant economic pressure on small-scale beekeepers that emphasize quality.
- Due to the global climate change and increasing pollutions bee colonies are more vulnerable, beekeepers face higher risk in their business. Specific challenge is the implementation of organic standards in beekeeping.
- The sector of beekeeping is very fragmented, the Czech Republic has got the highest number of beekeepers in relation to country area (about 55 thousand beekeepers). This situation creates many conflicts among different professional and interest groups, which impacts on regulation and standards in the sector.

### Innovation

Beekeepers must find new solution with respect to the increasing vulnerability of bee colonies. This challenge results in experimenting with treatments of varroa disease, which shall be in future handled with less chemical inputs and rely more on solutions that utilize natural processes and potentials of bee colonies. New practices and technology that respond to existing challenges related to increase vulnerability of bee colonies.



## Fruit spirits

Regional label, attempt to re-introduce the fruit spirits production typical for the past in the foothills of Jeseníky mountains. The company is presented as visionaries-producers who want to promote their production of highly qualitative refined products (to produce legendary spirits comparable with French, Spain, Scottish counterparts).

Šumperk is the area with high share of highlands and forests. Its landscape includes the nature protected area, which is the largest in the Czech Republic (555 km<sup>2</sup>). The most relevant asset of the territory is the unique nature, which provides very attractive conditions for tourism. The nature protected area located in the region is considered one of the most valuable locations in Europe. The landscape is historically known for extensive farming in perennial grassland, namely sheep and cattle.

Reference mountain landscape statistics  
(A: Data from NUTS3 CZ071)

Reference mountain chain	Jeseniky mountains		
Reference mountain landscape	Šumperk		
Size of the area (km <sup>2</sup> )	1,313	Average per capita income €/year	9,184 <sup>A</sup>
Altimetry (m; min-max)	360– 1,491	Total Gross Value Added (GVA) (€ million)/year	9,186 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	91.7	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	3.3% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	28,371 <sup>A</sup>	Secondary (including construction):	40.4% <sup>A</sup>
		Tertiary:	56.3% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	110	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	2,387	Primary:	4.3% <sup>A</sup>
Protected areas	Yes	Secondary:	42.7% <sup>A</sup>
		Tertiary:	53.0% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

Fruit (plums, apples, or rowanberry) spirits were traditional spirits made in Jeseníky mountain (rowanberry is the tree typical in the mountains). Distillery Ullersdorf (uses old German name - the Germans lived in the area till the end of WW II) re-started the tradition of formerly existing

small distilleries in the region of the Desna river valley (foothills of Jeseniky mountains). The vision to produce spirits comparable with the best fruit's spirits/brandies from France, Spain, Scotland, or Ireland pushes the founders of this VC ahead. To achieve their vision, they utilise the elements of the past (e.g., 400 old mills to mature the spirit in its cellars) and local fruits (including typical fruit from the Jeseniky mountain tree - rowanberry). They refer to the past of this mountain region (e.g., to its former German population) to generate novelty (that is we call it retro innovation).

### Key local assets

Rowanberries as the tree typical for lower levels of Jeseniky mountains (a mountain of similar type). The fruits from the foothills of Jeseniky mountain (plums, apples, pears) and unique space for maturing the spirits (balanced temperature in the cellars of 400 years old grain mill - the work of the mill ceased in the 1980s) are the main assets adding value to VC.

### Challenges

Re-start of type for VC existing in the past. The VC uses also typical fruit from Jeseniky mountain - rowanberry. In the past (the 1990s) the distillery operated only for local people (valley of the river Desna in Jeseniky mountains) who brought their fruits to be distilled for themselves and paid for the distilling process. Now they developed own business distilling their own spirits for sale. They want to utilise local wild fruits from mountains (rowanberry) and fruits from orchards in the local valley of the Desna river. They challenge contemporary high-quality distilleries using regional names but utilising the best fruits from various localities everywhere.

### Innovation

The innovation reflects the problem of large fruit distilleries. They produce high quality spirit using best fruits coming from everywhere (the quality of the fruits is the most important for these distilleries to produce high quality spirits, brandies). This VC utilises local fruits (and very specific Jeseniky mountain fruit - rowanberry) to build the extra quality of spirit not on the best quality of fruits but on the locality and its fruits quality and its traditions of spirits production (a sort of retro-innovation). They want to promote new quality of apple spirits. The VC brings new products (spirit of rowanberry) to contest other extra quality fruit spirits (made of plums or apricots). Since apricots are not produced in the locality, the company does not produce apricot spirit (some other high quality mountain distilleries do such apricot spirits production). As for the marketing, they refer to the past also in the name (German name /Ullesdorf/ which now the village is called in Czech Velké Losiny). That is also the reason we call it retro innovation.

## Sumava sheep wool

Sheep husbandry is a traditional farm activity located in Sumava region. The region is associated with a special breed of sheep "Sumavska ovce/Sumava sheep", which belong to a catalogue of the world genotypes of endangered farm animals. Sumava sheep can produce milk, meat, and wool. Sheep husbandry is a traditional farm activity that valorises natural (grazing management), cultural (history and tradition of the sheep breed) and symbolic local resources (tourism) of the Sumava region. However, the traditional products from the sheep farms have been substituted by other goods, so there not a stable demand for the sheep products (namely meat and wool).

Prevailing area of Prachatice consists of submontane highlands (with altitude 600-800 meters). Some settlements are in the altitude around 800 meters. Climate conditions are affected by relatively high altitude of the region. The region is rich of forests, which cover 52 % of the region. Share of agricultural land (due to the high altitude) is above regional average (within NUTS 3 level). The region is highly attractive for tourist during Winter and Summer season due to the unique nature. The region includes two nature protected areas.

### Reference mountain landscape statistics (A: Data from NUTS3 CZ031)

Reference mountain chain		Sumava - Cesky les	
Reference mountain landscape		Prachatice	
Size of the area (km <sup>2</sup> )	1,377	Average per capita income €/year	9,511 <sup>A</sup>
Altimetry (m; min-max)	410– 1,378	Total Gross Value Added (GVA) €/year	9,783 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	37	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.01%	Primary:	4.7% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	62,533 <sup>A</sup>	Secondary (including construction):	39.3% <sup>A</sup>
		Tertiary:	56.0% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	150	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	4,971	Primary:	5.5% <sup>A</sup>
Protected areas	Yes	Secondary:	40.6% <sup>A</sup>
		Tertiary:	53.9.3% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Sheep husbandry has got a long tradition within the Sumava region. The VCs spans over all important activities - from breeding, husbandry, processing food and products towards marketing. The VC contributes to a typical image of the Sumava region. Due to an economic risk associated with sheep husbandry, the sheep are often kept on farms with other animals (cattle and/or goats). Since the different groups of ruminants utilize different groups of plants, farmers can manage various types of plots include those located in nature protected areas. The classic breed of the regional sheep is also kept on farms in Germany.

### **Key local assets**

Sumava Mountains provide picturesque landscape and unique natural assets, the regions have been partly abandoned during the socialist-era (1950s-1989). In the last 30 years many farms have been renewed based on the pre-WII tradition. The region is highly attractive for tourists in Winter as well summer season. The sheep farms and their products are highly attractive for tourists. Some of them also offer services in agritourism.

### **Challenges**

The VC is firmly embedded and the region and relies on local resources. Sheep farms are important providers of ecosystem services. The VC faces economic challenges; the farms rely on agricultural subsidies. The VCs is also vulnerable due to the ongoing climate changes. Dry seasons result in shortage of water that reduce availability of grass (hay). These changes may threaten farms with large herds that may not be able to secure enough feedstuff for the sheep. Farms are often located in nature protected areas (or nearby). There areas are also a home for some predators, such as wolves, that have been re-introduced by humans. The predators are protected; however, they often cause damages to sheep farms. A present challenge is thus finding a balance between the environmental and economic interests that would enable to pursue the goals of both sides.

### **Innovation**

Due to a low demand for sheep products (meat and wool) that farms must aim on innovations in area of marketing. Farms are creating new marketing channels for selling their products.

## Beer from local small breweries

Local production of beer has recently emerged as a new VC in the food sector. The local breweries operate on niche markets with emphasis on territory and local consumption. Local breweries are typically associated with tourism, accommodation, and gastronomy. Local production of beer utilizes local resources (natural, economic, and cultural).

Trutnov is the largest district within the NUTS 3 Kralovehradecky. The landscape of the region is very diverse with large differences in altitude. Such landscape makes the region less favourable for agricultural activities. 43,2% of the region covers agricultural land. Approximately a half of the agricultural land is arable land (53%). There is also a high share of perennial grassland in the region (41,6%). Forest land covers 46,9% of the region and this is the highest share within the NUTS2. The region includes the highest mountains of the Czech Republic (Giant Mountains) with the highest peak 1602 meters above s.l. The area of the mountains includes the National Park (with 385 km<sup>2</sup>).

### Reference mountain landscape statistics (A: Data from NUTS3 CZ052)

Reference mountain chain	Sumava - Cesky les		
Reference mountain landscape	Trutnov		
Size of the area (km <sup>2</sup> )	1,147	Average per capita income €/year	10,131 <sup>A</sup>
Altimetry (m; min-max)	263– 1,603	Total Gross Value Added (GVA) €/year	9,173 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	103	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-1.84%	Primary:	4.5% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	55,419 <sup>A</sup>	Secondary (including construction):	40.5% <sup>A</sup>
		Tertiary:	55.1% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	100	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	1,759	Primary:	5.4% <sup>A</sup>
Protected areas	Yes	Secondary:	39.3% <sup>A</sup>
		Tertiary:	55.3% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

Founding a new local brewery require high investment. The local breweries are set up by sole organization, or within diversification activities of already existing businesses, such as restaurants or hotels. Setting up a brewery also requires specialized knowledge of technology. Production of

beer in small and mini breweries does not require land, nor local agricultural crops, but local water. What contributes to the success, beside the objective quality of the product, is the marketing that often utilizes local culture and traditions in marketing and branding. The VC is very popular, and it provides high added value for the regional economy.

### **Key local assets**

The quality of water significantly impacts on quality of the final product. Local breweries utilize cultural sources of the region. Beer products are usually sold with "stories" that refer to local history, legends, key personas etc.

### **Challenges**

Local breweries operate on unique niche markets. Distribution of beer relies on direct sale and eventually - depending on a capacity of a brewery – e-shops or specialized shops. The VCs depend on incoming guests. Main challenge for the future is make the CV more resilient to changes in several incoming tourists and develop additional marketing channels for sale.

### **Innovation**

The sheep-dairy value chain is a traditional one, where no innovations have been identified.

## Syrups

The VC aims on production of syrups of various flavours. The syrups are presented as a regional product that uses herbs and fruits collected in mountains. It also refers to traditional recipes for preparing the syrups. Although this product is not unique of mountain regions; it is a great example of utilizing natural and symbolic values associated with the region. To generate a unique selling proposition, the syrups are often marketing as a special regional product.

Trutnov is the largest district within the NUTS 3 Kralovehradecky. The landscape of the region is very diverse with large differences in altitude. Such landscape makes the region less favourable for agricultural activities. 43,2% of the region covers agricultural land. Approximately a half of the agricultural land is arable land (53%). There is also a high share of perennial grassland in the region (41,6%). Forest land covers 46,9% of the region and this is the highest share within the NUTS2. The region includes the highest mountains of the Czech Republic (Giant Mountains) with the highest peak 1602 meters above s.l. The area of the mountains includes the National Park (with 385 km<sup>2</sup>).

### Reference mountain landscape statistics (A: Data from NUTS3 CZ052)

Reference mountain chain		Sumava - Cesky les	
Reference mountain landscape		Trutnov	
Size of the area (km <sup>2</sup> )	1,147	Average per capita income €/year	10,131 <sup>A</sup>
Altimetry (m; min-max)	263– 1,603	Total Gross Value Added (GVA) €/year	9,173 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	103	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-1.84%	Primary:	4.5% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	55,419 <sup>A</sup>	Secondary (including construction):	40.5% <sup>A</sup>
		Tertiary:	55.1% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	100	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	1,759	Primary:	5.4% <sup>A</sup>
Protected areas	Yes	Secondary:	39.3% <sup>A</sup>
		Tertiary:	55.3% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

Syrup producers are not necessarily located in mountain areas. They collect ingredients from the mountain region and process the ingredients in nearby regions. Crucial part of the VC is the

marketing that utilizes symbolic value of the region. There are examples of producers that organize their businesses as a social enterprise with additional positive impacts in social areas. The VC is not so important in terms of the use of natural (tangible) resources, but it is a typical example of the VC that is embedded in mountain region but uses the intangible resources of the region.

### **Key local assets**

More important than the natural assets (that can be easily substituted) is the social construction of quality that is used in marketing. For this purpose, the producers refer to traditional knowledge embedded in the region, their product labels refer to cultural traits associated with the mountain area. The symbolic value referring to the mountains is what distinguishes the product from other similar products.

### **Challenges**

Syrups are sold on mainstream food markets that are highly competitive. Main challenge for the given VC is associated with valorisation of the product and with a marketing strategy.

### **Innovation**

The fruit syrups value chain is a traditional one, where no innovations have been identified.



## Rosehip wine

Non-filtered wine (6-7 month to be ready for sale) is produced from rosehips harvested (dried after harvest) on the hillsides of Jeseník spa (local rosehips). The product is marketed using a regional label mostly through e-shop. This 100% handmade wine is produced only by family business. The only large-scale producer of rosehip wine made in Czechia and Europe (two quality medals from USA).

Jeseník is the area with high share of highlands and forests. Its landscape includes the nature protected area, which is the largest in the Czech Republic (555 km<sup>2</sup>). The most relevant asset of the territory is the unique nature, which provides very attractive conditions for tourism. The nature protected area located in the region is considered one of the most valuable locations in Europe. The landscape is historically known for extensive farming in perennial grassland, namely sheep and cattle.

Reference mountain landscape statistics  
(A: Data from NUTS3 CZ071)

Reference mountain chain		Jeseniky mountains	
Reference mountain landscape		Jeseník	
Size of the area (km <sup>2</sup> )	719	Average per capita income €/year	9,184 <sup>A</sup>
Altimetry (m; min-max)	320– 1,423	Total Gross Value Added (GVA) (€ million)/year	9,186 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	52.8	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-7.9%	Primary:	3.3% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	28,371 <sup>A</sup>	Secondary (including construction):	40.4% <sup>A</sup>
		Tertiary:	56.3% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	110	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	2,387	Primary:	4.3% <sup>A</sup>
Protected areas	Yes	Secondary:	42.7% <sup>A</sup>
		Tertiary:	53.0% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

A family (better to say unmarried couple) produce exclusive alcoholic drink of fruit wine type. It uses rosehips which are traditionally processed for tea. Wine is a sort of alternative product (if

thinking tea from rosehip is mainly produced) using references to mountains (e.g., clean air). The company also produces typical fruit wines (black currants, strawberries) but the fruits are not local (purchase from Czechia and Slovakia).

### **Key local assets**

Rosehips are everywhere, they are used to make tea. This VC is an attempt to make wine out of them. The specificity is not in the rosehips but in the way of what is the final product out of them.

### **Challenges**

Result of the search for exclusive fruit wine of the family (attempted to produce normal fruit wines and finally found rosehip wine which is rich in flavour - it makes its exclusiveness). Utilize references to "the clearest air in Czechia" and famous Jeseník spa (Priessnitz spa - V. Priesnitz was the founder of natural healing - healing through manual work, fresh air, and clear mountain water). Example how regional product of alternative type (not normal wine but rosehip wine) can be attractive outside the region. Sold as exclusive products for gifts (in spa). Exclusiveness, uniqueness.

### **Innovation**

The innovation is the result of search for exclusive fruit wine (produced not from traditional fruits but from rosehips). As such is turned the understanding of what is exclusive fruit wine in terms of hand-made and long-time (8 month) to be matured. It is a new product for sale.

## Game meat

Mountain regions are home for wild animals that are hunted for meat. The VC utilizes the natural assets of the area - wild animals such as wild boar, deer, pheasant, hare. The animals are hunted members of the hunters' associations and marketed to consumers.

Trutnov is the largest district within the NUTS 3 Kralovehradecky. The landscape of the region is very diverse with large differences in altitude. Such landscape makes the region less favourable for agricultural activities. 43,2% of the region covers agricultural land. Approximately a half of the agricultural land is arable land (53%). There is also a high share of perennial grassland in the region (41,6%). Forest land covers 46,9% of the region and this is the highest share within the NUTS2. The region includes the highest mountains of the Czech Republic (Giant Mountains) with the highest peak 1602 meters above s.l. The area of the mountains includes the National Park (with 385 km<sup>2</sup>).

### Reference mountain landscape statistics (A: Data from NUTS3 CZ052)

Reference mountain chain		Sumava - Cesky les	
Reference mountain landscape		Trutnov	
Size of the area (km <sup>2</sup> )	1,147	Average per capita income €/year	10,131 <sup>A</sup>
Altimetry (m; min-max)	263– 1,603	Total Gross Value Added (GVA) €/year	9,173 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	103	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-1.84%	Primary:	4.5% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	55,419 <sup>A</sup>	Secondary (including construction):	40.5% <sup>A</sup>
		Tertiary:	55.1% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	100	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	1,759	Primary:	5.4% <sup>A</sup>
Protected areas	Yes	Secondary:	39.3% <sup>A</sup>
		Tertiary:	55.3% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Animals are hunted by members of the hunter's organization. The game meat was not available for mainstream consumers. The VC has recently opened to public by developing new marketing



channels. It is possible to buy game meat online from the associations of hunters. They do not sell meat products but the hunted animals that consumers must process on their own.

### **Key local assets**

The VC directly utilizes natural assets. It is a specific asset that can compete with meat products produced by conventional livestock farms.

### **Challenges**

VC is often in conflict with agricultural production. Wild animal proliferation results in damages on crops. The VC attempts to deliver products to mainstream consumers by developing new marketing channels. One of the key challenges for the VC is to establish trust with consumers. Meat needs to be tested, consumers need to have knowledge how to process the meat, since it is a less known food product.

### **Innovation**

The game meat value chain is a traditional one, where no innovations have been identified.

## Smoked meat and sausages

Meat production represents a specific part of the food production sector. The VCs valorises natural and symbolic values associated with the mountain region. The VC is a classic example of the alternative food network. Most of the meat production is carried out on farms that specialize in animal husbandry. Processing their farm products enables farms to gain higher added value from their farming activities. Meat products from such VCs are currently highly attractive even for mainstream consumers.

Klatovy's landscape is very diverse. This area of the region is covered by 46 % by agricultural land. About 55 % of the agricultural land is arable. Lower areas of the region (LAU 1) are suitable for relatively intense production of crops (including wheat and rape seeds). Upper areas are suitable for potato production. The south-western borders of the region neighbour the Germany. This is the area of the Sumava mountains. Due to the large share of the areas with high altitude there are many areas covered with forests. About 43 % of the region's areas are covered with forests.

### Reference mountain landscape statistics (A: Data from NUTS3 CZ032)

Reference mountain chain		Sumava - Cesky les	
Reference mountain landscape		Klatovy	
Size of the area (km <sup>2</sup> )	1,946	Average per capita income €/year	18,240 <sup>A</sup>
Altimetry (m; min-max)	250– 1,370	Total Gross Value Added (GVA) €/year	10,718 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	44	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-2.6%	Primary:	4.7% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	30,828 <sup>A</sup>	Secondary (including construction):	39.0% <sup>A</sup>
		Tertiary:	56.3% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	85	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	3,183	Primary:	3% <sup>A</sup>
Protected areas	Yes	Secondary:	41.0% <sup>A</sup>
		Tertiary:	56.0% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Producers are not necessarily located in the mountains. However, this business is mostly associated with livestock farms that strive for diversification and valorisation of their production. The most successful meat producers find their customers in nearby towns and large cities. The typical marketing channels include farm shops, farmers markets and on-farm sales. The VCs is linked with other VCs described previously, since the meat products can use different types of meat (beef, goat, sheep). Combination of these assets create powerful synergies that enable to valorise local resources and contribute to local production and consumption of food with many positive impacts.

### **Key local assets**

Sumava Mountains provide picturesque landscape and unique natural assets, the region has been partly abandoned during the socialist-era (1950s-1989). In the last 30 years many farms have been renewed based on the pre-WII tradition. The region is highly attractive for tourists in Winter as well Summer season. The producers of the meat products use these images in names of their products and description. In this way they valorise symbolic resources of the given mountain region.

### **Challenges**

Main challenges are associated with the marketing of the products and the hygienic rules that require very high investment costs. Most of the successful meat producers rely on quality meat inputs from their own farms. The challenges of this VCs are thus like the challenges related to VCs that consists of the cattle husbandry.

### **Innovation**

Innovation is associated with development of new food products that emphasize food quality in symbolic (process-based) and substantial (product-based) meaning. Producers are creating new marketing channels for selling their products and try to valorise symbolic features of the mountain region (such as "pure nature", "traditions" etc.)

## High-quality wood processing

High-quality wood processing for the furniture and construction industries is a typical VC associated with the Sumava region. The VC directly utilizes rich natural resources (forests). Forestry and wood processing has been a traditional source of livelihood for local inhabitants.

Klatovy's landscape is very diverse. This area of the region is covered by 46 % by agricultural land. About 55 % of the agricultural land is arable. Lower areas of the region (LAU 1) are suitable for relatively intense production of crops (including wheat and rape seeds). Upper areas are suitable for potato production. The south-western borders of the region neighbour the Germany. This is the area of the Sumava mountains. Due to the large share of the areas with high altitude there are many areas covered with forests. About 43 % of the region's areas are covered with forests.

Reference mountain landscape statistics  
(A: Data from NUTS3 CZ032)

Reference mountain chain		Sumava - Cesky les	
Reference mountain landscape		Klatovy	
Size of the area (km <sup>2</sup> )	1,946	Average per capita income €/year	18,240 <sup>A</sup>
Altimetry (m; min-max)	250– 1,370	Total Gross Value Added (GVA) €/year	10,718 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	44	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-2.6%	Primary:	4.7% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	30,828 <sup>A</sup>	Secondary (including construction):	39.0% <sup>A</sup>
		Tertiary:	56.3% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	85	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	3,183	Primary:	3% <sup>A</sup>
Protected areas	Yes	Secondary:	41.0% <sup>A</sup>
		Tertiary:	56.0% <sup>A</sup>

\*1 Nearest settlement with population > 100,000

\*2 share of total GVA/year

\*3 share of total employment)/year

The forests perform multiple functions in the region - spanning over environmental and economic functions. The ownership of forest land is fragmented, there are many owners of small forest plots and at the same time there are large companies. In the context of Sumava region it is important

to note that the area of the national park and nature protected area are owned and managed by the State-owned company. The high-quality wood processing VC represent a classic example of economic activity that has been traditionally pursued in the Sumava region. The VC currently include different economic actors - regional, national, State-owned, global that compete over the very specific assets. The regional actors that used to play very important role for the regional economy are facing high economic pressure. At the same time the VC is changing due to environmental challenges that are reflected in the forestry activities. The VC plays a crucial role in the mountain region because it is directly and firmly linked with the visible and tangible natural assets - forests. Functioning of this VC significantly affect environmental and economic aspects of the region with numerous indirect implications for other sectors (such as tourism). The VC obviously crosses over the borders to Germany and Austria just like the mountain region. However, the actors of the given VC operate in a different economic and social context.

### **Key local assets**

Key assets stem from natural capital of the region (forestry - spruce trees). The high-quality wood processing is important part of the regional economy. It can be also counted a part of the regional culture and tradition. Some of these businesses have operated in the region for a very long time (about one century). These traditional (small) business are experiencing a rising economic pressure related to their productivity. This is also a reason why some of these businesses were not able to cope with the existing price pressure.

### **Challenges**

The VC is currently facing many challenges. (1) Due to the global climate change, the forests that are typical of the Sumava region (spruce) are suffering from shortage of water. The trees are more vulnerable and threatened by bark beetle that is destroying large areas of spruce forests. (2) Forest areas located in the national park are subject of a long-term discussion about sustainable management of these areas. (3) Local wood processors are open for international trade with Germany and Austria. Many local wood processors went bankrupt due to the economic pressure that is increasing in the sector.

### **Innovation**

The high-quality wood processing value chain is a traditional one, where no innovations have been identified.



## Low-quality wood processing

Low-quality wood processing for energy production is a typical VC that is associated with Sumava mountains. This value impacts significantly on the look of the landscape and ecology of the region. The VC directly stems from the natural resources that are embedded in region.

Prevailing area of Prachatice consists of submontane highlands (with altitude 600-800 meters). Some settlements are in the altitude around 800 meters. Climate conditions are affected by relatively high altitude of the region. The region is rich of forests, which cover 52 % of the region. Share of agricultural land (due to the high altitude) is above regional average (within NUTS 3 level). The region is highly attractive for tourist during Winter and Summer season due to the unique nature. The region includes two nature protected areas.

Reference mountain landscape statistics  
(A: Data from NUTS3 CZ031)

Reference mountain chain		Sumava - Cesky les	
Reference mountain landscape		Prachatice	
Size of the area (km <sup>2</sup> )	1,377	Average per capita income €/year	9,511 <sup>A</sup>
Altimetry (m; min-max)	410– 1,378	Total Gross Value Added (GVA) €/year	9,783 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	37	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.01%	Primary:	4.7% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	62,533 <sup>A</sup>	Secondary (including construction):	39.3% <sup>A</sup>
		Tertiary:	56.0% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	150	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	4,971	Primary:	5.5% <sup>A</sup>
Protected areas	Yes	Secondary:	40.6% <sup>A</sup>
		Tertiary:	53.9.3% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Owners of the forest land, companies harvesting wood, households and companies that purchase wood. The VC is embedded in regional ecosystem. The current crisis (bark beetle) creates new disbalances that are present in forest ecosystem (rapid renewal of large forest land) and regional economy (low price of wood that hardly exceeds the costs of harvesting the wood). The VC as

such exists in neighbouring countries. However, the VC in the Czech Republic is nowadays undergoing a major transition process.

### **Key local assets**

Sumava Mountains is rich source of wood. The forests located in the national park and the nature protected areas are not the part of this VC. The wood for energy production is harvested outside these areas. Most of the wood that is harvested in this way is indeed used for the furniture and construction industries. The wood that is not suitable for the industry is used as a fuel. The wood is available for household consumption (for heating houses) and for companies producing heat and electricity on centralized basis. Wood is considered in the Czech Republic a sustainable source of energy and therefore it plays an important function in the national energy mix.

### **Challenges**

The low-quality wood processing sector is changing rapidly. The forestry in the Sumava mountains faces major environmental challenge represented by the bark beetle that destroys vast areas of forest land (spruce trees). Since 2019 there is a surplus of wood that is being harvested due to the parasite. This situation creates price pressure on local harvesting companies and owners of the forest land, who are required to cut down the spruce trees and renew the forests after the harvest. Main challenge for the future is renew the forest land so that the new forests will be resilient to the parasite and will be able to fulfil multiple functions.

### **Innovation**

The low-quality wood processing value chain is a traditional one, where no innovations have been identified.

## 13. Greece

### Graviera cheese (Gruyere)

Graviera is a PDO cheese of Crete, and the most famous among Greek cheese types. It is produced in the Amari region, in the western slopes of Psiloreitis Mountain. The predominant activity in the area is sheep and goat breeding..

Psiloreitis (Ida) mountain is the highest mountain in Crete, and registered as a UNESCO Global Geopark. The typical vegetation cover of Psiloreitis includes “Prinos” trees, and dispersed piles of rough Pine, Cypresses and Maples that form clusters up to 1,800 meters of height. At higher altitudes, the vegetation consists mainly of thorny plants bushes, such as heather. Around Kalogeros area the shrubby vegetation is prevalent. The Amari valley is bordered by Psiloreitis and Samitos and has remained largely untouched by modern development. It is full of picturesque villages, old Byzantine churches, Hellenistic and Roman settlements.

Reference mountain landscape statistics  
(A: Data from NUTS3 “EL433”)

Reference mountain chain		Psiloreitis Mountain	
Reference mountain landscape		Kalogerou Amari	
Size of the area (km <sup>2</sup> )	278.8	Average per capita income (EUR)/year	13,800 <sup>A</sup>
Altimetry (m; min-max)	294–2322	Total Gross Value Added (GVA) (EUR million)/year	1,046.1 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	58.8	GVA by sector (%) <sup>*2</sup>	
Population changes in the last 10 years	0.016%	Primary:	6.5% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	122	Secondary:	9.3% <sup>A</sup>
		Tertiary:	84.2% <sup>A</sup>
		Employment by sector (%) <sup>*3</sup>	
Road distance from Urban Poles <sup>*1</sup> (km)	90	Primary:	17.4% <sup>A</sup>
Number of agricultural holdings	13024	Secondary:	11.8% <sup>A</sup>
Protected areas	Yes	Tertiary:	84.2% <sup>A</sup>

\*1 Nearest settlement with population > 100,000

\*2 share of total GVA/year

\*3 share of total employment)/year

The endemic flora of the area contributes to the aromatic and rich in fat milk, which is mainly used for traditional dairy products at family level. Recently a new business endeavour by a well-known local cheesemaker in the village of Kalogerou-Amari has been undertaken, who is aiming to revive the cheese making as a small industry and re-introduce the well-established cheese in gastronomy. Graviera of Amari is a product of high quality, great reputation, and territorial identity in the area of Kalogerou / Amari. The production of graviera affects the graziers of the Kalogeros area and their families. The perspectives of the product bring together breeders, cultural associations, local authorities, and all local stakeholders involved in the production chain. Additionally, it affects the local catering, hosting and agro-tourism activities. The importance of the VC for the area has been recognized by the municipal and regional authorities, who are very proactive to support extroversion actions. Both the outstanding scenery and the wonderful climate are embedded in the cultures of all the civilizations that lived there. Shepherds' houses, called "mitata" are landmarks of Psiloreitis Mountains, made by local, platy, and dry-stone material. Totally weatherproof and fully adapted to the landscape, they are still used for cheese production. Psiloreitis UNESCO Global Geopark provides excellent opportunities for both recreation and education.

### Key local assets

Sheep and goats breeding in the mountainous areas and the use of mountain pastures is a traditional activity that is closely connected with the locals, their families, and their social activities. Cheese-making has always been a tradition and a family business in the region that has been carried out on special stone constructions, the mitata (constructions dating from the Minoan Civilization in 1600 BC), making it a social model and a way of life. The picturesque valley of Amari, along with the traditional way of life, draws the attention of many visitors all year long. In the wider area of Amari, many cultural events take place: concerts, theatrical performances, traditional dancing events, exhibitions, local gastronomy, ethics, excursions, workshops, education, art, culture and much more, make of it a unique opportunity to get acquainted with the authentic traditions of Crete. The local authorities as well as the Region of Crete have been trying hard to support sustainable development in Amari with an emphasis on the preservation of the natural environment and cultural heritage.

### Challenges

In the green and fertile valley of Amari, surrounded by the mountains of Kedros, Samitos and Psiloreitis the village of Kalogerou is the place where the cheese-making endeavour of the area is located. The area is characterized by a special natural beauty, scattered with many small, picturesque villages that retain their traditional colour. Sheep / goat breeding keeps the traditional way in livestock in the mountainous pastures of Amari. The main product of the activity is milk, which faces problems in disposal and has become economically unprofitable for the producers, who are heavily dependent on European subsidies to survive. Animal infections and climate change increase the uncertainty and vulnerability of the pastoral activities. Their hard life and the economic uncertainty are deterrent for the young people living in the area, which leads to a quick decline of the local population. Although graviera, an established, high priced cheese could become a solution

for the disposal of the local milk, the strong competition from local, national, and international products makes the endeavour challenging.

### **Innovation**

In the recent years, there has been a trend to enrich types of graviera after an increased demand of consumers and gastronomes; by mixing aromatic plants and spices. The cheese-making of Amari tends to gain an advantage of a demanding market by introducing such new types of graviera, along with the traditional one. The adopted strategy is based on increasing its presence and reputation through social media. Furthermore, the Crete Region has started an initiative to introduce new ways of livestock herds feeding, which showed promising results.

## Dry Anthotyros cheese

Dry Anthotyros is a hard white cheese, with a prominent position among other traditional Cretan Cheeses. Dry Anthotyros is a hard, matured, and a white cheese with pleasant, spicy taste and a rich fresh milk aroma. It is made of high- quality sheep & goat milk and whey. The animals graze on Lassithi plateau and fully-adapted to the environment, where their diet is based on the flora of the area. The plateau pastures in the area belong to the Municipalities, and the producers pay an annual rent, while there are many cases where pastures belong to the breeders. The distribution of cheese is done through the market (small and large supermarket chains) while the distribution through e-commerce is not widespread due to low persistency. The preparation of Dry Anthotyros contributes to a further utilization of whey after the preparation of soft or hard cheese. Because of dry Anthotyros's multi-usages in Cretan gastronomy, the product is strongly connected with many other activities of the area (Social, Tourism, cultural, etc.).

Reference mountain landscape statistics (A: Data from NUTS3 "EL432")			
Reference mountain chain		Dikti mountain	
Reference mountain landscape		Tzermiado	
Size of the area (km <sup>2</sup> )	129.8	Average per capita income (EUR)/year	16,100 <sup>A</sup>
Altimetry (m; min-max)	815-2148	Total Gross Value Added (GVA) (EUR million)/year	1,032.7 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	40.7	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years (%)	-0.028%	Primary:	13.3% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	36	Secondary:	14.8% <sup>A</sup>
		Tertiary:	71.9% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	55	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	12981	Primary:	23.2% <sup>A</sup>
Protected areas	Yes	Secondary:	9.9% <sup>A</sup>
		Tertiary:	66.9% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000  
\*<sup>2</sup> share of total GVA/year

Dry Anthotyros production affects the breeders in Lassithi plateau area and their families. The perspectives of the product bring together breeders, cultural associations, local authorities, and other local stakeholders involved in the production chain. Also, it affects the local catering, hosting and agro-tourism activities. The importance of the VC for the area has been recognized by local and regional authorities, who are willing to support extroversion actions. In the study area, there is the Cheese Factory of the Agricultural Cooperative of the Lassithi Plateau; located in Kaminaki, at an attitude of 860 m.

### **Key local assets**

Dry Anthotyros of Lassithi is a product of a local agricultural cooperative. The processing unit is located in Kaminaki, at an altitude of 860 meters. The unit cooperates with 85 small and large livestock farms, collecting milk from the surrounding mountains in the area. The unit follows an absolute traceability system, starting from the final products and ending with the producer and the day of raw milk collection. It is a standard traditional cheese factory that has been operating since 1984. The cheese-making is an activity of great importance for the sustainability of the area, both economically and socially. The dry anthotyros is a traditional cheese of ancient origin, part of the cultural heritage of the area and for Crete in general.

### **Challenges**

The main challenge for the VC and for the area in general is the rapid decline of the population. The traditional way in farming led to a low income due to non-standardised products.

### **Innovation**

The dry Anthotyros value chain is a traditional one, where no innovations have been identified.

## Meat (Sheep and goat breeding for meat production)

Sheep lambs and goat kids' meat from the Anogeia area is famous throughout Crete for its excellent organoleptic characteristics. In the area of Anogeia, at altitudes over 1000 m above sea level, sheep and goat breeding is a traditional activity with more than 80,000 heads of free-range animals. The natural flora of Psiloreitis Mountain contributes to the production of aromatic meat rich in nutrients, which is used in many different ways.

Psiloreitis (Ida) mountain is the highest mountain in Crete and registered as a UNESCO Global Geopark. Phrygana and macchia vegetation dominate the landscape up to a 1,600m of altitude. The typical vegetation cover of Psiloreitis includes "Prinos" trees, and dispersed piles of rough Pine, Cypresses, and Maples that form clusters up to 1,800 meters in height. At higher altitudes, the vegetation consists mainly of thorny plants bushes, such as heather. Around the Anogeia area the shrubby vegetation is prevalent. Relatively close to the town there exist the Skinakas observatory and the Idaion Andron Cave, the cave that Zeus was born, according to Greek mythology.

Reference mountain landscape statistics  
(A: Data from NUTS3 "EL433")

Reference mountain chain		Psiloreitis Mountain	
Reference mountain landscape		Anogeia	
Size of the area (km <sup>2</sup> )	102.1	Average per capita income (EUR)/year	13,800 <sup>A</sup>
Altimetry (m; min-max)	680-1250	Total Gross Value Added (GVA) (EUR million)/year	1,046.1 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	58.8	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years (%)	-0.016%	Primary:	6.5% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	50	Secondary:	9.3% <sup>A</sup>
		Tertiary:	84.2% <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	39	Primary:	17.4% <sup>A</sup>
Number of agricultural holdings	13024	Secondary:	11.8% <sup>A</sup>
Protected areas	Yes	Tertiary:	70.8% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year



Sheep and goat breeding is a predominant traditional activity in the Anogeia area. More than 200 pastures are organized in a local meat production cooperative. The establishment of the cooperative meets all modern standards for the production of quality meat. In conclusion, the meat of the Anogeia area is a product of high quality, of a great reputation, of the predominance of the connected land-use system, and with a territorial identity. Meat production affects the pastures of the Anogeia region and its population. The prospects of the product bring together pasturers, cultural associations, and local authorities. It also affects local catering, hospitality, and agri-tourism activities. The importance of the VC for the area has been recognized by municipal and regional authorities, who are very cautious in supporting extroversions actions. Anogeia breeders use the transhumance breeding system more than the breeders of other areas to a great extent directing their animals to other areas of Crete (Heraklion, Lassithi).

### **Key local assets**

The breeding of sheep and goats in the mountainous areas of Anogeia and the development of pastures is a traditional activity that is closely linked to the local people. Grassland in lower altitudes and forestry in higher ones, as well as natural land, are prerequisite land-use systems for meat production from free-range animals. Until recently, the production was a family business, making it a social norm and a way of life. The cooperative of the local breeders, through the meat production, gives better perspectives for them, their families, and the local society. The meat is consumed in large amounts in local festivities and agro-touristic events.

### **Challenges**

Livestock farming in the Anogeia area focuses mainly on dual-purpose breeding of sheep and goats (meat and milk). The activity has become economically unprofitable and is heavily dependent on European subsidies, because it faces significant competition from other livestock industries (pork meat, chicken meat, etc.). Nowadays, the local population in Crete shows a significant preference for mountain farmed animals due to non-stress type of production. The area of Anogeia is relatively isolated and the population is shrinking. Animal infections and climate change increase the uncertainty and vulnerability of their activities.

### **Innovation**

In recent years and based on EU funding, infrastructure (stables, milking machines, feed silos, etc.) has been significantly improved at all stages of rearing as well as slaughtering. Lately, milk whey (a dairy waste) has been utilized as animal feed, a fact that contributes significantly to the environment.

## Traditional edible products of Gergeri

In the Cretan delicatessen, a series of traditional edible products can be distinguished due to their taste and their nutritional value. A local woman cooperative in the Gergeri area, have been successfully producing such products for more than 20 years. The products are strongly connected with the area due to the land morphology and the high quality of local raw materials. Gergeri is located 40 Km southwest of Heraklion in the eastern slopes of Psiloreitis Mountain.

The area is located in the eastern hillside side of Psiloreitis (Ida) mountain. Psiloreitis (Ida) mountain is the highest mountain in Crete and registered as a UNESCO Global Geo-park. Phrygana and macchia vegetation dominate the landscape up to a 1,600m of altitude. The typical vegetation cover of Psiloreitis includes “Prinos” trees, and dispersed piles of rough Pine, Cypresses, and Maples that form clusters up to 1,800 meters in height. At higher altitudes, the vegetation consists mainly of thorny plants bushes, such as heather. The Gergeri community has always been connected to the forest of Rouvas, which is the largest source of kermes in Europe. With water sources and the unique creation of the Cretan land.

Reference mountain landscape statistics  
(A: Data from NUTS3 “EL431”)

Reference mountain chain		Psiloreitis Mountain	
Reference mountain landscape		Gergeri	
Size of the area (km <sup>2</sup> )	465.2	Average per capita income (EUR)/year	13,800 <sup>A</sup>
Altimetry (m; min-max)	0-1572	Total Gross Value Added (GVA) (EUR million)/year	3,752.1 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	119.4	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years (%)	-0.024%	Primary:	5.4% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	96	Secondary:	11.6% <sup>A</sup>
		Tertiary:	83% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	42	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	41162	Primary:	15.2% <sup>A</sup>
Protected areas	Yes	Secondary:	12.4% <sup>A</sup>
		Tertiary:	72.4% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The cooperative's activities have an important impact on the regional SES, as they offer entrepreneurship and work opportunities for women. Their products are used in local host and touristic activities under quality schemes that meet the market standards. The trademark of the cooperative is recognizable in Crete.

### **Key local assets**

Raw materials and products used at the cooperative level are provided mainly by the local natural resources, the grassland and natural land. The women's cooperative has an important impact for the area of Gergeri, as well as for every mountainous area in Crete. It is a success story for female community and mountainous entrepreneurship because it is adapted to both: environment and tradition. Most of their products have a reference to the Cretan culinary heritage.

### **Challenges**

Women in the Cretan highlands have limited and difficult access to occupations other than farming activities at family level, which makes them completely dependent and limited in terms of prospect for personal and occupational choices. Most young women in mountainous areas look for ways to leave their home villages, exacerbating the decline of the local population. Gergeri's women's cooperative is a successful example for tackling this social problem. The products they produce are of high quality, in close relation to the local raw materials and of high reputation in the Cretan market.

### **Innovation**

The cooperative's members use local raw materials and products, processed with innovative methods that follow the traditional recipes and standardize the final product for the market. The cooperative has introduced a few innovative products (e.g., glass vases with pickled wild artichoke hearts in olive oil), which are distributed through supermarkets, delicatessen shops, as well as several e-shops.

## Wine (PDO)

The PDO Peza zone was established in 1971 for red wine and in 1982 for white wine. It is situated in the central-eastern mountain area of Crete. The vineyards of Peza stretch sinuously on hilly terrain of varying inclines and exposures around the plain of Peza, in Heraklion district, up to 700 m above sea level.

Peza Plateau is situated in the eastern foothills of mountain Giouchtas (811 m height peak) lying to the east of Psiloreitis mountain range. Peza Plateau lies among central mountain volumes of the island and at a 30-minute drive from the biggest city of the island, Heraklion.

Reference mountain landscape statistics  
(A: Data from NUTS3 "EL431")

Reference mountain chain	Giouchtas		
Reference mountain landscape	Peza		
Size of the area (km <sup>2</sup> )	339.1	Average per capita income (EUR)/year	13,800 <sup>A</sup>
Altimetry (m; min-max)	310-811	Total Gross Value Added (GVA) (EUR million)/year	3,752.1 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	119.4	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years (%)	0.015%	Primary:	5.4% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	113	Secondary:	11.6% <sup>A</sup>
		Tertiary:	83% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	20	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	41162	Primary:	15.2% <sup>A</sup>
Protected areas	Yes	Secondary:	12.4% <sup>A</sup>
		Tertiary:	72.4% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The red varieties of Kotsifali and Mandilaria are cultivated in deep calcareous soil, although the vineyards of Peza are best known for white wine production from the local Vilana variety. It is mainly cultivated in the plain around the village of Peza, but the vineyards are found at higher altitudes, where ripening is slower and gentler, yielding more aromatic wines. The modern and linear plantings in Peza have the fastest pace of growth among Crete's vines growing areas. The

vineyards are planted at altitudes higher than 300m and they are a great example of mountain products that have established a good reputation, providing territorial identity, and supporting the community in the long run. The vineyards are owned by the cooperative's members and their families. The processing (vinification) capacity of the facilities is 700 tons in 12 hours; while for the production and preservation of superior quality wines, the company has 3 storey wine cellar of 1350 m<sup>2</sup> for each floor equipped with stainless steel wine tanks. Each of these tanks has a capacity of 2,400 tons and a bottling plant with a capacity of 5000 bottles per hour. It is the most important economic activity for the regional SES, affecting the landscape and the ecosystem through a sustainable traditional approach.

### Key local assets

There are more than 35,000 stremmata (1 stremma = 1000 m<sup>2</sup>) of vineyards in the area of Peza Union. 14,000 stremmata are producing VQPRD vines, 9,000 for table wines and 12,000 for raisins and table grapes. VQPRD stands for the E.U. characterisation of "Vin de Qualite Produit de Region Determinée" signifying special regions of distinguished quality products. The product of this VC presents great perspectives of growth and market share expansion, while also preserving traditional practices and the use of locally specific resources.

### Challenges

This VC is very much engaged with local producers and their families, working as a farmers' cooperative of 10 local villages and continuing a wine-production tradition of centuries. The growing expansion of this industry raises challenges for the sustainability of practices, as well as the potential of the cooperative to cover future demand. Another challenge is the sensitivity of wine production level and quality against climate change.

### Innovation

Peza Union and all their components are strongly interested in the development of new commercial presentations. In fact, the Sector has put in the market diverse kinds of wines and is also aware about the demand of consumer for natural products. Following this line of innovation, the Union has developed products including higher proportion or total presence of natural products. The development of this kind of products requires research that is beyond the possibilities of one single company or association. Moreover, the investment of PEZA UNION in the technology of aseptic package Tetra Pak, offered the opportunity of producing another innovative product in continuation to the rationale of the standardization of wine in bag-in-box (The Party's Wine).

## Cretan Tsikoudia (traditional distilled spirit drinks from grape pomace)

The “Tsikoudia” spirit drink has centuries of production old tradition in the area, using local distillation process on grapes pomace (residue of grapes after being pressed for wine production). It is similar to a more famous product spread in Eastern Mediterranean called Rakia, but tsikoudia follows some particular techniques and grape varieties that are typical of this region and associated with its cultural identity.

The location is situated in the north-eastern foothills of the Idi mountain range, where the highest peak of the range is 2,456 m. The surrounding area is characterized by high altitude rocky fields, with various small valleys of fertile soil. The highest altitudes levels close to the mountain range peak are rocky, arid and without plantation or trees. The foothills of the mountain range have a mixture of rocky and fertile landscape.

Reference mountain landscape statistics  
(A: Data from NUTS3 “EL431”)

Reference mountain chain		Psiloreitis mountain	
Reference mountain landscape		Hagia Varvara	
Size of the area (km <sup>2</sup> )	465.2	Average per capita income (EUR)/year	13,800 <sup>A</sup>
Altimetry (m; min-max)	0-1572	Total Gross Value Added (GVA) (EUR million)/year	3,752.1 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	119.4	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years (%)	0.024%	Primary:	5.4% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	78642 <sup>A</sup>	Secondary:	11.6% <sup>A</sup>
		Tertiary:	83% <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	30	Primary:	15.2% <sup>A</sup>
Number of agricultural holdings	41162	Secondary:	12.4% <sup>A</sup>
Protected areas	Yes	Tertiary:	72.4% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The grapes are produced in high altitude landscape, where pressing and distillation processes take place in local communities. Lately we have observed the introduction of innovative products, mainly spirit drinks combining the traditional tsikoudia product with locally produced honey or fruit aromas. The VC is characterized by low-volume, high-quality products that grow fast in brand reputation, supporting the local community in Hagia Varvara, at the foothills of Psiloreitis Mountain. The VC engages local producers and their families in sustainable vertical practices of grapes processing through cultivation, collection, wine/juice extraction, fermentation, and finally distillation to produce spirit products. Most of the producers are also landowners with land titles passed from one generation to another and have strong ties with the community. Most producers provide their products in bulk to the nearest market retailers, while a few businesses, such as: "Korsa Drinks", produce bottled labelled products like the product series named "BaiRaki".

### **Key local assets**

Soil characteristics, landscape, microclimate, and high-Altitude Mountains are ideal for the growth and increased quality production of the local grape varieties. The final products are characterized by high quality, distinct attributes, and cultural identity. A local tsikoudia festival is organized in mid-summer.

### **Challenges**

The most important challenge for this VC is to gain viable market share against competition. The low-volume traditional production process is halting local businesses to grow in scale and create a homogeneous brand name. Innovation and technology seem to reverse this challenge into opportunity, as it provides small producers with affordable means of promotion and quality assurance. Other challenges include the substitution of local grape varieties with more popular, productive ones, in addition to climate change; although, the local varieties are particularly adapted to the mountainous rocky soil of Crete and tested for a period of centuries.

### **Innovation**

Tsikoudia is an essential part of local tradition and cuisine. The producers of the Hagia Varavara area use the traditional distillation process. Unlike most Cretan producers, they have moved forward to bottling, marketing through e-shops, and introducing new types of tsikoudia with different flavours.

## Olive oil products (PDO)

The PDO olive oil from north mountainous area of Mylopotamos is of good reputation, with rare quality characteristics, related to the landscape of the area. The olive orchards are established in high altitudes, and oil is produced under traditional methods. The main factors differentiating this product quality is the climate, the soil composition, the variety of trees and the human cultivation processes.

The location is situated in the north-eastern foothills of the Idi mountain range, where the highest peak of the range is 2,456 m. The surrounding area is characterized by high altitude rocky fields, with various small valleys of fertile soil. The highest altitudes levels close to the mountain range peak are rocky, arid and without plantation or trees. The foothills of the mountain range have a mixture of rocky and fertile landscape.

Reference mountain landscape statistics  
(A: Data from NUTS3 "EL433")

Reference mountain chain		Psiloreitis mountain	
Reference mountain landscape		Mylopotamosa	
Size of the area (km <sup>2</sup> )	170	Average per capita income (EUR)/year	13,800 <sup>A</sup>
Altimetry (m; min-max)	200-900	Total Gross Value Added (GVA) (EUR million)/year	1,046.1 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	58.8	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years (%)	0.016%	Primary:	6.5% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	6998	Secondary:	9.3% <sup>A</sup>
		Tertiary:	84.2% <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	60	Primary:	17.4% <sup>A</sup>
Number of agricultural holdings	13024	Secondary:	11.8% <sup>A</sup>
Protected areas	Yes	Tertiary:	70.8% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year



Local SES presents a very high dependency to the VC, as olive oil production is the main agricultural activity of the area. Production quality is ensured through traditional family practices of fruit collection and olive oil extraction. The area, as the rest of the island, lacks a labelling scheme and the product is usually sold in bulk with great amounts of it being exported and bottled in EU countries.

### **Key local assets**

The mountainous area is optimal for olive trees' growth and yield an exceptional quality product. The altitude and aridity of the climate, together with specific soil characteristics of rocky landscape, are typical of local olive trees adaptation to climate. Some plantations include centuries old trees. The final products are of good reputation and production practices include families and community's involvement.

### **Challenges**

Olive oil production is sustainable when following traditional cultivation processes, especially on soils particularly suitable for olive trees' needs. The Crete Island has many areas that are suitable for olive trees' cultivation. The motivation for increased productivity and the expansion to non-suitable areas increases the unsustainable use of fertilizers and water. Moreover, climate change is raising some uncertainty factors, especially tree diseases that prosper in higher temperature and humidity conditions, leading to unsustainable use of pesticides. Additionally, a challenge for local producers arises because of low-cost import competition from non-EU countries.

### **Innovation**

A long history of tradition in agricultural practices has developed a list of strictly defined processes so as to adapt to the particular environment and produce high-quality products. The cultures follow specific distances between trees, limited tree-specific drip-irrigation, organic fertilizers (from sheep) adjusted to each tree's age and production stage, restricted use of non-organic fertilizers, traditional practices of pruning, bait traps against olive-fruit flies' infestation, restricted use of non-residual pesticides, olive-fruit collection with traditional practices.

## Carobs (carob products and by-products)

Carob is a characteristic plant of the arid Cretan landscape. It is adaptable to the dry Mediterranean climate. In the area of Selli, and in a semi-mountainous landscape (~500m), we find more than 3000 carob trees, naturally and man-planted; those trees are organically cultivated/exploited by local farmers. One family-based company collects the production of the area.

Despite its small size, Vrissinas represents the typical image of many mountain landscapes of Crete; steep slopes, mainly covered with shrubby vegetation and kermes oaks and numerous springs, associated with the aquatic vegetation (ferns). A Minoan Peak sanctuary is located at its arid peak, making it a favourable destination for walking excursions. In the small valley of Selli, the carob trees thrive. The area is ~20km far from Rethymno.

### Reference mountain landscape statistics (A: Data from NUTS3 "EL431")

Reference mountain chain		Vrissinas	
Reference mountain landscape		Selli Pethymno	
Size of the area (km <sup>2</sup> )	396.3	Average per capita income (EUR)/year	13,800 <sup>A</sup>
Altimetry (m; min-max)	0-773	Total Gross Value Added (GVA) (EUR million)/year	1,046.1 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	58.8	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years (%)	0.016%	Primary:	6.5% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	23633	Secondary:	9.3% <sup>A</sup>
		Tertiary:	84.2% <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	77.5	Primary:	17.4% <sup>A</sup>
Number of agricultural holdings	13024	Secondary:	11.8% <sup>A</sup>
Protected areas	Yes	Tertiary:	70.8% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

A small part is processed by that company to carob syrup, while the largest part is forwarded to other local companies that produce a variety of products and by-products for the Greek and

international market. Carob is of multi-use, producing a range of good reputation products, exhibits high prevalence, and a traditional connection to land use. The Selli area's carob cultivation has become the origin of an extensive VC developed in Rethymno prefecture, which involves local farmers and family firms producing a multitude of local products (bread, baked goods, pasta, cocoa, syrup used as natural sweetener, cosmetics, alternative sweeteners, and animal feed). Furthermore, it has ornamental use and timber. In addition to firms for standardization, packaging, promotion, and marketing. The carob products are considered part of the local gastronomy; they are present in hosting activities and tourism in general.

### **Key local assets**

Adaptable to dry Mediterranean climate, the carob tree can form the basis of an agroforestry system. The carob contributes to recover eroded soil, survives extreme droughts and wildfires, improves soil fertility by fixing nitrogen, and fixes 3 times more CO<sub>2</sub> than other woody crops using 2.5 times less water. The traditional character of carob cultivation involves local farmers and firms and strengthens their bonds. The carob is also a traditional ingredient of Cretan gastronomy, which had drawn attention due to new innovative edible products.

### **Challenges**

Although carob is resilient to aridity, climate change and severe climate events during the last years can impact the quality and availability of carob pods. There is a growing interest in the national and international market for carob products and by-products; however, this interest comes along with an intensive market competition from other Mediterranean countries.

### **Innovation**

The carob is a native tree in Crete, self-planted in many cases. The cultivation/exploitation is a traditional activity. The innovations are two-fold: (i) the organic cultivation and the integrated management of production. (ii) a variety of products and by-products based on carob (e.g. carob powder is used as a coffee substitute as well as flour).

## Aloe Vera

Aloe Vera grows in poor agroecosystems; accordingly, it favours rural development in marginalized areas, such as the Dikti mountain landscape. In the past 10 years, a specific variety is being cultivated and exported. Aloe Vera is drought tolerant and ideal for growing in dry conditions such as those in the Dikti mountain landscape and elsewhere in the semi-mountainous regions of Crete. It is grown in the Dikti area and processed in newly established processing and marketing companies in the same region. There is a high interest in nutraceutical and pharmaceutical products leading to innovation in processing and production opening wider export pathways.

Dikti mountain range has a maximum altitude of 2,148 m. Large parts of the mountain area are forested with pines (*Pinus brutia*), Kermes oaks (*Quercus coccifera*), cypresses (*Cupressus sempervirens*), Holm Oaks (*Quercus ilex*) and Cretan Maples (*Acer sempervirens*). The topology of the mountain range is rich with plateaus, valleys, and secondary peaks. The fertile valleys and plateaus of Dikti (Dicte) are of significant importance to the local economy. The warm and sunny climate of this mountainous region is ideal for the growth of aloe Vera.

Reference mountain landscape statistics  
(A: Data from NUTS3 "EL431")

Reference mountain chain	Dikti Mountains		
Reference mountain landscape	Viannos		
Size of the area (km <sup>2</sup> )	221.5	Average per capita income (EUR)/year	13,800 <sup>A</sup>
Altimetry (m; min-max)	0-1147	Total Gross Value Added (GVA) (EUR million)/year	3,752.1 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	119.4	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years (%)	0.024%	Primary:	5.4% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	22	Secondary:	11.6% <sup>A</sup>
		Tertiary:	83% <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	55	Primary:	15.2% <sup>A</sup>
Number of agricultural holdings	41162	Secondary:	12.4% <sup>A</sup>
Protected areas	Yes	Tertiary:	72.4% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The adaptability and ease of farming led to the cultivation of Aloe Vera as an alternative plant during the economic crisis of 2008-2016. The plant is being processed to produce juice, gel, cosmetics, and nutraceuticals involving research, new processing and production methods, and marketing strategies. The juice has been successfully integrated into the local diet and the cosmetics are also being marketed in the tourism sector. The main problem for producers is the distribution of the leaves and the fact that only a small number of leaf-processing units exist. Another issue is the seasonality in production that does not cover the fixed seasonal demand of the industry. The high cost of quality certification is also a detriment factor. The cooperation of Minoan Land has participated in many festivals, such as Cretan Diet Festival, while the Pan-Cretan Network of Organic Farmers of Aloe Vera has cooperated with Minoan Land.

### Key local assets

The agricultural sector is the only vital sector in the Dikti Mountain landscape. Olives are the primary crop. The cultivation of Aloe Vera has highly influenced production and distribution and brought on technological development in manufacturing methods. Aloe Vera is a supplementary income for farmers. Moreover, processing facilities focused on the food/cosmetic industries developed quickly in the past 5 years offering employment opportunities and sustaining the population in these areas. The cultivation of Aloe Vera has proven to be economically viable, especially through e-commerce and export pathways that are being further established.

### Challenges

Challenges include the risk of extinction of rare plants of the local flora which are endemic to the Dikti area and Viannos. Another challenge is that only a few leaf-processing units exist in the area which can contribute to a problematic supply chain. Quality checks are costly; hence, they may not be sufficient in number. Moreover, fluctuating quality of production has been reported leading to a risk of reduced harvests. Adulteration of the final products is another concern and risk. In Viannos, Aloe Vera is cultivated in great quantities and that helps the young people to stay in the rural areas of the region. Competition of land use and the implementation of ambivalent investment programs are also pressing concerns in the region. Aloe Vera is a very profitable investment, and that is significant for crisis-ravaged farmers in the region.

### Innovation

Innovation concerns: (i) a network of partners (including farmers and by product producers of Aloe Vera plants) has been established in the Dikti region. The cooperative is called the Minoan Land (ii) Cultivation is exclusively based on the principles of organic and contract farming and the goal is to produce high-quality leaves, free from residues of dangerous pesticides. (iii) raw material processing for high biological production value nutritional supplements and herbal cosmetics based on the modern green economy. The Aloe Vera leaves are processed to create juices, food, gel, and cosmetics; in addition to natural fertilizers production used as a by-product supporting the farming industries. (iv) research activities using aromatic/medicinal plants in the food industry, pharmaceutical, and nutraceutical industries are new to the region. Medical institutions and societies have approved the use of juice for specific medical conditions and diets.

## Chania Mountain Chestnut

Chestnut trees thrive in the western mountain areas of Crete, from 500 m to 800 m, and originally naturally grown; however, nowadays also planted and cultivated trees are found. Chania chestnut trees produce high-quality chestnuts. Chestnut cultivation/ exploitation is traditional in the area.

The White Mountains (2.453 m), the largest massif on the island, host a great variety of flora and fauna species, exclusively endemic (steno endemic), not to be found anywhere else –not even in other parts of Crete. The areas on the southern side of the mountain range are covered with cypress, oak, and pine trees, whereas humid areas favour the development of chestnuts, planes, and other aquatic plants. The area of the chestnut trees is the western part of the White Mountains. Elos (LAU2 Code: 74050201) is the centre of the VC. The VC is deployed in more than 20 little villages in the wider area, surrounded by forested and semi-forested land. The area is relatively close to coasts and tourist activities. It is an hour's drive far from Chania international airport and Souda bay international harbour.

### Reference mountain landscape statistics (A: Data from NUTS3 "EL434")

Reference mountain chain		White Mountains	
Reference mountain landscape		Kissamos	
Size of the area (km <sup>2</sup> )	334.2	Average per capita income (EUR)/year	14,700 <sup>A</sup>
Altimetry (m; min-max)	0-1000	Total Gross Value Added (GVA) (EUR million)/year	2,031.1 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	67.5	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years (%)	0.016%	Primary:	6.7% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	1444	Secondary:	9.7% <sup>A</sup>
		Tertiary:	83.7% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	54	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	19873	Primary:	14.8% <sup>A</sup>
Protected areas	Yes	Secondary:	11.5% <sup>A</sup>
		Tertiary:	73.8% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The local farmers, either through two cooperatives or individually sell their chestnuts to a local development company and to two private local firms, which process and promote the products to the Cretan and the Greek market. There is also limited interest from the Italian market. The chestnut tree performs various functions: productive, naturalistic, landscape, recreational. Chestnut trees in the area are characterized by a high-quality product, a good reputation product, territorial identity, cultural identity. The cultivation and the exploitation of the chestnut trees is a family and a community business for most farmers. Chestnut collection is an event that is celebrated. The perspectives of the product bring together farmers, local government, academic institutions, local catering and tourism, and small firms of standardization, packaging, promotion, and marketing.

### **Key local assets**

The use of the forested / semi forested areas as well as the grasslands of Western White Mountains contribute to the improvement of the landscape and enhance the scenery, helping the local agro-tourism throughout the year. The chestnut activities enforce the social bonds and have a positive impact on the conservation of the local population and their activities. There is traditional knowledge for the cultivation and preservation of the chestnut forests in the area. An annual three-day chestnut festival is organized by the cultural associations of the area, which brings many visitors to the area.

### **Challenges**

20 years ago, the chestnut trees of the area faced a difficult period of infections and reduced production, which made many traditional farmers move away from chestnut exploitation. Due to the economic crisis, more and more farmers reconsidered the chestnut and have started planting and cultivating new trees. Nonetheless, chestnut cultivation /exploitation remains partial activity for local farmers, which results a lack of professionalism and specialization. Infections and climate change increase the uncertainty, but, compared to competitive agricultural activities (e.g. olive oil trees), the chestnut has better perspectives in Greek and international markets.

### **Innovation**

Recently there is an increasing interest in the processing of chestnuts and the production of processed products and by-products, mainly for the international market. The interest is mainly motivated by the Region of Crete and the academic institutions.

## Pefkothimaromelo (Apiculture activity – Chania)

Apiculture in the Kissamos Mountains is a traditional activity. Pefkothimaromelo is a PDO, a natural blend of pine and thyme honey produced in Crete, through specific management of the hives. The blending creates a special category of honey, which combines the mild taste of pine honey with the intense aromatic profile of thyme. It is characterized by the presence of Cretan plants. Individual beekeepers in the mountains of Kissamos produce pefkothymatomelo and sell it to small companies in the area, which take care of standardization and resell the honey that complies with the constraints of PDO. Pefkothymaromelo is a high-quality product of good reputation and high value.

The White Mountains (2.453 m), the largest massif on the island, host a great variety of flora and fauna species, exclusively endemic (stenoendemic), not to be found anywhere else – not even in other parts of Crete. The areas on the southern side of the mountain range are covered with cypress, oak, and pine trees, whereas humid areas favour the development of chestnuts, planes, and other aquatic plants.

Reference mountain landscape statistics  
(A: Data from NUTS3 “EL434”)

Reference mountain chain	White Mountains		
Reference mountain landscape	Kissamos		
Size of the area (km <sup>2</sup> )	334.2	Average per capita income (EUR)/year	14,700 <sup>A</sup>
Altimetry (m; min-max)	0-1000	Total Gross Value Added (GVA) (EUR million)/year	2,031.1 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	67.5	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years (%)	0.016%	Primary:	6.7% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	1444	Secondary:	9.7% <sup>A</sup>
		Tertiary:	83.7% <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	52	Primary:	14.8% <sup>A</sup>
Number of agricultural holdings	19873	Secondary:	11.5% <sup>A</sup>
Protected areas	Yes	Tertiary:	73.8% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year



Local beekeepers produce pefkothymaromelo with the traditional ways of apiculture, involving their families. The product is processed by local units. The Region of Crete has additionally created a special regional labelling system for the quality systems of EU Geographical Indications (GIs). In this way, the production chain contributes substantially to the socio-ecological system of the region. In the area, the honey factories are certified by this regional label. Pefkothymaromelo is an excellent product of Crete, widely used in local gastronomy and a favourite buy for the visitors of the area.

### **Key local assets**

Beekeeping in the mountainous areas of Topolia/Kissamos, covered with forests, is a traditional activity that is closely linked to the Cretan way of life. The production of honey in mountains is usually a complementary activity of locals, while few beekeepers have been focused on more intensive forms of production. Obviously, locals have a strong historical, cultural, and social tie with beekeeping (Minoan Civilization 1600 BC). This tradition is a source of inspiration and creation in many other fields such as literature, poetry, jewellery production, etc. Due to the special climate of Crete (high number of sunshine days annually, not extremely low temperatures, etc.) these activities take place for a long time in the mountainous areas, significantly helping the local communities. During the autumn, the bee colonies are transferred to specific forest areas where bees are able to collect the pine trees' secretions in order to produce pine's honey. These seasonal activities can reduce the outflow of the local population to urban centres.

### **Challenges**

Due to climate change, Crete has been affected by severe weather conditions in the last 20 years. Temperature changes and heat waves affect the behaviour of bees and drastically reduce honey production. At the same time, the use of pesticides has increased in areas where intensive agricultural holdings are spread. Another challenge for Pefkothymaromelo is the adulteration with inferior types of honey, some of them imported at extremely low prices.

### **Innovation**

Although a product of traditional apiculture, pefkothymaromelo has introduced a new type of honey, branded, and protected by the PDO characterization. In the Kissamos area, there are a few small processing units, which, apart from pure pefkothymaromelo, make a variety of products based on honey.

## Pottery and Ceramics

Pottery and ceramic products in Margarites village are made of local soil and schist, a kind of soil of a very high granularity and concentration in argyle extracted from Psiloreitis Mountain. Hence, the activities are highly relevant to the ample reserve of clay found in the surroundings of Mountain Ida or Idi (Psiloreitis) 2,456 m. Margarites' pottery workshops have partnered with Psiloreitis UNESCO Global Geopark.

Psiloreitis Mountain is a UNESCO territorial site. Mountain Idi (Psiloreitis) is the highest in Crete reaching up to 2,456 m of altitude. The volcanic elements in the soil make the mountain unique for use in pottery. These traditions have been part of the region's culture for centuries. Moreover, the ancient myths surrounding the mountain bring tourists to the area. The mountain is a contributor to sustainable development since it is a centre of geo-tourism, where local art and culture are promoted, all of which strengthen the local economy.

Reference mountain landscape statistics  
(A: Data from NUTS3 "EL433")

Reference mountain chain		Psiloreitis mountain	
Reference mountain landscape		Magarites	
Size of the area (km <sup>2</sup> )	337.9	Average per capita income (EUR)/year	13,800 <sup>A</sup>
Altimetry (m; min-max)	0-1016	Total Gross Value Added (GVA) (EUR million)/year	1,046.1 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	58.8	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years (%)	0.016%	Primary:	6.5% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	6998	Secondary:	9.3% <sup>A</sup>
		Tertiary:	84.2% <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	54	Primary:	17.4% <sup>A</sup>
Number of agricultural holdings	13024	Secondary:	11.8% <sup>A</sup>
Protected areas	Yes	Tertiary:	70.8% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The Geopark is characterized by great geodiversity and biodiversity expanding the pottery tradition's impact into tourism, maintaining the cultural heritage, sustainable village development, and preserving the biodiversity. More than 23 potters exist in this village. The Margarites Village Pottery and Ceramics, the natural traditions and cultural knowledge are part of educational

programs in schools, and cultural institutions from Greece and abroad. In addition, thematic and cultural tourism is beginning to flourish in the region. Key activities include the collection of raw material, sifting out small stones, leaving the raw materials under the sun, and laying them in plastic bags. All these activities are applied by independent producers and no intermediaries are engaged in this process. In many interactive workshops, tourists and clients can participate in this process. The partnership with the Psiloreitis UNESCO Geopark has enhanced and has given notoriety to the pottery production traditions and their ties to the landscape. Additionally, further synergies have been developed with local enterprises of the UNESCO Global Geopark resulting in a local quality label, the “Psiloreitis Land” that characterizes products and services of the territory. A plan for sustainable development is under implementation by the Management Committee supporting initiatives that focus on geo-tourism, local art, and culture promotion, as well as strengthening the local economy.

### **Key local assets**

The natural landscape in the Municipality of Mylopotamos includes many raw materials that are connected to this VC. Margarites village has pottery and ceramic tradition dating back centuries. Pottery is one of the oldest arts developed in Crete from 3000 BC, where Minoan times and current pottery-production activities and techniques are similar to those traditionally applied. Psiloreitis Geopark, in co-operation with the Municipalities, the University of Crete, and other Bodies of local authorities and communities, all together have developed an appropriate infrastructure to provide to both its inhabitants and its guests a high-quality life in a non-urban environment. The Geopark also plays an active role in the promotion of natural and cultural heritage, as well as for sustainable local development through geo-tourism, cultural tourism, and thematic tourism. Potters from all around the world participate in the summer festivals of pottery in Margarites.

### **Challenges**

Over-tourism is a possible risk for Crete Island as a whole. Another risk is the less time-consuming forms of producing ceramic goods for local and tourist consumption. The governmental measures to restrict the spread of covid-19 have dramatically reduced the number of tourists that visit Margarites. Urbanization is a major challenge since the village has become a tourist attraction leading to the construction of new housing and buildings. Potters must search for a supplementary income since the income from the production of ceramic goods is very low during the winter months.

### **Innovation**

Techniques of pottery production are mostly traditional and date back to the Neolithic era. The innovations concern: (i) new products, while in the past, the focus was on products of practical utility, in the present more and more products (souvenirs) of decorative use are made. (ii) new processes of mixing innovative and traditional techniques (e.g., use of blue glaze & use of potter wheel, respectively). Since its recognition as a UNESCO Global Geopark, Psiloreitis Geopark has played an active role in the global efforts for the conservation and promotion of the environment, and of the natural and cultural heritage, through the geo-tourism and other touristic activities.

## Dittany

Dittany is an endemic plant found on ravines and cliffs in mountainous areas of Dikti. It has been cultivated for many years, and its cultivation now is centred in Embaros and the surrounding villages, south of Heraklion, where Mount Dikti is situated. Dittany is one of the priority species in the NATURA 2000 Network areas in Crete. In the past, the demand for plant material was covered only by the collection of wild populations, a fact which led to their rapid decrease and extinction from several areas of the island. Wild populations are given legal protection as vulnerable species.

The Dikti mountain range has a maximum altitude of 2,148. Large parts of the mountain area are forested with pines (*Pinus brutia*), Kermes oaks (*Quercus coccifera*), cypresses (*Cupressus sempervirens*), Holm Oaks (*Quercus ilex*), and Cretan Maples (*Acer sempervirens*). The topology of the mountain range is rich with plateaus, valleys, and secondary peaks. The fertile valleys and plateaus of Dikti are important in the local economy. Dittany adapts greatly and grows especially in the gorges, limestone soils, and cliffs of the mountain.

Reference mountain landscape statistics  
(A: Data from NUTS3 "EL431")

Reference mountain chain		Dikti Mountain	
Reference mountain landscape		Embaros	
Size of the area (km <sup>2</sup> )	221.5	Average per capita income (EUR)/year	13,800 <sup>A</sup>
Altimetry (m; min-max)	0-1147	Total Gross Value Added (GVA) (EUR million)/year	3,752.1 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	119.4	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years (%)	0.024%	Primary:	5.4% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	22	Secondary:	11.6% <sup>A</sup>
		Tertiary:	83% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	55	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	41162	Primary:	15.2% <sup>A</sup>
Protected areas	Yes	Secondary:	12.4% <sup>A</sup>
		Tertiary:	72.4% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Dittany has been growing wildly on Crete's mountains inside fissures and calcareous cliffs since ancient times. It is depicted in frescos and myths as a healing herb. It is part of the cultural heritage of Greece and Crete in particular. It is tied to communal "foraging- collecting" practices, essential oil extraction, and healing rituals. It depicts how the biodiversity of agricultural ecosystems can be brought in harmony with human praxis and be utilized for their benefit. Nowadays, the foraging practices are collectives in Crete, such as "Apo Koinou" that harvest herbs such as dittany and bring them to market. Currently, the use of Embaros dittany in liquors, cosmetics, insecticides, and pharmaceuticals shows how ancient cultural traditions are cycled into new industry forms of production, commerce, and ultimately, how a value chain is re-constituted in the 'postmodern' world. The Agricultural Coop of Emparos, Viannos Heraklion, is the major actor in this chain; however, it faces many challenges. The biodiversity of Cretan ecosystems is coupled with human activities years ago in the organized groups of collectors, such as Cretan cooperatives: "apo koinou," "to koukouli," "Agri Herb" and others.

### Key local assets

In the natural environment, the wild dittany is protected from extinction. Part of Crete's cultural heritage at ecosystem and healing practices levels is continued. Community of practice initiatives that existed in Crete's village community, subsistence praxis "collectors of herbs and medicines" that were exported around the world re-emerging in current practices within collectives and in larger industries where processing, packaging, and distilling occur. Today's products (cosmetics, nutraceuticals, etc.) are produced in Crete and also exported. Additionally, the communities of practice that existed, including collectors of wild dittany were organized groups of local people called "Erontades," "Atitanologi," "Botanologi" or "Mazoctades" who traveled across Crete to collect dittany and bring it to the market. These traditions and community practices depict how the biodiversity of agricultural ecosystems can be brought in harmony with human praxis and be utilized for their benefit.

### Challenges

Although the cultivation of dittany increased greatly until 1990, there are inconsistencies in cultivation and market value. Among the several reasons for the decrease of dittany cultivation, the most important is the lack of a properly organized marketing system for such a crop. In general, the dittany of Crete has been characterized by a threatened and vulnerable species. Efforts to cultivate dittany in other areas of the country were not successful. This shows that the climatic conditions of Embaros play an important role in the growth of dittany.

### Innovation

Innovation involves new products and processing. Namely, an ancient recipe of extracting dittany in olive oil is now patented by product and is being used as the basis in natural cosmetics. Both dittany and olive are cultivated in the Dicti mountain region. Currently, with e-commerce and the 'natural cosmetic' industry marketing improvements may increase value. Dittany's value chain is also valorised by tourism.

## Prickly Pear Cactus

Prickly pears are sustainable crops that can withstand drought and climate change in the Dicti landscape. Cactus pear grows on lands where no other crops are able to grow; this makes it particularly suitable for the Dicti landscape. Prickly pears can be used to restore degraded land and poor soils.

The Dicti mountain range has a maximum altitude of 2,148. Large parts of the mountain area are forested with pines (*Pinus brutia*), Kermes oaks (*Quercus coccifera*), cypresses (*Cupressus sempervirens*), Holm Oaks (*Quercus ilex*), and Cretan Maples (*Acer sempervirens*). The topology of the mountain range is rich with plateaus, valleys, and secondary peaks. The fertile valleys and plateaus of Dikti/Dicte are of significant importance in the local economy. Prickly pear adapts greatly and grows especially in the gorges, limestone soils, and cliffs of the mountain.

Reference mountain landscape statistics  
(A: Data from NUTS3 “EL431”)

Reference mountain chain		Dikti Mountain	
Reference mountain landscape		Viannos	
Size of the area (km <sup>2</sup> )	221.5	Average per capita income (EUR)/year	13,800 <sup>A</sup>
Altimetry (m; min-max)	0-2148	Total Gross Value Added (GVA) (EUR million)/year	3,752.1 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	119.4	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years (%)	0.024%	Primary:	5.4% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	22	Secondary:	11.6% <sup>A</sup>
		Tertiary:	83% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	55	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	41162	Primary:	15.2% <sup>A</sup>
Protected areas	Yes	Secondary:	12.4% <sup>A</sup>
		Tertiary:	72.4% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Cactus pear crops are gaining increasing interest due to the popularity of by products that are of high nutritional, cosmetic, and pharmaceutical value. In the Dicti region, prickly pears are grown in both agricultural systems and natural environments. They are crops that withstand drought and

climate change. Cooperation has been established for the production of numerous by products. The Minoan Land Cooperative processes the prickly pears to produce many by products including natural fertilizers. Prickly pear grows either wild or cultivated in the Dicti mountainous terrain of Crete. It is a new farming activity, and the production of by-products has not fully developed. The opportunities for production of this underused plant are many, including: food and beverage industry; livestock feed industry; pharmaceutical industry; cosmetic industry (e.g. creams, shampoos and lotions from cladodes); food supplements industry (e.g. fibre and flours from cladodes); natural additives industry (e.g. gums from cladodes and colorants from fruit); construction industry (e.g. binding compounds from mucilage/cladodes); agricultural inputs (e.g. soils, organic materials and improved drainage from the use of cactus pear plant products); tourism sector (e.g. artisan crafts made from lignified cladodes); textile industry (e.g. use for natural colorants). Such activities and by-products could have a more positive impact on regional SES and contribute to sustainability in that it is a plant that withstands draught and climate change.

### **Key local assets**

It grows naturally in the rocky soil of the Dicti area and other areas of Crete. The pads are a highly prized commodity in the dairy industry (that is highly developed in the region) and are used for animal feed. Culinary and nutraceutical uses have great potential, juice, jams, liquors. The eatable and cosmetic products are readily used and sold in the culinary tourist sector that is highly developed in the region. Prickly pear cultivation and wild plant harvesting can support and improve the livelihoods of rural populations by promoting and supporting agro-industries.

### **Challenges**

Prickly pear cactus farming and by products in the Dicti area is recent and not well developed. The economic high-yielding use of all the consumable parts of the plant in the by-product production of pharmaceutical and nutraceutical is not well developed. The exploitation of prickly pear by products may support the local economy and contribute to the preparation of added value products of specific origin. More specifically, its use in the production of food for livestock can decrease the cost and expenses of stockbreeders. However, there is no much demand by consumers for this product.

### **Innovation**

Innovative products produced from a plant that has been underused until recently. Products produced are of high nutritional and economic value. Natural fertilizers are also of high ecological value since the agricultural sector is well developed in Crete and natural fertilizers are increasingly applied. Innovative pharmaceutical prickly pear juices are considered of high importance in respect to the treatment of diabetes.

## Kozani Red saffron (PDO)

*Krokos Kozanis* is a PDO product with a strong territorial identity. It uniquely thrives, is cultivated, and produced by 40 small hamlets and villages that surround the farming town of Krokos, Western Macedonia Greece. Saffron is being cultivated in the area since the 17th century. Kozani is less favoured region of Greece with high unemployment.

Vourinos covers the southern Kozani regional unit. Highest elevation: 1866 m. Length ~30 km. Drained by the river Aliakmonas and its tributaries. Forests are found in the northern slopes and the lower areas. The higher elevations are covered with grasslands. The mountainous region with its mild climate produces the best quality organic saffron in the world.

Reference mountain landscape statistics  
(A: Data from NUTS3 "EL531")

Reference mountain chain		Vourinos Mountain	
Reference mountain landscape		Kozan	
Size of the area (km <sup>2</sup> )	1071	Average per capita income (EUR)/year	16,200 <sup>A</sup>
Altimetry (m; min-max)	350-680	Total Gross Value Added (GVA) (EUR million)/year	2,401.3 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	29.7	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.08%	Primary:	7.2% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	627	Secondary:	50.4% <sup>A</sup>
		Tertiary:	42.4% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	125	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	14168	Primary:	17.8% <sup>A</sup>
Protected areas	Yes	Secondary:	23.8% <sup>A</sup>
		Tertiary:	58.4% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

The actors and activities regarding *Krokos Kozani's* saffron are many. They include farming, harvesting, processing, and distribution. All these activities take place in the region. A local cooperative (Cooperative de Saffron) responsible for harvesting, assuring quality, drying, and sorting of Saffron exists. Crop yield, plantation span, packaging, and trading are all tied to a quality schemes PDO that the cooperative oversees.



## Key local assets

Saffron is a traditional product cultivated in the rural area of Kozani. The product has acquired the PDO label. Active farmers and cooperative stakeholders collaborate with universities to research the pharmaceutical uses of the product. Socioeconomically, a community (Cooperative de Saffron) has been established. Cultivation has existed in the region for centuries. Saffron is cultivated in forty villages in the region. Greece is the second largest saffron-producing country, with an average output of 4 tons of p.a. during the last four decades, most of which is directed in export markets. All the saffron production is in Kozani. The producer cooperative has the exclusive right to collect, process, package, and market all output. It has also adopted quality assurance systems and safety management systems assuring quality.

## Challenges

Challenges include the downturn of acreage and production of saffron during the last decade. Intense competition with multinational energy companies in respect to the land is another challenge. Trends in adulteration and vulnerability to climate conditions and climate change are other challenges.

## Innovation

Saffron is a well-established and famous spice. The innovations concern new innovative products, edible and cosmetics so that the added value of those products to be forwarded to the local producers.

## Florina Peppers

The peppers are cultivated in the small mountainous villages of Aghios Panteleimonas in the Florina region. The peppers are a PDO product of high economic and cultural impact. They are packaged and exported all over the world. Farmers and the processing industry have maintained both quality and traditions. The sustainability of the villages is of paramount importance. Cultural festivals around harvesting add both cultural and economic value.

The Vora mountain range is situated in two states: Greece and North Macedonia. It hosts many ski resorts. Its highest peak is Kaimakchalan (2,524m). The peaks of Mount Vora are a protected habitat of the Natura 2000 network (GR1240001). The vegetation includes wild cypresses, steppe grasslands, peatlands, beech forests, oak forests, chestnut forests, pine forests, etc. In the protected area of 400,000 acres, there are 14 caves of paleo-ecological interest. The soil and climatic conditions in this landscape contribute to the uniqueness of the Red Peppers of Florina.

Reference mountain landscape statistics  
(A: Data from NUTS3 "EL533")

Reference mountain chain		Voras mountain	
Reference mountain landscape		Aghios Panteleimonas	
Size of the area (km <sup>2</sup> )	827.6	Average per capita income (EUR)/year	17,100 <sup>A</sup>
Altimetry (m; min-max)	0-2528	Total Gross Value Added (GVA) (EUR million)/year	737.6 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	27.4	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years (%)	-0.054%	Primary:	10.6% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	252	Secondary:	46.2% <sup>A</sup>
		Tertiary:	43.2% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	130	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	5954	Primary:	15.9% <sup>A</sup>
Protected areas	Yes	Secondary:	17.7% <sup>A</sup>
		Tertiary:	66.4% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Actors and activities include farmers, processing and production businesses, packaging and distribution centres which are all in the wider area of Florina. This bolsters the local economy and

creates possibilities for gastro-tourism and sustainability of the villages and the region. The company Naomidis operates in the region of Agios Panteleimonas; it plays an important role in the production of Florina peppers. Moreover, the culinary uses of the peppers in Agios Panteleiomans expand to restaurants and eateries all over Greece and abroad. All of which are the most viable sectors of the pre-COVID economy in Greece. On the other hand, sustaining a steady production is a challenge.

### **Key local assets**

Culinary and farming traditions are maintained in the region. This has sustained the economy and the population of the villages. The Florina Peppers are cultivated and processed in the same region, PDO quality, and name safeguarding.

### **Challenges**

The challenges for the Florina peppers include maintaining high levels of cultivation, production, and authenticity. Competition for peppers that look like the Florina Pepper is also a challenge.

### **Innovation**

Florina peppers are more recently being used in the production of new products such as relish and spreads, while unique products are created (moustopiperies, piperomelo) and combined with products such as honey, tomatoes, eggplants etc. E-commerce is also developing.

## Legumes of Feneos

In the plateau of Feneos, at an altitude of 900m in the north-eastern Peloponnese, the technique of growing legumes is traditional: sowing, carving, tying plants, harvesting, cleaning, and packaging, and are done by hand, as decades ago. In the 19th century, the lake that covered the plateau was dried up, and the cultivation of legumes began. The soils and the microclimate of the area are considered ideal for growing legumes.

Feneos Plateau is surrounded by the mountains Ziria 2374m, Chelmos (Aroania) 2355m, Oligyrtos 1935m, and Saitas 1697m. Between 800 and 1,800 meters, the mountains are covered with pine forests. The higher areas consist of grasslands and barren rock. The area is relatively close to the coast and to tourist activities. It is a 2-hour driving from Patras and 2.5 hours from Athens.

### Reference mountain landscape statistics (A: Data from NUTS3 "EL652")

Reference mountain chain		HELMOS / KILLINI (ZIRIA)	
Reference mountain landscape		Korinthia	
Size of the area (km <sup>2</sup> )	226	Average per capita income (EUR)/year	13,600 <sup>A</sup>
Altimetry (m; min-max)	912-1024	Total Gross Value Added (GVA) (EUR million)/year	1,740.8 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	10.4	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years (%)	0.55%	Primary:	5.6% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	326	Secondary:	30.5% <sup>A</sup>
		Tertiary:	63.9% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	110	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	16219	Primary:	23.4% <sup>A</sup>
Protected areas	Yes	Secondary:	15.1% <sup>A</sup>
		Tertiary:	61.5% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

These conditions and the traditional knowledge are crucial for the quality of legumes. Feneou vanilla beans and Feneou fava beans have been identified as PGI products due to the ability of producers to discerning the exact time stage when the pods are ready for harvest, making the

products of high nutritional value. The products are marketed either by the farmers themselves or by small local firms, and sometimes by a local cooperative. The products have gained fame and recognition because of their high quality, high reputation, and territorial and cultural identity. The VC engages the local producers and their families, due to the traditional scheme of cultivation. There is one cooperative of all producers, responsible for the quality standards of cultivation. There are a few firms that undertake the packaging, handling, and marketing. Because of the traditional character of the product and the cultivation, the legumes are involved in local catering services and activities of local cultural collectives. The quality of the products has drawn the attention of the municipal administration and has brought the interest of the Greek market and gastronomy. Local legumes are also studied in research projects for their resilience to climatic change and their low carbon footprint.

### **Key local assets**

The picturesque landscape of the plateau provides ideal climatic conditions and soil composition. Legumes are cultivated in the area for centuries and traditional knowledge has been developed. The farmers are organized in a cooperative which strengthens the social interconnections and the sense of cooperation. The cooperation has undertaken actions towards standardization and marketing. The legumes are part of the cultural heritage and the gastronomy of the area. Nowadays the legume products are also sold in local festivals, and legumes are offered in religious festivities, in celebrations of joy, or in ceremonies of sorrow in the villages of Feneos. The increasing interest in the product in traditional Greek gastronomy has extended the VC beyond the limits of the area.

### **Challenges**

Legumes seem to be quite resilient to climate change compared to other cultivated plants. There is also evidence that the cultivation of legumes, especially with traditional techniques, has a very small energy footprint. Additionally, the increasing demand for legumes and the high nutritional value, make the prospects of the VC very promising. Although the domestic market is in short supply in legume products, the production and marketing of Feneos legumes face challenges: low crop yield, competition from imported products, lower cost / lower quality legume products, even adulteration threaten the cultivation in the area.

### **Innovation**

An endogenous innovation is the knowledge capital in cultivation organically and by hand. During the last decade there is an exogenous innovation in marketing: the local farmers, aided by the municipality administration, have been trying to create a brand name for the legume products of the area and they have achieved the geographic indication (PGI) for two products (beans and yellow split pea) and they keep trying for more.

## Apples of Pelium/Zagora (PGI)

Apple trees are cultivated in Zagora area (Pelium Mountain, Thessaly) from 300m to 1100m of altitudes. Apple cultivation is widespread in the area. The combination of the microclimatic conditions of the mountain and the sea breeze that prevails in the area is one of the main factors of the unique taste of the Zagora apples. For over a century, the local farmers have been organized in a very successful cooperative that promotes the apples to Greek and international market. The Zagora apples are PDO/PGI, of high quality, high reputation, territorial identity, and high exports.

The area of Zagora in Pelium Mountain is thickly forested, with both deciduous and perennial forests, mainly of beech, oak, maple, and chestnut trees, with olive, apple, pear trees, and plane tree groves surrounding places with water. Both slopes of Pelium end to the sea. The closest town is Volos (~50km, 1h15m), a picturesque place with an important harbour.

Reference mountain landscape statistics  
(A: Data from NUTS3 "EL613")

Reference mountain chain		Pelium Mountain	
Reference mountain landscape		Mylopotamosa	
Size of the area (km <sup>2</sup> )	150.3	Average per capita income (EUR)/year	12,600 <sup>A</sup>
Altimetry (m; min-max)	0-1624	Total Gross Value Added (GVA) (EUR million)/year	2,223.7 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	78.2	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years (%)	-0.025%	Primary:	5.3% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	2360	Secondary:	18.6% <sup>A</sup>
		Tertiary:	76.1% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	54	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	13354	Primary:	11.1% <sup>A</sup>
Protected areas	Yes	Secondary:	17.7% <sup>A</sup>
		Tertiary:	71.2% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The natural beauty of Pelium, a mountain with close proximity to the sea, along with the well-organized traditional apple cultivation creates a composite bundle of activities in the area, comprising of touristic, forest, and farming activities. The local apple producers and their families

retain their bonds and their resilience mainly because of their income from apples. The extrovert local cooperative has introduced innovations in production (organic cultivation and control of pests and diseases) and in marketing, which is vital for the sustainability of the area. The authorities at the local and regional levels and academic institutions contribute to the efforts. The resilience of the mountaineers has a positive impact on the preservation of the forest and the development of complementary activities (truffles/mushrooms, apiculture, logging, etc.)

### **Key local assets**

The area of Zagora is of outstanding natural beauty. The apple trees are cultivated with nature-friendly techniques in the high-slope fields. The farmers of the area are organized in a highly efficient cooperative, in which the role of women is very important. The cultivation /exploitation of apples is traditional and nowadays is the most important economic and social activity in the area, which incorporates cultural activities such as an annual apple festival.

### **Challenges**

The international market competition is intensive and sets the high-quality and the guaranteed quantity as prerequisites. Climate change makes the trees vulnerable and introduces a harvest precariousness. The economic uncertainty at the national and international levels could become a threat to the business model of the cooperative.

### **Innovation**

The cooperative has introduced innovative ways for the control of pests and diseases, based on academic research and participation in EU projects, along with a system of Integrated Production and Organic Production. Apart from apples, the products of the cooperative include the production of apple chips for diabetics, apple juices and organic apples, and condensed juice (petimezi).

## Epirus Feta cheese (PDO)

Epirus Feta is a successful PDO product. It is the best-known Greek cheese. It has a territorial identity due to the traditional production methods. Sheep and goat farming is considered to be one of the most dynamic sectors of the rural economy in Ammotopos, both in terms of employment and overall income. Ammotopos is a mountainous disadvantaged area of Greece. The goat and sheep farming sector have a strong link with the land and the environment, with a recognized role in biodiversity and landscape conservation and in measures to combat forest fires.

Epirus is a rugged and mountainous area in north-western Greece. The largest proportion of its land is considered mountainous, with three main mountains: Tzoumerka (Athmanika), Xerovouni, and Ori Valtou, all belonging to the Pindos Mountain Range. The Vikos-Aoos and Pindus National Parks are situated in the Ioannina Prefecture of the region. Both areas have a wide range of fauna and flora. The warm, alpine, and dry climate of Xerovouni is important for the production of feta since it permits the breeding of sheep and goats. The vegetation in the area is composed mainly of coniferous species.

### Reference mountain landscape statistics (A: Data from NUTS3 "EL541")

Reference mountain chain	Xerovouni/ PINDOS MOUNTAIN RANGE		
Reference mountain landscape	Ammotopos		
Size of the area (km <sup>2</sup> )	920.3	Average per capita income (EUR)/year	11,700 <sup>A</sup>
Altimetry (m; min-max)	0-2637	Total Gross Value Added (GVA) (EUR million)/year	1,229.5 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	46.3	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years (%)	-0.072%	Primary:	13.3% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	517	Secondary:	14.5% <sup>A</sup>
		Tertiary:	72.2% <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	171	Primary:	27.7% <sup>A</sup>
Number of agricultural holdings	17269	Secondary:	14% <sup>A</sup>
Protected areas	Yes	Tertiary:	58.3% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year



The actors in Ammotopos include small animal husbandry farmers where milk production is the main source of income. The company EPIRUS SA that operates in the region is one of the largest cheese-producing companies in Greece. The activities include quality assurance, milk collection and transportation, quality control, milk processing, the maturing process, and packaging. Milk processed and produced in state-of-the-art facilities and packaged in the Epirus region. Epirus Feta is marketed throughout the world. However, a decline in milk production has been reported in recent years. This is possibly linked to an aging population. Moreover, this type of farming has become a subsistence activity and the lack of policies regarding pricing schemes add to the economic sustainability concerns,

### **Key local assets**

Greece ranks seventh in global goat milk production (5, 2%). The Epirus region has the highest milk production, and it is known for its animal husbandry, and milk and milk products. These two sectors of animal production (sheep and goat) are of paramount importance for economic and social reasons because they help sustain the social fabric of local society in Ammotopos. This is the case since Epirus is the region in Greece with the third lowest GDP per capita and one of the poorest regions in the EU.

### **Challenges**

The Epirus Feta production system is semi-extensive, and it is based on the exploitation of local natural resources in Ammotopos. This is a challenge since this mountainous region is characterized by small size farms with an excessive fragmentation and degradation of communal pastures, and a high proportion of leased arable and pasture lands. The sustainability of this animal husbandry sector requires the implementation of policies that can improve the infrastructures in the mountain areas and take support measures for low input farming systems. The aging population of farmers, unfair competition, and the misleading of consumers by imitation products are also challenges.

### **Innovation**

Innovation relates to production and distribution. Innovation includes the production of low sodium and low-fat feta a change to meet today's consumer's needs. New market and packaging strategies and exporting pathways are also being developed.

## Potatoes

The area of Kato Nevrokopi is a mountainous basin consisting of several villages in the Prefecture of Drama, Eastern Macedonia. The basin is at 550m of altitude with a continental climate, characterized by low temperatures in winter (which is unusual for Greece). The microclimatic conditions of the area, the frequent changes in temperature as well as the slightly acidic and sandy soil, produce potatoes of special taste and flavour. The area is covered with snow for half a year, so there is no possibility for a double harvest, which is common in other areas, so the soil is not depleted. For more than 50 years the cultivation of potatoes prevails in the land use of Kato Nevrokopi. In the last decade, the potatoes are cultivated with integrated management, have gained a PGI, high reputation, and territorial identity.

The basin of Kato Nevrokopi is surrounded by the mountains Orvilos (2212m), Vrontou (1850m), and Falakro (2232m), covered with pines, firs, beeches, fruit nuts, and native hazelnuts. The area is relatively close to Drama (40min), and a 2h30 drive from Salonika.

Reference mountain landscape statistics  
(A: Data from NUTS3 "EL514")

Reference mountain chain	Mountains Orvilos, Vrontou and Falakro		
Reference mountain landscape	Kato Nevrokopi		
Size of the area (km <sup>2</sup> )	873.6	Average per capita income (EUR)/year	10,300 <sup>A</sup>
Altimetry (m; min-max)	410-1850	Total Gross Value Added (GVA) (EUR million)/year	867.6 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	28.2	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years (%)	-0.018%	Primary:	10.7% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	173	Secondary:	24.4% <sup>A</sup>
		Tertiary:	64.9% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	137	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	5480	Primary:	19% <sup>A</sup>
Protected areas	Yes	Secondary:	16.9% <sup>A</sup>
		Tertiary:	64.1% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The VC comprises the activities of local producers' groups and their families. Furthermore, there is a local cooperative for standardization, packaging, promotion, and marketing of a high reputation product. The production of potatoes is complementary with the other activities of the area that support the income of the community during the winter. In the area, there are ski centres at higher altitudes and picturesque villages with hosting activities. The local cooperative is trying to extend the VC and enhance the prospects of the product.

### **Key local assets**

The soil and the harsh climate have made potato cultivation the prevailing land use in Kato Nevrokopi, a basin surrounded by mountains. Potato cultivation is a single crop, supporting the local community and strengthening their bonds against the threats and precariousness.

### **Challenges**

The climate of the area is continental and that affects the cultivation and the quality of potatoes. Climate change has brought more rain and less snow, which has started affecting the cultivation of potatoes. Additionally, there is extensive adulteration in potatoes, which intensifies market competition. The income of the local population depends heavily on potato production and on the consumption of potatoes in Greece. These factors create vulnerabilities and precariousness for the local community of the area. During the last 5 years, more than 5% of potato producers have abandoned this traditional cultivation.

### **Innovation**

A local cooperative of 50 farmers (out of the 300) has introduced new marketing practices for the potatoes, starting with logos. The innovation lies in the fact that farmers have decided to take extroversion actions to face the competition, protect the product against adulteration, and to highlight the uniqueness of their product.

## Frumenty

In the Cretan delicatessen, Ksinochondros, the traditional frumenty, keeps an important role both in terms of taste and nutritional value. Ksinochondros combines the protein from milk and the unprocessed carbohydrates of wheat. In the past, wheat was grounded in a hand mill, an essential tool for every household. Sour milk is the product obtained by mixing sour milk and fat.

Psiloreitis (Ida) mountain is the highest mountain in Crete and among the highest in Greece. It is a UNESCO Global Geopark. Phrygana and macchia vegetation dominate the landscape up to 1,600 m of altitude. The typical maquis vegetation of Psiloreitis includes prinios, while scattered are piles of rough pine, cypresses and maples that form clusters up to a height of 1,800 m. At higher altitudes the vegetation consists of bushes mainly of thorny plants, such as heather. Around Anogeia the shrubby vegetation is prevalent. Relatively close to the town there exist the Skinakas observatory and the Idaion Andron Cave, the cave that Zeus was born, according to the Greek mythology.

Reference mountain landscape statistics  
(A: Data from NUTS3 "EL433")

Reference mountain chain		Psiloreitis mountain	
Reference mountain landscape		Anogeia	
Size of the area (km <sup>2</sup> )	102.1	Average per capita income (EUR)/year	13,800 <sup>A</sup>
Altimetry (m; min-max)	680-1250	Total Gross Value Added (GVA) (EUR million)/year	1,046.1 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	58.8	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years (%)	0.016%	Primary:	6.5% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	50	Secondary:	9.3% <sup>A</sup>
		Tertiary:	84.2% <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	39	Primary:	17.4% <sup>A</sup>
Number of agricultural holdings	13024	Secondary:	11.8% <sup>A</sup>
Protected areas	Yes	Tertiary:	70.8% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Anogeia is in the north-eastern slopes of Psiloreitis. The high reputation of ksinochondros in Crete makes the VC of high importance for the people in the Anogeia area. The product is strongly connected to the area due to its land morphology and the high quality of milk (sheep and goats). Traditionally, families' female members are involved in milk processing and wheat preparation, in order to produce ksinochondros. Still a widely home-made product in Crete, ksinochondros has become the output of a successful women's cooperative in Gergeri. The activity interconnects to the sheep and goat breeding, the local festivities, and gastronomy.

### **Key local assets**

The land use for animal breeding (sheep and goats) is predominant in an area with proximity to the forest of Rouvas. The SES of the area depends on a series of activities based on livestock, which interconnects with the production of ksinochondros an integral part of the diet of the mountaineers of Crete and a favorite ingredient of the Cretan cuisine.

### **Challenges**

Livestock in the Anogeia area focuses mainly on sheep and goat breeds for dairy production, although traditional sheep/goat breeding has become economically unprofitable and heavily dependent on European subsidies. Ksinochondros, a relatively high-priced product, can give a prospect to the greasers. It is a traditional product that is not well known among the new generation of consumers. The high quality of milk in combination with the high quality of local wheat creates a unique product that could be called a superfood.

### **Innovation**

The innovation refers to the characteristics of sour cream. A product with high shelf life, low production cost, high nutritional value, and produced from local resources. In addition to its close connection to local productions, it has its share of economic impact in the region. Lately, ksinochondros has made its place in Greek gastronomy as a traditional alternative to cereals in breakfast.

## 14. United Kingdom

### Mineral water

The 2nd most used brand in UK (2019) Highland Spring has bottled water at their plant since 1979, bottles 400 million litres p.a, from a Spring found in 1509. They export to 30 countries. They ban farming on the source ground which is grass/heather; the land is organic accredited; and they have EMAS award for sustainability in production/logistics.

Most of Perth and Kinross is a sparsely populated upland landscape of mountains, lochs, and forests, including major rivers (Tay, Earn). The south contains high quality agricultural land and major road and rail links, and the largest settlement of Perth. Like many other parts of the Highlands, this region is popular for tourism and outdoor recreation: it is a relatively accessible area for residents of Scotland's central belt.

Reference mountain landscape statistics  
(A: Data from NUTS3 "Perth & Kinross and Stirling")

Reference mountain chain		Eastern Scotland	
Reference mountain landscape		Perth and Kinross	
Size of the area (km <sup>2</sup> )	5,383.72	Average per capita income €/year	24,365.67 <sup>A</sup>
Altimetry (m; min-max)	8-1084	Total Gross Value Added (GVA) (€ million)/year	7,894.11 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	28.22	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	5.25%	Primary:	3.06% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	21,499 <sup>A</sup>	Secondary (including construction):	30.77% <sup>A</sup>
		Tertiary:	66.16% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	35.2	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	3,635	Primary:	4.46% <sup>A</sup>
Protected areas	Yes	Secondary:	16.96% <sup>A</sup>
		Tertiary:	78.57% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

There are mineral water brands that are produced in other mountain areas across the UK (for example Highland Spring also bottle Hydr8 from Blaen Twyni Brecon Beacon National Park), and most focus on the purity associated with being in mountains. Highland Spring and Tesco perthshire mineral waters (still and sparkling) depend on extracting spring/ground water from the protected catchment sources in the Ochil Hills and bottling them at their plants for distribution to supermarkets and restaurants and vending machines. These catchment sources do not allow farming (but are grazed by wild deer, rabbits; habitat for bees and birds). There Ochils site (at Blackford, Perthshire) employs around 280 staff. Highland Spring is a listed company (Highland Spring Group) that has sales revenues of £110m (2018 figures) from all brands/sites. The products are transported from their sites by lorry, but they are planning a new rail siding to their main bottling plant. We suspect HSG also produce the other brands (Tesco Perthshire, Aldi Strathrowan) but this is unverified. As noted above, HSG are accredited by Soil Association; Good Shopping Guide and Brand Reputation Through Compliance Global Standards; meet ISO14001 standard and approved supplier to Sustainable Restaurant Association. Mineral water will be involved in the wider food and drink tourism or overall Visit Scotland brand that focusses on the healthy and green landscapes for visitors.

### Key local assets

The VC is based on local assets - so Perthshire Mineral Water is dependent on the groundwater filtered through upland land cover (heather and grass); value is added by the processing done in the glens (valleys) of the EMA (just outside the Highland and Island region) using expertise built over time (plant there since 1979) and Highland Spring describe themselves as major local employers (but not sure if this is really 'traditional' knowledge). HS also contributes to the local assets e.g., supporting local healthy hydration and anti-littering schemes e.g., helping with social assets, reducing negative impacts on natural assets. HS also support national Corporate Social Responsibility activities (charitable and industry associations).

### Challenges

Water Stewardship is increasingly important -reducing pressure on fossil water use and carbon neutrality in processing; and plastic packaging/transport emissions. Climate change projections suggest less rainfall in the East of Scotland, which (over time) may reduce the amount of groundwater it is safe to abstract. HS Group recently closed its Speyside Glenlivet bottling plant to retrench to their Perthshire plant 'due to the increasingly competitive market' for glassed natural source water products. There have been pay cuts and redundancies due to the drop in demand due to Covid 19 in 2020.

### Innovation

Bottles are now 100% recycled and recyclable for Highland Spring, work with WRAP (UK government Plastic Pact) and SEDEX (NGO for ethical supply chains); and produce bottles onsite to reduce travel miles; and using Air Recovery system to reduce energy use. Won 'most ethical' natural source water brand for 11 years in the row. They market their brand on the basis of local/family connection to the hills whilst being connected to wider global industry debates. There



is less information for Tesco brand per se, although Tesco also has general 'Little Helps' Sustainability Plan that includes a focus on water stewardship.



## Hard white cows' milk cheese (PGI)

Caerphilly cheese was first made in Caerphilly in 1830. Caerphilly cheese is mass produced in English counties of Somerset and Wiltshire, however Castle Dairies began to make the cheese once again in Caerphilly using pre-war production techniques (i.e., by hand). Caerphilly town hosts an annual three-day festival to celebrate the cheese (The Big Cheese). This attracts 80,000 visitors annually. Variants of Caerphilly cheese (i.e., Gorwydd) have won gold awards at the International Cheese Awards. Important for territorial identity (festival, culture in Caerphilly itself).

Caerphilly is in the south of Wales and is a densely populated area of steep-sided valleys, situated close to Cardiff and Newport. Historically it is an industrial and mining region, and although the area has lost its traditional industries, the secondary sector remains a key part of the economy. The area is not a traditional tourist destination (in the way that other parts of Wales are) and has suffered from periods of high unemployment in the past.

Reference mountain landscape statistics  
(A: Data from NUTS3 "Gwent Valleys")

Reference mountain chain		West Wales	
Reference mountain landscape		Caerphilly	
Size of the area (km <sup>2</sup> )	277.39	Average per capita income €/year	17,614.6 <sup>A</sup>
Altimetry (m; min-max)	0-535	Total Gross Value Added (GVA) (€ million)/year	6,037.01 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	652.78	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	1.28%	Primary:	0.07% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	2,577 <sup>A</sup>	Secondary (including construction):	36% <sup>A</sup>
		Tertiary:	63.92% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	36.3	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	330	Primary:	0.90% <sup>A</sup>
Protected areas	Yes	Secondary:	29.09% <sup>A</sup>
		Tertiary:	70% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

Traditional Welsh artisanal Caerphilly cheese is protected with European Protected Geographical Indication (PGI) status. PGI status is for English and Welsh spellings.

### **Key local assets**

Relies on/ creates natural, social, and cultural local assets. In terms of natural assets Caerphilly cheese relies on land that is suitable for dairy cattle. There are also connections to natural scenery assets as a base for the tourism from the annual Big Cheese festival. In terms of social assets, the Big Cheese festival relies on strong community relations within Caerphilly. For cultural assets, there is a reliance on local and traditional knowledge for undertaking traditional (but innovative) processing of Caerphilly cheese. There is also a lot of cultural heritage tied into the brand, even from those made in England. There are links to the cultural history of Caerphilly as the cheese was originally made for local coal miners. PGI status also for Welsh spelling of the term linking again to cultural assets.

### **Challenges**

Relies partly on tourism to areas, so difficult during COVID. Lots of the cheese is now made in England so threat to territorial identity if the local Caerphilly producers cannot compete/ continue. Pre-war techniques of local Caerphilly producers more expensive than mass production methods.

### **Innovation**

Most non-local Caerphilly cheese is made using factory and machine-based methods. However, the innovative aspect of locally based Caerphilly cheese is the re-engagement with traditional pre-war cheesemaking processes in which the cheese is made by hand. It is also innovative in its return to making the cheese within the town and surrounding area of Caerphilly.

## Scottish Heather honey

Scottish Heather honey is award-winning and known as the Champagne of honeys due to the geographical location of the hives, terrain, and climate. Relies on the mountainous terrain and climate of the area for the quality of the honey. Several examples including [www.heatherhills.co.uk](http://www.heatherhills.co.uk). Winner of Scottish 'great taste gold award'. Heather Hills honey lies within Perth and Kinross LAU1.

Most of Perth and Kinross is a sparsely populated upland landscape of mountains, lochs, and forests, including major rivers (Tay, Earn). The south contains high quality agricultural land and major road and rail links, and the largest settlement of Perth. Like many other parts of the Highlands, this region is popular for tourism and outdoor recreation: it is a relatively accessible area for residents of Scotland's central belt.

Reference mountain landscape statistics  
(A: Data from NUTS3 "Perth & Kinross and Stirling")

Reference mountain chain		Eastern Scotland	
Reference mountain landscape		Perth and Kinross	
Size of the area (km <sup>2</sup> )	5,383.72	Average per capita income €/year	24,365.67 <sup>A</sup>
Altimetry (m; min-max)	8-1084	Total Gross Value Added (GVA) (€ million)/year	7,894.11 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	28.22	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	5.25%	Primary:	3.06% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	21,499 <sup>A</sup>	Secondary (including construction):	30.77% <sup>A</sup>
		Tertiary:	66.16% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	35.2	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	3,635	Primary:	4.46% <sup>A</sup>
Protected areas	Yes	Secondary:	16.96% <sup>A</sup>
		Tertiary:	78.57% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The UK has 50% of the heather moorland in the world. Heather honey is one product that is made using this special moorland. Heather is produced across Perth and Kinross. Heather honey is

used as both a preserve and within cosmetics such as hand cream and lip balm. Scottish heather Honey is award winning (Scottish great taste gold award) and has been deemed the champagne of preserves due to the terrain and climate of the heather. Heather Hills in Perthshire have 1300 hives with 52million honeybees. They also produce beeswax and cosmetics products using the heather honey. Their net assets for 2020 were roughly £271,000). Scottish heather honey was also the first product in the UK to be awarded the new British Standards Institution Kitemark for Food Assurance as Honey is one of the world's most copied and fraudulent food products. It also ensures that the honey is safe, sustainable, and socially responsible.

### **Key local assets**

Natural assets include maintaining the terrain and climate (and heather) to ensure the bees produce the same quality of honey and have the same ability to roam. Currently Heather Hills have 1300 hives (52 million honeybees) and their bees can roam for 5 miles radius from their hives. Cultural assets include the use of traditional knowledge for the means of production and processing to ensure goodness of the honey is maintained during harvesting, separating, and bottling. Social assets include 8 direct employees in the area including a 'Honey Sommelier', but there are wider assets and employment figures when not solely considering heather hills company.

### **Challenges**

Challenges from changing climate may impact on the quality of the product. Uses traditional methods of collection which are more costly/ less economically efficient.

### **Innovation**

Uses innovative traditional methods of processing the honey and makes sure hives have a lot of space to ensure a quality product. First food product to attain BCI kitemark in UK.

## Sporting game - organised hunting of deer.

Sporting game is an important income for many Scottish estates, and many have high reputations around the world. Deer stalking alone is a £100 million industry. All stalking is undertaken with a stalking guide to ensure overstocking does not occur.

Most of Perth and Kinross is a sparsely populated upland landscape of mountains, lochs and forests, including major rivers (Tay, Earn). The south contains high quality agricultural land and major road and rail links, and the largest settlement of Perth. Like many other parts of the Highlands, this region is popular for tourism and outdoor recreation: it is a relatively accessible area for residents of Scotland's central belt.

Reference mountain landscape statistics  
(A: Data from NUTS3 "Perth & Kinross and Stirling")

Reference mountain chain	Eastern Scotland		
Reference mountain landscape	Perth and Kinross		
Size of the area (km <sup>2</sup> )	5,383.72	Average per capita income €/year	24,365.67 <sup>A</sup>
Altimetry (m; min-max)	8-1084	Total Gross Value Added (GVA) (€ million)/year	7,894.11 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	28.22	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	5.25%	Primary:	3.06% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	21,499 <sup>A</sup>	Secondary (including construction):	30.77% <sup>A</sup>
		Tertiary:	66.16% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	35.2	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	3,635	Primary:	4.46% <sup>A</sup>
Protected areas	Yes	Secondary:	16.96% <sup>A</sup>
		Tertiary:	78.57% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The land is wild but is managed in terms of burning gorse/heather and culling mountain hares as they interfere with the game hunting. Venison meat is of high quality and reputation within and beyond Scotland. For instance, the industry has its own safeguard (Scottish Quality Wild Venisons) to ensure high standards of meat procurement and handling. Within Perth and Kinross

Atholl estate ([www.atholl-estates.co.uk](http://www.atholl-estates.co.uk)) undertake 3-yearly cycle of surveys aiming for measurable improvement in habitat quality. They use drones/ thermal imaging/ camera traps to count deer numbers. Deer hunting (stalking) are popular tourist activities within the Highlands and Islands of Scotland. The land in which the stalking takes place is wild land, however it is managed in terms of the culling of mountain hares and burning of heather/ gorse to improve hunting potential in the area. Stalking season for stags runs between July and October, but roe and fallow bucks can be stalked almost year-round. Within Perth and Kinross (LAU1) there are a range of estates and gamekeepers offering opportunities for stalking including Blair Atholl Estates and Glen Lyon. Venison meat is then sold across Perth and Kinross and the wider Highlands and islands NUT3 region in local butchers and online hubs e.g., [www.highlandgame.com](http://www.highlandgame.com).

### **Key local assets**

Natural assets: relies on wild (but managed) land to ensure there is a hospitable environment for the deer and grouse. Also, this land contributes to nice and attractive scenery for stalking visitors. Social assets: relies on good relations with the local communities living and working near and in these stalking estates (i.e., for tourist accommodation), with hikers and wildlife conservation organisations. In terms of cultural assets, sporting game relies on traditional and local knowledge for stalking practices, processes, and habitat management. The processes for deer stalking have remained largely the same for centuries, including the use of ponies to remove deer trophies from the mountain.

### **Challenges**

Potential for or existing conflicts with other agricultural activities (i.e., sheep) and hillwalking. Relies heavily on international tourists which have been absent during COVID. Potential conflicts over land management practices and culling of mountain hares and burning of gorse. Conflicts between organisations promoting the culling of deer and those visiting for stalking purposes (i.e., returning empty-handed). For grouse shooting there are also actual/ potential conflicts with population numbers of other birds (i.e., raptors) being scared off/ accidentally killed. Potential difficulties in sale of venison eat abroad due to Brexit. In addition to the risk of landscape overgrazing.

### **Innovation**

Methods of counting deer numbers -i.e. using drones, camera traps, GPS collars, thermal imaging.

## Fly fishing of wild salmon.

Scottish wild salmon has a PDO. This is specifically for Atlantic salmon caught up to 1.5km from the coast of Scotland using specific methods. Fly fishing for salmon is popular on the Rivers Spey and Findhorn and relies on good condition of the river right from its upland starting point. Salmon fishing in Badenoch and Strathspey is important as a product derived from the natural asset (river/water) and for territorial identity (i.e., PDO and tourist venture). It relies on good relationships across the chain i.e., local community, estate owners, angler clubs, hospitality. Salmon that are caught are returned to the river (i.e., not kept and eaten to maintain fish stocks).

Badenoch and Strathspey is a highly scenic area which is valued for outdoor recreation and wildlife, and contains large forests, the upper River Spey and parts of the Cairngorm mountains. The population is concentrated in Aviemore and other small settlements: most of the region is remote and is regularly affected by snow in the winter. The A9 road and railway line form key transport links to central Scotland and Inverness.

Reference mountain landscape statistics  
(A: Data from NUTS3 "Inverness & Nairn and Moray, Badenoch & Strathspey")

Reference mountain chain	Highlands and Islands		
Reference mountain landscape	Badenoch and Strathspey		
Size of the area (km <sup>2</sup> )	2,369.81	Average per capita income €/year	22,078.39 <sup>A</sup>
Altimetry (m; min-max)	148-1281	Total Gross Value Added (GVA) (€ million)/year	6,416.79 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	5.90	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	6.52%	Primary:	1.37% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	15,574 <sup>A</sup>	Secondary (including construction):	35% <sup>A</sup>
		Tertiary:	63.62% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	141	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	10,230	Primary:	6.81% <sup>A</sup>
Protected areas	Yes	Secondary:	20.45% <sup>A</sup>
		Tertiary:	72.72% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Fly fishing of wild salmon is an important value chain in the Scottish Highlands. Generally, the fish are caught and then returned to the river (relatively) unharmed to preserve fish stocks. Scottish Wild Salmon has Protected designation of origin (PDO). Much of Scotland's salmon fishing is conducted on the River Spey which is Scotland's second longest river. Salmon fly fishing season runs from February to September. Fly fishing in the area is through permits which can cost between £30- £500 each. Positives for area include economic value to area and involve range of actors.

### **Key local assets**

Natural - importance of maintaining scenery for nice surroundings for fly fishing, maintaining quality of river catchment so fish stocks remain high. Social - good relations with communities and landowners for welcoming (and allowing access) tourists and sharing rivers with locals (and vice versa). Cultural - relies of traditional fly-fishing methods and good local knowledge of good areas for salmon catches.

### **Challenges**

Activities on the upper levels of the rivers/ lochs can impact on the populations of salmon lower down (and then have a knock-on economic impact). This could include changes to the river course because of flooding/potential flooding. If numbers of permits were to increase this may reduce the likelihoods of successful catches and again have a knock-on economic impact. Less tourist numbers visiting due to COVID-19/ Brexit.

### **Innovation**

Traditional because fly fishing has occurred in these areas for many years.



## Government investment allows restoration for biodiversity and investment in C sequestration.

Scotland has 1.7mill ha of peatland storing 1.6 billion tonnes of C, but 80% in poor condition. To reach net-zero by 2045 need to restore potential emission sources. Funding for landscape scale, multi-year projects generate skilled jobs in rural areas. Also, biodiversity and flood prevention outcomes. UK peatland code (under IUCN) provides independent verification for growing natural capital investment market. Peatland common in upland/mountain areas in the UK, associated with extensive grazing and sporting (hunting game).

Ross and Cromarty is a region in the far north of Scotland. It is very remote from the largest cities in Scotland, but it does contain parts of the commuter belt to the city of Inverness and some small towns. Most people live in the lowlands and eastern coastal areas of the region. The uplands and west coast are very sparsely populated with spectacular scenery of mountains, moors, lochs and a rugged coastline.

Reference mountain landscape statistics  
(A: Data from NUTS3 "Caithness & Sutherland and Ross & Cromarty")

Reference mountain chain		Highlands and Islands	
Reference mountain landscape		Ross and Cromarty	
Size of the area (km <sup>2</sup> )	5,202.05	Average per capita income €/year	22,243.38 <sup>A</sup>
Altimetry (m; min-max)	-3-1094	Total Gross Value Added (GVA) (€ million)/year	2,345.4 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	10.68	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	2.43%	Primary:	4.09% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	8,124 <sup>A</sup>	Secondary (including construction):	22.6% <sup>A</sup>
		Tertiary:	73.3% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	197	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	10,230	Primary:	8.16% <sup>A</sup>
Protected areas	Yes	Secondary:	16.32% <sup>A</sup>
		Tertiary:	75.51% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Example of (re) valorising habitat/land cover previously considered of no economic value. 5 projects in development and one validated project, (Lochrosque Estate, working with 250ha over 100 years, to restore 27 ha eroding bog and 223 drained bogs, with predicted emission reduction of 87,000tCO<sub>2</sub>e). Currently the EU ETS averages around 23euro/tCO<sub>2</sub>e. Most of the Scottish projects are being developed by Angus Davidson Ltd (consultancy based in Inverness) and all projects from this source are being validated by Organic Farmers & Growers C.I.C., which also includes Scottish Organic Producers Association (co-operative) so new actors enrolled in this process. These actors are not within the LAU1 or RR9. Other actors are 6 landowners involved, NatureScot (Government nature/environmental agency) and consultants to advise on actions and do the measures (blocking gullies etc). Educational training and resources now being provided to upscale this approach across Scotland. VC very dependent on local assets but the national Peatland Action Programme is being rolled out to the whole of Scotland (including all RR9) and UK Peatland Code covers all UK. About reaching UK/Scottish climate and biodiversity targets.

### Key local assets

Investment would not be possible without natural asset (raised and blanket peat bogs and associated hydro-ecology); and lack of competing land uses (e.g. not allowed to plant trees or plough the land). Peat used to be associated with local fuel source but no longer occurs in uplands due to environmental/climate concerns. But also land tenure important most projects on large estates where owners willing to invest in restoration as long-term natural capital investment due to having other income sources (often estates are tax havens) so not managed for food production nor does it have to sustain a family.

### Challenges

Since 2012 Peatland ACTION programme only restored 25,000 ha and only 4 verified projects covering ~100,000 Pending Issuance Units on UK Land Carbon Registry (20 projects in development) illustrating difficulties in recruiting land managers and achieving restoration. Increasing concern that peatland become sources do not sink for GHGs.

### Innovation

Restoring peatlands that were considered low value land is relatively new. Requires local knowledge to get land manager uptake and practical familiarity with peat bogs to do the work; but the funding scheme, UK peatland code, and actors involved in validation tend to be exogenous (but within Scotland).

## Rewilding (Nature Restoration)

There are two estates in this LAU1 where traditional estates (mix of farmed and forested land) have been bought and land use changed to restore more natural habitat and restore ecological functions as well as providing educational programmes. Dundreggan (10,000 acres) wants to restore Caledonian (native pinewood)

Inverness and Nairn is a region in northern Scotland. The vast majority of its population live in the growing city of Inverness and its surroundings, which is a major hub for transport links, economic activity and services. This area includes part of the Moray Firth coastline and some lowland agricultural areas, but large areas of sparsely populated mountains, including the well-known tourist region of Loch Ness.

Reference mountain landscape statistics  
(A: Data from NUTS3 "Inverness & Nairn and Moray, Badenoch & Strathspey")

Reference mountain chain	Highlands and Islands		
Reference mountain landscape	Inverness and Nairn		
Size of the area (km <sup>2</sup> )	3,331.51	Average per capita income €/year	22,078.39 <sup>A</sup>
Altimetry (m; min-max)	8-1179	Total Gross Value Added (GVA) (€ million)/year	6,416.79 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	28.50	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	1.51%	Primary:	1.37% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	15,574 <sup>A</sup>	Secondary (including construction):	35% <sup>A</sup>
		Tertiary:	63.62% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	167	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	10,230	Primary:	6.81% <sup>A</sup>
Protected areas	Yes	Secondary:	20.45% <sup>A</sup>
		Tertiary:	72.72% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Forest through tree planting and removing grazing pressure. A rewilding Centre will open in 2022; and the estate is part of the wider 'East West Wild' initiative (linking this LAU1 to Skye and Lochaber). Bunloit (1262 acres) is planting trees, using extensive grazing and natural

regeneration to increase biodiversity and reach net Zero including building eco-homes. There is also the 'Lifescape' project (100 acres) that is in the 'Highlands' near Loch Ness (location restricted to protect the rare species) which is in the area. Key activities: tree planting, habitat restoration, monitoring flora and fauna; key actors - land owners (NGOs or wealthy philanthropists); consultants; students/academics and volunteers; inputs include seedlings for tree planting, materials for gully blocking, path and fencing, scientific monitoring equipment, lots of marketing (websites, social media). ; outputs - increased habitat quality, increased flora and fauna populations, increased skills and understanding, piloting new natural capital monitoring tools (that may lead to a quality scheme). VC dependent on SES system and claims to improve social as well as ecological aspects of the system, particularly where education, skills and housing are included. Aim to show that investing in natural capital can generate more 'value' than traditional value chains in these landscapes.

### Key local assets

As described above, these estates are typical of upland Scottish estates - mix of forestry, semi-natural habitats, and rough grazing - some designated areas under EU Natura 2000 or UK designation, sheep and cattle grazing and potentially hunting deer - but have been repurposed to reduce production of timber and meat (there is some timber/lamb production) and increase the production of public goods (regulating and cultural ecosystem services). The future success of the rewilding will depend on local as well as national support and acceptance of this switch. It is unclear from desktop research how much cultural (local) knowledge is involved, with many partners in the rewilding effort coming from elsewhere in the UK or even internationally.

### Challenges

Rewilding is very contentious in Scotland (for example the Nature Agency does not use the term). It's proponents' critique traditional approaches to upland land management as damaging to Nature and increases in native (or reintroduced) species e.g., boar, golden eagles, beavers can create damage to livestock or pasture; whilst trees decrease grazing available to wild game (deer, grouse). Much rewilding is associated with public funding or public donations (NGOs) or wealthy philanthropists; and investments are often tied to predicted returns from carbon markets or wildlife tourism, which are relatively high-risk long-term investments.

### Innovation

Whilst rewilding is not 'new' (Alladale Estate in Sutherland started in 2003), it has become much more prominent with the increased focus on resolving the climate and biodiversity crises; and there have been several recent investments in land to 'rewild' them. The innovation tends to start with the change in ownership with an 'external' owner taking over the land, and often involves external expert consultants to undertake the monitoring and advise on ecological measures. Some of the measures require contractors (e.g., large machinery to plant trees) which are not available locally. However, these estates prioritise involving local volunteers and training local people in conservation jobs.

## Forestry - on edges

Scottish Government aims to have 21% of Scotland covered by forests by 2032. Forestry used for multiple purposes - i.e., timber, recreation, but also increasingly biomass energy. Argyll and Bute has a high reputation for forestry, containing most of the forestry sites across Scotland. Also, it is an important value chain with multiple connected actors and for multiple purposes (i.e., timber vs recreation). Important linking to other land uses i.e. potential conflicts with land owners/farmers.

The mainland of Argyll and Bute is a region in western Scotland, which includes relatively remote peninsulas (Cowal and Kintyre) and some islands. Due to the long and indented coastline and mountainous landscape, road access is relatively poor (involving a long journey to the north) and ferries provide important connections between islands and the mainland. The area has suffered depopulation in the last ten years: there are several small towns distributed across the region. The area has extensive forests and moors, with higher mountains and tourist destinations in the north.

### Reference mountain landscape statistics

(A: Data from NUTS3 "Lochaber, Skye & Lochalsh, Arran & Cumbrae and Argyll & Bute")

Reference mountain chain	Highlands and Islands		
Reference mountain landscape	Argyll and Bute Mainland		
Size of the area (km <sup>2</sup> )	4,493.66	Average per capita income €/year	21,200.32 <sup>A</sup>
Altimetry (m; min-max)	-3-1126	Total Gross Value Added (GVA) (€ million)/year	2,790.74 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	11.76	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-4.84%	Primary:	5.42% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	29,913 <sup>A</sup>	Secondary (including construction):	22.07% <sup>A</sup>
		Tertiary:	72.49% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	54.6	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	1,944	Primary:	6.25% <sup>A</sup>
		Secondary:	16.66% <sup>A</sup>
Protected areas	Yes	Tertiary:	77.08% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Forestry and the timber industry are of huge importance to the Scottish economy, with processing £285 million of Gross value added to the economy each year. Furthermore, forestry provides more than 30,000 jobs (including wood production, forest management, haulage, and processing). Much of the processing takes place in non-mountain areas, but the wood is often grown on the shoulders of mountains, such as in Argyll and Bute LAU1 (generating £58 million per annum GVA and roughly 1300 direct jobs and 2255 indirect jobs). This area contains semi-natural woodland. Forestry has dual purpose here - for production and for recreation. Argyll Forest Park is Britain's oldest forest and offers opportunities for mountain biking, hiking, wildlife watching. Much of the commercial forestry here is however processed out with the LAU1. 49 of the LAU1's 122 SSSIs are designated because of their woodland.

### **Key local assets**

Natural assets - the forested areas are of key importance, for production, setting and attractive scenery. Social assets - forestry activities require good and productive relationships with forestry managers/ workers, landowners, tourists, local communities. Cultural assets - there are strong links, particularly in Argyll and Bute between the heritage and ancient quality of the forestry and the identity for those in the region. There is also reliance on traditional knowledge for processing and understanding the best growing conditions for various types of forestry.

### **Challenges**

Risks to the forestry areas due to climate change, carbon sequestration levels. Risks from Brexit/ COVID-19 for increased/ decreased visitor numbers of forestry recreation sites to reduce economic value of areas from decreased numbers but also potential for erosion/ damage from increased numbers.

### **Innovation**

Use of forestry for timber and recreation is traditional but use of biomass heating and energy is more innovative. This is also increased interest in forestry for social prescribing which can include forest walking and recreation activities within the forest areas.

## Scotch beef (PGI)

Successful registration of the PGI scheme of scotch beef. Important for territorial identity of the Highlands and Islands region because of the PGI status. Important means of conservation of the area (i.e., through environmental schemes and grazing of the common grazing). The creation of a local abattoir is also of interest to shorten the supply chains and the impacts on the environment.

Skye and Lochalsh features the large island of Skye (joined to the mainland via bridge) and a remote part of the western coast of Scotland. The area is relatively isolated with long journeys required to reach larger cities in Scotland but includes spectacular mountains and coastal scenery and is therefore popular with tourists and visitors. As with many areas of western Scotland, the area is sparsely populated with some larger settlements near the coast. The region has road, rail, and ferry links, but these are prone to weather disruption and the networks pass through upland areas. Scotch beef is a PGI marked product i.e., it will be awarded PGI status if it is produced in Scotland from cattle reared, slaughtered, and dressed in Scotland.

Reference mountain landscape statistics  
(A: Data from NUTS3 “Lochaber, Skye & Lochalsh, Arran & Cumbrae and Argyll & Bute”)

Reference mountain chain	Highlands and Islands		
Reference mountain landscape	Skye and Lochalsh		
Size of the area (km <sup>2</sup> )	2,742	Average per capita income €/year	21,200.32 <sup>A</sup>
Altimetry (m; min-max)	-4-1184	Total Gross Value Added (GVA) (€ million)/year	2,790.74 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	4.83	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	2.84%	Primary:	5.42% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	29,913 <sup>A</sup>	Secondary (including construction):	22.07% <sup>A</sup>
		Tertiary:	72.49% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	346	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	10,230	Primary:	6.25% <sup>A</sup>
Protected areas	Yes	Secondary:	16.66% <sup>A</sup>
		Tertiary:	77.08% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Scotch beef industry is worth £675 million, and Scotland has more than 30% of the UK beef herd. Although beef is often processed in lowland areas, the cattle are reared in upland areas, including within Skye and Lochalsh (LAU1). Scotch beef is world renowned for its quality and high welfare standards. For example, Isle of Skye Free Range rear Shetland beef on the hills of Skye. Waternish farm rear a herd of Aberdeen Angus and they graze the rough grazing and improve the land through grazing and their dung for improving the pasture's nutrient cycle. Many of these farmers also act as conservators of the land, improving it for wildlife and biodiversity. There is an ongoing project attempting to develop a local micro-abattoir on Skye to reduce food miles and environmental impact and create local jobs.

### **Key local assets**

**Natural assets:** The importance of maintaining the landscape and land use so it suitable for scotch beef, and simultaneously these cattle and improve the natural asset. **Social assets** - strong relationships throughout the value chain to ensure that the PGI status is maintained and to create the local abattoir. Also, good relations amongst the cattle farmers who often rear cattle on upland common grazing (shared land for farming). Social assets have also been strengthened through the recent scotch beef monitor farm project within Skye and Lochalsh. **Cultural assets** are the reliance and continuation of traditional knowledge and practices for ensuring good quality scotch beef production.

### **Challenges**

Scotch beef requires full rearing and production in Scotland, which may become more difficult if costs become too high or more competitive elsewhere. Scotch beef is highly reputable across the world however this may change in the future, especially if there is an outbreak of disease i.e. Bovine TB/ foot and mouth etc. Impacts from climate change may change the land characteristics of the area, meaning that the scotch beef is unable to be reared in areas such as Skye and Lochalsh. Also, there is potential for over grazing of areas to meet or increase demand/ profits of scotch beef. Impacts of/ on scotch beef may change with new government policies.

### **Innovation**

Scotch beef production is a very traditional activity within Scotland's upland regions.



## Welsh Lamb (PGI)

Welsh Lamb has PGI status and is world-renowned for being of high quality. The PGI status assures purchasers where the lamb has come from and the specific processes which have been used to rear it. Abattoir's processing Welsh lamb must to use specific processes. Lambs are tagged at birth and so can be associated with a specific farm. Uses marginal mountainous land for production of high-quality food. 80% of Welsh land mass is suited to livestock farming. In Powys as with the rest of Wales they use traditional non-intensive processes to rear their lamb.

Powys is a large and mostly rural region of Wales, which contains parts of the River Severn, Wye and Usk valleys and the Brecon Beacons in the south, a very popular hiking area. The area contains no large urban areas, although the area is relatively accessible to major population centres in other parts of Wales and England.

### Reference mountain landscape statistics (A: Data from NUTS3 "Powys")

Reference mountain chain		East Wales	
Reference mountain landscape		Powys	
Size of the area (km <sup>2</sup> )	5,195.32	Average per capita income €/year	20,674.83 <sup>A</sup>
Altimetry (m; min-max)	0-886	Total Gross Value Added (GVA) (€ million)/year	2,548.86 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	25.49	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.47%	Primary:	5.32% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	37,960 <sup>A</sup>	Secondary (including construction):	19.37% <sup>A</sup>
		Tertiary:	75.29% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	76.1	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	4,766	Primary:	13.55% <sup>A</sup>
Protected areas	Yes	Secondary:	18.64% <sup>A</sup>
		Tertiary:	67.79% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

Welsh Lamb is designated with a PGI mark (since 2003), and it is often considered as the best lamb in the world. It is reared using traditional non-intensive processes on (upland) land which is not viable to be used for crop growing or similar activities. Within the Powys area lamb farmers, butchers, abattoir workers and local shops are involved in the VC. Also, local auction houses are involved. The lamb is sold in butchers, supermarkets and in meat boxes online. Welsh lamb, beef and pork industry combined has a value of over £1 billion a year to the Welsh economy and it consumes only 5% of the red meat it produces so exports are very important. Lamb and beef exports account for one third of all sales and are worth more than £224 million (2013). The industry supports over 50,000 jobs. International sales of PGI marked Welsh lamb grew to £154.7 million in 2013.

### **Key local assets**

Natural assets - Relies on the land to be maintained in same way (i.e., not used for another non-farming purpose) to ensure quality Welsh lamb can be reared here. Social assets - good relationships within and across the VC. Cultural - relies of traditional knowledge to maintain same lamb rearing processes.

### **Challenges**

Threats of costs of lamb production/ price obtained at market through Brexit/ COVID lockdown. Welsh lamb very dependent on land so challenges are predicted if land use/ rainfall etc change because of climate change. Local abattoir has closed in early 2021, impacting on the VC as now some lamb farmers must travel further. There has been a 99% decrease in local abattoirs between 1930 and 2017 according to the Sustainable Food Trust.

### **Innovation**

Traditional value chain as have been using these processes and farming lamb in this area for many years.

## Artisanal/bespoke timber products (such as furniture, toys, jewellery)

High quality and hand-crafted timber products made using traditional (i.e., often by hand) means of production' Use of local (i.e., within the same LAU1) reclaimed timber to ensure short supply chains and a continued link to the area. Often there are clear attempts for sustainable practices given they use reclaimed timber (i.e., which may otherwise have been wasted) and work and sell locally.

Ross and Cromarty are regions in the far north of Scotland. It is very remote from the largest cities in Scotland, but it does contain parts of the commuter belt to the city of Inverness and some small towns. Most people live in the lowlands and eastern coastal areas of the region. The uplands and west coast are very sparsely populated with spectacular scenery of mountains, moors, lochs, and a rugged coastline.

Reference mountain landscape statistics  
(A: Data from NUTS3 "Caithness & Sutherland and Ross & Cromarty")

Reference mountain chain	Highlands and Islands		
Reference mountain landscape	Ross and Cromarty		
Size of the area (km <sup>2</sup> )	5,202.05	Average per capita income €/year	22,243.38 <sup>A</sup>
Altimetry (m; min-max)	-3-1094	Total Gross Value Added (GVA) (€ million)/year	2,345.4 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	10.68	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	2.43%	Primary:	4.09% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	8,124 <sup>A</sup>	Secondary (including construction):	22.6% <sup>A</sup>
		Tertiary:	73.3% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	197	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	10,230	Primary:	8.16% <sup>A</sup>
Protected areas	Yes	Secondary:	16.32% <sup>A</sup>
		Tertiary:	75.51% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Although most forestry in Scotland is maintained/ managed for large-scale commercial or recreation use, there is a growing interest in artisanal/ bespoke wood products (using local wood)

from local diversified farms and retail. Products include furniture, kitchen equipment, toys, and jewellery. Within Ross and Cromarty there are several bespoke wood producers. Craobh handcrafted wood specialise in using local reclaimed timber. These family-run businesses received LEADER funding to help them expand. Meanwhile, Farmhouse furniture use local timber to create handmade wooden furniture and mantelpieces. There are additional ventures such as Black Isle wood turning which offer training on how to turn wood i.e., for cups and bowls etc. (this also uses local Ross and Cromarty timber). This VC requires good relations amongst the craftspeople, timber producers and land managers.

### **Key local assets**

Natural assets - reliant on timber which grows on shoulders of upland mountain areas. Also, steady climate and maintained land use. Social assets: good relations amongst those in the VC including timber producer, land managers, bespoke carpenters, and tourism businesses. Cultural assets: traditional knowledge for traditional handcrafted timber production methods, and links to the cultural heritage of the area (i.e., knowledge of local trees and how best they can be used).

### **Challenges**

Less wood may be available for artisanal use given Scottish Government's desire to have more of the land covered in forestry (and reduce climate change impacts) in the future (21% forestry cover by 2032). Challenge of reduced tourist market due to BREXIT/ COVID.

### **Innovation**

Although this is a more niche value chain, artisanal timber products are not a new innovation.

## Highland cows - bred for genes and cultural status

Highland cows are synonymous with Scotland (and mountainous and rural land) due to their long hair and friendly nature. They are hardy and able to survive (and even improve the quality of the) mountainous terrain of the Highlands and Islands region. In Lochaber they are often able to roam free in the common gradings of the villages. They are helpful at encouraging wildflowers and butterflies to areas. They are kept partly for meat, but also more and more commonly as a tourist attraction and a symbol of territorial (i.e., Highland) identity.

Lochaber is a region in the west of Scotland which features spectacular scenery, including the highest mountain in the UK, Ben Nevis, coastal areas, and valleys. The area is a major destination for tourism and outdoor recreation. The largest town, Fort William, has a population of 10,340, which is slightly over half of the population of the LAU1 mountain reference landscape: the population density is very low in rural parts of the region.

Reference mountain landscape statistics  
(A: Data from NUTS3 “Lochaber, Skye & Lochalsh, Arran & Cumbrae and Argyll & Bute”)

Reference mountain chain	Highlands and Islands		
Reference mountain landscape	Lochaber		
Size of the area (km <sup>2</sup> )	4,654.83	Average per capita income €/year	21,200.32 <sup>A</sup>
Altimetry (m; min-max)	-1-1346	Total Gross Value Added (GVA) (€ million)/year	2,790.74 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	4.25	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	0.49%	Primary:	5.42% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	29,913 <sup>A</sup>	Secondary (including construction):	22.07% <sup>A</sup>
		Tertiary:	72.49% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	161	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	10,230	Primary:	6.25% <sup>A</sup>
Protected areas	Yes	Secondary:	16.66% <sup>A</sup>
		Tertiary:	77.08% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Highland cattle are very symbolic of Scotland and a great cultural asset to Scotland. They are kept as both a cultural asset and due to their good genetics (i.e., they produce leaner meat and

birth more calves than other breeds of cows). Their milk also has a high butterfat content, so they are frequently kept as house cows. Highland cow is also used to help crop the grass to the right conditions to encourage wildflowers and butterflies. They are well suited to the cold Scottish climate as they are hardy and can survive also in mountainous terrain. In multiple Lochaber villages highland cattle roam freely highlighting both their importance to those areas, but also the potential for conflicts.

### **Key local assets**

They can happily live on the poor mountainous terrain throughout Lochaber LAU1, and they are also able to assist with conservation of the area (butterflies and wildflowers). They also add to the scenery of the area due to their attractive and iconic status. They are an important cultural asset as they help create a cultural link between Scotland and its land. They have also been bred and kept in Scotland for centuries, relying on local and traditional knowledge. In terms of social assets, having highland cows in an area necessitates good relations with the land/ highland cattle owner and the local community and tourism ventures to ensure that the draw of tourists to an area to see the highland cattle is a positive experience for all involved.

### **Challenges**

Challenges in terms of tourists getting too close to the cattle to get a 'good selfie'. Challenges if their meat/ genetics become less favourable because of restricted market. They may become more difficult/ less important to keep if Scotland becomes less attractive to tourists, or more impacted by climate changes (i.e., then the climate may no longer suit the cattle).

### **Innovation**

The keeping of highland cows for meat/ genetics is traditional, but their role as a territorial/ cultural identity symbol is new and innovative.

## Jewellery made from heather

Heather jewellery (i.e., heather gems producer) is unique to Perth and Kinross but sold globally online. Their products are of high reputation due to the connection with the land and the traditional processes for turning the heather into jewellery. It is important for moving given that the heather is produced in mountainous areas but simultaneously the removal of the heather helps with regeneration of the mountainous areas (as heather has no nutritional value to wildlife). Heather gems ([www.heathergems.com](http://www.heathergems.com)) is the main producer - based in Pitlochry within Perth and Kinross LAU1.

Most of Perth and Kinross is a sparsely populated upland landscape of mountains, lochs and forests, including major rivers (Tay, Earn). The south contains high quality agricultural land and major road and rail links, and the largest settlement of Perth. Like many other parts of the Highlands, this region is popular for tourism and outdoor recreation: it is a relatively accessible area for residents of Scotland's central belt.

Reference mountain landscape statistics  
(A: Data from NUTS3 "Perth & Kinross and Stirling")

Reference mountain chain		Eastern Scotland	
Reference mountain landscape		Perth and Kinross	
Size of the area (km <sup>2</sup> )	5,383.72	Average per capita income €/year	24,365.67 <sup>A</sup>
Altimetry (m; min-max)	8-1084	Total Gross Value Added (GVA) (€ million)/year	7,894.11 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	28.22	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	5.25%	Primary:	3.06% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	21,499 <sup>A</sup>	Secondary (including construction):	30.77% <sup>A</sup>
		Tertiary:	66.16% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	35.2	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	3,635	Primary:	4.46% <sup>A</sup>
Protected areas	Yes	Secondary:	16.96% <sup>A</sup>
		Tertiary:	78.57% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

Just as Scottish heather can be used to make honey, it is also used in jewellery making. The woody stems of heather provide no nutritional value for wildlife and so by using it in jewellery as a commodity this is also a small way of regenerating the landscape. Heathergems in Perth and Kinross are the main producer/processor of heather jewellery. It is cut, cleaned, and dyed and compressed and soaked with resin to then cut into shapes for jewellery. One main manufacturer but multiple online stockists. Mountainous natural land is needed to provide the heather in the first place. Heathergems has 37 employees, and its holding company is worth £3.3 million (net assets).

### **Key local assets**

Natural assets - product (heather) is directly taken from mountainous areas. Cultural assets - processes for heathergem jewellery making goes back 50+ years so relies on traditional knowledge. Also, an interest in the Scottish landscape/ Scottish culture is needed to ensure there is a viable market for selling heather jewellery. Social assets - requires good relationship with the land/ estate managers where the heather is picked from.

### **Challenges**

Relies on production of heather in mountainous area for initial product so important to have strong working relationships with the landowners (i.e., so they do not decide to use the land for another purpose). Sell online so potentially less restricted by Brexit/ COVID impacts but cannot compete with larger producers if others start to sell similar products.

### **Innovation**

Innovative through the continues use of traditional processes for heather jewellery making and new means of selling (i.e., online stores)



## Mountain wool for Harris tweed

Harris tweed is important for territorial identity of Western Isles. It is a highly reputable product with a legal act behind it. Strong connection to the natural asset - the land in the Western Isles.

The Western Isles is a remote island group off the north-west of Scotland, which relies on ferry and air links to the mainland. Aside from the main town, Stornoway, the region has a very low population density and has suffered population loss over the last 10 years. The area has a Gaelic language and crofting heritage.

Reference mountain landscape statistics  
(A: Data from NUTS3 "Na h-Eileanan Siar (Western Isles)")

Reference mountain chain	Highlands and Islands		
Reference mountain landscape	Na h-Eileanan Siar		
Size of the area (km <sup>2</sup> )	3,092.1	Average per capita income €/year	20,263.48 <sup>A</sup>
Altimetry (m; min-max)	-6-728	Total Gross Value Added (GVA) (€ million)/year	640.89 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	8.64	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-2.55%	Primary:	4.58% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	2,407 <sup>A</sup>	Secondary (including construction):	14.1% <sup>A</sup>
		Tertiary:	81.3% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	342	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	6293	Primary:	21.42% <sup>A</sup>
Protected areas	Yes	Secondary:	14.28% <sup>A</sup>
		Tertiary:	64.28% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

Harris tweed is produced solely on the LAU1 of Western Isles (or Na h-Eileanan Siar in Gaelic). Harris Tweed is a spun wool cloth used to make specialised clothing, shoes, and carpets (for example). According to the Harris Tweed Act, 1993, the cloth must be woven, finished, and made in and from wool derived from the Outer Hebrides (western Isles LAU1). This Act has safeguarded Harris Tweeds name, quality, and reputation. Harris Tweed is hand stamped with an Orb mark

(of the Harris Tweed Authority). Three mills operate on the Western Isles. Most wool is grown on the UK mainland, but Harris wool is also used to create the mix. Strong links between VC and local cultural identity and boost for tourism in the LAU1, as well as a market for Western Isles' sheep farmers. Harris Tweed's annual output of £1-1.5 m supports employment of 220 weavers and 160 jobs in the wider industry.

### **Key local assets**

Harris tweed relies on maintaining the mountainous landscape so that sheep can continue to be kept on this land. Also, natural assets such as scenery are also important for drawing visitors to the Western Isles. Cultural assets are important as tweed production relies on long-standing traditional methods of production, for both the wool sheering and the production of tweed. Also given that Harris tweed can only be produced on the Western Isles, this represents its importance as a cultural and social asset. Other Social assets include good relations with local farmers and processors of harris tweed.

### **Challenges**

Although most of the wool for harris tweed comes from the UK mainland, maintenance of mountainous land mass in Western Isles for the additional harris wool into the mix is important. Thus, maintaining land use is important. Threats to exports and tourism due to Brexit and COVID. Threats of cheaper fraudulent copies of Harris Tweed being produced more cheaply. It is considered a sustainable industry due to its localised production methods and environmentally friendly methods too.

### **Innovation**

This is a traditional VC as it uses long-standing traditions for gathering, making, and processing the tweed.

## Hydropower - upland river lakes for renewable energy

There are still only four pumped storage hydropower projects in the UK, but they have potential in generating 2800MW. These are in Scotland and Wales and are an important renewable energy source. Electric Mountain is located in Gwynedd LAU1 and is the largest scheme. It also is home to many rare bird species including peregrine falcons. Also, its dual purpose as a tourist attraction and source of renewable energy production and the impacts on the surrounding scenery (although attempts have been made to minimise these impacts). Dinorwig/ Electric Mountain has been referred to as 'the UK's largest battery' and it is the largest scheme of its kind in Europe.

Gwynedd, in Northwest Wales, is most known for its spectacular mountain, lake and forest scenery, which features Snowdonia National Park and the highest mountain in Wales. The area is relatively isolated but is well-connected to north Wales and Northwest England by road and rail. The largest settlement, Bangor, is a small university city.

Reference mountain landscape statistics  
(A: Data from NUTS3 "Gwynedd")

Reference mountain chain		West Wales	
Reference mountain landscape		Gwynedd	
Size of the area (km <sup>2</sup> )	2,548.08	Average per capita income €/year	18,362.69 <sup>A</sup>
Altimetry (m; min-max)	0-1085	Total Gross Value Added (GVA) (€ million)/year	2,990.81 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	48.88	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	2.49%	Primary:	1.36% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	125,126 <sup>A</sup>	Secondary (including construction):	30.76% <sup>A</sup>
		Tertiary:	67.87% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	110	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	2,171	Primary:	5.08% <sup>A</sup>
Protected areas	Yes	Secondary:	13.55% <sup>A</sup>
		Tertiary:	81.35% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

Dinorwig power station (or Electric Mountain) is a pumped-storage hydroelectric scheme in Snowdonia National Park (Gwynedd LAU1). Water is stored in an upland lake/reservoir on the mountain and sent through the turbines to create hydro-electric power when needed. It can provide power for up to six hours from full and has an energy storage capacity of 9.1 (GWh). It is also designed to support the National Grid restart in instances of power outage. Electric mountain is also a tourist attraction with 132,000 visitors annually, to the visitor centre and opportunity to tour the power station. The benefits of pumped hydro-electric power are not always clearly recognised given the high initial construction costs.

### **Key local assets**

Key local assets are natural and social. Natural assets are the necessity of water/ rainfall for the energy to be produced. Also important is the power station having minimal impact on the surrounding scenery and landscape given it is built within Snowdonia National Park. Social assets are the need for good working and community relationships between and across staff, community members, national park officials, farmers and other land managers and local community members to ensure good cooperation. Electric Mountain have also set up and sponsored multiple local groups such as a slare Museum and a hiking trail. They also sponsor local events including the Snowdonia Marathon.

### **Challenges**

Electric mountain faced challenges in how to ensure protection of a local rare fish (Welsh Arctic Charr). These fish were subsequently moved. Impacts if climate change impacts on the amount of water gathered in the reservoir to make hydro-electric power. The surrounding land is also open access leading to necessary good relations between hikers etc and Electric Mountain staff. It is also built within Snowdonia National Park and so there are potential challenges between conflicting interests of the land/ scenery. Financial justification of pumped hydro-electric schemes can be hard to justify, especially with moved to cleaner energy production. The visitor centres/ tours are currently closed due to renovation representing a reduced income from tourism.

### **Innovation**

Traditional as pumped hydro-electric is not a new activity.

## Wind energy

This VC relies on wind energy to produce electricity via 76 turbines. There have been issues/concerns over the peatland located close to/within the turbine area - local conservation groups campaigned against the turbines because of their potential to ruin the peatland, however, the construction company have also developed the largest peatland restoration scheme in Southern Britain to counter these impacts. Impacts on the 'scenery' for residents and it may change local territorial identity. The project has brought over 1000 jobs to the areas and can produce sizeable amounts of renewable electricity.

Neath and Port Talbot is situated in the South of Wales on the coast, close to Swansea. It stretches from the coast to the border with the Brecon Beacons National Park. There is urban development along the south of the MRL (e.g., Neath and Port Talbot) and a large amount of upland area towards the north, mainly covered by forestry. Although the population of the area declined throughout the 20th century, there has been population growth in the 21st century. Employment and economic activity rates for the area are lower than the Welsh average.

Reference mountain landscape statistics  
(A: Data from NUTS3 "Bridgend and Neath Port Talbot")

Reference mountain chain		West Wales	
Reference mountain landscape		Neath Port Talbot	
Size of the area (km <sup>2</sup> )	442.34	Average per capita income €/year	18,777.42 <sup>A</sup>
Altimetry (m; min-max)	0-600	Total Gross Value Added (GVA) (€ million)/year	6,715.19 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	323.99	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	2.45%	Primary:	0.13% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	22,131 <sup>A</sup>	Secondary (including construction):	36.04% <sup>A</sup>
		Tertiary:	63.82% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	23.3	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	303	Primary:	0.90% <sup>A</sup>
Protected areas	No	Secondary:	25.45% <sup>A</sup>
		Tertiary:	73.63% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

51% of Wales' energy is met by renewables (2019) and two thirds of this is through wind (both on and offshore turbines). Pen y Cymoedd windfarm is the highest altitude windfarm in the UK. It is an onshore windfarm of 76 turbines located within Neath and Port Talbot and was opened in 2017. It can produce enough electricity to power 15% of homes in Wales annually. Its construction (three years) created more than 1000 local jobs, and it now supports 100 jobs. It supports the local community through a £1.8 million annual fund and is responsible for launching the Lost Peatlands Project (one of Southern Britain's largest Peatland projects). There is open access to the wind turbine land, so it is also enjoyed and shared by walkers and cyclists. However, the development was objected and campaigned against by several local community and conservation groups because of the potential impacts on the scenery and peatland (hence the community fund agreement).

### Key local assets

Natural assets are the land use and wind to ensure that the turbines can successfully generate electricity. They also impact on the scenery for some local communities who overlook the turbines. Social assets - especially given the controversy of this project maintaining good community relations is important. This has been implemented in the project through the community fund, local jobs, and peatland restoration fund. May also impact/ change the cultural heritage of the land (i.e., now locals have a different connection to it through the turbines).

### Challenges

Reliance on wind energy which may be unpredictable. Poor relations with local communities/ conservation groups may have been developed (however the construction company have made attempts to improve these relations). Impacts of climate change may impact on the importance of peat protection/ restoration. Also, turbines may be relied upon to generate greater amounts of electricity in the future. Potential impacts on birds (i.e., who may get caught in the turbines arms).

### Innovation

Traditional as wind turbines (onshore) are not a new venture.

## Scotch whisky (PDO)

Scotch Whisky has PDO status and is highly regarded around the world. Exports are worth £4.9 billion and accounted for 75% of all Scottish food and drink exports for 2019. The industry provides £5.5 billion GVA to the UK economy and directly employs more than 10,000 people and indirectly more than 40,000 people. Iconic for territorial identity and Scotland's high reputation for food and drink tourism. Scotch Whisky association have also committed to net-zero emissions by 2040 through its new sustainability strategy.

Badenoch and Strathspey is a highly scenic area which is valued for outdoor recreation and wildlife, and contains large forests, the upper River Spey and parts of the Cairngorm mountains. The population is concentrated in Aviemore and other small settlements: most of the region is remote and is regularly affected by snow in the winter. The A9 road and railway line form key transport links to central Scotland and Inverness. It is included in Cairngorms National Park.

Reference mountain landscape statistics  
(A: Data from NUTS3 "Inverness & Nairn and Moray, Badenoch & Strathspey")

Reference mountain chain	Highlands and Islands		
Reference mountain landscape	Badenoch and Strathspey		
Size of the area (km <sup>2</sup> )	2,369.81	Average per capita income €/year	22,078.39 <sup>A</sup>
Altimetry (m; min-max)	148-1281	Total Gross Value Added (GVA) (€ million)/year	6,416.79 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	5.90	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	6.52%	Primary:	1.37% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	15,574 <sup>A</sup>	Secondary (including construction):	35% <sup>A</sup>
		Tertiary:	63.62% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	141	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	10,230	Primary:	6.81% <sup>A</sup>
Protected areas	Yes	Secondary:	20.45% <sup>A</sup>
		Tertiary:	72.72% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

There are over 130 distilleries producing whisky across Scotland. Scotch Whisky is a PDO, in which 'Scotch' must be distilled and matured in Scotland. There are many distilleries within Badenoch and Strathspey LAU1. Whisky production is dependent on clean water, peat, and barley. More recently the whisky industry has become intertwined with tourism, for instance, within Badenoch and Strathspey there is the Malt Whisky Trail on which 14 distilleries can be reached. Official tours can also be undertaken within and between distilleries. There are also new tourism ventures such as Whisky Festivals (i.e., Speyside).

### **Key local assets**

Natural assets are clean water, peat, and barley. Also important is the land for scenery (important for promoting the whisky distilleries to wider tourist market). Social assets are good relationships across the value chain including distillery workers, farmers, landowners, local communities, and tourists. Cultural assets are the cultural heritage intertwined with the whisky industry (i.e., whisky is iconic for Scotland), and traditional knowledge for distilling practices.

### **Challenges**

Relies on climate that produces clean water, and good quality peat and barley - so may be impacted by climate change. Also, BREXIT and COVID can and may impact on the export market and the tourism revenue. Negative impacts of whisky industry (i.e., alcoholism). It may also be a challenge to achieve net-zero by 2040.

### **Innovation**

Whisky production itself is not innovative, but the tourism connection/ experience is new and innovative.



## Adventure experience

Prevalence of outdoor adventure companies and promotion of the area as England's 'outdoor capital'. Adrenaline-based experiences generate economic value from landscape features and local knowledge to negotiate safe access.

South Lakeland is in the north-west of England and is partly within the Lake District National Park, an internationally renowned area for recreation and tourism. The area has a mixed landscape of mountains, hills, lakes, lowlands, and coast and is accessible for large numbers of people in the north of England, with good road and rail links. Upland areas have a tradition of hill farming and sheep grazing, although the tourism industry is very important particularly in 'honeypots'.

### Reference mountain landscape statistics (A: Data from NUTS3 "East Cumbria")

Reference mountain chain	Cumbria		
Reference mountain landscape	South Lakeland		
Size of the area (km <sup>2</sup> )	1,553.03	Average per capita income €/year	24,595.08 <sup>A</sup>
Altimetry (m; min-max)	0-902	Total Gross Value Added (GVA) (€ million)/year	7,703.09 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	67.66	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	1.32%	Primary:	2.87% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	53,310 <sup>A</sup>	Secondary (including construction):	22.62% <sup>A</sup>
		Tertiary:	74.49% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	36.4	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	1,198	Primary:	4.10% <sup>A</sup>
Protected areas	Yes	Secondary:	17.80% <sup>A</sup>
		Tertiary:	78.08% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

South Lakeland includes much of the Lake District National Park (and UNESCO World Heritage Site), including all the land higher than 3,000ft in England, the country's highest mountain (Scafell Pike, 928m/3209ft) and largest lake (Windermere). The area's landscape and geological features support a range of activities based on their remarkability (e.g., rock climbing, abseiling, canyoning,

gorge walking, high-wire crossings) and employment of expert instructors and guides in their provision. Adventure experience days provide adrenaline-fuelled and place-based access for tourism and other markets in the country's 'outdoor capital' -- recent thematic campaigns are also strengthening the region's association with adventure activities. Economic value associated with the adventure tourism market is also strongly linked to leisure, accommodation, hospitality, and other tourism facilities in the area. Tourism is worth £2.44 billion to the Cumbrian economy (2015); 16% of all trips to North-West England involve some form of outdoor activity.

### **Key local assets**

Landscape features that support outdoor activities (including peaks, valleys, cliffs, gorges, lakes, caves, scree) and attract tourism markets (scenery); cultural knowledge associated with place and practice of mountain-based pursuits to support and commodify access for novice and tourism markets.

### **Challenges**

Carrying capacity/environmental impacts associated with access. Impact on experience-value associated with volume of visitors. Access via private land/conflict with landowners/managers.

### **Innovation**

Experience days enable tourism access to adventure activities that require high levels of experience and awareness of health and safety requirements. Companies supply the equipment (often highly technical) and commodify knowledge and experience (including local/cultural knowledge of place) through provision of instruction and guidance to visitor markets.

## Independent and guided visits (visiting wild places and seeing wildlife)

This type of tourism is based on visitors' being able to experience wild places and view, study, or enjoy focal species (e.g., red deer, ptarmigan, mountain hare, golden eagle, peregrine) in alpine and sub-alpine habitats. The value chain is dispersed and ad hoc, but includes wildlife tour operators, as well as small-scale accommodation, providers, and other hospitality and service-based businesses based in remote rural communities. Seasonality relates to both tourism demand and natural seasons (e.g., mating, migrations, births, flowering/dormancy).

Caithness and Sutherland is situated in the far north of the Scottish/UK mainland and is very remote from large cities. It has a very low population density with most people living in towns and villages on the coast: the inland area features large areas of moors and wetlands, and the region has a long coastline to the west, north and east. The area has suffered depopulation in the last ten years. The largest town (Thurso) has an important ferry link to the Orkney Islands.

Reference mountain landscape statistics  
(A: Data from NUTS3 "Caithness & Sutherland and Ross & Cromarty")

Reference mountain chain		Highlands and Islands	
Reference mountain landscape		Caithness and Sutherland	
Size of the area (km <sup>2</sup> )	7,862.11	Average per capita income €/year	22,243.38 <sup>A</sup>
Altimetry (m; min-max)	-4-994	Total Gross Value Added (GVA) (€ million)/year	2,345.4 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	4.86	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-3.42	Primary:	4.09% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	8,124 <sup>A</sup>	Secondary (including construction):	22.6% <sup>A</sup>
		Tertiary:	73.3% <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	340	Primary:	8.16% <sup>A</sup>
Number of agricultural holdings	10,230	Secondary:	16.32% <sup>A</sup>
Protected areas	Yes	Tertiary:	75.51% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The distinctive and dramatic North-West Highland landscape is based on the contrast and vicinity of the mountains to the coast. Wildlife tourism in the area also benefits from this proximity, often combining opportunities to see marine, coastal, and mountain species. Tour operators include national companies and local guides who offer flexible and bespoke tours. Wildlife tourism in the wider Scottish Highlands was estimated to be worth £124 million in 2010. Local markets for wildlife and birdwatching also presents opportunities relating to physical and mental well-being. However, there are difficulties in defining this value chain, in terms of its distinctness from other forms of countryside tourism, and the national/regional tourism 'product', which build on iconography of key species in branding and characterisation of the Highlands in terms of wildness. Non-specific/informal wildlife and nature tourism experiences are contributory in tourism motivations and satisfaction (generating return visits).

### **Key local assets**

Flora and fauna species in the north-west Highlands, including red deer, ptarmigan, mountain hare, golden eagle, peregrine, mosses, lichens, liverworts, alpine bearberry, juniper, crowberry, cowberry, mountain sedges. The dramatic landscape and geology represent high scenic value for visitors. Environmental and cultural knowledge by land managers and locals that link to the tourism sector (e.g., tour guides, hospitality, and accommodation providers) increased the value of visitors' stay through information and interpretation.

### **Challenges**

Wildlife disturbance/ecological impacts of visitors. Challenges relating difficulty/scarcity of sightings, which may be increased by professional guides, and/or mitigated through multi-purpose trips. Climate change impacts might include 'positive' and negative effects for species and habitats. Land ownership and land use factors contribute to habitat preservation/destruction and the nature of access for visitors to wild areas. Species reintroduction projects introduces potential opportunities and conflict for the sector. Covid-19 has resulted in increased visitor numbers/impacts in parts of rural Scotland, based on social-distancing (open spaces) and renewed well-being motivations.

### **Innovation**

Commercialisation of a traditional activity, including wildlife tours designed for tourism markets, element of destination product and imagery, online bookability, bespoke 'experiences' catering to visitor demand and trends for authenticity and nature. Links to remote and virtual experiences, e.g., TV programmes such as Autumn Watch, installation of webcams, and rise of social media experience and photography sharing, stimulating demand to view species in their natural habitat.

## Climbing or walking of popular/accessible peaks

Scotland is renowned for walking opportunities and 'Munro Bagging' (climbing peaks over 914.4m) ascribes value Scottish mountains as cultural and economic assets. Overlooking iconic Loch Lomond and located close the country's cities, Ben Lomond (974m) is one the most climbed mountains in the country (30,000 climbers in 2010).

Helensburgh and Lomond is situated just to the north west of Glasgow and includes the renowned beauty spot of Loch Lomond, as well as surrounding mountains and parts of the northern shore of the Firth of Clyde and Loch Long. Parts of the area are within the Loch Lomond and the Trossachs National Park, and it is a highly accessible area for recreation for residents of Glasgow and its northern commuter towns.

### Reference mountain landscape statistics

(A: Data from NUTS3 "East Dunbartonshire, West Dunbartonshire and Helensburgh & Lomond")

Reference mountain chain		West Central Scotland	
Reference mountain landscape		Helensburgh and Lomond	
Size of the area (km <sup>2</sup> )	381.12	Average per capita income €/year	23,565.57 <sup>A</sup>
Altimetry (m; min-max)	9-942	Total Gross Value Added (GVA) (€ million)/year	4,014.87 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	67.75	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-1.88%	Primary:	0.16% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	2,660 <sup>A</sup>	Secondary (including construction):	21.33% <sup>A</sup>
		Tertiary:	78.49% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	43.4	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	1,944	Primary:	1.44% <sup>A</sup>
Protected areas	No	Secondary:	15.94% <sup>A</sup>
		Tertiary:	82.60% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

As the most southerly 'Munro', Ben Lomond presents an accessible entry point to cultural challenge of 'Munro Bagging' (named after the mountaineer who first surveyed and catalogued Scottish Mountains above 3,000ft/914.4m in 1891). Managed by the National Trust for Scotland,

in association with the Loch Lomond and Trossachs National Park Authority and Forestry Commission, balancing environmental objectives with responsible access is at the core of this value chain, including provision and maintenance of facilities (paths, parking, etc.), and interpretation of the landscape and culture (including rangers and guides). Engaging local people and groups in activities (e.g., through charities such as the John Muir Trust and the Outdoor Access Trust for Scotland) extends the societal value of Ben Lomond as a destination beyond the tourism economy.

### **Key local assets**

Overlooking iconic Scottish Loch (lake) Lomond, Ben (mountain) Lomond is a natural asset that is valued in ecological (SSSI habitat for black grouse, ptarmigan, upland waders, eagle, pine marten, etc.), societal (accessible from key population centres), cultural (iconic landscape and scenery, most popular 'Munro'), and economic (tourism and hospitality) terms. The average daily spend of the 'long walk' market in Scotland is £19 per day (2015), increasing by approximately 4x when accommodation is included (based on 2003 figures). The hill and long-distance walking sector in the Loch Lomond and Trossachs National Park was valued at £3.5m in 2011, after costs.

### **Challenges**

Balance of environmental protection (including SSSI species) and visitor access objectives, including erosion from footfall and wildlife disturbance (e.g., from drones).

### **Innovation**

Projects based on enhanced mental health and wellbeing and/or re-skilling based on activities such as green exercise and repairing damage associated with visitor access. Online communities (including Munro society, and other hill walking and mountaineering groups) providing information and exchange relating to routes, tips, sharing photography, etc.

## Winter sports (downhill skiing and snowboarding)

The lecht ski centre [www.lecht.co.uk](http://www.lecht.co.uk) lies in the heart of both the Cairngorms National Park and Aberdeenshire (LAU1 name). It began operating in 1977 and promotes itself as a good area for beginner skiers and snowboarders. It is home to the only wind turbine within the Cairngorms National Park. This turbine is used to (partially) power their snow factory (artificial snow making). The lecht is important for local schoolchildren (to learn to ski/ snowboard). It has 14 lifts (i.e., 1 chair lift and 13 surface lifts) which can have an impact on the land cover/use and its potential within summer months. In the summer, the area is also used for mountain biking and hillwalking.

Aberdeenshire is in the north-east of Scotland and is a highly diverse landscape, with a long coastline, lowland agricultural areas, large rivers and the mountains and valleys of the Cairngorms. It surrounds the city of Aberdeen and contains several towns, including six settlements with a population of over 10,000. The oil and gas industry is a key economic sector, with land-based industries and tourism more important in the rural parts of the region.

Reference mountain landscape statistics  
(A: Data from NUTS3 “Aberdeen City and Aberdeenshire”)

Reference mountain chain		North Eastern Scotland	
Reference mountain landscape		Aberdeenshire	
Size of the area (km <sup>2</sup> )	6,318	Average per capita income €/year	24,463.99 <sup>A</sup>
Altimetry (m; min-max)	-3-1307	Total Gross Value Added (GVA) (€ million)/year	20,611.27 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	41.34	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	4.89%	Primary:	2.45% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	14,233 <sup>A</sup>	Secondary (including construction):	28.08% <sup>A</sup>
		Tertiary:	69.45% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	51.7	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	8,612	Primary:	3.29% <sup>A</sup>
Protected areas	Yes	Secondary:	23.07% <sup>A</sup>
		Tertiary:	73.62% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

Key activities and key actors, labelling, quality schemes in place, dependencies of VC on local SES and impacts (positive and negative) of VC on regional SES.

### **Key local assets**

Lecht ski resorts depend on a range of natural, cultural, and social assets. In terms of natural assets it relies on the attractive landscape to both provide the basis for the skiing, but also the pleasant surroundings (which encourage visitors to come). They also depend on good snowfall to ensure they can open for as long a season as possible (also to enable artificial snowmaking). In terms of social assets, Cairngorms ski resorts are dependent on good community relations both with the Cairngorms National Park Authority, the landowners and the local tourism operators and residents of the local village Tomintoul. Without their support the ski resort would likely fail. In terms of cultural assets there is a reliance on local traditional knowledge for Lecht-specific ski knowledge and as an important part of local childhood. Also, Lecht is dependent on local Braemar Mountain Rescue team [www.braemarmountainrescue.org.uk](http://www.braemarmountainrescue.org.uk) who voluntarily serve the surrounding mountains if hillwalkers/ Skiers/snowboarders injure themselves whilst on the mountains. These volunteers are required to live locally and need long-term experiences with the local area.

### **Challenges**

Future issues concern lack of snowsports possibility due to climate change impacts, and current closures from COVID - potential for land to be used for more specifically land-connected activities but these may not be so profitable or helpful for resilience (i.e., in terms of wider jobs and tourism). There is also tension between habitat designations on the plateau and the ski slopes providing access to these areas (and infrastructure e.g., car parks, cafes). The tension between tourism and conservation is at the heart of the reason why the National Park was designated.

### **Innovation**

The use of the wind turbine to power the snow factory is innovative as it both extends the season for skiing and improves its reliability (and thus economic sustainability), but also is drawing on renewable energy. Nowhere else in the UK powers their snowmaking through such innovative means, however there is existing use of renewable energy sources within ski resorts, thus the innovation is exogenous. The Cairngorms resort is currently reviewing plans to power its snowmaking through sustainably produced HVO (hydrotreated vegetable oil) to reduce its reliance on diesel for their snow cannons.



## Venison - Farmed and wild deer

Venison (both farmed and wild deer meat) is a highly reputable product. The venison industry has the Scottish Quality Wild Venison safeguard for ensuring humane and sustainable practices from 'hill to plate' (for wild venison). Deer are synonymous with Scotland's mountainous areas and due to a lack of larger predators are thus managed for better land management. 50 Deer Management groups exist in Scotland made up of multiple landowners, gamekeepers etc. The venison VC interacts with the sporting game VC.

Lochaber is a region in the west of Scotland which features spectacular scenery, including the highest mountain in the UK, Ben Nevis, coastal areas, and valleys. The area is a major destination for tourism and outdoor recreation. The largest town, Fort William, has a population of 10,340, which is slightly over half of the population of the LAU1 mountain reference landscape: the population density is very low in rural parts of the region.

Reference mountain landscape statistics  
(A: Data from NUTS3 "Lochaber, Skye & Lochalsh, Arran & Cumbrae and Argyll & Bute")

Reference mountain chain	Highlands and Islands		
Reference mountain landscape	Lochaber		
Size of the area (km <sup>2</sup> )	4,654.83	Average per capita income €/year	21,200.32 <sup>A</sup>
Altimetry (m; min-max)	-1-1346	Total Gross Value Added (GVA) (€ million)/year	2,790.74 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	4.25	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	0.49%	Primary:	5.42% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	29,913 <sup>A</sup>	Secondary (including construction):	22.07% <sup>A</sup>
		Tertiary:	72.49% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	161	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	10,230	Primary:	6.25% <sup>A</sup>
Protected areas	Yes	Secondary:	16.66% <sup>A</sup>
		Tertiary:	77.08% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Scotland is the UK's largest venison producer, of 3500 tonnes of wild venison and 70 tonnes of farmed venison. As of 2020 there were 97 deer farms in Scotland. As there are no natural predators for deers they are managed (through culling to maintain a healthy herd). Venison is a highly reputable product and the SQWV (Scottish Quality Wild Venison) scheme work to ensure humane and proper standards are followed. Farmed and wild deer thrive in the mountainous landscapes of Scotland and several producers are based in Lochaber including Great Glen Charcuterie. They turn venison into charcuterie meats, and they are great taste award winners (2020). Whilst Jahama Highland Estate sell wild venison butchery products (mince, burgers, steaks). The farmed and wild venison VC is very reliant on wider SES in terms of good relations with landowners, gamekeepers and tourist ventures and ensuring deer management practices are upheld sustainably. The UK venison market is estimated at £100million and deer management supports 25200 FTE jobs.

### **Key local assets**

Natural: venison requires mountainous and 'wild' terrain for venison production as well as attractive landscape and scenery to add to the 'venison brand' (i.e., iconic views of Scotland). Venison production/ deer management requires a lot of cooperation across landowners, gamekeepers, tourist ventures, local communities, conservation groups etc. There are around 50 Deer Management groups in Scotland established for this cooperation. Cultural assets are the reliance on traditional knowledge for culling and processing practices. Also, to maintain a link with Scotland's heritage -i.e. the deer are 'the monarch of the glen'.

### **Challenges**

Relies on good communication and strong relations across the value chain and any associated Deer Management group - negative impacts may occur if such relationships break down. Relies on strong export market which could be impacted by BREXIT/ COVID. Farmed venison takes two years to make a return-on-investment meaning is a difficult business to start. Overgrazing or over culling may be other challenges. Challenges related to climate change may mean the deer framing/ production could become too costly or the terrain/ climate may no longer be suitable.

### **Innovation**

Venison production is traditional, but production as charcuterie is innovative.

## Spirits (Gin)

Gin produced in the UK is widely exported and highly regarded around the world. Small batch gin distilleries such as within Gwynedd are highly regarded due to their use of local botanical ingredients and connection to the local community and landscape.

Gwynedd, in Northwest Wales, is most known for its spectacular mountain, lake and forest scenery, which features Snowdonia National Park and the highest mountain in Wales. The area is relatively isolated but is well-connected to north Wales and Northwest England by road and rail. The largest settlement, Bangor, is a small university city.

Reference mountain landscape statistics  
(A: Data from NUTS3 "Gwynedd")

Reference mountain chain	West Wales		
Reference mountain landscape	Gwynedd		
Size of the area (km <sup>2</sup> )	2,548.08	Average per capita income €/year	18,362.69 <sup>A</sup>
Altimetry (m; min-max)	0-1085	Total Gross Value Added (GVA) (€ million)/year	2,990.81 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	48.88	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	2.49%	Primary:	1.36% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	125,126 <sup>A</sup>	Secondary (including construction):	30.76% <sup>A</sup>
		Tertiary:	67.87% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	110	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	2,171	Primary:	5.08% <sup>A</sup>
Protected areas	Yes	Secondary:	13.55% <sup>A</sup>
		Tertiary:	81.35% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

For instance, Blue Slate Gin (from Dinorwig Distillery) make just 2000 bottles a year but sell these globally, but also mostly locally at Gin Festivals. Dinorwig try to promote their products through both English and Welsh language. They worked with a local artist to design their labelling. Meanwhile, Dyfi gin is also produced in Gwynedd using upland botanicals and was chosen as

Britain's best gin at the Great British Food Awards 2017. It is possible for others that Gin is marketed as using rare botanicals from uplands but mainly produced in lowlands. Gin sales in the UK were around £2.6 billion in 2019. The UK is the world's largest exporter of gin, and the number of distilleries has increased four-fold in the last 4 years. Within Gwynedd (LAU1), there are an increasing number of Gin distilleries, many of which also produce whisky and other liqueurs. Although the distilleries are based in the lowland areas of Gwynedd, but they use botanicals that grow in the upland areas. Furthermore, Blue Slate Gin (from Dinorwig distillery) is distilled in the mountains of Snowdonia and Dinorwig distillery carry out the full production (from distilling to labelling, marketing, and shipping). They use mountain well water in the distilling process.

### Key local assets

Natural assets: Gin in Gwynedd (i.e., Dinorwig) relies on the mountainous terrain and climate to produce the botanicals (e.g., coriander seeds, rosemary, oak bark, heather honey) for the gin. Also, reliance on clean water for the distilling process. Social assets: good relations with the landowners to enable access to the mountainous water and botanicals. Cultural assets: Relies on traditional knowledge of the Gwynedd area and of gin distilling processes to create the Blue Slate Gin. Also, strong links to Welsh language, i.e., having a Welsh speaker at their selling events (i.e. Gin festivals).

### Challenges

Gin is a big export market and so there are potential challenges in terms of BREXIT/ COVID, as well as closures of hospitality due to COVID. Gin production in Gwynedd is reliant on mountainous climate/ terrain for the specific botanicals used in their distillation, as well as upland water (taken from a well). Changes in land use/ climate may impact on the quality of the gin that is possible. Also changes in the fashionable/ 'trendiness' of gin may impact on the viability of gin production, as well as a saturated market due to ever increasing numbers of gin distilleries across the UK.

### Innovation

Gin as a product is not new, however the processing of gin in upland areas such as Gwynedd is new and innovative. There has also been a massive increase in gin production across the UK recent years, i.e. within whisky distilleries and to meet the growing demand of local and flavoured gins (and increased demand from younger generation as gin is now considered a 'trendy' drink).

## Beeswax products including soap, candles, skincare, and food wraps

Often these producers are linked to food and drink quality schemes (i.e., for their honey) and beekeepers associations. They are high reputation products given that they use pure raw local honey/ beeswax. The beeswax and wider honey products connect to the wider territorial identity of Southern Wales. Beeswax wraps raise awareness of single-use plastics and food waste.

Blaenau Gwent is in South Wales. It borders the Brecon Beacons National Park at its northern boundary. The largest town is Ebbw Vale and the areas as quite an industrial employment history (i.e., steelworks and coal mining) and it has higher than average unemployment rates (compared to the Welsh average).

### Reference mountain landscape statistics (A: Data from NUTS3 "Gwent Valleys")

Reference mountain chain		West Wales	
Reference mountain landscape		Blaenau Gwent	
Size of the area (km <sup>2</sup> )	108.73	Average per capita income €/year	17,614.6 <sup>A</sup>
Altimetry (m; min-max)	0-578	Total Gross Value Added (GVA) (€ million)/year	6,037.01 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	642.53	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	0.07%	Primary:	0.07% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	2,577 <sup>A</sup>	Secondary (including construction):	36% <sup>A</sup>
		Tertiary:	63.92% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	33.9	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	100	Primary:	0.90% <sup>A</sup>
Protected areas	Yes	Secondary:	29.09% <sup>A</sup>
		Tertiary:	70% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Gwent Valley (or Blaenau Gwent in Welsh) (LAU1) Beeswax products include candles, soaps, other beauty products and reusable food wraps (i.e., instead of cling film). Honeybee Beautiful for instance is a sustainable honey and beeswax skincare business based in Gwent Valley. They

only use raw Welsh Honey and Beeswax capping. Meanwhile, Sirhowy Valley Honeybees are a social enterprise honey producer in Gwent but are starting to branch into education (i.e., through schools workshops) and beeswax products. Market of beeswax wraps is increasing as society becomes more aware of reducing their environmental footprint (i.e., using less single-use plastics).

### **Key local assets**

Natural assets: relies on maintenance of ecosystem to ensure good quality and quantity of beeswax/ honey. Social assets are good relationships with the landowners and producers of beeswax products. Cultural assets and the use of traditional knowledge of beekeeping practices and the importance of maintaining links to local Welsh identity and promoting Welsh honey/ beeswax products through education trips and visits.

### **Challenges**

Reliant on maintenance of the local ecosystem to ensure bees continue to produce good quantity and quality of beeswax/ honey. Potential difficulties in selling to their markets due to BREXIT/ COVID. Good relations with the local land managers need to be maintained to ensure access to hives/ and good environment (i.e. pollinators). Also, potential impacts of bee numbers/ quality of honey from climate change.

### **Innovation**

Use of more-than honey products for candles, skincare, food wraps and education.

## Breakfast puddings (e.g., Haggis, black pudding, white pudding)

Scottish breakfasts (mainly served in tourist cafes and accommodation i.e., B&Bs) always contain at least one type of 'pudding' based on oatmeal, barley, beef fat and beef or sheep offal, traditionally served in a sheep's stomach. They are often associated with remote rural agricultural areas and regions.

The Western Isles is a remote island group off the north-west of Scotland, which relies on ferry and air links to the mainland. Aside from the main town, Stornoway, the region has a very low population density and has suffered population loss over the last 10 years. The area has a Gaelic language and crofting heritage.

Reference mountain landscape statistics  
(A: Data from NUTS3 "Na h-Eileanan Siar (Western Isles)")

Reference mountain chain	Highlands and Islands		
Reference mountain landscape	Na h-Eileanan Siar		
Size of the area (km <sup>2</sup> )	3,092.1	Average per capita income €/year	20,263.48 <sup>A</sup>
Altimetry (m; min-max)	-6-728	Total Gross Value Added (GVA) (€ million)/year	640.89 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	8.64	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-2.55%	Primary:	4.58% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	2,407 <sup>A</sup>	Secondary (including construction):	14.1% <sup>A</sup>
		Tertiary:	81.3% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	342	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	6293	Primary:	21.42% <sup>A</sup>
Protected areas	Yes	Secondary:	14.28% <sup>A</sup>
		Tertiary:	64.28% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

Haggis, especially, has cultural connections to territorial identity, being frequently eaten across Scotland (and beyond) within a 'Burns Supper' to celebrate Scottish poet Robbie Burns. Black pudding from Stornoway (Western Isles LAU1) has PGI status. Such puddings need to be made on the Isle of Lewis to a specific recipe. Charles MacLeod (original producers of Stornoway Black

pudding) has won multiple awards including six Great Taste Awards. Breakfast puddings including haggis and Stornoway black pudding are an important Scottish food and export commodity. Haggis has an export value of £8.8 million over the last ten years. Stornoway Black pudding has PGI status and is a world-renowned Scottish product. Charles MacLeod (original Stornoway Black pudding producers) is worth around £2 million. Pudding production links multiple actors in a value chain including crofters/farmers, butchers, tourism providers and tourists themselves.

### **Key local assets**

Natural assets: relies on land use for livestock farming, also landscape/ scenery to link to tourism ventures (i.e., Scottish breakfast puddings often served in tourist accommodation). Social assets: strong links throughout the VC including between farmer/crofter, butcher, and tourism provider. Cultural assets: Links to traditional knowledge for pudding production, but also crofting and livestock farming practices. Haggis and black pudding are also important cultural icons for Scottish food industry.

### **Challenges**

Relies on tourism for a good market for selling produce (potential challenges from BREXIT/ COVID). Relies on good relations across the VC (i.e., farmers, pudding producers, tourism ventures, tourists). Relies on maintaining land use/ climate so it can be suitable for livestock farming - potential impacts from climate change may alter this. Only Stornoway black pudding has PGI status, other pudding may be at risk from 'imposters'. Black pudding is also made in Lancaster LAU1.

### **Innovation**

Traditional as have been created and sold in these areas for many years.



## 15. North Macedonia

### Juniper essential oil

High quality products, which are produced in a very cleaned environment, such as Maleshevija.

Maleshevski mountains are in the eastern part of the Republic of North Macedonia. They cover the municipalities of Berovo and Pehchevo, characterized with the natural and cultural wealth. Two rivers cross the region, Bregalnica and Strumica. Forests covers 52% of the Maleshevija region, while pastures around 20%.

Reference mountain landscape statistics  
(A: Data from NUTS3 AT224)

Reference mountain chain		Mountain Meleshevija	
Reference mountain landscape		(LAU1)	
Size of the area (km <sup>2</sup> )	806	Average per capita income €/year	5056
Altimetry (m; min-max)	660– 1932	Total Gross Value Added (GVA) (€ million)/year	769
Population density (Inhabitants/km <sup>2</sup> )	49.3	GVA by sector*2	
Population changes in the last 10 years	-3%	Primary:	9,80%
Total bed places (BPs) in tourist accommodations/year	2088	Secondary (including construction):	45,60%
		Tertiary:	44,53%
Road distance from Urban Poles*1 (km)		Employment by sector*3	
Number of agricultural holdings	26003	Primary:	
Protected areas	Yes	Secondary:	

\*1 Nearest settlement with population > 100,000

\*2 share of total GVA/year.

\*3 share of total employment)/year

There is not a consolidated VC on this product.

### Key local assets



The unique relief, landscape, flora, and fauna in Maleshevija.

### **Challenges**

Production of Juniper essential oil is very variable and depends mainly on climate change. Chemicals used sometimes wrongly and needlessly. Currently, there is not a consolidated VC for this product.

### **Innovation**

Juniper essential oil is used in different final innovative products with high values.

## Honey in Maleshevija

High quality products, which are produced in a very cleaned environment, such as Maleshevija mountains.

Maleshevski mountains are in the eastern part of the Republic of North Macedonia. They cover the municipalities of Berovo and Pehchevo, characterized with the natural and cultural wealth. Two rivers cross the region, Bregalnica and Strumica. Forests covers 52% of the Maleshevija region, while pastures around 20%.

### Reference mountain landscape statistics (A: Data from NUTS3 AT224)

Reference mountain chain		Mountain Meleshevija	
Reference mountain landscape		(LAU1)	
Size of the area (km <sup>2</sup> )	806	Average per capita income €/year	5056
Altimetry (m; min-max)	660– 1932	Total Gross Value Added (GVA) (€ million)/year	769
Population density (Inhabitants/km <sup>2</sup> )	49.3	GVA by sector*2	
Population changes in the last 10 years	-3%	Primary:	9,80%
Total bed places (BPs) in tourist accommodations/year	2088	Secondary (including construction):	45,60%
		Tertiary:	44,53%
Road distance from Urban Poles*1 (km)		Employment by sector*3	
Number of agricultural holdings	26003	Primary:	
Protected areas	Yes	Secondary:	

\*1 Nearest settlement with population > 100,000

\*2 share of total GVA/year.

\*3 share of total employment)/year

Key actors dealing with honey in Maleshevija and the key brands: a) Pcelarstvo Bobolibbksi b) Shumi Med c) Maleshevski Med d) Pcelarstvo Radinski. There is a big number of private individuals/families engaged in producing and selling honey, next to few businesses.

## Key local assets

The unique relief, landscape, flora, and fauna in Maleshevija. The traditional way of life and culture in the region.

### **Challenges**

Production of honey is very variable and depends mainly on climate change. Global climate change, environmental pollution, the decrease in natural lands under human pressure weaken the bees and make them more vulnerable to diseases. Chemicals used sometimes wrongly and needlessly, by farmers and beekeepers, excessive and unnecessary treatment of the hive/colony, are threatening the honey in Maleshevija mountain. Given that honey is a usual product, it is also present in other Member States.

### **Innovation**

Honey is used in different final innovative products (in different industries). Beyond the traditional usage of honey, nowadays it is used in different final products, such as in pharmacy, cosmetics, consumer goods etc. As an ingredient as well as for taste/ flavour.

## Mushrooms

Non-timber Forest Products (NTFP) have a tremendous potential to involve local collectors for establishing micro- enterprises through clear tenured rights, better collection methods, capacity development, infrastructure, and institutional support in near future. With these efforts there is a potential to create employment opportunity thereby, helping in decreasing poverty and increasing empowerment of, particularly women. The Maleshevski mountain offers very good condition for further development of NTFP in general, including mushrooms.

Maleshevski mountains are in the eastern part of the Republic of North Macedonia. They cover the municipalities of Berovo and Pehchevo, characterized with the natural and cultural wealth. Two rivers cross the region, Bregalnica and Strumica. Forests covers 52% of the Maleshevija region, while pastures around 20%.

Reference mountain landscape statistics  
(A: Data from NUTS3 AT224)

Reference mountain chain		Mountain Meleshevija	
Reference mountain landscape		(LAU1)	
Size of the area (km <sup>2</sup> )	806	Average per capita income €/year	5056
Altimetry (m; min-max)	660– 1932	Total Gross Value Added (GVA) (€ million)/year	769
Population density (Inhabitants/km <sup>2</sup> )	49.3	GVA by sector*2	
Population changes in the last 10 years	-3%	Primary:	9,80%
Total bed places (BPs) in tourist accommodations/year	2088	Secondary (including construction):	45,60%
		Tertiary:	44,53%
Road distance from Urban Poles*1 (km)		Employment by sector*3	
Number of agricultural holdings	26003	Primary:	
Protected areas	Yes	Secondary:	

\*1 Nearest settlement with population > 100,000

\*2 share of total GVA/year.

\*3 share of total employment)/year

Key actors dealing with NTFP (Mushrooms) in Maleshevija : a) Agro Maks b) Balivski c) Emilija Pehcheva d) Krstovski Gjorgji There is many private individuals/families leaving in the region of Maleshevija, who are engaged in producing and selling Mushrooms, next to few businesses.

### **Key local assets**

In the mountain of Maleshevo there are identified more than 300 herbs, among which, the most distinct are Mushrooms, Berries, Medicinal herbs, herbal tea, plums, etc.

### **Challenges**

Harvesting is often done in a non-sustainable manner, careless about the resource, one due to the lack of training, and second due to the competition among harvesters to get quantity over quality. Buyout values quantity and rarely quality. Buyout is often done via informal (illegal) buyout channels; thus, it involves several middlemen. The buyout prices are generally low. The stakeholders are disorganized, though some efforts of organization exist. This VC is also present in the Member States.

### **Innovation**

The usage of new and high technology for processing this product. Mushrooms are natural, healthy, and wild products with big potential in the Meleshevski mountains. This activity is contributing thus to rural families for income generation. who are involved in such activities?

## Berries

Berries, as a NTFP product, have a big potential in the region of Maleshevija. This product has a good potential to involve local collectors through clear tenured rights, better collection methods, capacity development, infrastructure, and institutional support in near future. The Maleshevski mountain offers very good condition for further development of berries, including Jams and juices produced from different types of berries (wild strawberry; blue berry; red raspberry; black berry).

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Reference mountain landscape statistics  
(A: Data from NUTS3 AT224)

Reference mountain chain	Mountain Meleshevija		
Reference mountain landscape	(LAU1)		
Size of the area (km <sup>2</sup> )	806	Average per capita income €/year	5056
Altimetry (m; min-max)	660– 1932	Total Gross Value Added (GVA) (€ million)/year	769
Population density (Inhabitants/km <sup>2</sup> )	49.3	GVA by sector*2	
Population changes in the last 10 years	-3%	Primary:	9,80%
Total bed places (BPs) in tourist accommodations/year	2088	Secondary (including construction):	45,60%
		Tertiary:	44,53%
Road distance from Urban Poles*1 (km)		Employment by sector*3	
Number of agricultural holdings	26003	Primary:	
Protected areas	Yes	Secondary:	

\*1 Nearest settlement with population > 100,000

\*2 share of total GVA/year.

\*3 share of total employment)/year

Key actors dealing with berries in Maleshevija: a) Agro Maks b) Balivski c) Emilija Pehcheva d) Krstovski Gjorgji. There are many private individuals/families leaving in the region of Maleshevija, who are engaged in producing and selling honey, next to few businesses.

### **Key local assets**

In the mountain of Maleshevo there are identified more than 300 medicine herbs and forest berries. A very big potential offers Maleshevski Mountain for collecting berries.

### **Challenges**

Harvesting is often done in a non-sustainable manner, careless about the resource, one due to the lack of training, and second due to the competition among harvesters to get quantity over quality. Buyout values quantity and rarely quality. Buyout is often done via informal (illegal) buyout channels; thus, it involves several middlemen. The buyout prices are generally low. The stakeholders are disorganized, though some efforts of organization exist. The VC is also present in the Member States.

### **Innovation**

The usage of new and high technology for processing this product. Berries are natural, healthy, and wild products with big potential in the Meleshevski mountains. Jams and juices are produced from different types of NTFP in the region of Maleshevija (wild strawberry; blue berry; red raspberry; black berry, plum's jams) contributing thus to rural families in that region, who are involved in such activities.



## Medicinal herbs

Most of the recorded plants are used in form of teas, and mainly for minor dysfunctions of the respiratory system, in a form of medicinal herbs. These herbs have a potential to involve local collectors, mainly individuals and families from the region of Maleshevija. With these efforts there is a potential to create employment opportunity thereby, helping in decreasing poverty and increasing empowerment of, particularly women. The Maleshevski mountain offers very good condition for further development of NTFP, including medicinal herbs.

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### Reference mountain landscape statistics (A: Data from NUTS3 AT224)

Reference mountain chain		Mountain Meleshevija	
Reference mountain landscape		(LAU1)	
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Total bed places (BPs) in tourist accommodations/year	2088	Secondary (including construction):	45,60%
		Tertiary:	44,53%
Road distance from Urban Poles*1 (km)		Employment by sector*3	
Number of agricultural holdings	26003	Primary:	
Protected areas	Yes	Secondary:	

\*1 Nearest settlement with population > 100,000

\*2 share of total GVA/year.

\*3 share of total employment)/year

Key actors dealing with NTFP in Maleshevija: a) Agro Maks b) Balivski c) Emilija Pehcheva d) Krstovski Gjorgji There are many private individuals/families leaving in the region of Maleshevija, who are engaged in collecting and selling this product.

### **Key local assets**

In the mountain of Maleshevo there are identified more than 300 medicine herbs and forest berries.

### **Challenges**

Harvesting is often done in a non-sustainable manner, careless about the resource, one due to the lack of training, and second due to the competition among harvesters to get quantity over quality. Buyout values quantity and rarely quality. It is raised concerns regarding the possibility of over exploitation of a few species due to collecting practices serving both local and outside (pharmaceutical) markets. The stakeholders are disorganized, though some efforts of organization exist. The VC is also present in the Member States.

### **Innovation**

The new processes and the technology applied for producing this product. Medicinal herbs, as a NTFP product, have a big potential in the region of Maleshevija. This product has a good potential to involve local collectors through clear tenured rights, better collection methods, capacity development, infrastructure, and institutional support in near future. The Maleshevski mountain offers very good condition for further development of berries.

## Tea herbs

Most of the recorded plants are used in form of teas, and mainly for minor dysfunctions of the respiratory system, in a form of medicinal herbs. These herbs have a potential to involve local collectors, mainly individuals and families from the region of Maleshevija. With these efforts there is a potential to create employment opportunity thereby, helping in decreasing poverty and increasing women empowerment. The Maleshevski mountain offers very good condition for further development of tea herbs.

Maleshevski mountains are located in the eastern part of the Republic of North Macedonia. They cover the municipalities of Berovo and Pehchevo, characterized with the natural and cultural wealth. Two rivers cross the region, Bregalnica and Strumica. Forests covers 52% of the Maleshevija region, while pastures around 20%.

### Reference mountain landscape statistics (A: Data from NUTS3 AT224)

Reference mountain chain		Mountain Meleshevija	
Reference mountain landscape		(LAU1)	
Size of the area (km <sup>2</sup> )	806	Average per capita income €/year	5056
Altimetry (m; min-max)	660– 1932	Total Gross Value Added (GVA) (€ million)/year	769
Population density (Inhabitants/km <sup>2</sup> )	49.3	GVA by sector*2	
Population changes in the last 10 years	-3%	Primary:	9,80%
Total bed places (BPs) in tourist accommodations/year	2088	Secondary (including construction):	45,60%
		Tertiary:	44,53%
Road distance from Urban Poles*1 (km)		Employment by sector*3	
Number of agricultural holdings	26003	Primary:	
Protected areas	Yes	Secondary:	

\*1 Nearest settlement with population > 100,000

\*2 share of total GVA/year.

\*3 share of total employment)/year

Key actors dealing with NTFP in Maleshevija: a) Agro Maks b) Balivski c) Emilija Pehcheva d) Krstovski Gjorgji. There are many private individuals/families leaving in the region of Maleshevija, who are engaged in collecting and selling this product.

### **Key local assets**

In the mountain of Maleshevo there are identified different tea herbs, with a good potential for further development.

### **Challenges**

Harvesting is often done in a non-sustainable manner, careless about the resource, one due to the lack of training, and second due to the competition among harvesters to get quantity over quality. Buyout values quantity and rarely quality. A significant portion of study participants raised concerns regarding the possibility of over exploitation of a few species due to collecting practices serving both local and outside (pharmaceutical) markets. The stakeholders are disorganized, though some efforts of organization exist. The VC is also present in the Member States.

### **Innovation**

The new processes and the technology applied for producing this product. Tea herbs, as NTFP, are natural, healthy, and wild products with good potential in the Meleshevski mountains. Rural families in that region, are involved in such activities.

## Plumbs

Plumbs as NTFP have a tremendous potential to involve local collectors. With these efforts there is a potential to create employment opportunity thereby, helping in decreasing poverty and increasing empowerment of, particularly women. The Maleshevski mountain offers very good condition for further development of NTFP, including Jams and juices produced from different types of plumbs.

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Reference mountain landscape statistics  
(A: Data from NUTS3 AT224)

Reference mountain chain	Mountain Meleshevija		
Reference mountain landscape	(LAU1)		
Size of the area (km <sup>2</sup> )	806	Average per capita income €/year	5056
Altimetry (m; min-max)	660– 1932	Total Gross Value Added (GVA) (€ million)/year	769
Population density (Inhabitants/km <sup>2</sup> )	49.3	GVA by sector*2	
Population changes in the last 10 years	-3%	Primary:	9,80%
Total bed places (BPs) in tourist accommodations/year	2088	Secondary (including construction):	45,60%
		Tertiary:	44,53%
Road distance from Urban Poles*1 (km)		Employment by sector*3	
Number of agricultural holdings	26003	Primary:	
Protected areas	Yes	Secondary:	

\*1 Nearest settlement with population > 100,000

\*2 share of total GVA/year.

\*3 share of total employment)/year

Key actors dealing with NTFP in Maleshevija: a) Agro Maks b) Balivski c) Emilija Pehcheva d) Krstovski Gjorgji There are many private individuals/families leaving in the region of Maleshevija, who are engaged in collecting and selling this product.

### **Key local assets**

In the mountain of Maleshevo there are good potentials for plumbs, with a good potential for further development. The environment, climate, and natural conditions are in the favour of this product.

### **Challenges**

Harvesting is often done in a non-sustainable manner, careless about the resource, one due to the lack of training, and second due to the competition among harvesters to get quantity over quality. Buyout values quantity and rarely quality. Buyout is often done via informal (illegal) buyout channels; thus, it involves several middlemen. The buyout prices are generally low. The stakeholders are disorganized, though some efforts of organization exist. The VC is also present in the Member States.

### **Innovation**

The new processes and the technology applied for producing this product. NTFP are natural, healthy, and wild products with big potential in the Meleshevski mountains. Jams and juices are produced from plumbs, contributing economically thus to rural families in that region, who are involved in such activities.

## Potatoes

Potatoes are with a high quality, due to natural factors, which are produced in a very cleaned environment, such as Maleshevija. Potatoes have a good identity from the region of Maleshevija and are sold across the country.

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### Reference mountain landscape statistics (A: Data from NUTS3 AT224)

Reference mountain chain		Mountain Meleshevija	
Reference mountain landscape		(LAU1)	
Size of the area (km <sup>2</sup> )	806	Average per capita income €/year	5056
Altimetry (m; min-max)	660– 1932	Total Gross Value Added (GVA) (€ million)/year	769
Population density (Inhabitants/km <sup>2</sup> )	49.3	GVA by sector*2	
Population changes in the last 10 years	-3%	Primary:	9,80%
Total bed places (BPs) in tourist accommodations/year	2088	Secondary (including construction):	45,60%
		Tertiary:	44,53%
Road distance from Urban Poles*1 (km)		Employment by sector*3	
Number of agricultural holdings	26003	Primary:	
Protected areas	Yes	Secondary:	

\*1 Nearest settlement with population > 100,000

\*2 share of total GVA/year.

\*3 share of total employment)/year

Mainly private individuals and families dealing with the agriculture.

## Key local assets



The unique soil, relief. The traditional way of huge experience in the region in producing potatoes.

### **Challenges**

On few occasions, the lack of consolidated VC. Potatoes are sold directly to customers or retailed on the green markets. There are no indications for the origin of the product and clear identity/brand name.

### **Innovation**

Potatoes are part of many other products in the catering industry. The new processes and the technology applied for producing this product. The high-quality product, due to natural factors. Well recognized across the country the Maleshevski potatoes.



## Cheese

Agriculture is one of the basic economic activities in the region of Maleshevija. Sheep breeding is a traditional activity of Maleshevija, while Berovo cheese is well recognized as a quality product across the country and even beyond.

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### Reference mountain landscape statistics (A: Data from NUTS3 AT224)

Reference mountain chain		Mountain Meleshevija	
Reference mountain landscape		(LAU1)	
Size of the area (km <sup>2</sup> )	806	Average per capita income €/year	5056
Altimetry (m; min-max)	660– 1932	Total Gross Value Added (GVA) (€ million)/year	769
Population density (Inhabitants/km <sup>2</sup> )	49.3	GVA by sector*2	
Population changes in the last 10 years	-3%	Primary:	9,80%
Total bed places (BPs) in tourist accommodations/year	2088	Secondary (including construction):	45,60%
		Tertiary:	44,53%
Road distance from Urban Poles*1 (km)		Employment by sector*3	
Number of agricultural holdings	26003	Primary:	
Protected areas	Yes	Secondary:	

\*1 Nearest settlement with population > 100,000

\*2 share of total GVA/year.

\*3 share of total employment)/year

Key actors dealing with cheese in Maleshevija and the kew brands: a) Maleshevo milk Berovo b) Mlekara Malesh c) Mlekara Natasha d) Farma Pacarski. There are meny individual families involved in producing sheep's cheese.

### **Key local assets**

Pasture; Cleaned environment; A good climate for sheep breeding; Water and rivers in the region; Identity of the product (cheese)

### **Challenges**

The sheep number is rapidly decreasing, and this is a big issue in the region. There are less interested people to deal with the sheep, and very hardly to find human capacities in the industry, including shepherds. In some cases, the market is not well consolidated, and the cheese might be sold on the grey market. It is also present in other Member States.

### **Innovation**

Cheese is used widely in other final products, mainly in catering. The new processes and the technology applied for producing this product. There is further potential for development of the VC, mainly from the perspective of the market chain. Cheese is with a high quality, due to the cleaned environment in Maleshevija mountains. Maleshevski cheese is having a very good identity, and it is sold across the country. Very high demand for this product.

## Round wood for processing

The forests in the Maleshevija Mountain take place with around 52%. Mostly there are pine forest (f. Pinacae), oak forest (f. Quercacae) and the beech forest (f. Fugacae). The wood in all matters, is with a bog potential of this region. Wood, in all its forms is with high potential for development. Distributed to processing mills for further transformation.

Maleshevski mountains are in the eastern part of the Republic of North Macedonia. They cover the municipalities of Berovo and Pehchevo, characterized with the natural and cultural wealth. Two rivers cross the region, Bregalnica and Strumica. Forests covers 52% of the Maleshevija region, while pastures around 20%.

### Reference mountain landscape statistics (A: Data from NUTS3 AT224)

Reference mountain chain		Mountain Meleshevija	
Reference mountain landscape		(LAU1)	
Size of the area (km <sup>2</sup> )	806	Average per capita income €/year	5056
Altimetry (m; min-max)	660– 1932	Total Gross Value Added (GVA) (€ million)/year	769
Population density (Inhabitants/km <sup>2</sup> )	49.3	GVA by sector*2	
Population changes in the last 10 years	-3%	Primary:	9,80%
Total bed places (BPs) in tourist accommodations/year	2088	Secondary (including construction):	45,60%
		Tertiary:	44,53%
Road distance from Urban Poles*1 (km)		Employment by sector*3	
Number of agricultural holdings	26003	Primary:	
Protected areas	Yes	Secondary:	

\*1 Nearest settlement with population > 100,000

\*2 share of total GVA/year.

\*3 share of total employment)/year



Mainly the state-owned company (Makedonski Shumi) deals with the forestry and wood in the region of Maleshevija. Few private initiatives, from private forestry owners (very few) are also arising.

### **Key local assets**

The uniqueness climate and natural resources in the region for wood development.

### **Challenges**

Most of the forest in Maleshevija, is state owned, and there is a Public Entity dealing with the wood and forest in general. The main challenge is also the illegitimate deforestation and the grey market.

### **Innovation**

The new processes and the technology applied for producing this product. The usage for heating as an alternative way of energy. Wood is one of the main products in the Maleshevija mountains, which is used for different reasons, in different industries across the country. Wood is one of the main products in the Maleshevija mountains, which is used for different reasons, in different industries across the country.

## Firewood for households

The forests in the Maleshevija Mountain take place with around 52%. Mostly there are pine forest (f. Pinacae), oak forest (f. Quercacae) and the beech forest (f. Fugacae). Around the 62 percent of the total number of Macedonian households use firewood as a primary source of energy, 29 percent use electricity, and only eight percent are connected to central heating, according to recent research.

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		Tertiary:	44,53%
Road distance from Urban Poles*1 (km)		Employment by sector*3	
Number of agricultural holdings	26003	Primary:	
Protected areas	Yes	Secondary:	

\*1 Nearest settlement with population > 100,000

\*2 share of total GVA/year.

\*3 share of total employment)/year

Heating with firewood is still the most economical, and that electricity is the most environmentally friendly options in all matters, is with a bog potential of this region. Wood, in all its forms is with high potential for development. Distributed to processing mills for further transformation. Mainly the state-owned company (Makedonski Shumi) deals with the forestry and wood in the region of Maleshevija.

### **Key local assets**

The uniqueness climate and natural resources in the region for wood development.

### **Challenges**

Most of the forest in Maleshevija, is state owned, and there is a Public Entity dealing with the wood and forest in general. The main challenge is also the illegitimate deforestation. Operational capacities to fight against forestry crimes with an integrated approach ia missing, as well as the raising awareness of new technologies and tools for detecting forestry crimes.

### **Innovation**

Using technology (high tech) for all involved stakeholders to improve the detection of forest crimes through remote monitoring and data consolidation; modelling and mapping the risk of forestry crimes in the region. Wood is one of the main products in the Maleshevija mountains, which is used for different reasons, in different industries across the country.

## Lamb meat

Sheep breeding is a traditional activity of Maleshevija, while for lamb meat is well recognized as a quality product across the country and even beyond. The largest part of the lamb meat produced in the Republic of Macedonia is exported to Italy, Greece, Croatia, Serbia, Montenegro and Bosnia and Herzegovina.

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\*1 Nearest settlement with population > 100,000

\*2 share of total GVA/year.

\*3 share of total employment)/year

In the region, mainly the private owners who are breeding sheep, they do sell the lambs in a collective manner.

### **Key local assets**

Pasture; Cleaned environment; A good climate for sheep breeding; Water and rivers in the region; Identity of the product.

### **Challenges**

The sheep number is rapidly decreasing, and this is a big issue in the region. There are less interested people to deal with the sheep, and very hardly to find human capacities in the industry, including shepherds. In some cases, the market is not well consolidated, and the cheese might be sold on the grey market. The most of sheep farms are in the Eastern and North-eastern region, sheep breeding in these regions is characterized with presence of sheep flocks with less than 50 heads per flock.

### **Innovation**

The new technology used in the processing the lamb meat. The technology also used in the distribution channels coverage for the foreign countries/markets. Farming is among basic economic activity for vulnerable families in the region of Maleshevija. Because of the specific conditions and relief of Maleshevija who is characterized by mountains offering very cleaned environment, sheep breeding. Given that the lamb meat of Macedonia is well recognized also in foreign markets, it is a good opportunity for analysing the details of this VC.



## Hunting

Hunting and hunting grounds in North Macedonia are characterized by rich vegetation and wildlife that provide good conditions, as well as natural shelters. All the hunting grounds have clean water that enable survival of the wildlife and vegetation. In the hunting area of Maleshevski mountains, there is Wild boar; Fallow deer; Red deer; Wild goat; Rock partridge etc.

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Mainly the state-owned company (Makedonski Shumi) deals with the forestry and wood in the region of Maleshevija. Macedonia 's hunting grounds are leased to 63 hunting associations throughout the country, which protect the game and are intended for local and foreign hunters' recreational hunting. Annual membership fee is 30-40 euros.

### **Key local assets**

The uniqueness climate and natural resources in the region for hunting development. According to a Macedonian Government ruling based on Article 30, Paragraph 1 of the Hunting Law, there is a total of 253 hunting grounds, 108 of which for large game and 145 for small game.

### **Challenges**

It is not a big Value Chain. It is a hunting association in the region of Maleshevija, which requires membership for interested hunters in the region. The season is limited to only few months during the winter period. Few stakeholders involved in the Value Chain.

### **Innovation**

Given the natural opportunities, Hunting and hunting sports might be an interesting value chain the future. It might be closely linked with tourism, and boost income hunters from abroad.

## Rural tourism in Maleshevija - Mountain related tourism

Maleshevija is part of the National strategy for tourism development of North Macedonia. It has a big potential for alternative and rural tourism. Has a clear identity and very good natural resources for rural tourism development.

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Key actors dealing with tourism in Maleshevija: a) Hotel Manastir b) Vila Marija c) Vila Lina d) Aurora hotel. There are many families offering private accommodation. This VC is also linked to

the natural products produced in the reference region, and it represents a very big opportunity for further development.

### **Key local assets**

The clean air and the good climate of Maleshevija. The low density of the population in the region. The natural beauties (lakes, waterfalls, rivers, etc.). The hospitality of the people in the area. The private accommodation in addition to the hotels in the region. Good potentials and infrastructure for further tourism development.

### **Challenges**

Many villages have suffered from extreme levels of emigration, often by the youngest and most active and reproductive groups, as well as females. Communication/language barriers with foreign tourists. Accommodation capacities and standardization of accommodation not well structured. All are challenges for the VC. This value chains, since it includes a wider range of people in the chain (private accommodation), many families offer private accommodation for potential tourists. It links together the catering value chain (mainly products from the region), and the diverse selling points through available tourist capacities in the region.

### **Innovation**

The high technology and intensive communication have made the world more unique, and Maleshevija more accessible. Private accommodations in the region are increasing and many families are linked to this VC. There are hiking trails that are made for recreation, hiking, mountain biking, and enjoying the clean mountain air. The trails are part of the Balkan Mountaineering Transversal and are published in the mountain trials maps. There are numerous rapids, small cascades, and waterfalls (up to 10 m high) along the mountain rivers in the region.

## Forestry seed and seedlings

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Mainly the state-owned company (Makedonski Shumi) deals with the forestry and wood in the region of Maleshevija.



### **Key local assets**

The uniqueness climate and natural resources in the region for wood development.

### **Challenges**

Most of the forest in Maleshevija, is state owned, and there is a Public Entity dealing with the wood and forest in general. The main challenge is also the illegitimate deforestation. Is not paid much attention to quality seeds and seedlings. The monitoring of seedlings is also lacking.

### **Innovation**

Different technological approaches in maintaining seeds and planting seedlings. GIS application on thickness of the forestry/oaks. Research and development on oaks to be grown and properly used in the region of Maleshevija. Wood is one of the main products in the Maleshevija mountains, which is used for different reasons, in different industries across the country.

## Kozhuvchanka - Drinking water produced from a spring in a Kozhuv Mountain

The Vardar planning region has excellent climatic conditions for the development of commercial water. Water resources of the region are the lower reaches of the rivers Vardar, Crni Drim, Bregalnica, Babuna, Topolka and Otovica, which give the opportunity to build 6 hydro reservoirs, of which three have been raised so far, Tikvesh, Lices and Mladost.

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Road distance from Urban Poles*1 (km)		Employment by sector*3	
Number of agricultural holdings	26003	Primary:	
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\*2 share of total GVA/year.

\*3 share of total employment)/year



The main actors in the bottled water in the region are Kozuvcanka, Pelisterka, Maya etc. They are private companies but associated in a National Chamber of Commerce.

### **Key local assets**

The uniqueness climate and natural resources in the region for producing cleaned and mineral water.

### **Challenges**

Kozuvcanka is a private commercial company, producing mineral water. The region of Maleshevski mountain is outside of the Vardarski region, where the brand Kozuvcanka is produced. A very limited Value Chain. The involvement and benefits from this Value Chain have not direct linkages with the population who are living in the region of Maleshevija (the reference region of the project).

### **Innovation**

The used technology on production and distribution. Kozuvcanka is a private commercial company in the region of Kavadarci (Tikvesh). The source of the mineral water is located at an altitude of 900 meters, and the springs come from a depth of 85 meters, carrying with it a wealth of minerals.



## Oriental tobacco

Republic of Macedonia is distinguished by tobacco production which consists only of oriental types. In Macedonia there were also big oscillations in tobacco production, depending on the state policy. In fact, this production was going to collapse, but with the subsidizing policy of the state it has been re-established, with good opportunities even to increase. This is especially important because there is no alternative crop that would absorb so much labour force and would have such an economic impact as tobacco.

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		Tertiary:	44,53%
Road distance from Urban Poles*1 (km)		Employment by sector*3	
Number of agricultural holdings	26003	Primary:	
Protected areas	Yes	Secondary:	

\*1 Nearest settlement with population > 100,000

\*2 share of total GVA/year.

\*3 share of total employment)/year

The process goes from tobacco seeds, planting seedlings, harvesting, selling the raw material, processing, and selling the final tobacco product to the end users. During the growing process of tobacco, private families are engaged mainly in their agricultural land to produce the raw tobacco. Jaka Prilep is one of the well-known companies which deals with the processing of the tobacco.

### **Key local assets**

The uniqueness climate and natural resources in the region for tobacco development.

### **Challenges**

Production of oriental tobacco was reduced for over four times. The reason for this decline is due to the shift from tobacco toward growing other agricultural products with more value added. The other challenge is also the less people smoking tobacco, and this is a global trend. The labour-intensive need for growing and producing tobacco is also a challenge in the region. The reference region has not solid soil potential for producing tobacco.

### **Innovation**

Annually about 30,000 families or approximately 100,000 people are involved in tobacco production. Tobacco is important for the Macedonian agriculture because it uses relatively poorer soils, for which no one-year culture could contribute so much.

## Wine - Vranec

The Vardar planning region has excellent climatic conditions for the development of agriculture and especially viticulture. Agricultural land covers an area of 145,699 ha (12 % of the total agricultural area in the Republic of North Macedonia), of which arable land is 70,006 ha and pastures 75,666 ha. In this region, there are about 45% of the total vineyards in the country.

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\*1 Nearest settlement with population > 100,000

\*2 share of total GVA/year.

\*3 share of total employment)/year

The top 15 wineries are members of the body “Wines of Macedonia” and they work together to represent the country’s wines and wine regions in expert markets. The same body participates in



creating wine law and appellations to improve the quality, together with the Ministry of Agriculture of North Macedonia.

### **Key local assets**

The uniqueness climate and natural resources in the region for grape and winery production.

### **Challenges**

Most winery yards and wineries are not in the region of Maleshevski mountain, though close to. The involvement and benefits from this Value Chain have not direct linkages with the population who are living in the region of Maleshevija (the reference region of the project).

### **Innovation**

The used technology on production and distribution. The winery represents a big development potential for the country and the national economy. There are 74 registered wineries across the country, and all together produce over 90 million liters of wine annually. In general, Macedonian wineries are export-oriented (around 85% of production is exported), and it contributes to the image of the country. The local production of wine, is covering very well the domestic market, leaving a very small space for the imported wines.

## Bee families in North Macedonia

Because of the geographical location and the relief of Macedonia, the climate in the country is partly Mediterranean and Continental, and on the mountains with peaks over 2000 meters the climate is Mountainous, and it offers a very good condition for the beekeepers across the country. Production of bee genetic material from Macedonian bee (*Apis mellifera macedonica*) is well recognized. The bees from the region are producing high quality honey, with a clear identity of the cleaned environment, such as Maleshevija.

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Key actors dealing with honey in Maleshevija and the key brands: a) Pcelarstvo Bobolibbksi b) Shumi Med c) Maleshevski Med d) Pcelarstvo Radinski. At national level there are 2 national federations that are members of a larger umbrella organization called the Federation of Farmers of Republic of Macedonia that unites all farmers in the country. Organic beekeepers are each individually involved through the local associations of producers into the Macedonian Organic Producers Federation which represents exclusively the interests of organic producers.

### **Key local assets**

The unique relief, landscape, flora, and fauna. The traditional way of life and culture in the region.

### **Challenges**

Global climate change, environmental pollution, the decrease in natural lands under human pressure weaken the bees and make them more vulnerable to diseases. Chemicals used sometimes wrongly and needlessly, by farmers and beekeepers, excessive and unnecessary treatment of the hive/colony, are threatening the honey in Maleshevija mountain. Given that honey is a usual product, it is also present in other Member States.

### **Innovation**

Honey is used in different final innovative products. Beyond the traditional usage of honey, nowadays it is used in different final products, such as in pharmacy, cosmetics, consumer goods etc. As an ingredient as well as for taste/ flavour. Many families from Maleshevija are engaged with the bee keeping, while the region offers very good conditions for that. It is also important to mention that, due to the highly developed biodiversity of honey flora, 98% of the honey in the country is polyfloral. Some recent studies have shown that only 2% of the honey is nonfloral and this honey is produced from white acacia (*Ribinia pseudoacacia*).

## Propolis (bee glue)

Because of the geographical location and the relief of Macedonia, the climate in the country is partly Mediterranean and Continental, and on the mountains with peaks over 2000 meters the climate is mountainous, and it offers a very good condition for the beekeepers across the country. Production of bee genetic material from Macedonian bee (*Apis mellifera macedonica*). High quality products, which are produced in a very cleaned environment, such as Maleshevija. The interest on this product deals with the Herbal propolis (30% propolis in alcohol with extracts of mountain herbs).

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Protected areas	Yes	Secondary:	

\*1 Nearest settlement with population > 100,000

\*2 share of total GVA/year.

\*3 share of total employment)/year

Key actors dealing with propolis in Maleshevija and the key brands: a) Pcelarstvo Bobolibbksi b) Shumi Med c) Maleshevski Med d) Pcelarstvo Radinski. At national level there are 2 national federations that are members of a larger umbrella organization called the Federation of Farmers of Republic of Macedonia that unites all farmers in the country. Organic beekeepers are each individually involved through the local associations of producers into the Macedonian Organic Producers Federation which represents exclusively the interests of organic producers.

### **Key local assets**

The unique relief, landscape, flora, and fauna. The traditional way of life and culture in the region.

### **Challenges**

Global climate change, environmental pollution, the decrease in natural lands under human pressure weaken the bees and make them more vulnerable to diseases. Chemicals used sometimes wrongly and needlessly, by farmers and beekeepers, excessive and unnecessary treatment of the hive/colony, are threatening the honey across the country, including Maleshevija-Osogovski mountain. Given that propolis is a usual product, it is also present in other Member States.

### **Innovation**

Propolis is used in different final innovative products. Beyond the traditional usage propolis, nowadays it is used in different final products, such as in pharmacy, cosmetics, consumer goods etc. Current applications of propolis include formulations for cold syndrome (upper respiratory tract infections, common cold, and flu-like infections), as well as dermatological preparations useful in wound healing, treatment of burns, acne, herpes simplex and genitals, and neurodermatitis.



## Honey, fruits - honey with dried fruits of plum, apricot, and fig

Because of the geographical location and the relief of Macedonia, the climate in the country is partly Mediterranean and Continental, and on the mountains with peaks over 2000 meters the climate is mountainous, and it offers a very good condition for the honey and the fruits. Production of bee genetic material from Macedonian bee (*Apis mellifera macedonica*).

Maleshevski mountains are in the eastern part of the Republic of North Macedonia. They cover the municipalities of Berovo and Pehchevo, characterized with the natural and cultural wealth. Two rivers cross the region, Bregalnica and Strumica. Forests cover 52% of the Malesheviija region, while pastures around 20%.

### Reference mountain landscape statistics (A: Data from NUTS3 AT224)

Reference mountain chain		Mountain Meleshevija	
Reference mountain landscape		(LAU1)	
Size of the area (km <sup>2</sup> )	806	Average per capita income €/year	5056
Altimetry (m; min-max)	660– 1932	Total Gross Value Added (GVA) (€ million)/year	769
Population density (Inhabitants/km <sup>2</sup> )	49.3	GVA by sector*2	
Population changes in the last 10 years	-3%	Primary:	9,80%
Total bed places (BPs) in tourist accommodations/year	2088	Secondary (including construction):	45,60%
		Tertiary:	44,53%
Road distance from Urban Poles*1 (km)		Employment by sector*3	
Number of agricultural holdings	26003	Primary:	
Protected areas	Yes	Secondary:	

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High quality products, which are produced in a very cleaned environment, such as Malesheviija. Fruits dried and roasted, especially with added honey, nuts and dried fruits spiced with vanilla

and cinnamon are delicious. This way is substituting the desert. When honey is used with the fruits. Key actors dealing with honey and fruits in Maleshevija and the kew brands: a) Pcelarstvo Bobolibbksi b) Shumi Med c) Maleshevski Med d) Pcelarstvo Radinski. At national level there are 2 national federations that are members of a larger umbrella organization called the Federation of Farmers of Republic of Macedonia that unites all farmers in the country. Organic beekeepers are each individually involved through the local associations of producers into the Macedonian Organic Producers Federation which represents exclusively the interests of organic producers.

### **Key local assets**

The unique relief, landscape, flora, and fauna. The traditional way of life and culture in the region.

### **Challenges**

Global climate change, environmental pollution, the decrease in natural lands under human pressure weaken the bees and make them more vulnerable to diseases. Chemicals used sometimes wrongly and needlessly, by farmers and beekeepers, excessive and unnecessary treatment of the hive/colony, are threatening the honey across the country, including Maleshevija-Osogovski mountain. Given that honey with dried fruits is a usual product, it is also present in other Member States.

### **Innovation**

Honey is used in different final innovative products. Honey with dried fruits of plum, apricot, and fig. Beyond the traditional usage of honey, nowadays it is used in different final products, in the catering industry.

## Royal Jelly - Mixture of royal jelly, bee glue, pollen, and honey

Because of the geographical location and the relief of Macedonia, the climate in the country is partly Mediterranean and Continental, and on the mountains with peaks over 2000 meters the climate is mountainous, and it offers a very good condition for the honey and honey products. Royal jelly, a white and viscous jelly-like substance, is a form of hypopharyngeal and mandibular gland secretion from the worker bees. It is also known as a “superfood” that is solely consumed by the queen bee.

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### **Innovation**

Royal Jelly is used in different final innovative products. Recent years have seen the fast application of bee products in both traditional and modern medicine. Currently, many studies are targeted toward investigating directed health benefits and pharmacological properties of bee products due to their efficacies including the Royal jelly. Royal jelly consists of water (50%–60%), proteins (18%), carbohydrates (15%), lipids (3%–6%), mineral salts (1.5%), and vitamins [16]. Based on modern spectrometric analysis, approximately 185 organic compounds have been detected in royal jelly. Royalactin is the most important protein present in royal jelly. Royal jelly is widely used as a dietary nutritional complex to help combat various chronic health conditions. Furthermore, it is one of the profitable remedies for human beings in both traditional and modern medicine. Many pharmacological activities such as antibacterial, antitumor, antiallergy, anti-inflammatory, and immunomodulatory effects have also been attributed to it.

## Pinecones - Dry pinecones with purpose of decoration.

The forests in the Maleshevija Mountain take place with around 52%. Mostly there are pine forest (f. Pinacae), oak forest (f. Quercacae) and the beech forest (f. Fugacae). The wood in all matters, is with a bog potential of this region. Wood, in all its forms is with high potential for development. Dry pinecones with purpose of decoration are a small value of the forestry in the region of Maleshevija.

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Mainly the state-owned company (Makedonski Shumi) deals with the forestry and wood in the region of Maleshevija.

### **Key local assets**

The uniqueness climate and natural resources in the region for wood development.

### **Challenges**

Most of the forest in Maleshevija, is state owned, and there is a Public Entity dealing with the wood and forest in general. The main challenge is also the illegitimate deforestation. Is not paid much attention to quality seeds and seedlings. This is a very small VC, without consolidated actors, activities, and markets.

### **Innovation**

Different technological approaches in maintaining. GIS application on thickness of the forestry/oaks. Research and development on oaks to be grown and properly used in the region of Maleshevija. Wood is one of the main products in the Maleshevija mountains, which is used for different reasons, in different industries across the country.

## 16. Switzerland

### Traditional alpine dairy products

The traditional alpine dairy products are the most common and most traditional VC in the area, linked to culture and identity of area, high-quality sought-after products, production process ideally suited for area, some labels (e.g., organic, Pro Montagna) in place, alpine livestock maintains landscape.

Grisons is the only tri-lingual canton of Switzerland and economically, culturally, and politically very diverse. It is the only place where the Romansh language is spoken. Grisons has more than 900 mountain peaks and 150 valleys, it has typical mountain area and highland landscapes. 41% of the people here live above 1000 masl. The majority is employed in the service sector, tourism is a pillar of the canton's economy. Agriculturally, the farmers cultivate land stretching across the entire Alpine arc, from the grapes and chestnuts in the south to the highest alps and steep slopes down to the Rhine Walley, where all crops grow.

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Altimetry (m; min-max)	253-4,048	Total Gross Value Added (GVA) (€ million)/year	12,500
Population density (Inhabitants/km <sup>2</sup> )	28	GVA by sector <sup>*2</sup>	
Population changes in the last 10 years	-	Primary:	0.8%
Total bed places (BPs) in tourist accommodations/year:	-	Secondary:	22.4%
		Tertiary:	72%
Road distance from Urban Poles <sup>*1</sup> (km)	100	Employment by sector <sup>*3</sup>	
Number of agricultural holdings	2,445	Primary:	6.4%
Protected areas	Yes	Secondary:	30.8%
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VC present in all Swiss alps, several labels in place (organic, "from alps", national park labels etc.), very traditional, part of Swiss identity.

#### Key local assets

Natural: only little outside input needed, mainly grassland agriculture, social: infrastructure in place for hundreds of years, important social community interactions and shared cultivation of land, cultural: many traditions linked to alpine pasturing practices

#### Challenge

In dry summers there is not enough hay to feed animals through winter, very labour intensive, revenue not very big.

#### Innovation

This VC is a traditional one, where no innovations have been identified.



## Traditional alpine meat (and other animal) products

One of the most common and most traditional VC in the area, linked to culture and identity of area, high-quality sought-after products, production process ideally suited for area, some labels (e.g., organic, Pro Montagna) in place, alpine livestock maintains landscape.

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### Challenge

In dry summers there is not enough hay to feed animals through winter, very labour intensive, revenue not very big.

### Innovation

This VC is a traditional one, where no innovations have been identified.

## Traditional alpine fruit products

Very traditional, done like this for many years, part of local identity, basis for many traditional products, ideally suited to local landscape.

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## Key local assets

Key local assets are:

- natural resources: some places ideally suited for fruit trees with pastures underneath, other areas wild berries and fruits grow naturally and can be collected.
- social resources: tradition, way of working together to preserve fruit, cultural: many traditional products require fruits.

### Challenge

climate change conditions will make it both more difficult to grow some varieties and easier to grow others, very labour intensive (steep) and not very lucrative (needs passion)

### Innovation

This VC is a traditional one, where no innovations have been identified.

## Wine

Typical VC for mountain area, but not exclusively, however, wine from mountains often has better reputation as it gets more sun etc., different labels in use.

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## Key local assets



As with all traditional Swiss VCs it is an important part of local identity, bringing people together in the production process and having many cultural activities linked to it. also ideally suited to steep sunny landscape

### Challenge

Wine plants are threatened by dryness, lack of sun, and mainly predators like insects and fungus.

### Innovation

This VC is a traditional one, where no innovations have been identified.

## Traditional alpine herbs

This is a very traditional VC, done like this for many years, part of local identity, basis for many traditional products, ideally suited to local landscape.

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## Key local assets

Key local assets for this VC are:

- Natural resources: wild and cultivated herbs (in gardens)



- Social resources: the gathering is a social activity.

### Challenge

This VC is very labour intensive, low revenue and in parts threatened by warming climate with less water availability.

### Innovation

This VC is a traditional one, where no innovations have been identified.



## Traditional alpine vegetable products

This VC is mostly done in private gardens and smaller scale, some labels in place for very special varieties, important part of local cultural foods.

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## Key local assets

The products of this VC are important ingredient for local food although vegetable production is not very suitable for the local landscape and climatic conditions.



### Challenge

Vegetables are not the easiest thing to grow in the alps, changing climate will allow for different varieties.

### Innovation

This VC is a traditional one, where no innovations have been identified.

## Game animals

very traditional, part of local identity, symbolism of alpine game animals, products often consumed by hunters and close family but when sold it is high reputation, high value products, sought after "Swiss identity" products.

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## Key local assets



Hunting mountain animals is a highly regarded skill, hunting in the mountains is very regulated by local and state authorities, linked to prestige, social and cultural traditions linked to the practice, very time limited activity in the year and then many traditions linked to it.

### Challenge

Some animals are getting fewer while others are getting more, disputes between people living in the alps and hunting in a sustainable way and "greeny" people from the lowlands who see hunting traditional symbolic animals as barbaric (moral of hunting)

### Innovation

This VC is a traditional one, where no innovations have been identified.

## Wood

The collection and production of wood products has a long tradition, mountain forests need special care.

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## Key local assets

The collection of wood and the production of wood products has a long tradition in the Swiss Alps. The mountain forest needs special care and well-trained foresters who must use e.g., helicopters.



Traditional products are e.g., firewood, furniture, buildings, bridges, and cosmetics made of fragrant Swiss stone pine or cedar wood or even the well-known alphorn instruments.

### Challenge

water scarcity due to climate change as well as introduction of new predator insects.

### Innovation

This VC is a traditional one, where no innovations have been identified.

## "Bergkartoffeln" gourmet potatoes

Farmer led initiative, trying to reach gourmet market, no labels other than "old varieites", this project is already being copied elsewhere.

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## Key local assets

Among the different vegetables, potatoes are most suited to high alpine production. Moreover, there is cultural value attached to the different local varieties.



### Challenge

This VC is very labour intensive which correspond to little revenue to framers.

### Innovation

innovative way of reviving traditional production system A few farmers in Albula Vally in Grisons revive and preserve over 30 old and partly adapted potato varieties that used to be grown in similar conditions.



## Beer

Craft beers have become popular only in the last max. 10 years in Switzerland, innovative way of using locally adapted produce, marketed towards younger customers than more traditional alpine products.

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Total bed places (BPs) in tourist accommodations/year:	-	Secondary: 22.4%
		Tertiary: 72%
Road distance from Urban Poles* <sup>1</sup> (km)	100	Employment by sector* <sup>3</sup>
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Protected areas	Yes	Secondary: 30.8%
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There is one major beer brand ("Appenzellerbier") that uses barley from the mountain regions, as well as many smaller breweries producing many types of beer. However, the production of barley (and other beer grains).



### Key local assets

Natural landscape suitable for high quality grain production (more sun, later germination season etc.) and cultural factor is used for marketing (e.g., made with "strong" water made by the alps)

### Challenge

first there was a label for grains produced in the mountains and then this led to finding new ways of using the barley, hence different "mountain beers" were born, however, not yet enough grain production in the swiss alps and part is imported There are efforts to increase the amount of beer grain produced in the Swiss mountains.

### Innovation

This VC provides an innovative use of mountain traditional grain varieties.

## Grain and cereal products

While most of the Swiss cereal production is concentrated in the lowlands, cereals are also grown in the highest mountain regions. This includes all common European grains, including rice and maize.

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## Key local assets

This VC is based on a traditional land use and its activities are easy to implement.



### Challenge

This VC is significantly treated by climate change.

### Innovation

This VC is a traditional one, where no innovations have been identified.

## "GranAlpin" cereal products

Gran Alpin is a label for cereals produced above a certain altitude and in organic production systems. It also supports the production of more varieties of cereal. Some cereal specialties, such as buckwheat, used to be grown much more in the mountains, but were then replaced by imported products. In recent years, some producers have started to grow buckwheat again in Graubünden. This is because some traditional mountain dishes are prepared with this cereal, e.g., pizzocheri, a traditional pasta-like dish in Graubünden.

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### Key local assets

natural: good way of land use without a lot of external input, social and cultural: revival of old traditional processes and jobs (e.g., mills or pasta making), traditional products (pasta, beer etc.) and no longer cultivated cereals like buckwheat.

### Challenge

GranAlpin presents grains grown in an organic way above a certain altitude in a certain region, this is basically how it has always been done label is so successful, not enough farmers use it, problems with water scarcity and dry weather as well as with pests.

### Innovation

The only innovation is the label and thus the way of marketing and highlighting the high quality of the product.

## Mushrooms

Mushroom collection is a very traditional activity in Swiss Alps, and it can be considered part of regional culture.

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## Key local assets

Many people do this on a private scale and products made from the mushrooms are only sold at a small scale, no input needed, as only wild mushrooms are collected, gathering is social activity.



### Challenge

The main challenges connected not very high revenue, not a lot of people collect mushrooms anymore.

### Innovation

This VC is a traditional one, where no innovations have been identified.



## "Röteli" - cherry liquor

This VC is very traditional of the region. It is considered a regional product but only little of the VC is in the region.

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### Key local assets

this product profits from its cultural value but the production brings almost no value to the greater region.



### Challenge

most of the value of the VC is generated elsewhere but product profits from the regional tradition.

### Innovation

This VC is a traditional one, where no innovations have been identified.

## "Soglio" cosmetics

This VC is characterized by a very well-known brand that is identified and linked to the Alps mountain area.

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## Key local assets

The product is advertised as “using wild alpine herbs.” However, most of the primary ingredient are commercially grown and profit of the cultural value and heritage.



### Challenge

This VC is strongly threatened by climate change.

### Innovation

Making cosmetics from local natural finds like herbs has a long tradition, SOGLIO managed to make a well-established brand out of it. However, they also import or grow ingredients in very commercial ways.

## "Patrimont Switzerland" saving old breeds

This transnational organisation supports farmers who breed old animal, this concerns old sheep and goat breeds such as "Engadiner", "Spiegelschaf", "Nera Verzasca" or "Capra Grigia". Pigs such as the "Black Alpine Pig" or chickens. The products are labelled and can be sold at a better price.

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## Key local assets



these old breeds are well suited to the landscape, revival of traditional breeds, also good for biodiversity.

### Challenge

This VC can be strongly affected by the emerging consumers' dietary habits such as vegetarianism and veganism.

### Innovation

This transnational organisation supports farmers who breed old animal breeds and sell their products.

## Mountain honey

Honey from the alps is supposed to have a special gourmet taste. It is often produced in small batches and then sold directly by the producers or in nearby farm shops. Increasingly, these products are also sold in online shops. Some products are also sold to larger retailers. There are several labels and brands for alpine products, e.g., "Pro Montagna", a retail brand for products from mountain zones 1-4.

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## Key local assets



Although beehives can be placed almost anywhere, the mountain vegetation (flowers) apparently gives the honey an especially good taste.

### Challenge

This VC relies on bees, which are currently under severe threats due to the intensive use of pesticides in intensive agriculture. Additionally, this VC is also threatened by climate change.

### Innovation

This VC is a traditional one, where no innovations have been identified.



## Touristic services

Alpine tourism has a long tradition in Switzerland. Many towns and rural areas in the Alps depend on the tourism industry (hotels, restaurants, and sports attractions such as ski lifts). The standard with which these tourism infrastructures are built differs greatly between richer and less prosperous regions.

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## Key local assets



Tourism profits mainly of the aesthetics of the Swiss Alps and is linked to a high number of jobs and incomes, it also has cultural value (e.g., skiing and hiking)

### Challenge

When done in an unsustainable way, this VC might destroy the natural resource it relies upon. Additionally, it can be affected by climate change trends. However, this VC represent a big chance for young people to stay in the mountains because of high revenues.

### Innovation

This VC catches a very large variety of touristic attractions, some are traditional (skiing) some innovative and some a mix of both.

## Saffron

In Mund in Valais, Saffron has been cultivated for a long time. An increasing number of producers are starting with this special spice, which is sold directly or to restaurant. 4 producers known in Grisons (Sagogn, Donat, Arezen, Val Schons).

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## Key local assets



The product of this VC is used in some traditional cooking, relatively easy to produce with the landscape but very labour intensive.

### Challenge

This VC is strongly threatened by climate change.

### Innovation

Traditionally, saffron is not produced in Switzerland, but then realised that it is possible and while it needs a lot of labour input it does not need much else

## Veg Alp

Veg Alp is an initiative of gourmet chefs in Grisons who experiment with local flavours, breeds, and species to create luxury foods for restaurants and private customers. For example, they make "soy sauce" from barley or treat vegetables like traditional dried meat to cater to a vegan audience.

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## Key local assets

This VC brings new skills to the region, new interpretation of traditional products.



### Challenge

Focuses only on vegan production in an alpine context, where this area is traditionally perceived as animal-based production.

### Innovation

New vegan production in an alpine context

## "Orma" Whiskey

"Orma" is a young whiskey brand distilled at 3303 m.a.s.l. in Grisons.

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## Key local assets

It is not yet clear whether they source all their preliminary products from the region. They are marketed through retailers and an online store.

## Challenge



Innovative, young product that seems to be doing well.

### **Innovation**

This is a VC base on the innovative idea of bringing whiskey production to Switzerland and use very Swiss features as part of marketing.



## Alpine Fish

Fish was not traditionally produced in the alps but seeing that a lot of fish is consumed in Switzerland and most of it is imported, there have been projects launched to produce high-quality fish. The fish is sold to restaurant or to private individuals through direct farm and online shops. We know of two examples: Lake trout by CarpederFood in Grisons and salmon by Alpenlachs in Ticino.

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## Key local assets



This VC is strongly connected with the local context, and it is well suited for the valorisation of local natural resources.

### Challenge

This VC might be threatened by the high exclusivity of its products, which are very expensive and only destined to luxury markets only.

### Innovation

This VC produce new product which were not done before in the Alps.

## Frutti per tutti

Fruttipertutti is a project by a few farmers in the Puschlav. Wherever you see a sign saying "Fruttipertutti", you can pick the fruit and learn the name of the fruit in Italian and German at the same time. The project also aims to support the continued cultivation and care of traditional fruits (berries, red peaches) that are used in some places in other crops (e.g., viticulture or pastures)

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### Reference mountain landscape statistics

Reference mountain chain	Swiss Alp		
Reference mountain landscape	Canton of Grison (NUTS3: CH056)		
Size of the area (km <sup>2</sup> )	7,105	Average per capita income (€/year)	52,000
Altimetry (m; min-max)	253-4,048	Total Gross Value Added (GVA) (€ million)/year	12,500
Population density (Inhabitants/km <sup>2</sup> )	28	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	0.8%
Total bed places (BPs) in tourist accommodations/year:	-	Secondary:	22.4%
		Tertiary:	72%
Road distance from Urban Poles* <sup>1</sup> (km)	100	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	2,445	Primary:	6.4%
Protected areas	Yes	Secondary:	30.8%
		Tertiary:	91.2%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

## Key local assets



This VC is a community led initiative, where the social networks and interactions among farmers represent the more relevant asset.

### Challenge

Since the product is made available for free, this VC needs to find other sources to cover production costs.

### Innovation

The business model of this value chain is highly innovative as well as the proposed marketing strategy: the product is technically free, but it represents a good advertisement for area.

## "ZOJA" apple tasting box

These boxes were developed by a community of interest to preserve and promote old high-stemmed apple varieties. A box contains 6-9 varieties of apples (1 each), accompanied by info cards. The varieties are selected only from the Domleschg valley in Grisons.

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### Reference mountain landscape statistics

Reference mountain chain	Swiss Alp	
Reference mountain landscape	Canton of Grison (NUTS3: CH056)	
Size of the area (km <sup>2</sup> )	7,105	Average per capita income (€/year) 52,000
Altimetry (m; min-max)	253-4,048	Total Gross Value Added (GVA) (€ million)/year 12,500
Population density (Inhabitants/km <sup>2</sup> )	28	GVA by sector* <sup>2</sup>
Population changes in the last 10 years	-	Primary: 0.8%
Total bed places (BPs) in tourist accommodations/year:	-	Secondary: 22.4%
		Tertiary: 72%
Road distance from Urban Poles* <sup>1</sup> (km)	100	Employment by sector* <sup>3</sup>
Number of agricultural holdings	2,445	Primary: 6.4%
Protected areas	Yes	Secondary: 30.8%
		Tertiary: 91.2%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

## Key local assets



This VC relies on the knowledge and expertise of local farmers, which can keep producing “old” apple varieties that, otherwise will be out of the market due to low yields.

### Challenge

The main challenge of this VC related to the size (very small and specific) and its high labour requirements which both might cause its disappearance in the future.

### Innovation

This VC has been developed by a community of interest to preserve old varieties, marketing old apple varieties as high quality and selling an experience (tasting).

## "AlpenPionier" hemp products

Hemp was commonly produced in the mountains until the 1930s. The young label "AlpenPionier" aspires to revive alpine hemp production in Grisons with an array of products such as hemp nuts, bars, tea, beer, oil, pasta, or hemp powder, which are prescribed to be very healthy and contain a lot of protein. The products are marketed through farm shops, an online shop, and some bigger retailers all over Switzerland.).

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### Reference mountain landscape statistics

Reference mountain chain	Swiss Alp		
Reference mountain landscape	Canton of Grison (NUTS3: CH056)		
Size of the area (km <sup>2</sup> )	7,105	Average per capita income (€/year)	52,000
Altimetry (m; min-max)	253-4,048	Total Gross Value Added (GVA) (€ million)/year	12,500
Population density (Inhabitants/km <sup>2</sup> )	28	GVA by sector <sup>*2</sup>	
Population changes in the last 10 years	-	Primary:	0.8%
Total bed places (BPs) in tourist accommodations/year:	-	Secondary:	22.4%
		Tertiary:	72%
Road distance from Urban Poles <sup>*1</sup> (km)	100	Employment by sector <sup>*3</sup>	
Number of agricultural holdings	2,445	Primary:	6.4%
Protected areas	Yes	Secondary:	30.8%
		Tertiary:	91.2%

\*1 Nearest settlement with population > 100,000

\*2 share of total GVA/year

\*3 share of total employment)/year

## Key local assets



Hemp is a well-suited crop for the area. This VC supports the re-introduction of old traditional products in the region. Additionally, the VC has been initiated by people which are well connected in the area.

### Challenge

The main challenge of this VC related to the specificity of the product and its reliance on a niche market.

### Innovation

Reintroduction of hemp production and products, products targeted at a modern audience.



## "Alpinavera" Nuts

In the past, various nut trees were grown all over the Swiss mountain regions, but due to the low yield and difficult processing, nuts cultivation has declined considerably. In 1951 there were over half a million walnut trees in Graubünden, but today there are fewer than 150,000. However, an interest group - supported by the organisation and label "Alpinavera" - is trying to bring nut production back to Graubünden. are starting with this special spice, which is sold directly or to restaurant. 4 producers known in Grisons (Sagogn, Donat, Arezen, Val Schons).

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### Reference mountain landscape statistics

Reference mountain chain	Swiss Alp		
Reference mountain landscape	Canton of Grison (NUTS3: CH056)		
Size of the area (km <sup>2</sup> )	7,105	Average per capita income (€/year)	52,000
Altimetry (m; min-max)	253-4,048	Total Gross Value Added (GVA) (€ million)/year	12,500
Population density (Inhabitants/km <sup>2</sup> )	28	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	0.8%
Total bed places (BPs) in tourist accommodations/year:	-	Secondary:	22.4%
		Tertiary:	72%
Road distance from Urban Poles* <sup>1</sup> (km)	100	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	2,445	Primary:	6.4%
Protected areas	Yes	Secondary:	30.8%
		Tertiary:	91.2%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year



### Key local assets

This VC relies on already planted plants and it supplements farmers which are interested in developing a new production line. Additionally, it is very important that the VC is connected to a strong network.

### Challenge

No challenges have been identified for this VC.

### Innovation

The innovation in this VC relies on the re-introduction of traditional nuts varieties.

## "Valser Naturstein" quartzite

The quartzite called "Valser Naturstein" is characterised by a great compactness, has a dense structure and a pronounced frost resistance. It is traditionally used for roofing houses and is now in great demand among architects.

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### Reference mountain landscape statistics

Reference mountain chain	Swiss Alp	
Reference mountain landscape	Canton of Grison (NUTS3: CH056)	
Size of the area (km <sup>2</sup> )	7,105	Average per capita income (€/year) 52,000
Altimetry (m; min-max)	253-4,048	Total Gross Value Added (GVA) (€ million)/year 12,500
Population density (Inhabitants/km <sup>2</sup> )	28	GVA by sector* <sup>2</sup>
Population changes in the last 10 years	-	Primary: 0.8%
Total bed places (BPs) in tourist accommodations/year:	-	Secondary: 22.4%
		Tertiary: 72%
Road distance from Urban Poles* <sup>1</sup> (km)	100	Employment by sector* <sup>3</sup>
Number of agricultural holdings	2,445	Primary: 6.4%
Protected areas	Yes	Secondary: 30.8%
		Tertiary: 91.2%

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\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

## Key local assets



This rock only comes from this region. It is very requested in architecture; and it profits from alpine image.

### Challenge

The challenge identified in this VC is that limited availability of the resource.

### Innovation

This VC is a traditional one, where no innovations have been identified.

## "AlpenHirt" dried meat

This is an example of an innovative small local producer of dried meat products, working closely with local farmers, using old cows and other local products like "AlpenPionier" hemp nuts. Most of their products are sold in their online shop or at retailers.

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### Reference mountain landscape statistics

Reference mountain chain	Swiss Alp	
Reference mountain landscape	Canton of Grison (NUTS3: CH056)	
Size of the area (km <sup>2</sup> )	7,105	Average per capita income (€/year) 52,000
Altimetry (m; min-max)	253-4,048	Total Gross Value Added (GVA) (€ million)/year 12,500
Population density (Inhabitants/km <sup>2</sup> )	28	GVA by sector* <sup>2</sup>
Population changes in the last 10 years	-	Primary: 0.8%
Total bed places (BPs) in tourist accommodations/year:	-	Secondary: 22.4%
		Tertiary: 72%
Road distance from Urban Poles* <sup>1</sup> (km)	100	Employment by sector* <sup>3</sup>
Number of agricultural holdings	2,445	Primary: 6.4%
Protected areas	Yes	Secondary: 30.8%
		Tertiary: 91.2%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

## Key local assets



This VC uses same products as traditional meat VCs, but labels and brands them in an innovative and more appealing fashion.

### Challenge

This VC can be strongly affected by the emerging consumers' dietary habits such as vegetarianism and veganism.

### Innovation

Only the marketing style is innovative, the products are very traditional, uses trendy branding and is marketed mainly online

## "Allesmassiv" carpentry

This is an example of an innovative small local carpentry in Tenna, Grisons using only local wood and producing traditional as well as modern furniture and other wood products. The production is in a nature park and is sold with a corresponding label.

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### Reference mountain landscape statistics

Reference mountain chain	Swiss Alp	
Reference mountain landscape	Canton of Grison (NUTS3: CH056)	
Size of the area (km <sup>2</sup> )	7,105	Average per capita income (€/year) 52,000
Altimetry (m; min-max)	253-4,048	Total Gross Value Added (GVA) (€ million)/year 12,500
Population density (Inhabitants/km <sup>2</sup> )	28	GVA by sector <sup>*2</sup>
Population changes in the last 10 years	-	Primary: 0.8%
Total bed places (BPs) in tourist accommodations/year:	-	Secondary: 22.4%
		Tertiary: 72%
Road distance from Urban Poles <sup>*1</sup> (km)	100	Employment by sector <sup>*3</sup>
Number of agricultural holdings	2,445	Primary: 6.4%
Protected areas	Yes	Secondary: 30.8%
		Tertiary: 91.2%

\*1 Nearest settlement with population > 100,000

\*2 share of total GVA/year

\*3 share of total employment)/year

## Key local assets



This VC combines local natural assets and is also key in bringing cooperation between VCs together and making infrastructure building in other VCs possible at a local scale.

### Challenge

This VC is strongly threatened by the imports of cheaper wooden materials.

### Innovation

This VC uses traditional materials and practices, but makes modern products, e.g., trendy furniture.



## Alps Art Academy & Art Safiental

Yearly since 2016, international artists create temporary works in dialogue with landscape and nature and present them freely accessible and free of charge throughout the Safien valley. The exhibition is accompanied by an exhibition guide including a walking map that tells visitors the exact location of the artworks and interesting facts about rural and environmental art, the Art Safiental exhibition, its individual works and the Safiental valley. The exhibition is accompanied by a rich programme of guided tours, lectures, performances, and other events.

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### Reference mountain landscape statistics

Reference mountain chain	Swiss Alp		
Reference mountain landscape	Canton of Grison (NUTS3: CH056)		
Size of the area (km <sup>2</sup> )	7,105	Average per capita income (€/year)	52,000
Altimetry (m; min-max)	253-4,048	Total Gross Value Added (GVA) (€ million)/year	12,500
Population density (Inhabitants/km <sup>2</sup> )	28	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	0.8%
Total bed places (BPs) in tourist accommodations/year:	-	Secondary:	22.4%
		Tertiary:	72%
Road distance from Urban Poles* <sup>1</sup> (km)	100	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	2,445	Primary:	6.4%
Protected areas	Yes	Secondary:	30.8%
		Tertiary:	91.2%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year



### Key local assets

Landscape amenities play a key role in art installations provided by this VC.

### Challenge

The regional communities and authorities need to be open to this kind of landscape valorisation activities. Thus, this VC is strongly subjected to appreciation trends.

### Innovation

This is a completely new VC in the region. It is strongly connected with tourism, and it generates non-material value from local resources.

## Tête de Moine cheese PDO

The Mountain Reference Landscape is a region composed of limestone rocks, which are permeable and have difficulty retaining water, forming a succession of shallow valleys and high plateaus. It is covered by forest and wooded pasture.

### Reference mountain landscape statistics

(A: Aggregate data from Corgémont; Cormoret; Cortébert; Courtelary; La Ferrière; Mont-Tramelan; Orvin; Renan; Romont, and other municipalities)

Reference mountain chain	Jura		
Reference mountain landscape	Canton Bern (NUTS3 CH021)		
Size of the area (km <sup>2</sup> )	75.263 <sup>A</sup>	Average per capita income (€)/year	24,718 <sup>A</sup>
Altimetry (m; min-max)	415-1,606 <sup>A</sup>	Total Gross Value Added (GVA) (€ million)/year	79,468
Population density (Inhabitants/km <sup>2</sup> )	79	GVA by sector*2	
Population changes in the last 10 years	3,9%	Primary:	1%
Total bed places (BPs) in tourist accommodations/year:	1,085 <sup>A</sup>	Secondary:	33%
		Tertiary:	66%
Road distance from Urban Poles*1 (km)	75 <sup>A</sup>	Employment by sector*3	
Number of agricultural holdings	879 <sup>A</sup>	Primary:	8% <sup>A</sup>
Protected areas	Yes	Secondary:	43% <sup>A</sup>
		Tertiary:	48% <sup>A</sup>

\*1 Nearest settlement with population > 100,000

\*2 (year 2018) 131000 employed people (equal to 102000 full time employments)

\*3 share of total employment)/year

The VC has 237 dairy farms, 9 cheese dairies and 2 rippers. It is labelled with the protected designation of origin (PDO) and can therefore only be produced in a limited area straddling two cantons. It is organised by three associations: Interprofessional Tête de Moine who asked for the label, Association of tête de moine producers and the Association of involved dairy farmers.

### Key local assets

Milk is produced from cattle on extensive grazing systems, often in wooden pastures. The cheese production is based on traditional knowledge dating back to the 17th century. The current PDO

organization demonstrates furthermore social resources, such as interactions among farmers and cheese producers, to maintain a sufficient milk price.

### Challenge

The natural resources on which the milk used for cheese production is based are threatened by increasing droughts due to climate change (loss of fodder, death of spruce trees in wooded pastures changing the landscape and shade). There are uncertainties about the real effect of climate change on grassland production and animal health (reduced grass growth in summer but a one-month longer growing season depending on the scenario). Counterfeit of the "girolle" have emerged on the market, which represents direct competition and takes away the unique and innovative aspect of the product.

### Innovation

The invention of the "girolle" in 1999, followed by the reorganization of the actors in a PDO in 1997, represents an innovation since it placed the cheese as a unique product on a niche market (fast and costly), and allowed a big increase in the production. The girolle is a wheel that which allows the cheese to be scraped to form small flower.

## Franche Montagne Horse breed

The MLR is a region composed of limestone rocks, which are permeable and have difficulty retaining water, forming a succession of shallow valleys and high plateaus. It is covered by forest and wooded pasture.

### Reference mountain landscape statistics

(A: Aggregate data from Cortébert; Courtelary; La Ferrière; Mont-Tramelan; Renan (BE); Saint-Imier; Sonceboz-Sombeval; Tramelan; Villeret; Péry-La Heutte; Champoz; Court; Eschert; Grandval; Moutier; Perrefitte; Reconvilier; Saicourt; Saules, and other municipalities)

Reference mountain chain	Swiss Alp		
Reference mountain landscape	Canton Bern (NUTS3 CH021)		
Size of the area (km <sup>2</sup> )	111.98 <sup>A</sup>	Average per capita income (€)/year	25,417 <sup>A</sup>
Altimetry (m; min-max)	364-1,607 <sup>A</sup>	Total Gross Value Added (GVA) (€ million)/year	79,468
Population density (Inhabitants/km <sup>2</sup> )	97	GVA by sector*2	
Population changes in the last 10 years	5,0%	Primary:	1%
Total bed places (BPs) in tourist accommodations/year:	1,950 <sup>A</sup>	Secondary:	57%
		Tertiary:	42%
Road distance from Urban Poles*1 (km)	48 <sup>A</sup>	Employment by sector*3	
Number of agricultural holdings	1,294 <sup>A</sup>	Primary:	6% <sup>A</sup>
Protected areas	Yes	Secondary:	40% <sup>A</sup>
		Tertiary:	54% <sup>A</sup>

\*1 Nearest settlement with population > 100,000

\*2 (year 2018) 131000 employed people (equal to 102000 full time employments)

\*3 share of total employment)/year

The Swiss Federation of the Franches-Montagnes (FSFM) is the official breeding organisation whose aim is to develop and promote the breeding and use of horses of the Franches-Montagnes breed. It is made up of breeding syndicates, independent breeders and other organisations that support the breeding of the Franches-Montagnes horse and promote its use. The FSFM actively collaborates with the Swiss National Stud which depends on the FOAG (provision of stallions for breeders, promotion of the breed, advisory support, etc.). In the Jura canton, the Fédération

jurassienne d'élevage chevalin (FJEC) groups together around 500 active breeders in the cradle of the Franches-Montagnes breed and holds more than a quarter of the breeding horses of the entire breed. The hair from this region has the label "speciality of the canton of Jura". There are 8 syndicates for the Jura canton.

### Key local assets

The key assets are local know-how and cultural heritage. The first traces of horse breeding in the Jura are from the 17th century. Livestock farming is also based on wooded pastures which represent the typical landscape of the franchises montagnes region.

### Challenge

There are no current perceived challenges for this VC. Sales have recently increased with covid. The composition of woodland pastures, and especially the presence of trees, suffers from summer droughts which can lead to a change in the general landscape on which the horses graze.

### Innovation

The innovation in this VC is associated with the need to constantly adapt the breed and adjust to consumer demand.

## Gruyère d'alpage AOP

The MLR is a region composed of limestone rocks, which are permeable and have difficulty retaining water, forming a succession of shallow valleys and high plateaus. It is covered by forest and wooded pasture.

### Reference mountain landscape statistics

(A: Aggregate data from Corgémont; Cormoret; Cortébert; Courtelary; La Ferrière; Mont-Tramelan; Orvin; Renan (BE); Romont (BE); Saint-Imier; Sonceboz-Sombeval; Sonvilier; Tramelan; Villeret; Sauge; Péry-La Heutte; Belprahon; Champoz; Corcelles, and other municipalities)

Reference mountain chain	Swiss Alp		
Reference mountain landscape	Canton Bern (NUTS3 CH021)		
Size of the area (km <sup>2</sup> )	213,624 <sup>A</sup>	Average per capita income (€)/year	27,208 <sup>A</sup>
Altimetry (m; min-max)	383-1650 <sup>A</sup>	Total Gross Value Added (GVA) (€ million)/year	79.468
Population density (Inhabitants/km <sup>2</sup> )	109	GVA by sector*2	
Population changes in the last 10 years	+4,9%	Primary:	1%
Total bed places (BPs) in tourist accommodations/year:	3,478 <sup>A</sup>	Secondary:	33%
		Tertiary:	66%
Road distance from Urban Poles*1 (km)	48	Employment by sector*3	
Number of agricultural holdings	2,159 <sup>A</sup>	Primary:	5% <sup>A</sup>
Protected areas	Yes	Secondary:	43% <sup>A</sup>
		Tertiary:	52% <sup>A</sup>

\*1 Nearest settlement with population > 100,000

\*2 (year 2018) 131000 employed people (equal to 102000 full time employments)

\*3 share of total employment)/year

Alpine Gruyère is produced seasonally from April to October in 53 alpine chalets. Gruyère production is organised by the Gruyère Interprofession created in 1997 who brings together milk producers, cheese makers and ripeners and thus guarantees the quality and identity of Gruyère.

### Key local assets

Dairy production is based on pastures (natural asset), which represent the typical swiss cultural landscape. Grazing therefore depends on these landscapes and these landscapes depends in return on cattle, otherwise they would return to the state of the forest. Cheese production allows



to value milk (produced in large quantities on a national scale) and maintain this landscape and its biodiversity. Gruyère production is furthermore based on traditional and historical know-how.

### Challenge

The natural resources on which the milk used for cheese production is based are threatened by increasing droughts due to climate change (loss of fodder, death of spruce trees in wooded pastures changing the landscape and shade). There are uncertainties about the real effect of climate change on grassland production and animal health (reduced grass growth in summer but a one-month longer growing season depending on the scenario).

### Innovation

This VC is a traditional one, where no innovations have been identified.



## Jogitz yogurt

The VC includes a family farm that produces, processes, and sells yogurt directly on the farm. Sales are also made to local cheese dairies. The product is labelled "IP Suisse".

The MLR is a region composed of limestone rocks, which are permeable and have difficulty retaining water, forming a succession of shallow valleys and high plateaus. It is covered by forest and wooded pasture. Milk and cheese production are the first agricultural resource of the massif. Temperature vary strongly between summer and winter and the annual rainfall are abundant (>1000 mm). Clock-making by farmers in the form of peasant clockmakers has been practiced since the Middle Ages and offers a cultural heritage to the region.

Reference mountain landscape statistics  
(A: Data from NUTS3 CH021)

Reference mountain chain	Swiss Alp Jura		
Reference mountain landscape	Renan		
Size of the area (km <sup>2</sup> )	1,263	Average per capita income (€)/year	25,100
Altimetry (m; min-max)	823-1265	Total Gross Value Added (GVA) (€ million)/year	79,468 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	73	GVA by sector*2	
Population changes in the last 10 years	+8,9%	Primary:	1% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	-	Secondary:	33% <sup>A</sup>
		Tertiary:	66% <sup>A</sup>
Road distance from Urban Poles*1 (km)	75	Employment by sector*3	
Number of agricultural holdings	21	Primary:	21% <sup>A</sup>
Protected areas	Yes	Secondary:	20% <sup>A</sup>
		Tertiary:	59% <sup>A</sup>

\*1 Nearest settlement with population > 100,000

\*2 (year 2018) 131000 employed people (equal to 102000 full time employments)

\*3 share of total employment)/year

## Key local assets

Dairy production is based on pastures (natural asset), which represent the typical swiss cultural landscape. Grazing therefore depends on these landscapes and these landscapes depends in return on cattle, otherwise they would return to the state of the forest. The goat species are part



of pro specie rara, the Swiss foundation for the heritage and genetic diversity of plants and animals which represents a strong cultural heritage.

### Challenge

The natural resources on which the milk used for yogurt production is based are threatened by increasing droughts due to climate change (loss of fodder, death of spruce trees in wooded pastures changing the landscape and shade). There are uncertainties about the real effect of climate change on grassland production and animal health (reduced grass growth in summer but a one-month longer growing season depending on the scenario).

### Innovation

Traditional, family-based, and diversified agriculture farm who produces, transforms, and sells the goat's milk into yogurt on the farm.

## Toetché

The cake has a strong territorial identity, being considered as a traditional speciality from the Jura canton, consumed extensively during local festivals. It is produced from flour and cream, made from the abundant dairy resources in the region.

The MLR is a region composed of limestone rocks, which are permeable and have difficulty retaining water, forming a succession of shallow valleys and high plateaus. It is covered by forest and wooded pasture. Milk and cheese production are the first agricultural resource of the massif. Temperature vary strongly between summer and winter and the annual rainfall are abundant (>1000 mm). Clock-making by farmers in the form of peasant clockmakers has been practiced since the Middle Ages and offers a cultural heritage to the region.

Reference mountain landscape statistics  
(A: Data from the municipalities of Boécourt; Courrendlin; Courtételle; Haute-Sorne; Les Bois; Les Breuleux; Le Noirmont; Saignelégier)

Reference mountain chain	Jura	
Reference mountain landscape	District of Jura	
Size of the area (km <sup>2</sup> )	20,609 <sup>A</sup>	Average per capita income (€/year) 25,903 <sup>A</sup>
Altimetry (m; min-max)	415-1293 <sup>A</sup>	Total Gross Value Added (GVA) (€ million)/year 79,468
Population density (Inhabitants/km <sup>2</sup> )	104 <sup>A</sup>	GVA by sector*2
Population changes in the last 10 years	+9,4% <sup>A</sup>	Primary: 1%
Total bed places (BPs) in tourist accommodations/year:	428 <sup>A</sup>	Secondary: 57%
		Tertiary: 42%
Road distance from Urban Poles*1 (km)	73 <sup>A</sup>	Employment by sector*3
Number of agricultural holdings	227 <sup>A</sup>	Primary: 6% <sup>A</sup>
Protected areas	Yes	Secondary: 53% <sup>A</sup>
		Tertiary: 41% <sup>A</sup>

\*1 Nearest settlement with population > 100,000

\*2 (year 2018) 131000 employed people (equal to 102000 full time employments)

\*3 share of total employment)/year

## Key local assets



Before refrigerators, the acidification of cream was done without human intervention. The raw milk was stored in a cool place for several days. The cream would rise to the surface and, as it aged, acquire a sour taste through bacterial transformation. The recipe has maintained this old artisanal production technique which is a strong cultural asset.

### Challenge

No challenges have been identified for this VC.

### Innovation

This VC is a traditional one, where no innovations have been identified.

## Trout farming

The trout farming has existed since 1959 in the form of a small family production. There are two different sites: the breeding is in Soubey (in the spring water) and the storage and slaughtering are in Courtemaîche, where the sale is also done. It is a small company, which is the only one that sells fresh fish. The company also offers cooked fish, diversifying into catering.

The MLR is a region composed of limestone rocks, which are permeable and have difficulty retaining water, forming a succession of shallow valleys and high plateaus. It is covered by forest and wooded pasture. Milk and cheese production are the first agricultural resource of the massif. Temperature vary strongly between summer and winter and the annual rainfall are abundant (>1000 mm). Clock-making by farmers in the form of peasant clockmakers has been practiced since the Middle Ages and offers a cultural heritage to the region.

### Reference mountain landscape statistics (A: Data from the NUTS3 CH025)

Reference mountain chain	Jura		
Reference mountain landscape	Soubey and Basse-Allaine		
Size of the area (km <sup>2</sup> )	3,653	Average per capita income (€)/year	23,476
Altimetry (m; min-max)	375-907	Total Gross Value Added (GVA) (€ million)/year	79.468 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	37	GVA by sector*2	
Population changes in the last 10 years	-6,4%	Primary:	1% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	15	Secondary:	57% <sup>A</sup>
		Tertiary:	42% <sup>A</sup>
Road distance from Urban Poles*1 (km)	42	Employment by sector*3	
Number of agricultural holdings	63	Primary:	35%
Protected areas	Yes	Secondary:	36%
		Tertiary:	27%

\*1 Nearest settlement with population > 100,000

\*2 (year 2018) 131000 employed people (equal to 102000 full time employments)

\*3 share of total employment)/year

## Key local assets



The trout are produced in the spring water in Soubey (Doubs River) and are therefore directly dependent on the quantity and quality of the river water.

### Challenge

The river Doubs on which the production is based suffers from numerous droughts (almost total drying up in some areas in 2018).

### Innovation

This VC is a traditional one, where no innovations have been identified.

## Mustard

The VC is composed only of farms, which produce, process, and sell the resource directly on the farm. Some external and local inputs are used for colouring and flavouring.

The MLR is a region composed of limestone rocks, which are permeable and have difficulty retaining water, forming a succession of shallow valleys and high plateaus. It is covered by forest and wooded pasture. Milk and cheese production are the first agricultural resource of the massif. Temperature vary strongly between summer and winter and the annual rainfall are abundant (>1000 mm). Clock-making by farmers in the form of peasant clockmakers has been practiced since the Middle Ages and offers a cultural heritage to the region.

Reference mountain landscape statistics  
(A: Data from the NUTS3 CH011)

Reference mountain chain	Jura		
Reference mountain landscape	Tévenon		
Size of the area (km <sup>2</sup> )	1,428	Average per capita income (€)/year	30,308
Altimetry (m; min-max)	539-1,433	Total Gross Value Added (GVA) (€ million)/year	79.468 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	63	GVA by sector (share of total GVA)/year:	
Population changes in the last 10 years	28,9%	Primary:	1% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	2	Secondary:	30% <sup>A</sup>
		Tertiary:	69% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	50	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	10	Primary:	20%
Protected areas	No	Secondary:	13%
		Tertiary:	67%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> (year 2018) 131000 employed people (equal to 102000 full time employments)

\*<sup>3</sup> share of total employment)/year

## Key local assets

The mustard is produced through processes based on traditional knowledge.



### Challenge

No challenges have been identified for this VC.

### Innovation

This is an entirely local VC based on artisanal production, where no innovations have been identified.



## Malt

Cooperative that promotes barley from the Jura region and shortens the production circuit of local beer, from the barley sower to the consumer, by setting up a malting plant.

The MLR is a region composed of limestone rocks, which are permeable and have difficulty retaining water, forming a succession of shallow valleys and high plateaus. It is covered by forest and wooded pasture. Milk and cheese production are the first agricultural resource of the massif. Temperature vary strongly between summer and winter and the annual rainfall are abundant (>1000 mm). Clock-making by farmers in the form of peasant clockmakers has been practiced since the Middle Ages and offers a cultural heritage to the region.

### Reference mountain landscape statistics

(A: Data from the municipalities of Orvin; Bourrignon; Delémont; Haute-Sorne; Val Terbi; Les Bois; Saignelégier; Cornol; Courgenay; Fahy; Basse-Allaine)

Reference mountain chain	Jura		
Reference mountain landscape	Canton of Berne		
Size of the area (km <sup>2</sup> )	29,093 <sup>A</sup>	Average per capita income (€)/year	25.179 <sup>A</sup>
Altimetry (m; min-max)	375-1,340 <sup>A</sup>	Total Gross Value Added (GVA) (€ million)/year	79.468
Population density (Inhabitants/km <sup>2</sup> )	114 <sup>A</sup>	GVA by sector*2	
Population changes in the last 10 years	6,5% <sup>A</sup>	Primary:	1%
Total bed places (BPs) in tourist accommodations/year:	714 <sup>A</sup>	Secondary:	57%
		Tertiary:	42%
Road distance from Urban Poles*1 (km)	46 <sup>A</sup>	Employment by sector*3	
Number of agricultural holdings	338 <sup>A</sup>	Primary:	5% <sup>A</sup>
Protected areas	Yes	Secondary:	34% <sup>A</sup>
		Tertiary:	61% <sup>A</sup>

\*1 Nearest settlement with population > 100,000

\*2 (year 2018) 131000 employed people (equal to 102000 full time employments)

\*3 share of total employment)/year



The malthouse has 34 members, including 14 farmers, 16 breweries and other malt processors, as well as 14 other people interested in the development of the regional brewing industry. Farmers can bring in their barley, which is processed into malt to be used in the production of beer.

#### Key local assets

Key local asset for this VC is the horizontal cooperation among all the actors. Such collective efforts are translated into participatory funding and a strong community interaction.

#### Challenge

The cultivation of barley varies greatly with the weather fluctuations and the quantities of barley processed therefore vary greatly, which can penalise downstream beer production.

#### Innovation

The innovation comes from the creation of this cooperative with participatory funding, including all the actors involved in the production of the beer in a horizontal and participative process.

## Absinthe

Absinthe is a set of spirits made from absinth plants, to be mixed with water for consumption. This VC is an example of successful registration of a quality scheme with a PDO, strong territorial identity and high reputation product (alcohol was banned for years because it drove people mad, a whole regional myth exists around this drink), preparation and consumption ritual, unique product.

The MLR is a region composed of limestone rocks, which are permeable and have difficulty retaining water, forming a succession of shallow valleys and high plateaus. It is covered by forest and wooded pasture. Milk and cheese production are the first agricultural resource of the massif. Temperature vary strongly between summer and winter and the annual rainfall are abundant (>1000 mm). Clock-making by farmers in the form of peasant clockmakers has been practiced since the Middle Ages and offers a cultural heritage to the region.

### Reference mountain landscape statistics (A: Data for NUTS3 CH024)

Reference mountain chain	Jura		
Reference mountain landscape	Val-de-Travers		
Size of the area (km <sup>2</sup> )	12,474	Average per capita income (€)/year	23,186
Altimetry (m; min-max)	692-1469	Total Gross Value Added (GVA) (€ million)/year	79,468 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	86	GVA by sector*2	
Population changes in the last 10 years	-1,3%	Primary:	1% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	74	Secondary:	57% <sup>A</sup>
		Tertiary:	42% <sup>A</sup>
Road distance from Urban Poles*1 (km)	69	Employment by sector*3	
Number of agricultural holdings	107	Primary:	6%
Protected areas	No	Secondary:	44%
		Tertiary:	50%

\*1 Nearest settlement with population > 100,000

\*2 (year 2018) 131000 employed people (equal to 102000 full time employments)

\*3 share of total employment)/year



The VC is managed by the "Association inter professionnelle de l'absinthe" - which groups together all the legal distillers and growers of absinthe in the district, created in 2005 with the legalisation of the production and consumption of the product. To be able to sell the product, it is necessary to carry out a self-control and to obtain a patent delivered by the canton.

#### Key local assets

The production of absinthe is based on a local know-how that has been passed down from generation to generation, and which was hidden for a long time because it was illegal.

#### Challenge

Difficulty in certifying absinthe with a controlled designation of origin (AOC) due to opposition slowing down the processes.

#### Innovation

This VC is a traditional one, where no innovations have been identified.

## Vacherin Mont d'Or cheese AOP

The VC is made up of 11 manufacturers and ripeners as well as milk producers from the Jura Mountain areas. The milk is processed and sold locally, in large Swiss supermarkets and is exported. Its production is seasonal and runs from 15 August to 31 March. The sales period is from September to April. To make this cheese, the specifications of Vacherin Mont- d'Or; protected designation of origin (PDO) must be respected.

The MLR is a region composed of limestone rocks, which are permeable and have difficulty retaining water, forming a succession of shallow valleys and high plateaus. It is covered by forest and wooded pasture.

### Reference mountain landscape statistics

(A: Aggregate data from Apples; Aubonne; Ballens; Berolle; Bière; Bougy-Villars; Féchy; Gimel; Longirod; Marchissy; Mollens (VD); Montherod; Saint-George; Saint-Livres; Saint-Oyens; Saubraz; Bettens; Bournens; BousSENS; La Chaux (Cossonay); Chavannes-le-Veyron; Chevilly; Cossonay; Cottens (VD), and other municipalities)

Reference mountain chain	Jura		
Reference mountain landscape			
Size of the area (km <sup>2</sup> )	108,633 <sup>A</sup>	Average per capita income (€)/year	36,180 <sup>A</sup>
Altimetry (m; min-max)	371 -1,369 <sup>A</sup>	Total Gross Value Added (GVA) (€ million)/year	79,468
Population density (Inhabitants/km <sup>2</sup> )	129 <sup>A</sup>	GVA by sector*2	
Population changes in the last 10 years	14,2% <sup>A</sup>	Primary:	1%
Total bed places (BPs) in tourist accommodations/year:	2,046 <sup>A</sup>	Secondary:	30%
		Tertiary:	69%
Road distance from Urban Poles*1 (km)	20 <sup>A</sup>	Employment by sector*3	
Number of agricultural holdings	1,134 <sup>A</sup>	Primary:	6% <sup>A</sup>
Protected areas	Yes	Secondary:	31% <sup>A</sup>
		Tertiary:	63% <sup>A</sup>

\*1 Nearest settlement with population > 100,000

\*2 (year 2018) 131000 employed people (equal to 102000 full time employments)

\*3 share of total employment)/year

This VC is an example of successful registration of a quality scheme and territorial identity with a PDO, high quality product; maintenance of a high milk price for the dairy producers in the VC (in the face of competition and the opening of markets with EU), thus maintaining the pasture and the landscape, maintenance of extensive grazing in wooden pastures.

#### Key local assets

Dairy production is based on pastures (natural asset), which represent the typical Swiss cultural landscape. Grazing therefore depends on these landscapes and these landscapes depends in return on cattle, otherwise they would return to the state of the forest.

#### Challenge

The natural resources on which the milk used for cheese production is based are threatened by increasing droughts due to climate change (loss of fodder, death of spruce trees in wooded pastures changing the landscape and shade). There are uncertainties about the real effect of climate change on grassland production and animal health (reduced grass growth in summer but a one-month longer growing season depending on the scenario).

#### Innovation

This VC is a traditional one, where no innovations have been identified.

## Agritourism

This activity allows farmers to diversify their activity and increase their resilience to climatic or economic shocks. The key actors are the farmers themselves, as it is a farmer-driven and motivated action. There is no organisation within this value chain. Each farmer manages and promotes his activity independently. They are all in direct competition.

The MLR is a region composed of limestone rocks, which are permeable and have difficulty retaining water, forming a succession of shallow valleys and high plateaus. It is covered by forest and wooded pasture. Milk and cheese production are the first agricultural resource of the massif. Temperature vary strongly between summer and winter and the annual rainfall are abundant (>1000 mm). Clock-making by farmers in the form of peasant clockmakers has been practiced since the Middle Ages and offers a cultural heritage to the region.

### Reference mountain landscape statistics

(A; Aggregate data from Corgémont; Cormoret; Cortébert; Courtelary; La Ferrière; Mont-Tramelan; Orvin; Renan; and other municipalities)

Reference mountain chain	Jura		
Reference mountain landscape	Canton of Bern		
Size of the area (km <sup>2</sup> )	218,619 <sup>A</sup>	Average per capita income (€)/year	27,255 <sup>A</sup>
Altimetry (m; min-max)	383-1,650 <sup>A</sup>	Total Gross Value Added (GVA) (€ million)/year	79,468
Population density (Inhabitants/km <sup>2</sup> )	112 <sup>A</sup>	GVA by sector*2	
Population changes in the last 10 years	4,8% <sup>A</sup>	Primary:	1%
Total bed places (BPs) in tourist accommodations/year:	3,534 <sup>A</sup>	Secondary:	33%
		Tertiary:	66%
Road distance from Urban Poles*1 (km)	70 <sup>A</sup>	Employment by sector*3	
Number of agricultural holdings	2,267 <sup>A</sup>	Primary:	5% <sup>A</sup>
Protected areas	Yes	Secondary:	43% <sup>A</sup>
		Tertiary:	52% <sup>A</sup>

\*1 Nearest settlement with population > 100,000

\*2 (year 2018) 131000 employed people (equal to 102000 full time employments)

\*3 share of total employment)/year



### Key local assets

The local assets represent all the natural and cultural capital present to motivate a tourist to stay in this region (monument, local horse breed, canoeing, landscapes, etc.). This can be directly on the farm but also in the surrounding area.

### Challenge

Visibility to customers can be the major challenge in carrying out this activity. Competition between farms can be another difficulty, as they often offer similar services. It is therefore necessary to know how to differentiate and make yourself visible.

### Innovation

Innovation comes from diversifying farmers' activities and not just focusing on food production.



## NaturaBeef bio

This VC is broad and includes all producers, slaughterhouses, retailers (department stores, local butchers and direct sales depending on the farms).

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Reference mountain landscape statistics  
(A; Aggregate data from Corgémont; Cormoret; Cortébert; Courtelary; La Ferrière; Mont-Tramelan; Orvin; Renan; and other municipalities)

Reference mountain chain		Jura	
Reference mountain landscape		Canton of Bern	
Size of the area (km <sup>2</sup> )	218,619 <sup>A</sup>	Average per capita income (€)/year	27,255 <sup>A</sup>
Altimetry (m; min-max)	383-1,650 <sup>A</sup>	Total Gross Value Added (GVA) (€ million)/year	79,468
Population density (Inhabitants/km <sup>2</sup> )	112 <sup>A</sup>	GVA by sector*2	
Population changes in the last 10 years	4,8% <sup>A</sup>	Primary:	1%
Total bed places (BPs) in tourist accommodations/year:	3,534 <sup>A</sup>	Secondary:	33%
		Tertiary:	66%
		Employment by sector*3	
Road distance from Urban Poles*1 (km)	70 <sup>A</sup>	Primary:	5% <sup>A</sup>
Number of agricultural holdings	2,267 <sup>A</sup>	Secondary:	43% <sup>A</sup>
Protected areas	Yes	Tertiary:	52% <sup>A</sup>

\*1 Nearest settlement with population > 100,000

\*2 (year 2018) 131000 employed people (equal to 102000 full time employments)

\*3 share of total employment)/year

Farmers must comply with strict specifications (those of the Swiss Mother Cow Association and of Swiss organic production). It is a large, highly organised, and supervised VC.

### Key local assets

The main asset is natural as it includes the pastures on which the cattle feed and the croplands that produce cattle food for winter.

### Challenge

The natural resources on which cattle feed are threatened by increasing droughts due to climate change (loss of fodder, death of spruce trees in wooded pastures changing the landscape and shade). There are uncertainties about the real effect of climate change on grassland production and animal health (reduced grass growth in summer but a one-month longer growing season depending on the scenario).

### Innovation

This VC is a traditional one, where no innovations have been identified.

## Wood

The forest covers a very large part of the Jura Mountain (together with the pastures) and therefore represents a large prevalence of land use systems. The forest area should not be reduced in favour of built-up or agricultural area, as it is extremely protected in Switzerland. The sustainable development of the forest is therefore extremely important for the development of the Swiss Jura mountains.

The MLR is a region composed of limestone rocks, which are permeable and have difficulty retaining water, forming a succession of shallow valleys and high plateaus. It is covered by forest and wooded pasture. Milk and cheese production are the first agricultural resource of the massif. Temperature vary strongly between summer and winter and the annual rainfall are abundant (>1000 mm). Clock-making by farmers in the form of peasant clockmakers has been practiced since the Middle Ages and offers a cultural heritage to the region.

### Reference mountain landscape statistics

(A: Aggregate data for the municipalities of Aarberg; Barmen; Grossaffoltern; Kallnach; Kappelen; Lyss; Meikirch; Radelfingen; Rapperswil; Schüpfen; Seedorf, and other municipalities)

Reference mountain chain	Jura		
Reference mountain landscape	Canton of Bern (CH021)		
Size of the area (km <sup>2</sup> )	279,797 <sup>A</sup>	Average per capita income (€)/year	27,726 <sup>A</sup>
Altimetry (m; min-max)	364-1,650 <sup>A</sup>	Total Gross Value Added (GVA) (€ million)/year	79,468
Population density (Inhabitants/km <sup>2</sup> )	142 <sup>A</sup>	GVA by sector*2	
Population changes in the last 10 years	5,6% <sup>A</sup>	Primary:	1%
Total bed places (BPs) in tourist accommodations/year:	5,665 <sup>A</sup>	Secondary:	30%
		Tertiary:	69%
Road distance from Urban Poles*1 (km)	38 <sup>A</sup>	Employment by sector*3	
Number of agricultural holdings	3,051 <sup>A</sup>	Primary:	4% <sup>A</sup>
Protected areas	Yes	Secondary:	34% <sup>A</sup>
		Tertiary:	62% <sup>A</sup>

\*1 Nearest settlement with population > 100,000

\*2 (year 2018) 131000 employed people (equal to 102000 full time employments)

\*3 share of total employment)/year



The VC is composed of several actors such as public and private forest owners, their forestry departments and other processing and sales companies. There is therefore often a mix of public and private actors. There is a Swiss wood label, which indicates that the wood comes from Swiss forests and has been processed in Swiss companies by highly qualified professionals.

#### Key local assets

Forests are a local asset and depend strongly on natural conditions (change in rainfall, temperature, soils, slope, etc.). In Switzerland, forests are managed by legal bases guaranteeing sustainable exploitation in the framework of forestry planning.

#### Challenge

Wood production is threatened by natural hazards such as drought increased by climate change (in addition to the shallow, calcareous soil), as well as the bark beetle. A major transformation in the composition of forests is expected.

#### Innovation

This VC is a traditional one, where no innovations have been identified.

## Wool

Valorisation of a product that was not or hardly valued until now, in response to a federal political decision to stop supporting the processing of wool by organising itself in the form of an association, innovative organization among actors, high quality product from mainly, organic farming and processing of the wool.

The MLR is a region composed of limestone rocks, which are permeable and have difficulty retaining water, forming a succession of shallow valleys and high plateaus. It is covered by forest and wooded pasture. Milk and cheese production are the first agricultural resource of the massif. Temperature vary strongly between summer and winter and the annual rainfall are abundant (>1000 mm). Clock-making by farmers in the form of peasant clockmakers has been practiced since the Middle Ages and offers a cultural heritage to the region.

### Reference mountain landscape statistics

(A: Aggregate data from the municipalities of Aarberg; Barga (BE); Grossaffoltern; Kallnach; Kappelen; Lyss; Meikirch; Radelfingen; Rapperswil and other municipalities)

Reference mountain chain	Jura		
Reference mountain landscape	Canton of Bern (CH021)		
Size of the area (km <sup>2</sup> )	738,590 <sup>A</sup>	Average per capita income (€)/year	29,849 <sup>A</sup>
Altimetry (m; min-max)	364-4,271 <sup>A</sup>	Total Gross Value Added (GVA) (€ million)/year	79,468
Population density (Inhabitants/km <sup>2</sup> )	174 <sup>A</sup>	GVA by sector*2	
Population changes in the last 10 years	5,4% <sup>A</sup>	Primary:	1%
Total bed places (BPs) in tourist accommodations/year:	36,571 <sup>A</sup>	Secondary:	33%
		Tertiary:	66%
Road distance from Urban Poles*1 (km)	0	Employment by sector*3	
Number of agricultural holdings	12,046	Primary:	5% <sup>A</sup>
Protected areas	Yes	Secondary:	23% <sup>A</sup>
		Tertiary:	72% <sup>A</sup>

\*1 Nearest settlement with population > 100,000

\*2 (year 2018) 131000 employed people (equal to 102000 full time employments)

\*3 share of total employment)/year



The VC is composed of about 60 sheep farmers, members of the association and consumers. The association collects the wool and then processes and adds value to it. The wool is washed in the German part of Switzerland, then carded in the Jura and sold at the regional wool centre. The wool is spun, dyed, felted, and transformed into various creations. In addition, educational activities are organised.

### Key local assets

Sheep and their wool are directly dependent on pasture for food, which is the natural capital. The development of the association and the commitment and motivation of each actor based on common values have developed new forms of collaboration and interactions.

### Challenge

More than two thirds of the wool produced in Switzerland is destroyed, due to a lack of recognition, time, and remuneration, but also because a whole know-how has been lost.

### Innovation

The innovation comes from the willingness to valorise wool and to give an economic life to wool which is often perceived as a waste product. The organisation in the form of an association, operating in a horizontal manner with a will to raise awareness and inform through its educational pole, represents a form of innovation.

## Honey

The value chain consists of a beekeeper who produces and markets his honey locally, in small local shops and sells it online. The honeys also go through a certification process as they are certified with two labels: "Miel du Pays de Vaud" and "produit des parcs suisse".

The MLR is a region composed of limestone rocks, which are permeable and have difficulty retaining water, forming a succession of shallow valleys and high plateaus. It is covered by forest and wooded pasture. Milk and cheese production are the first agricultural resource of the massif. Temperature vary strongly between summer and winter and the annual rainfall are abundant (>1000 mm). Clock-making by farmers in the form of peasant clockmakers has been practiced since the Middle Ages and offers a cultural heritage to the region.

### Reference mountain landscape statistics (A: Data from the NUTS3 CH011 )

Reference mountain chain	Jura		
Reference mountain landscape	L'Isle; L'Abbaye; Le Chenit; Le Lieu		
Size of the area (km <sup>2</sup> )	17,983	Average per capita income (€)/year	29.320 <sup>A</sup>
Altimetry (m; min-max)	599 -1,650	Total Gross Value Added (GVA) (€ million)/year	79.468
Population density (Inhabitants/km <sup>2</sup> )	45	GVA by sector*2	
Population changes in the last 10 years	7,4%	Primary:	1% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	333	Secondary:	30% <sup>A</sup>
		Tertiary:	69% <sup>A</sup>
Road distance from Urban Poles*1 (km)	59	Employment by sector*3	
Number of agricultural holdings	55	Primary:	2%
Protected areas	Yes	Secondary:	68%
		Tertiary:	30%

\*1 Nearest settlement with population > 100,000

\*2 (year 2018) 131000 employed people (equal to 102000 full time employments)

\*3 share of total employment)/year

## Key local assets

Production is mainly based on the natural assets (flowers, trees, etc.) surrounding the hives.



### Challenge

As the production is done in transhumance, there are challenges linked to the plains and challenges linked to the mountain regions. On the plains, the aim is to have an abundance of flowers and good biodiversity and little or no phytosanitary treatment by farmers or individuals (not too close to conventional field crops). In the mountains, the limiting factors are related to the cold, which requires transhumance.

### Innovation

In addition to the production of artisanal honey, the producer proposes to sponsor beehives to make consumers aware of the importance of bees and to provide an additional income.



## Raw mountain milk

The VC is very short and includes farmers and potentially resellers in local markets as raw milk cannot be stored for a long time and is mainly sold directly.

The MLR is a region composed of limestone rocks, which are permeable and have difficulty retaining water, forming a succession of shallow valleys and high plateaus. It is covered by forest and wooded pasture. Milk and cheese production are the first agricultural resource of the massif. Temperature vary strongly between summer and winter and the annual rainfall are abundant (>1000 mm). Clock-making by farmers in the form of peasant clockmakers has been practiced since the Middle Ages and offers a cultural heritage to the region.

### Reference mountain landscape statistics

(A: Aggregate data from Corgémont; Cormoret; Cortébert; Courtelary; La Ferrière; Mont-Tramelan; Orvin; Renan, and other municipalities)

Reference mountain chain		Jura	
Reference mountain landscape		Canton of Bern (CH021)	
Size of the area (km <sup>2</sup> )	218,619 <sup>A</sup>	Average per capita income (€)/year	27,255 <sup>A</sup>
Altimetry (m; min-max)	383-1,650 <sup>A</sup>	Total Gross Value Added (GVA) (€ million)/year	79,468
Population density (Inhabitants/km <sup>2</sup> )	112 <sup>A</sup>	GVA by sector*2	
Population changes in the last 10 years	4,8% <sup>A</sup>	Primary:	1%
Total bed places (BPs) in tourist accommodations/year:	3,534 <sup>A</sup>	Secondary:	33%
		Tertiary:	66%
Road distance from Urban Poles*1 (km)	48 <sup>A</sup>	Employment by sector*3	
Number of agricultural holdings	2,267 <sup>A</sup>	Primary:	5% <sup>A</sup>
Protected areas	Yes	Secondary:	43% <sup>A</sup>
		Tertiary:	52% <sup>A</sup>

\*1 Nearest settlement with population > 100,000

\*2 (year 2018) 131000 employed people (equal to 102000 full time employments)

\*3 share of total employment)/year

## Key local assets

Dairy production is based on pastures (natural asset), which represent the typical swiss cultural landscape. Grazing therefore depends on these landscapes and these landscapes depends in return on cattle, otherwise they would return to the state of the forest.

### Challenge

Conservation is a challenge since raw milk must be sold quickly as it cannot be stored at room temperature for several days. The natural resources on which the milk used for cheese production is based are threatened by increasing droughts due to climate change (loss of fodder, death of spruce trees in wooded pastures changing the landscape and shade). There are uncertainties about the real effect of climate change on grassland production and animal health (reduced grass growth in summer but a one-month longer growing season depending on the scenario)

### Innovation

Raw milk is a return to earlier and traditional forms of milk, which may represent innovation as it stands out from contemporary and industrial milk consumption.

## Goat's cheese

The VC includes mainly farmers which produce, local retailers in addition to consumers, as the product is processed directly on the farm by the farmers themselves. Additionally, It is therefore a short VC. the producers are organised in a producers' cooperative called DorignoL. The production benefits from the label "produit des parcs suisses" or "parc du Jura Vaudois".

The MLR is a region composed of limestone rocks, which are permeable and have difficulty retaining water, forming a succession of shallow valleys and high plateaus. It is covered by forest and wooded pasture. Milk and cheese production are the first agricultural resource of the massif. Temperature vary strongly between summer and winter and the annual rainfall are abundant (>1000 mm). Clock-making by farmers in the form of peasant clockmakers has been practiced since the Middle Ages and offers a cultural heritage to the region.

### Reference mountain landscape statistics (A: Data for the NUTS3 CH011)

Reference mountain chain	Jura		
Reference mountain landscape	<i>Gimel; Vaulion</i>		
Size of the area (km <sup>2</sup> )	1.315	Average per capita income (€)/year	23.347
Altimetry (m; min-max)	852-1483	Total Gross Value Added (GVA) (€ million)/year	79.468 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	38	GVA by sector*2	
Population changes in the last 10 years	+9,7%	Primary:	1% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	26	Secondary:	30% <sup>A</sup>
		Tertiary:	69% <sup>A</sup>
Road distance from Urban Poles*1 (km)	32	Employment by sector*3	
Number of agricultural holdings	27	Primary:	38%
Protected areas	Yes	Secondary:	30%
		Tertiary:	33%

\*1 Nearest settlement with population > 100,000

\*2 (year 2018) 131000 employed people (equal to 102000 full time employments)

\*3 share of total employment)/year

## Key local assets



Dairy production is based on pastures (natural asset), which represent the typical Swiss cultural landscape. Grazing therefore depends on these landscapes and these landscapes depends in return on cattle, otherwise they would return to the state of the forest. Transformation into cheese depends on traditional knowledge since it is produced in an artisanal way.

### Challenge

No challenges have been identified for this VC.

### Innovation

This VC is a traditional one, where no innovations have been identified.

## Medicinal plants and organic aromatic herbs

Cultivation only in mountain areas, high reputation product with a strong demand from consumers and cosmetics companies for the valorisation of medicinal and aromatic plants and herbs, fast-growing market, mostly organic and nature-friendly production, direct sales, and e-commerce.

The MLR is a region composed of limestone rocks, which are permeable and have difficulty retaining water, forming a succession of shallow valleys and high plateaus. It is covered by forest and wooded pasture. Milk and cheese production are the first agricultural resource of the massif. Temperature vary strongly between summer and winter and the annual rainfall are abundant (>1000 mm). Clock-making by farmers in the form of peasant clockmakers has been practiced since the Middle Ages and offers a cultural heritage to the region.

Reference mountain landscape statistics  
(A: Data for the NUTS3 CH011)

Reference mountain chain		Jura	
Reference mountain landscape		Vaulion	
Size of the area (km <sup>2</sup> )	1,315	Average per capita income (€)/year	23,347
Altimetry (m; min-max)	852-1,483	Total Gross Value Added (GVA) (€ million)/year	79,468 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	38	GVA by sector*2	
Population changes in the last 10 years	9,7%	Primary:	1% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	9	Secondary:	30% <sup>A</sup>
		Tertiary:	69% <sup>A</sup>
Road distance from Urban Poles*1 (km)	40	Employment by sector*3	
Number of agricultural holdings	12	Primary:	38%
Protected areas	Yes	Secondary:	30%
		Tertiary:	33%

\*1 Nearest settlement with population > 100,000

\*2 (year 2018) 131000 employed people (equal to 102000 full time employments)

\*3 share of total employment)/year

Familiar farm of 2 hectares of land. The plants are planted, weeded, and harvested by hand, then gently dried in a specially designed dryer. Each plant requires a specific treatment that must be



respected at every stage from planting to packaging. Some of the plants are purchased from other producers of the VBKB association, which groups together the producers of organic medicinal plants from the Swiss mountain regions. The production is certified organic.

#### Key local assets

The production depends on altitude, which has a beneficial effect on secondary plant metabolites if traditional knowledge.

#### Challenge

Complex crops with some problems related to planting, fertilisation, plant protection, optimal harvesting date, cutting frequency and height, drying and storage; weed, disease and pest pressure; difficulty in covering production costs with the selling price, development, and preservation of swiss mountainous traditional culture.

#### Innovation

This VC is traditional. All the products are then transformed directly on the farm, into herbal tea or cosmetics and sold online or on site.

## Horse meat

Complementary product to the production of horses for sport and leisure, perpetuation of the Franches Montagnes breed, limitation of imports (90% in 2019), horses raised in wooded pastures which are strongly present in the Franches Montagnes region, high quality meat cheaper than cow meat.

The MLR is a region composed of limestone rocks, which are permeable and have difficulty retaining water, forming a succession of shallow valleys and high plateaus. It is covered by forest and wooded pasture. Milk and cheese production are the first agricultural resource of the massif. Temperature vary strongly between summer and winter and the annual rainfall are abundant (>1000 mm). Clock-making by farmers in the form of peasant clockmakers has been practiced since the Middle Ages and offers a cultural heritage to the region.

Reference mountain landscape statistics  
(A: Aggregate data from ortébert; Courtelary; La Ferrière; Mont-Tramelan; Renan, and other municipalities)

Reference mountain chain	Jura		
Reference mountain landscape	Canton of Bern (CH021)		
Size of the area (km <sup>2</sup> )	111,981 <sup>A</sup>	Average per capita income (€)/year	25,417 <sup>A</sup>
Altimetry (m; min-max)	364-1,607 <sup>A</sup>	Total Gross Value Added (GVA) (€ million)/year	79,468
Population density (Inhabitants/km <sup>2</sup> )	97 <sup>A</sup>	GVA by sector*2	
Population changes in the last 10 years	5,0% <sup>A</sup>	Primary:	1%
Total bed places (BPs) in tourist accommodations/year:	1,950 <sup>A</sup>	Secondary:	57%
		Tertiary:	42%
Road distance from Urban Poles*1 (km)	48 <sup>A</sup>	Employment by sector*3	
Number of agricultural holdings	1,294 <sup>A</sup>	Primary:	6% <sup>A</sup>
Protected areas	Yes	Secondary:	40% <sup>A</sup>
		Tertiary:	54% <sup>A</sup>

\*1 Nearest settlement with population > 100,000

\*2 (year 2018) 131000 employed people (equal to 102000 full time employments)

\*3 share of total employment)/year

## Key local assets



The key local assets are especially local know-how and cultural heritage, same as for the Franche-Montagne horse breed. The first traces of horse breeding in the Jura are from the 17th century. Livestock farming is also based on wooded pastures which represent the typical landscape of the franchises montagnes region.

### Challenge

The main challenge comes from the existing taboo around horse meat. Many meat consumers have an emotional bond with the animal and therefore refuse to eat. In any case Instead of being incinerated, the horse is turned into a new product which is local meat.

### Innovation

The objective is to add value to the meat of horses that are slaughtered for various reasons and to recognise the quality of this meat instead of incinerating it. To promote the meat and counteract the taboos, sales strategies have been put in place such as promoting the local side with a horse raised directly in the wooded pastures without any feed supplement from abroad.



## Sheep's cheese

The VC is composed of small-scale farming with the farmers that produce and transform the sheep's milk and sell the cheese directly on the farm. The milk is processed into a number of different cheeses which are labelled as organic.

The MLR is a region composed of limestone rocks, which are permeable and have difficulty retaining water, forming a succession of shallow valleys and high plateaus. It is covered by forest and wooded pasture. Milk and cheese production are the first agricultural resource of the massif. Temperature vary strongly between summer and winter and the annual rainfall are abundant (>1000 mm). Clock-making by farmers in the form of peasant clockmakers has been practiced since the Middle Ages and offers a cultural heritage to the region.

Reference mountain landscape statistics  
(A: Data from the NUTS3 CH011)

Reference mountain chain	Jura		
Reference mountain landscape	Bière; Gimel; Longirod; Montricher; Le Chenit; Le Lieu		
Size of the area (km <sup>2</sup> )	21,114	Average per capita income (€)/year	35,066
Altimetry (m; min-max)	565-1,679	Total Gross Value Added (GVA) (€ million)/year	79,468 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	51	GVA by sector*2	
Population changes in the last 10 years	11,7%	Primary:	1% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	286	Secondary:	30% <sup>A</sup>
		Tertiary:	69% <sup>A</sup>
Road distance from Urban Poles*1 (km)	56	Employment by sector*3	
Number of agricultural holdings	93	Primary:	4%
Protected areas	Yes	Secondary:	62%
		Tertiary:	34%

\*1 Nearest settlement with population > 100,000

\*2 (year 2018) 131000 employed people (equal to 102000 full time employments)

\*3 share of total employment)/year

## Key local assets

Dairy production is based on pastures (natural asset), which represent the typical Swiss cultural landscape. Grazing therefore depends on these landscapes and these landscapes depends in return on cattle, otherwise they would return to the state of the forest. Transformation into cheese depends on traditional knowledge since it is produced in an artisanal way.

### Challenge

There are uncertainties about the real effect of climate change on grassland production and animal health (reduced grass growth in summer but a one-month longer growing season depending on the scenario).

### Innovation

This VC is a traditional one, where no innovations have been identified.

## Merlot from Alps - Ticino

Ticino's vineyards are an example of high-quality mountain viticulture, with vineyards planted on terraces scattered in small parcels, The VITI quality label characterising quality red wine, produced strictly from Merlot grapes.

Castel San Pietro is a municipality in the district of Mendrisio in the canton of Ticino in Switzerland. It lies on a hilly territory with a difference in height that varies from 276msm of the river Breggia by which it is crossed, to 1615msm of the arrival station of the train of Monte Generoso. Castel San Pietro is one of the vineyard-covered municipalities in Canton Ticino.

Reference mountain landscape statistics  
(A: Data from the NUTS3 CH070)

Reference mountain chain	Swiss Alps		
Reference mountain landscape	Castel San Pietrol		
Size of the area (km2)	11,8	Average per capita income (€)/year	-
Altimetry (m; min-max)	276-1,615	Total Gross Value Added (GVA) (€ million)/year	27,201 <sup>A</sup>
Population density (Inhabitants/km2)	185, 5	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	5.40	Primary:	0.3% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	109	Secondary:	35.2% <sup>A</sup>
		Tertiary:	64.5% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	58	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	26	Primary:	5.1% <sup>A</sup>
Protected areas	Yes	Secondary:	59.7% <sup>A</sup>
		Tertiary:	35.3% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Key actors of the VC are represented mostly by small individual winegrowers, who are selling the grapes to bigger private wineries. Most of the producers, 75,8%, cultivate an area smaller than 0.2 ha, so some of the small winegrowers tend to cooperate vinifying their harvests together, to

guarantee the requested quality standards. The high level imposed by the VITI label has had a decisive influence in making Ticino wine known and appreciated on the national market and has helped to ensure a progressive economic interest in local winegrowing.

### **Key local assets**

Key local assets include splendid mountain scenery coupled to the Mediterranean climate, very favourable for wine production. Most Ticino vines have always been grown on terraces. Their function is to protect the soil from erosion by the heavy rainfall typical of the pre-alpine zone. In terms of vines, the key local asset is Merlot, international grape variety, well adapted to the specific climatic conditions of the region.

### **Challenges**

The main challenge remains to find solutions to optimise the profitability of vineyards on steeply sloping terrain. In terms of sustainability the ecological value of mountain can be further enhanced through the biodiversity enhancement and safeguarding.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.

## 17. Hungary

### Cold mountain shelter – Knowledge economy

The community produces food through permaculture, contour farming, forest agriculture, extensive animal husbandry, etc. They organise courses, events exhibitions in permaculture, sustainable water management, building, etc. They are creating an online knowledge platform for sharing environmental- and community friendly technology.

Barnag is a small village (municipality), in Veszprém county. The village belongs to the Balaton-Uplands area and is part of a National Park. The nearest city is Veszprém (20 km), and the nearest big city (Budapest) is 135 km away. Only one inferior route passes through the settlement.

Reference mountain landscape statistics  
(A: Data from NUTS3 HU213)

Reference mountain chain		Transdanubian Mountains	
Reference mountain landscape		Barnag	
Size of the area (km <sup>2</sup> )	12.01	Average per capita income (€)/year	3877 <sup>A</sup>
Altimetry (m; min-max)	344	Total Gross Value Added (GVA) (€ million)/year	3286 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	10.4	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	8,7 %	Primary:	4.99 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	0	Secondary:	27.78 <sup>A</sup>
		Tertiary:	67.22 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	14	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	7	Primary:	4.47 <sup>A</sup>
		Secondary:	42.86 <sup>A</sup>
Protected areas	Yes	Tertiary:	52.67 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

An emerging community of young educated environmentally conscious lifestyle migrants, co-operating with the local authority. They produce food through permaculture, contour farming,

forest agriculture, extensive animal husbandry, etc. though most of it they consume within the community. They organise courses, events exhibitions in permaculture, sustainable water management, building, etc. where they charge participants for the knowledge and the food too (made of their own products). They are creating an online knowledge platform for sharing environmental- and community friendly technology (both innovative and traditional).

### **Key local assets**

Untouched clean natural environment, beautiful landscape, expert knowledge on sustainable farming, water management, building and everyday life practices; developed local, national, and international social networks.

### **Challenges**

Climate change (warming, new pests, extreme weather conditions). Civilisation/urbanisation pressure on the Mountain landscape. Turning knowledge on sustainability into income. Finding a balance between commercial and volunteer actions. Social distancing for COVID cancelled events.

### **Innovation**

The VC is innovative, because it transforms known old knowledge into modern technologies that are easy to use today. VC is both endogenous and exogenous because it is done by immigrants, moved to the area from outside, but is based entirely on local conditions.

It is relevant for land use, saving and creating environmental and community values, it is an excellent example of how a conscious and powerful community can create and spread knowledge about resilience and sustainability. They represent important socio-economic trend, spreading fast in developed countries, trying to find links between innovation and tradition.

## Gastro village – Köveskál ‘Eat the View.’

The Gastro village consists of a boutique hotel with restaurant, two successful restaurants, two wineries and an art gallery/cafe. The restaurants use some local products and sell local wine. They have an organization for co-operating with each other, some common marketing, events, etc. This initiative has become one of the most successful rural tourism destinations in Hungary, however, it carries many conflicts, tensions, challenges.

Köveskál is a small village (municipality), in Veszprém county. The village belongs to the Balaton-Uplands area and is part of a National Park. The nearest city is Tapolca (15 km), and the nearest big city (Budapest) is 154 km away. Only one inferior route passes through the settlement, it has a poor bus connection. The population is aging, although there are new young incomers, they only buy second homes. Real estate prices are very high, which is why local people are migrating even more.

### Reference mountain landscape statistics (A: Data from NUTS3 HU213)

Reference mountain chain		Transdanubian Mountains	
Reference mountain landscape		Köveskál	
Size of the area (km <sup>2</sup> )	14	Average per capita income (€)/year	3877 <sup>A</sup>
Altimetry (m; min-max)	170	Total Gross Value Added (GVA) (€ million)/year	3286 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	23.1	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.2 %	Primary:	4.99 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	71	Secondary:	27.78 <sup>A</sup>
		Tertiary:	67.22 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	16	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	36	Primary:	4.47 <sup>A</sup>
		Secondary:	42.86 <sup>A</sup>
Protected areas	Yes	Tertiary:	52.67 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The Gastro-village is successful area of rural tourism, mainly due to a few fine-dining restaurants, wineries, cafes, making the whole area very fashionable. The most interesting aspect is the 'Eat the View' phenomena: The 'hype of the place,' attracting most of the visitors, is created by the 'Gastro village,' that, apart from being nested in the local landscape, has little to do with the locality. Thus, the Gastro-village is very relevant to land use, environment, and local culture, and is also highly susceptible to demographic changes, overexploitation, and climate change.

### **Key local assets**

The most interesting aspect is the 'Eat the View' phenomena, that is: the 'hype of the place,' attracting most of the visitors, is created by the 'Gastro village,' that, apart from being nested in the local landscape, has little to do with the locality.

### **Challenges**

Successful tourism creates serious local tensions. There is a fast-growing visitor pressure, local infrastructure cannot keep up, traffic pollution, etc. Indigenous local people gain little income from tourism business, most enterprises are owned by incomers. co-operation between restaurants and local food producers is difficult. There are split realities (economic, social, cultural) in the locality, bringing tension and challenges. Hospices skyrocketed, local people are being pushed out, land use systems are changing, agricultural production is diminishing.

### **Innovation**

High quality accommodation, fine dining restaurants and wineries are unique in the area and in small villages in general. Using local products is also considered to be innovative. The innovation is exogenous, mostly people from the big cities maintain these places (some are not even living in the village).

Using local products is a hard and innovative process, few restaurants try to do so. Co-operation joined events amongst restaurants, wineries, etc. is a novelty. They also co-operate with the municipality; they invest into the infrastructure of the village (for example building a sidewalk) they aim for self-governance. Social networks, ICT, etc are used for reaching customers.



## Nivegy-valley small family wineries

Small family wineries (some organic) – in a 500ha pocket vine region. They are making alliances, joint actions (Kó-bor túra - vaga-wine tours) co-operate and produce high quality wine, selling through short chains but increasingly through the Internet.

Szentantalfa village is in Veszprém county, in the Balatonfüred district. The nearest larger town (Veszprém) is 30 km away and the capital is 150 km away. There is a significant Nazarene community in the village. The age structure is very young. The area is very favourable for wine production.

Reference mountain landscape statistics  
(A: Data from NUTS3 HU213)

Reference mountain chain		Transdanubian Mountains	
Reference mountain landscape		Szentantalfa	
Size of the area (km <sup>2</sup> )	7	Average per capita income (€)/year	3877 <sup>A</sup>
Altimetry (m; min-max)	307	Total Gross Value Added (GVA) (€ million)/year	3286 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	69.0	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	0.13 %	Primary:	4.99 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	0	Secondary:	27.78 <sup>A</sup>
		Tertiary:	67.22 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	26	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	74	Primary:	4.47 <sup>A</sup>
		Secondary:	42.86 <sup>A</sup>
Protected areas	Yes	Tertiary:	52.67 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

A group of small family wineries (some organic) – in a 500ha pocket vine region making alliances, producing high quality wine, selling it increasingly through the Internet, direct sales, and different networks. They have interesting, innovative, and co-operative joint actions in the field of social

organisation, marketing, logistics, etc. and involve local food producers, using their products (cheese, meat, etc.) on wine tastings and dinners.

### **Key local assets**

Not only their production, but also wine tours/wine tastings/dinners during the scenery. Cooperation and collaboration, local open winemakers contribute to the success of wineries. The wineries adapt to both the natural and cultural conditions of the area with viticulture and winemaking.

### **Challenges**

Climate change (warming, new pests, extreme weather conditions). Civilisation/urbanisation pressure on the Mountain landscape. Social distancing for COVID cancelled events. Difficulties in cooperation, collaboration, and communication between the wineries.

### **Innovation**

Nivegy Valley has a centuries-old tradition of viticulture and winemaking. Most of the winemakers here carry on the family traditions, but there are also some urban people bringing their knowledge from outside. Sales take place in short supply chains, or via the Internet, the design is in most cases special and demanding, most wines are made with modern technology (innovative). Co-operation is also an innovative feature for winemakers.

A group of winemakers organize events together and cooperate with each other, considering the common interests of the mini wine region. They also have a wine route that helps selling their products. Their common marketing slogan is Nivegy Valley as a familiar wine region that they all use. They organise wine tastings/dinners, which they harmonise with each other.

## Pumpkin seed products in Boldva

In addition to other vegetables and herbs, peeled seedless pumpkins began to be grown in Boldva, in the framework in a public employment based social enterprise, giving livelihood to poor, disadvantaged social groups (mainly Roma). A small processing plant, including high tech solar drying equipment was built, branding, design, a small shop was developed, and short food chains approached with the products in the area.

Boldva village in Borsod-Abaúj-Zemplén county, Edelényi district. It is a settlement located in the north-western part of the county, the closest bigger city Miskolc is 15 km away and Budapest is 196 km away.

Reference mountain landscape statistics  
(A: Data from NUTS3 HU311)

Reference mountain chain		Northern Medium Mountains	
Reference mountain landscape		Boldva	
Size of the area (km <sup>2</sup> )	28	Average per capita income (€)/year	6560 <sup>A</sup>
Altimetry (m; min-max)	221	Total Gross Value Added (GVA) (€ million)/year	5560 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	82.3	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.02 %	Primary:	3.88 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	0	Secondary:	34.68 <sup>A</sup>
		Tertiary:	61.44 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	15	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	79	Primary:	3.89 <sup>A</sup>
Protected areas	No	Secondary:	40.14 <sup>A</sup>
		Tertiary:	55.97 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Within a social employment programme, initiated by the local government, members of the local community (poor, unemployed, Roma) produce pumpkin seeds and process it into different products in a small, local processing plant, on environmentally friendly ways. The programme provides employment for disadvantaged people, uses cropland on a traditional, but environmentally friendly way and provides healthy food products to urban customers through short food chains.

The initiative is part of the local territorial quality mark system.

### **Key local assets**

The VC uses the natural resources of the area, they cultivate a pumpkin plantation to produce raw material for the pumpkin seed oil and produce herbs. The cooperation within the village, the support of the local authority, the local human resources are cornerstones of the project. They have become part of the local territorial quality assurance system.

### **Challenges**

Challenges in connection with climate change (draughts, extreme weather events, etc.) and the potentially less yield due to these issues. Difficulties of working with disadvantaged social groups and continuously changing policy environment.

### **Innovation**

The municipality's program provides jobs for locals and produces high-quality products that are sold through both short and long supply chains. They use solar energy for drying. The design of the products is beautiful and demanding. The project is the mayor's initiative and is implemented with the locals - the innovation is endogenous. However, the financial support that enabled the process was coming from the government, through an employment programme.

The municipality initiated this project, which is not common, there is a high level of co-operation and community spirit in the village in the framework of a social enterprise. The products are traditional, however, well designed and packaged for wealthy customers, sold through short chains. They imply solar energy during production and processing and use social networks and ICT for marketing.

## Trizs, the fruitful village

This is a 'public employment program' of the municipality of Trizs, perceived as a social economy-based business of the village. Most of the people working in the program are women, who initially defined the scope of activities as well. The “Women of Trizs” bring their fruit and vegetable processing experiences from their own households to the community scene. They create high value-added products and market it through short chains.

Trizs is a village in Borsod-Abaúj-Zemplén County, Putnok District. It is a settlement located in the north-western part of the county, next to the Slovakian border and next to the Aggtelek National Park. The closest bigger city Miskolc is 50 km away and Budapest is 230 km away.

### Reference mountain landscape statistics (A: Data from NUTS3 HU311)

Reference mountain chain		Northern Medium Mountains	
Reference mountain landscape		Trizs	
Size of the area (km <sup>2</sup> )	10	Average per capita income (€)/year	6560 <sup>A</sup>
Altimetry (m; min-max)	364	Total Gross Value Added (GVA) (€ million)/year	5560 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	18.8	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.15 %	Primary:	3.88 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	0	Secondary:	34.68 <sup>A</sup>
		Tertiary:	61.44 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	47	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	12	Primary:	3.89 <sup>A</sup>
		Secondary:	40.14 <sup>A</sup>
Protected areas	Yes	Tertiary:	55.97 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

In the framework of a local social employment programme (from 2010), poor local community members cultivate a three hectares community garden, producing fruit, vegetables, herbs, and spices, complemented with forest fruits collected at the edge of the local national park. Processed on traditional ways into conserves, jams, compotes, etc. The programme provides employment for disadvantaged people, uses cropland on a traditional, but environmentally friendly way and provides healthy food products to urban customers through short food chains.

### **Key local assets**

The VC uses the natural resources of the area, the fruit trees and berry plantation in the area give raw material for the production. The cooperation of the village, the local human resources is one of the cornerstones of the project. The products are based on local traditions. They have become part of the local territorial quality assurance system.

### **Challenges**

To keep the involvement of poor excluded women for the long run. To make the social enterprise financially sustainable (through generating income and finding project funding). Generating local tourism, making by passers to stop and spend money in the village.

### **Innovation**

The production and processing of fruit is traditional. However, using up-to-date design and packaging, selling the products through short food chains, using ICT, and approaching CSA groups is innovative. The products are based on the knowledge of local people and the local municipality launched the initiative, using available assets (land, knowledge, funds for employment, investment, etc.).

The municipality initiated this project, which is not common, a high level of trust and co-operative culture has been developed to achieve both social and economic goals in the context of sustainable production. They sell the projects in their own local product shop, on the shelves of local, regional, and more distant sample shops, and by other partners.

## Orfú mills, bakery, and visitor centre products

A rural museum with guided tours where you can see a grain grinder, a paper mill and oil mill (water-powered / horsepower dry mill). There is a bakery using flowers produced in the mill. There is a reception building and a café, where they sell the delicacies of their bakery, organize one or more day mini-festivals, concerts, and workshops. In their graphic workshop, they make custom-designed, hand-screened T-shirts and canvas bags.

Orfú village is in Baranya County, in the Pécs district. It is one of the most important settlements of the county from the point of view of tourism, there are three lakes in its territory. The nearest larger town, Pécs, is 17 km away and 215 km from the capital city.

### Reference mountain landscape statistics (A: Data from NUTS3 HU231)

Reference mountain chain	Northern Medium Mountains		
Reference mountain landscape	Trizs		
Size of the area (km <sup>2</sup> )	32	Average per capita income (€)/year	3655 <sup>A</sup>
Altimetry (m; min-max)	412	Total Gross Value Added (GVA) (€ million)/year	3098 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	30.9	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	0.10 %	Primary:	8.46 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	-	Secondary:	15.27 <sup>A</sup>
		Tertiary:	76.28 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	18	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	18	Primary:	7.74 <sup>A</sup>
Protected areas	Yes	Secondary:	32.35 <sup>A</sup>
		Tertiary:	59.91 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

A rural museum with guided tours where you can see a grain grinder, a paper mill and oil mill (water-powered / horsepower dry mill). There is a reception building and a café, where they sell the delicacies of their bakery, organize one or more day mini-festivals, concerts, and workshops. In their graphic workshop, they make custom-designed, hand-screened T-shirts and canvas bags. They also bake bread.

### **Key local assets**

The Mill Museum is in a beautiful natural environment with lakes and forests, a prime tourism destination in the area attracting many people. Also, they use the water for the milling, old, but beautifully refurbished agro-industrial buildings, old but revived knowledge, cultural and working traditions.

### **Challenges**

It is difficult to find employees for these traditional activities (millers, bakers, maintaining traditional wooden mill equipment, etc.), there is labour shortage. It is not easy to find good quality grains for the mill. Their social media and other electronic marketing platforms need development. They have no visitors during the pandemic. The maintenance of the many buildings and equipment and producing enough income from their activities is a continuous challenge. They have won various project supports from different EU sources, to realise those projects (pre-financing, administration, etc.) is also a challenge.

### **Innovation**

The interactive, working mill museum makes a bridge between the past and the present, explores, preserves, recreates, and makes available knowledge of traditional agricultural technology and lifestyle for the present and future generations. The physical space uses past agro-knowledge to help sensitize and change attitudes to social and ecological problems.

The innovation here is the well-designed interpretation of past culture in a 'working museum'.



## Biscuits and chocolate from Pannonhalma

It is part of an exceptionally well-designed high value-added local products' cluster, run by a monastery, mixing thousand-year tradition with modern design and marketing tools, selling history and culture (it is an UNESCO World Heritage site) as much as products. These products are innovative and special.

Pannonhalma is a small town of 3000 inhabitants, having an 1100-year-old benedict monastery. It is a low mountain area, at the north of the Bakony mountains in the west of Hungary near the Austrian border.

Reference mountain landscape statistics  
(A: Data from NUTS3 HU231)

Reference mountain chain	Northern Medium Mountains		
Reference mountain landscape	Pannonhalma		
Size of the area (km <sup>2</sup> )	30	Average per capita income (€)/year	3655 <sup>A</sup>
Altimetry (m; min-max)	271	Total Gross Value Added (GVA) (€ million)/year	3098 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	135.48	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	0.04 %	Primary:	8.46 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	125	Secondary:	15.27 <sup>A</sup>
		Tertiary:	76.28 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	22	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	115	Primary:	7.74 <sup>A</sup>
Protected areas	Yes	Secondary:	32.35 <sup>A</sup>
		Tertiary:	59.91 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

It is part of an exceptionally well-designed high value-added local products' cluster, run by a monastery, mixing thousand-year tradition with modern design and marketing tools, selling history and culture (it is an UNESCO World Heritage site) as much as products. Chocolate and biscuits using locally produced herbs, honey, etc. processed, packaged, and marketed with innovative design. Most of the production is organic. They use the profit made through local products for maintaining natural and cultural heritage and supporting social and religious aims.

An UNESCO world heritage site, where respect for traditional natural and cultural values is very successfully coupled with modern design and marketing in the framework of a local products and tourism cluster.

### **Key local assets**

The monastery has some 60 ha of land, including an herb garden. They have a well-documented history of their own agricultural production (products, stories, etc.) for 1000 years, this knowledge is used in production and marketing effectively. The managers of the different sections, products (the herb garden, winery, brewery, fruit and vegetable gardens, local shop, design, marketing, etc.) are normally having some strong ties to the monastery (e.g., monks, or graduated from the secondary school of the monastery, etc.) Staff is normally very committed, loyal, and strongly identifies with the place and the community. Being a UNESCO World heritage site also helps.

### **Challenges**

Providing income for the religious and educative activities of the monastery, based on very limited land (the monastery used to have thousands of hectares of land compared to some 50-60 ha today). Harmonising tradition and innovation, finding new ways of marketing, products, design, etc.

### **Innovation**

These products are part of a complex cluster, including many products, tourist attractions, etc. Chocolate and biscuits using locally produced herbs, honey, etc. processed, packaged, and marketed with innovative design.

Chocolate and biscuits are reasonably new products for the monastery, especially using traditionally produced herbs (lavender, thyme, etc.) to make the products special. Packaging and the presentation of the products is also high quality and innovative. The marketing of the whole products' cluster is based on 'selling the 1000-year history' of the place, all products are made to appear a mixture of tradition and innovation. The UNESCO World heritage status of the monastery is also used effectively in marketing.

## Cosmetics, health products and herbal tea in Pannonhalma

It is part of an exceptionally well-designed high value-added local products' cluster, run by a monastery, mixing thousand-year tradition with modern design and marketing tools, selling history and culture (it is an UNESCO World Heritage site) as much as products. These products are innovative and special. One of the main ingredients in the products is lavender, which is grown in the garden of the abbey.

Pannonhalma is a small town of 3000 inhabitants, having a 1100-year-old benedict monastery. It is a low mountain area, at the north of the Bakony mountains in the west of Hungary near the Austrian border.

### Reference mountain landscape statistics (A: Data from NUTS3 HU231)

Reference mountain chain		Northern Medium Mountains	
Reference mountain landscape		Pannonhalma	
Size of the area (km <sup>2</sup> )	30	Average per capita income (€)/year	3655 <sup>A</sup>
Altimetry (m; min-max)	271	Total Gross Value Added (GVA) (€ million)/year	3098 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	135.48	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	0.04 %	Primary:	8.46 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	125	Secondary:	15.27 <sup>A</sup>
		Tertiary:	76.28 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	22	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	115	Primary:	7.74 <sup>A</sup>
		Secondary:	32.35 <sup>A</sup>
		Tertiary:	59.91 <sup>A</sup>
Protected areas	Yes		

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

It is part of an exceptionally well-designed high value-added local products' cluster, run by a monastery, mixing thousand-year tradition with modern design and marketing tools, selling history and culture (it is an UNESCO World Heritage site) as much as products. Chocolate and biscuits using locally produced herbs, honey, etc. processed, packaged, and marketed with innovative design. Most of the production is organic. They use the profit made through local products for maintaining natural and cultural heritage and supporting social and religious aims.

An UNESCO world heritage site, where respect for traditional natural and cultural values is very successfully coupled with modern design and marketing in the framework of a local products and tourism cluster.

### **Key local assets**

The monastery has some 60 ha of land, including an herb garden. They have a well-documented history of their own agricultural production (products, stories, etc.) for 1000 years, this knowledge is used in production and marketing effectively. The managers of the different sections, products (the herb garden, winery, brewery, fruit and vegetable gardens, local shop, design, marketing, etc.) are normally having some strong ties to the monastery (e.g., monks, or graduated from the secondary school of the monastery, etc.) Staff is normally very committed, loyal, and strongly identifies with the place and the community. Being a UNESCO World heritage site also helps.

### **Challenges**

Providing income for the religious and educative activities of the monastery, based on very limited land (the monastery used to have thousands of hectares of land compared to some 50-60 ha today). Harmonising tradition and innovation, finding new ways of marketing, products, design, etc.

### **Innovation**

These products are part of a complex cluster, including many products, tourist attractions, etc. Cosmetics, oils, soaps, bath salts and teas using locally produced herbs, honey, etc. processed, packaged, and marketed with innovative design. Handicraft products made in the herbal workshop of the Archabbey of Pannonhalma Officina Sancti Martini.

Packaging and the presentation of the products is also high quality and innovative. The marketing of the whole products' cluster is based on 'selling the 1000-year history' of the place, all products are made to appear a mixture of tradition and innovation. The UNESCO World heritage status of the monastery is also used effectively in marketing.

## Traditional potato from Olaszfalu

Successful local integration of small traditional potato producers by a slightly larger local producer, who organises logistics, storage, processing, and trading of the products. They have become part of the local territorial quality assurance system (European Territorial Quality Mark).

Olaszfalu is a small village (municipality), in Veszprém county, belonging to a small town Zirc, with reasonably good road and railway connections. It is situated in a valley with good alluvial soils, wet and cool weather, surrounded by large, forested areas.

### Reference mountain landscape statistics (A: Data from NUTS3 HU213)

Reference mountain chain		Transdanubian mountains	
Reference mountain landscape		Olaszfalu	
Size of the area (km <sup>2</sup> )	43	Average per capita income (€)/year	3877 <sup>A</sup>
Altimetry (m; min-max)	486	Total Gross Value Added (GVA) (€ million)/year	3286 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	24.5	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.06 %	Primary:	4.99 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	---	Secondary:	27.78 <sup>A</sup>
		Tertiary:	67.22 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	21	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	125	Primary:	4.47 <sup>A</sup>
		Secondary:	42.86 <sup>A</sup>
Protected areas	No	Tertiary:	52.67 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Traditional production of potato with special local varieties, produced by small farmers, integrated by one larger one, marketed through both short and long supply chains (in Hungary and abroad).

SES - maintain traditional, more sustainable ways of production, rural lifestyle, landscape. Producing high quality, sustainable food.

### **Key local assets**

Very good conditions (weather, soil) and a long cultural tradition of cabbage production. The presence of human capacity to organise logistics and achieve economies of scale. Available technology for storage and logistics (based on a 'recycled processing and storage plant of a multinational company). Good connections with the local LEADER LAG, organising marketing and community action.

### **Challenges**

Difficult communication between producers, finding markets, challenges in connection with climate change (draughts, extreme weather events, etc.), maintaining interest of producers in participating in the local producers' networks, etc.

### **Innovation**

An indigenous local producer managed to integrate small producers in and around the municipality, create the necessary high technology infrastructure for logistics and storage and create a considerable volume from a traditional product, enough to approach larger markets. Plus, participation in the ETQM - social innovation, etc. Potato is a very traditional product for mountain agriculture in the region, however traditional producers are on the verge of extinction due to marketing problems and large-scale competition. The only way forward seems to be integration, of which this is an excellent example.

## Traditional cabbages from Olaszfalu

Successful local integration of small traditional cabbage producers by a slightly larger local producer, who organises logistics, storage, processing, and trading of the products. They have become part of the local territorial quality assurance system (European Territorial Quality Mark).

Olaszfalu is a small village (municipality), in Veszprém county, belonging to a small town Zirc, with reasonably good road and railway connections. It is situated in a valley with good alluvial soils, wet and cool weather, surrounded by large, forested areas.

### Reference mountain landscape statistics (A: Data from NUTS3 HU213)

Reference mountain chain		Transdanubian mountains	
Reference mountain landscape		Olaszfalu	
Size of the area (km <sup>2</sup> )	43	Average per capita income (€)/year	3877 <sup>A</sup>
Altimetry (m; min-max)	486	Total Gross Value Added (GVA) (€ million)/year	3286 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	24.5	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.06 %	Primary:	4.99 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	---	Secondary:	27.78 <sup>A</sup>
		Tertiary:	67.22 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	21	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	125	Primary:	4.47 <sup>A</sup>
Protected areas	No	Secondary:	42.86 <sup>A</sup>
		Tertiary:	52.67 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Traditional production of cabbages (red, white, cauliflower, etc.) with special local varieties, produced by small farmers, integrated by one larger one, marketed through both short and long supply chains (in Hungary and abroad). SES - maintain traditional, more sustainable ways of production, rural lifestyle, landscape. Producing high quality, sustainable food.

### **Key local assets**

Very good conditions (weather, soil) and a long cultural tradition of cabbage production. The presence of human capacity to organise logistics and achieve economies of scale. Available technology for storage and logistics (based on a 'recycled processing and storage plant of a multinational company). Good connections with the local LEADER LAG, organising marketing and community action.

### **Challenges**

Difficult communication between producers, finding markets, challenges in connection with climate change (draughts, extreme weather events, etc.), maintaining interest of producers in participating in the local producers' networks, etc.

### **Innovation**

An indigenous local producer managed to integrate small producers in and around the municipality, create the necessary high technology infrastructure for logistics and storage and create a considerable volume from a traditional product, enough to approach larger markets. Plus, participation in the ETQM - social innovation, etc.

Cabbage is a very traditional product for mountain agriculture in the region, however traditional producers are on the verge of extinction due to marketing problems and large-scale competition. The only way forward seems to be integration, of which this is an excellent example.



## Logging, timber production, afforestation, maintenance, leisure, sport

Logging for firewood, sawmill, and nearby thermal power plant. Replantation and maintenance of the forest. Typical and traditional mountain activity, complemented with building and maintaining tourist routes, resting places, watch towers, etc.

The town of Zirc in Veszprém county is the only town in the Zirc district and its center, the "capital of the Bakony". It is the highest town in Hungary (the 400-meter level line passes through the city center). Zirc has not only road but also rail access.

### Reference mountain landscape statistics (A: Data from NUTS3 HU213)

Reference mountain chain		Transdanubian mountains	
Reference mountain landscape		Zirc	
Size of the area (km <sup>2</sup> )	37	Average per capita income (€)/year	3877 <sup>A</sup>
Altimetry (m; min-max)	503	Total Gross Value Added (GVA) (€ million)/year	3286 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	184.6	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.04 %	Primary:	4.99 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	350	Secondary:	27.78 <sup>A</sup>
		Tertiary:	67.22 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	24	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	29	Primary:	4.47 <sup>A</sup>
		Secondary:	42.86 <sup>A</sup>
Protected areas	Yes	Tertiary:	52.67 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Logging for firewood, sawmill, and nearby thermal power plant. Replantation and maintenance of the forest. Typical and traditional mountain activity, complemented with building and maintaining tourist routes, resting places, watch towers, etc. Workers employed in forestry are often

disadvantaged, poor people, not having other possibilities for income, thus forestry is important for social reasons. Well managed forest provides for biodiversity.

### **Key local assets**

Forest management is a typical mountain activity and is also traditional locally, based entirely on traditional local knowledge. It uses the local forests and woods and infrastructure.

### **Challenges**

Climate change (warming, new pests, extreme weather conditions, draught, frost damages). Managing forest workers (often poor, excluded social groups.) Theft of wood, illegal activities. Wild animals can also cause significant damage to new installations. Conflicts with forest users, littering, visitor pressure (hikers, motorcyclists, cyclists, mushroom pickers). Vandalism, damaging forest furniture, resting places, etc.

### **Innovation**

Forest management is a typical mountain activity and is also traditional locally, based entirely on traditional local knowledge. The use of modern machinery and the sale of wood to a nearby thermal power plant is innovative. Developing watch towers, tourist paths in recent years is a 'traditional innovation' in this field.

The use of modern machinery and the sale of wood to a nearby thermal power plant is innovative.

## Forest adventure experience in Csesznek

Active tourism, cycling, walking, climbing, via ferrata routes, adventure parks (new tourist attraction) combined with catering, accommodation, equipment rental and selling local products.

Csesznek is a village in Veszprém County, Zirc district. It is in the Bakony Mountains, 11 km north of Zirc. Csesznek is the pearl of the Bakony Mountains, where the visitors can choose active recreation or quiet relaxation in addition to the gastronomic eateries.

Reference mountain landscape statistics  
(A: Data from NUTS3 HU213)

Reference mountain chain		Transdanubian mountains	
Reference mountain landscape		Csesznek	
Size of the area (km <sup>2</sup> )	24	Average per capita income (€)/year	3877 <sup>A</sup>
Altimetry (m; min-max)	509	Total Gross Value Added (GVA) (€ million)/year	3286 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	21.9	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.01 %	Primary:	4.99 <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	0	Secondary:	27.78 <sup>A</sup>
		Tertiary:	67.22 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	37	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	29	Primary:	4.47 <sup>A</sup>
		Secondary:	42.86 <sup>A</sup>
Protected areas	Yes	Tertiary:	52.67 <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Active tourism, cycling, walking, climbing, via ferrata routes, adventure parks (new tourist attraction) combined with catering, accommodation, equipment rental and selling local products. Actors are local service providers, adventure tour associations and circles, forest managers.

These activities allow for the spreading of knowledge about nature, for active and healthy tourism and can also generate income for local people. However, there are important conflicts too.

### **Key local assets**

Forested areas, rocks, mountains, caves, waterfalls. Also, the built via ferrates and the equipment rental system. A traditional system of signed tourist routes in the mountains with the according maps. Local and regional associations of tourism.

### **Challenges**

Climate change (warming, new pests, extreme weather conditions) can make their services inaccessible. Over-tourism and the crowds that show up on weekends, visitor pressure, littering and inappropriate forest use can ruin VC's resource base. Competing usage of forest (logging, tourism, hunting, forest products) causes conflicts between different actors. Social distancing due to COVID restriction can bankrupt enterprises.

### **Innovation**

The area has a long tradition of hiking and trekking. Via ferrata routes are a very successful recent invention. The connection of the via ferrata route and the excursion with catering, accommodation, equipment rental and selling local products is also novel.

Via ferrata routes and the adventure park is an innovative initiative in this area. The connection of the via ferrata route and the excursion with catering, accommodation, equipment rental and selling local products is novel.

## Skiing and downhill cycling

Eplény ski arena is creating huge tourism during the winter and during the summer with downhill cycling. It is the most developed ski resort in Hungary, with artificial snow, modern ski lifts, lighting, etc. It creates the basis for local economic development, through the availability of tourism related income.

Eplény is a settlement located between the Zirc Basin and the Veszprém Plateau. It is located 14 km north of Veszprém and 7 km south of Zirc, next to the main road 82. A main railway route also passes through the settlement. Next to Eplény is one of the most modern ski resorts in Hungary, the Ski Arena, where the country's first four-seater ski lift has been available since December 2009. Many protected plants of the Bakony mountain can be seen nearby on a study trail.

Reference mountain landscape statistics  
(A: Data from NUTS3 HU213)

Reference mountain chain	Transdanubian mountains		
Reference mountain landscape	Eplény		
Size of the area (km <sup>2</sup> )	8	Average per capita income €/year	3,877 <sup>A</sup>
Altimetry (m; min)	504	Total Gross Value Added (GVA) (€ million)/year	3,286 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	60.25	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.10%	Primary:	4.99% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	21	Secondary (including construction):	27.78% <sup>A</sup>
		Tertiary:	67.22% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	17	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	16	Primary:	4.47% <sup>A</sup>
Protected areas	Yes	Secondary:	42.86% <sup>A</sup>
		Tertiary:	52.67% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Eplény ski arena is creating huge tourism during the winter and during the summer with downhill cycling. It is the most developed ski resort in Hungary, with artificial snow, modern ski lifts, lighting, etc. It creates the basis for local economic development, through the availability of tourism related

income. It is using a quite limited geographical area on a very intensive, however, mostly controllable way, providing income for locals and possibility for being in nature all around the year for visitors. It especially attracts younger generations, who are otherwise difficult to seduce to the outdoors.

### **Key local assets**

It is the steep, northerly, high slope, which, especially with the built-in skiing infrastructure can provide a skiing experience for the longest period in Hungary.

### **Challenges**

Climate change, very warm winters, short ski season, overuse, visitor pressure, soil erosion (both from skying and downhill cycling)

### **Innovation**

Both skiing and downhill cycling is a reasonably new activity in the area. High tech equipment has been installed (ski lifts, snow cannons, automatic access control system)

## Honey

In the Bakony Mountains, there are many people involved in beekeeping, some who started it 50 years ago, some in recent years, migrating with the bees, following the blossoming of different plants and trees. These beekeepers are members of European Territorial Quality Mark Bakonyi Local Brand trademark. Their products are sold through short supply chains with some common design.

Olaszfalu is a small village (municipality), in Veszprém county, belonging to a small town Zirc, with reasonably good road and railway connections. It is situated in a valley with good alluvial soils, wet and cool weather, surrounded by large, forested areas.

Reference mountain landscape statistics  
(A: Data from NUTS3 HU213)

Reference mountain chain	Transdanubian mountains		
Reference mountain landscape	Olaszfalu		
Size of the area (km <sup>2</sup> )	43	Average per capita income €/year	3,877 <sup>A</sup>
Altimetry (m; max)	486	Total Gross Value Added (GVA) (€ million)/year	3,286 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	24.48	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.05%	Primary:	4.99% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	47	Secondary (including construction):	27.78% <sup>A</sup>
		Tertiary:	67.22% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	21	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	125	Primary:	4.47% <sup>A</sup>
Protected areas	No	Secondary:	42.86% <sup>A</sup>
		Tertiary:	52.67% <sup>A</sup>

\*1 Nearest settlement with population > 100,000

\*2 share of total GVA/year

\*3 share of total employment)/year

In the Bakony Mountains, there are many people involved in beekeeping, some who started it 50 years ago, some in recent years. They are members of the European Territorial Quality Mark: Bakonyi Local Brand trademark. Their products are sold through short supply chains within the brand of the trademark. They produce different kinds of honey (mixed flower, linden, acacia,

sunflower, canola, and phacelia) and special and flavoured ones (lavender honey, wild onion honey, chestnut honey).

### **Key local assets**

Very good condition and a long cultural tradition of honey production, large forested and agricultural areas. Good co-operation with agricultural producers (they are most happy to accept the bees on their land). Good connections with the local LEADER LAG, organising marketing and community action.

### **Challenges**

Mainly bee pests and diseases, as well as the effects of climate change, are also causing chemical treatments associated with industrial crop production. Fewer and fewer people choose beekeeping as a profession. For big companies honey can be sold at low prices, but a lot of energy needs to be invested in short supply chains. Many of the beekeepers are ageing, they stop selling in small scale and they often do not have anyone to pass the profession (and their bees) on.

### **Innovation**

Honey itself is considered traditional in this field, but demanding packaging, quality, and often online sales through a short supply chain are considered innovative. Many of the beekeepers are locals, but others are lifestyle entrepreneur incomers, bringing new knowledge, technology, etc. to the common pool.



## Organic garlic

Organic garlic production, a joint enterprise of two small family businesses with modern machines purchased with the help of the local Leader LAG. High-quality garlic produced, cleaned, packaged, and sold in a design package as Hungarian garlic through short supply chains. Members of European Territorial Quality Mark Bakonyi Local Brand trademark.

Olaszfalva is a small village (municipality), in Veszprém County, belonging to a small town Zirc, with reasonably good road and railway connections. It is situated in a valley with good alluvial soils, wet and cool weather, surrounded by large, forested areas.

Reference mountain landscape statistics  
(A: Data from NUTS3 HU213)

Reference mountain chain		Transdanubian mountains	
Reference mountain landscape		Olaszfalva	
Size of the area (km <sup>2</sup> )	43	Average per capita income €/year	3,877 <sup>A</sup>
Altimetry (m; max)	486	Total Gross Value Added (GVA) (€ million)/year	3,286 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	24.48	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.05%	Primary:	4.99% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	47	Secondary (including construction):	27.78% <sup>A</sup>
		Tertiary:	67.22% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	21	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	125	Primary:	4.47% <sup>A</sup>
Protected areas	No	Secondary:	42.86% <sup>A</sup>
		Tertiary:	52.67% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Organic garlic production, a joint enterprise of two small family businesses with modern machines purchased with the help of the local Leader LAG. High-quality garlic produced, cleaned, packaged, and sold in a design package as Hungarian garlic through short supply chains. Members of European Territorial Quality Mark Bakonyi Local Brand trademark.

### **Key local assets**

VC uses locally available lands for organic garlic growing. Good co-operation with agricultural producers and good connections with the local LEADER LAG, organising marketing and community actions.

### **Challenges**

Labour shortages are possible in this industry. Due to global trends, major changes are expected in the garlic market, Chinese competition is very strong. This is a new line of production in the area (and for these businesses) made possible by climate change, there is some lack of knowledge and experience...

### **Innovation**

Garlic is not a traditional product in the Bakony Mountains, also the special quality, the organic cultivation and the specialty of the packaging make VC innovative. An indigenous local producer manages this business with his son; the general agricultural production knowledge is endogenous.

### **References:**

## Organic farming and wine production

Small family organic winery, organic vegetable, and fruit garden. They work with the whole family together (3 generations), use social media extensively to promote their products and lifestyle. They sell directly to customers (web shop, Facebook, etc.) or through short food chains.

Vadna village is in Borsod-Abaúj-Zemplén county, Kazincbarcika district, near the Slovak border. The nearest town, Miskolc, is 30 km away. The settlement is in the Sajó Valley micro-region, it is an ancient settlement. It is on a major rail route, making it quite easily accessible.

Reference mountain landscape statistics  
(A: Data from NUTS3 HU311)

Reference mountain chain	Northern Medium Mountains		
Reference mountain landscape	Vadna		
Size of the area (km <sup>2</sup> )	8	Average per capita income €/year	6,560 <sup>A</sup>
Altimetry (m; min)	357	Total Gross Value Added (GVA) (€ million)/year	5,560 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	83.25	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	0.07%	Primary:	3.88% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	0	Secondary (including construction):	34.68% <sup>A</sup>
		Tertiary:	61.44% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	29	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	7	Primary:	3.89% <sup>A</sup>
Protected areas	Yes	Secondary:	40.14% <sup>A</sup>
		Tertiary:	55.97% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The backbone of the business, launched in 2010, is a chemical engineer couple, who farm with the help of their children and their parents. They produce and sell wine (Chardonnay, Rajnai Riesling, Sauvignon Blanc, Pinot Noir, and some traditional Hungarian varieties). They have organic, bio vegetable and fruit garden, producing organic root vegetables. They also sell juice from home produced goods. They are professional in online communication, and they sell the products through internet, big distributors, local and other restaurants, and hotels.

### **Key local assets**

They use their vineyards and orchards and vegetable gardens, not only for production, but also as a venue for wine tastings and for their online communication. Carrying on the family tradition, they farm on the land of their parents, with whom they also work. They also pass on the love of farming and organic principles to their children.

### **Challenges**

Climate change (warming, new pests, extreme weather conditions). It is a small business, and their development depends heavily on the available sources of external support. Some of their wines are sold in restaurants and hotels, nearby and in Budapest - loss of income due to Covid.

### **Innovation**

Producing organic root vegetables is traditional to the area, organic wine, and juice production here is innovative. The well-studied chemical engineer couple gained 'external knowledge', on the other hand, they 'went back' to their family estate and the whole production system is based on a joint family co-operation, including several generations. They adapt organic methods to local conditions. They are currently developing a small processing plant (for fruit and vegetables) supported by EU rural development project money.

## Pasta (a social economy project)

In the framework of a local social economy public employment programme, run by the local authority, they produce eggs then make pasta in a small processing plant. They also have a small mill to produce flour. Pasta is partly used by the local public kitchen, partly sold in nearby local grocery stores. The project provides employment for disadvantaged social groups (Roma mainly).

Múcsony is a village in Borsod-Abaúj-Zemplén county, Kazincbarcika district. It is in the valley of the Szuha and Sajó, 23 km north of Miskolc (the nearest larger town). There used to be a brick factory here, followed by a mine that closed in the early 1990s.

Reference mountain landscape statistics  
(A: Data from NUTS3 HU311)

Reference mountain chain	Northern Medium Mountains		
Reference mountain landscape	Múcsony		
Size of the area (km <sup>2</sup> )	18	Average per capita income €/year	6,560 <sup>A</sup>
Altimetry (m; min)	201	Total Gross Value Added (GVA) (€ million)/year	5,560 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	160.44	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.10%	Primary:	3.88% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	0	Secondary (including construction):	34.68% <sup>A</sup>
		Tertiary:	61.44% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	24	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	37	Primary:	3.89% <sup>A</sup>
Protected areas	No	Secondary:	40.14% <sup>A</sup>
		Tertiary:	55.97% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Homemade pasta, free of additives and artificial substances. The pasta is from only two ingredients: flour and eggs. They produce the raw materials needed for production almost entirely locally (they also have eggs and their own mills). Their products are also sold in nearby local grocery stores. The product is beautifully packaged and high quality. The project operates within the framework of a social enterprise for social and economic purposes.

### **Key local assets**

The VC uses the natural resources of the area, to produce eggs and flour. The cooperation of the village, the local human resources is one of the cornerstones of the project.

### **Challenges**

- Climate change (warming, new pests, extreme weather conditions).
- Various viruses can appear that can interfere with egg production.
- Narrowing sales' channels. Problems of social enterprise labour supply and work ethic.

### **Innovation**

Pasta preparation and hen keeping, flour grinding are traditional activities. The VC is implemented within the framework of a social enterprise, initiated by the local municipality (to provide work opportunities for locals and to gain some money). They can produce relatively large quantities of pasta, which they sell in nearby and local grocery stores. The product is nicely packaged and high quality. Their products are also preservative-free and healthy.

## Ecological garden (a joint enterprise)

An ecological vegetable garden in the mountains of Börzsöny, run in partnership by 5 individual producers and the local authority. They use permaculture and aim to sell their products (vegetables, fruit) through a box scheme. This is the first year of the project, they are in the phase of development.

The village of Kóspallag is in the northern part of Pest County, in the Szobi district. The nearest larger town (Vác) is 23 km away and the capital is 65 km away. The settlement is in Börzsöny, in the Kóspallag basin, surrounded by mountains. The area of the settlement belongs to the Danube-Ipoly National Park.

Reference mountain landscape statistics  
(A: Data from NUTS3 HU120)

Reference mountain chain		Börzsöny Mountain	
Reference mountain landscape		Kóspallag	
Size of the area (km <sup>2</sup> )	13	Average per capita income €/year	15,339 <sup>A</sup>
Altimetry (m; min)	440	Total Gross Value Added (GVA) (€ million)/year	13,000 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	56.38	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.08	Primary:	2.34% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	29	Secondary (including construction):	21.60% <sup>A</sup>
		Tertiary:	76.06% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	23	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	78	Primary:	1.19% <sup>A</sup>
Protected areas	Yes	Secondary:	22.01% <sup>A</sup>
		Tertiary:	76.80% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

An ecological vegetable garden in the mountains of Börzsöny, run in partnership by 5 individual producers and the local authority. They use permaculture and aim to sell their products (vegetables, fruit) through a box scheme. This is the first year of the project, they are in the phase of development. The municipality helps them with 4 public employees, providing some land and

investment for equipment and machinery. The local municipality also receives revenue from the products sold through the box system.

### **Key local assets**

The VC uses nearly 1 ha land. They use local methods to produce and, local traditional types, rooted in the local culture. Co-operating with the local municipality is a social asset.

### **Challenges**

Key challenges for this VC relate to:

- Challenges in connection with climate change (draughts, extreme weather events, etc.).
- Unexpected difficulties due to inexperience (it is their first season). E.g., the customers do not have to pay in advance yet - they do not know if they will have regular customers. Working in partnership with each-other and the local authority (including a local employment programme) carries many possibilities for conflicts and problems.

### **Innovation**

Selling in box-scheme and the method of permaculture is innovative but producing local varieties with ecological approach is traditional. The actors of this VC are young urban incomers, they study agriculture, so they bring a lot of external knowledge. Using local endogenous varieties counts.



## The tastes of Monostor

The monastery of the Cistercian Sisters in Kismaros processes their own fruit, and they make processed products from purchased raw materials. They produce jams and syrups. They also have a small local product shop and sell their products abroad (Austria and Germany) through contacts of the Cistercian Order.

Kismaros village is in Pest County, in the Szobi district. It is a settlement on the left bank of the Danube, in the Danube Bend. The settlement has a good train connection, it is possible to get to the capital very soon. It is located 55 km from Budapest, and the road connection is also excellent.

### Reference mountain landscape statistics (A: Data from NUTS3 HU120)

Reference mountain chain	Börzsöny Mountain		
Reference mountain landscape	Kismaros		
Size of the area (km <sup>2</sup> )	12	Average per capita income €/year	15,339 <sup>A</sup>
Altimetry (m; min)	243	Total Gross Value Added (GVA) (€ million)/year	13,000 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	197.25	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	0.12%	Primary:	2.34% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	69	Secondary (including construction):	21.60% <sup>A</sup>
		Tertiary:	76.06% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	12	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	51	Primary:	1.19% <sup>A</sup>
Protected areas	Yes	Secondary:	22.01% <sup>A</sup>
		Tertiary:	76.80% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The monastery of the Cistercian Sisters in Kismaros processes their own fruit, and they make processed products from purchased raw materials. They produce jams and syrups. They also have a small local product shop and sell their products abroad (Austria and Germany) through contacts of the Cistercian Order. In addition to processing their own fruit, they make processed



products from purchased raw materials. They make special products - with honey/without sugar/preservative free.

### **Challenges**

Challenges in connection with climate change (draughts, extreme weather events, etc.) and the potentially less yield. Logistics at the time of COVID to Austria and Germany, keeping international marketing channels, major reduction of tourism related sales.

### **Innovation**

The processing is immediate; the products do not contain artificial additives or preservatives. They preserve the products by heat treatment (traditional). Selling the products within short food chains and the beautiful design they have is innovative.

The VC is based on local production knowledge of the Cistercian sisters.

## Ranger - truffle hunting

A young couple - lifestyle entrepreneurs - moved to a village. They collect truffles with their dogs in the Balaton Uplands area. They sell processed products and organise guided truffle collecting tours.

Barnag is a small village (municipality), in Veszprém County. The village belongs to the Balaton-Uplands area and is part of a National Park. The nearest city is Veszprém (20 km), and the nearest big city (Budapest) is 135 km away. Only one inferior route passes through the settlement.

Reference mountain landscape statistics  
(A: Data from NUTS3 HU213)

Reference mountain chain	Transdanubian mountains		
Reference mountain landscape	Barnag		
Size of the area (km <sup>2</sup> )	12.01	Average per capita income €/year	3,877 <sup>A</sup>
Altimetry (m; min)	344	Total Gross Value Added (GVA) (€ million)/year	3,286 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	10.40	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	8.69	Primary:	4.99% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	0	Secondary (including construction):	27.78% <sup>A</sup>
		Tertiary:	67.22% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	14	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	7	Primary:	4.47% <sup>A</sup>
Protected areas	Yes	Secondary:	42.86% <sup>A</sup>
		Tertiary:	52.67% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The key activities of this VC are collecting truffles, making special processed products, and organising truffle collecting tours. They use forest areas on an environmentally friendly, sustainable way, not interfering with other activities, and at the same time creating high value-added products. As lifestyle entrepreneurs, they are connected to a local community, seeking sustainable lifestyles; through them they connect to short food chains and can contribute to developing and spreading knowledge about sustainability.

### **Key local assets**

This VC uses the forests in the area to look for truffles, using dogs that is a method based on traditional culture and knowledge (though in this area it is innovative). Being part of a local immigrant community seeking sustainable lifestyles connects them to short food chains.

### **Challenges**

Creating their processed products only from local ingredients (e.g., using local artisanal cheese would raise their prices too much). Uncertainty, whether they can continue to use forests to collect truffles. Marketing their truffle-adventure tours.

### **Innovation**

The processed products within this VC are special and innovative (truffle stuffed cheese, oil with truffle, salt with truffle). Looking for truffles is rare in the area; this VC is based on external knowledge. They are also in connection with a local community promoting sustainable lifestyles and creating and spreading knowledge in this field.

## Living Country house - farm museum

The 'Living Country House' preserves, re-creates, and demonstrates traditional agricultural and rural lifestyle knowledge to the young urban generation. It also combines traditional knowledge with modern technology. It connects the younger generation with the older one, urban dwellers with rural ones, and immigrants with locals making bridges amongst all these. The initiative is implemented in a partnership with the active participation of local associations, external institutions (various universities), individuals and the local authority.

The village of Kóspallag is in the northern part of Pest County, in the Szobi district. The nearest larger town (Vác) is 23 km away and the capital is 65 km away. The settlement is in Börzsöny, in the Kóspallag basin, surrounded by mountains. The area of the settlement belongs to the Danube-Ipoly National Park.

Reference mountain landscape statistics  
(A: Data from NUTS3 HU120)

Reference mountain chain		Börzsöny Mountain	
Reference mountain landscape		Kóspallag	
Size of the area (km <sup>2</sup> )	13	Average per capita income €/year	15,339 <sup>A</sup>
Altimetry (m; min)	440	Total Gross Value Added (GVA) (€ million)/year	13,000 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	56.38	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.08	Primary:	2.34% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	29	Secondary (including construction):	21.60% <sup>A</sup>
		Tertiary:	76.06% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	23	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	78	Primary:	1.19% <sup>A</sup>
Protected areas	Yes	Secondary:	22.01% <sup>A</sup>
		Tertiary:	76.80% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

This is a community of young people from the city, whose main area of expertise is ethnography. They work together with the local community to renovate an old farmhouse with old local

technologies. All of this will be the subject of a community-based exhibition on the history of the place and the agricultural past. The aim is to protect, transform and pass on traditional values and to contribute to the creation of a local sustainable knowledge and value-based community.

### **Key local assets**

They research local knowledge (cognitive, practical, and situational). Learning from local's results empowerment. Nature is also used (mushroom hiking, local fruit trees).

### **Challenges**

Key challenges for this VC relate to:

- The issue of house ownership - currently private property.
- The difference between the worldviews of recent immigrants and indigenous residents, throughout community planning. For instance, there is a split in terms of production methods and the ecological point of view.
- Finding resources for the conservation and development of the house and the exhibition, and latter to maintain activities in the house. Involving local people widely in the project.

### **Innovation**

The VC works with community planning, which is endogenous, but there are also many external connections, external help (researchers, experts). The VC adds the past to the present, explores preserves, recreates, and makes available knowledge of traditional agricultural technology and lifestyle for the present and future generations. The physical space uses past agro-knowledge to help sensitize and change attitudes to social and ecological problems.

## Sustainable local food system project

The local government has various initiatives to enhance local community and a sustainable food system. The goal is to provide sustainable local food for local people, to sell and get income from the remaining products and to save local varieties. There is a community garden (also providing employment for the local poor) and a cross-border co-operation programme on exploring and spreading local fruit and vegetable varieties in the area. They are currently developing a farmers' market/shop/and catering facility and a small processing plant for fruit and vegetables to be used by the whole community.

The village of Kóspallag is in the northern part of Pest County, in the Szobi district. The nearest larger town (Vác) is 23 km away and the capital is 65 km away. The settlement is in Börzsöny, in the Kóspallag basin, surrounded by mountains. The area of the settlement belongs to the Danube-Ipoly National Park.

### Reference mountain landscape statistics (A: Data from NUTS3 HU120)

Reference mountain chain		Börzsöny Mountain	
Reference mountain landscape		Kóspallag	
Size of the area (km <sup>2</sup> )	13	Average per capita income €/year	15,339 <sup>A</sup>
Altimetry (m; min)	440	Total Gross Value Added (GVA) (€ million)/year	13,000 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	56.38	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.08	Primary:	2.34% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	29	Secondary (including construction):	21.60% <sup>A</sup>
		Tertiary:	76.06% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	23	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	78	Primary:	1.19% <sup>A</sup>
Protected areas	Yes	Secondary:	22.01% <sup>A</sup>
		Tertiary:	76.80% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

In Kóspallag, the local government has various initiatives to enhance local community and a sustainable food system. The goal is to provide sustainable local food for local people, to sell and get income from the remaining products and to save local varieties. There is a community garden (also providing employment for the local poor) and a cross-border co-operation programme on exploring and spreading local fruit and vegetable varieties in the area. They are supporting local organic producers with agricultural land and other assets owned by the local authority. They are currently developing a farmers' market/shop/and catering facility and a small processing plant for fruit and vegetables to be used by the whole community.

### **Key local assets**

The municipality creates and manages a community garden, supports local organic producers with agricultural land and other assets owned by the local authority. They run a transnational project for saving local fruit varieties and create a fruit garden. They turn an old public kitchen into a small fruit and vegetable processing plant open to be used by the local community, etc.

### **Challenges**

Key challenges for this VC relate to:

- Challenges in connection with climate change (draughts, extreme weather events, etc.).
- To find enough resources for the implementation of all projects (in Hungary, local governments do not have independent income, they rely on external sources).
- Located in a beautiful hilly area, over-tourism, big investors and rising real estate prices and population change can be future a problem (these problems also show signs now).

### **Innovation**

The VC is innovative, because all these initiatives are not obligations for a municipality, but extra commitments. We can count the VC traditional, since it relies on local conditions, local land, and traditional varieties.

The idea and knowledge come from inside, from the local mayor and his team, but also from outside, because the mayor studied about sustainability on various universities.



## Nivegy-valley artisan cheese makers

There are three different cheese producers in Nivegy-valley micro-region. They produce high quality artisan cheese and milk products. They keep animals (goat/cow), and their products are marketed in SFC-s, restaurants, farmers markets, on-farm-sales, and web shop delivery.

Szentantalfa village is in Veszprém county, in the Balatonfüred district. The nearest larger town (Veszprém) is 30 km away and the capital is 150 km away. There is a significant Nazarene community in the village. The age structure is very young. The area is very favourable for wine production.

Reference mountain landscape statistics  
(A: Data from NUTS3 HU213)

Reference mountain chain	Transdanubian mountains		
Reference mountain landscape	Szentantalfa		
Size of the area (km <sup>2</sup> )	7	Average per capita income €/year	3,877 <sup>A</sup>
Altimetry (m; min)	307	Total Gross Value Added (GVA) (€ million)/year	3,286 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	69	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	0.13	Primary:	4.99% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	0	Secondary (including construction):	27.78% <sup>A</sup>
		Tertiary:	67.22% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	26	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	74	Primary:	4.47% <sup>A</sup>
Protected areas	Yes	Secondary:	42.86% <sup>A</sup>
		Tertiary:	52.67% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

There are three different cheese producers in Nivegy-valley micro-region. They produce high quality artisan cheese and milk products. They keep animals (goat/cow), and their products are marketed in SFC-s, restaurants, farmers markets, on-farm-sales, and web shop delivery. Animal husbandry are traditional in this area, however, cheese-making, especially high quality, beautiful packaging and short supply chains, sales via the internet are innovative. They all use innovative

tools, small machinery, solar power, ICT for marketing, etc. They are using the possibilities provided by the fast-developing tourism of the area on reflexive, flexible and successful ways.

### **Key local assets**

The cheese makers use local grasslands as a resource. Nearby the area (Lake Balaton, Káli Basin) there are a lot of tourists, which provides them good opportunity to sell their products. Some of them carry on the traditional animal husbandry activities of the area and the family in a modern way (marketing, new sales channels). They also have a good impact on the social environment, as they employ people.

### **Challenges**

Climate change (warming, new pests, extreme weather conditions). Civilisation/urbanisation's pressure on the Mountain landscape. During COVID, they have problems to sell cheese (lack of tourists, no events, no restaurants, hotels). They have lots of other challenges characteristic to very small producers in Hungary.

### **Innovation**

Animal husbandry are traditional in this area, however, cheese-making, especially high quality, beautiful packaging and short supply chains, sales via the internet are innovative. All the three cheesemakers started from no experience with cheese, however two of them are from traditional peasant families. The third is from a city with no agricultural past. They all use innovative tools, small machinery, solar power, ICT for marketing, etc.

## 18. Romania

### Eco-fertilizer

Very innovative use of a low value by-product (wool) from sheep production in the South Romanian Carpathians. This new product could help to maintain the productivity of traditional shepherding systems in the region, especially those in the more marginal mountain areas which are most prone to abandonment.

Sura Mica commune is located near the city of Sibiu, but wool is collected from the whole of Sibiu County (RO126). Sibiu County is covered by almost equal proportions of forest (35%) and open, semi-natural grasslands (34%) - plus some 20% of relatively low input arable. The area supports a remarkable species richness (including many endemic species and medicinal plants), consequently most of the grasslands are considered as High Nature Value (HNV). For a fuller description of the landscape and associated farming systems.

Reference mountain landscape statistics  
(A: Data from NUTS3 RO126)

Reference mountain chain	Southern Romanian Carpathian Mountains		
Reference mountain landscape	Sura Mica		
Size of the area (km <sup>2</sup> )	49.4	Average per capita income (€)/year	11,400 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	4,121 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	64.4	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	2.8% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	6,065 <sup>A</sup>	Secondary:	42.8% <sup>A</sup>
		Tertiary:	54.4% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	-	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	51,620 <sup>A</sup>	Primary:	6.3% <sup>A</sup>
Protected areas	Yes	Secondary:	48.2% <sup>A</sup>
		Tertiary:	45.5% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The processing unit is in the commune of Sura Mica close to the regional city of Sibiu. Wool is purchased from sheep farmers in the surrounding area, including those grazing communal flocks in the nearby mountain pastures of the South Romanian Carpathians. The processing equipment (converting wool to pellets) is purchased from Germany and when fully operational will have a capacity of up to 50 tonnes of pellets per month. The fertilizer is targeted at a range of potential end-users from gardeners to commercial vegetable growers. The pellets are therefore sold in packs of 450g, 1 kg, 5 kg, 15 kg, 25 kg, or a Big Bag of 500 kg.

### **Key local assets**

Sibiu is historically an important centre for transhumance in south-east Europe and the area developed a specific farming system based on mixed sheep and cattle grazing and mowing, plus mobile pastoralism on long or short distances. The political changes in late 19th century forced the shepherds to restrain long-distance movements within the boundaries of the Carpathians. This led to early deforestation of the region and the creation of mountain grasslands with their own biodiversity value - what is now commonly known as High Nature Value (HNV) grasslands. The conservation of the biodiversity value of these HNV grasslands depend upon the maintenance of traditional patterns of sheep grazing and haymaking.

### **Challenges**

The main challenge is developing the brand ("Naked Sheep") and establishing a functional value chain for this new product, especially since it is so unusual and different. However, the business has received a lot of attention in the local and national media which is very encouraging for them - see here: <https://www.nakedsheep.ro/aparitii-in-mass-media/> The Covid crisis has inevitably slowed the initial growth of the business with a limit on current production capacity because the necessary installation engineers were not able to travel to Romania.

### **Innovation**

"Naked Sheep" is a start-up company (opened in February 2020) that is buying wool from local sheep farmers and making the wool into pellets that are sold as an organic fertilizer. This is sold online mainly for vegetable growers - the website is here: <https://www.nakedsheep.ro/>. This VC represents a great example of entrepreneurship and innovation in a very traditional agricultural sector for Romania.

## Mountain honey

Beekeeping is an important economic activity in Romania (especially in more marginal rural areas) which is recognised by the government and supported with appropriate interventions within the framework of a National Beekeeping Programme (<https://www.madr.ro/programul-national-apicol.html>).

Braşov county is a hilly mountainous region (500 - 2000 metres altitude) located in the south-eastern part of Transylvania. The relief is a diverse mix of mountainous (35%), hilly (50%) and lower altitude plain areas (15%) with an associated land use of forests (mainly in the mountain areas), permanent grasslands (mainly in the hilly areas), cultivated arable fields (in the hilly areas and lower altitude plains and hill areas) – plus some urban, industrial and water surfaces (lakes and reservoirs).

Reference mountain landscape statistics  
(A: Data from NUTS3 RO122)

Reference mountain chain	Southern Romanian Carpathian Mountains		
Reference mountain landscape	Buneşti		
Size of the area (km <sup>2</sup> )	19.18	Average per capita income (€)/year	12,600 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	6,260 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	64.4	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	2.4% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	17,795 <sup>A</sup>	Secondary:	35.8% <sup>A</sup>
		Tertiary:	61.8% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	-	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	47;980 <sup>A</sup>	Primary:	8.8% <sup>A</sup>
Protected areas	Yes	Secondary:	40.3% <sup>A</sup>
		Tertiary:	51.2% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Beneficiaries of the programme include both individual beekeepers and beekeeping organisations. Available support includes specialist consultancy services; promotion of bee products; training courses; investment support for production and processing facilities (including direct support for transhumance of hives); subsidised medicinal products for varroosis; national

level management of transhumance / pastoral beekeeping (especially important in the mountain areas); financial assistance for restocking (purchase of queens and bee families), and; analytical services for testing quality of honey. In 2019 there were a total of 39,501 bee families / hives registered in Brasov County for honey production - more than twice the amount registered in 1990 (INSSE data, 2021). The owners of these hives range from private households to commercial honey producers selling via many different value chains. These range from very local value chains to much longer value chains involving both the international sales of speciality honeys to the blending of honeys for mass sales via multiple retailers. In all cases there is a clear need for honey producers to continue to work on product conformity and value chain development. The specific value chain selected for this VC card is a social enterprise - AgroVision - set-up 14 years ago in the village of Crits in Brasov County to develop and present a model of modern small-scale farming to alleviate rural poverty and social exclusion. In 2018 AgroVision diversified into honey production and started collecting, processing, and marketing honey from local beekeepers under the brand of 'Marindar' (<https://merindar.ro/about>). This specific enterprise has been specifically chosen to highlight the potential importance of bee keeping and the honey value chain as a source of income for disadvantaged communities in the mountain areas of Romania. Agrovision now works with 650 beekeepers organised into 9 bee-keeping associations in five counties. They have donated hives and 2,600 bee families, provided training and support for small bee-keeping businesses, and are working to promote beekeeping to young people in 7 High Schools.

### Key local assets

There are many different types of honey produced in Braşov county depending upon the season and the vegetation that is flowering. The most common types are Acacia, Lime and Poliflora, but very specific local types such as "mountain raspberry" and "mountain pasture" honey are also produced. Organically certified poliflora honey is also available.

### Challenges

The sector has great potential to grow both in terms of production capacity and consumer demand, but there is inevitably growing concern about the on-going threat of disease, invasive species, and loss of habitats / feeding sources due both to the intensification of arable cropping (including poor management of insecticides) and the abandonment of grasslands, especially in the mountain areas. The long-term effects of climate change and climate variability remain unknown but are likely to have negative impacts upon productivity of honeybees. Additional interventions are therefore needed to strengthen the capacity of beekeepers to adapt through integrating climate services with available indigenous knowledge and local practices.

### Innovation

This VC is a traditional one, where no innovations have been identified.

## Certified Ecotourism

The Piatra Craiului National Park is a high-quality tourist destination in Romania, but also a fragile landscape and vulnerable ecosystem that is under great pressure from inappropriate development. Certified ecotourism is an innovative form of tourism very well-suited to the sustainable development of the local area.

Braşov county is a hilly mountainous region (500 - 2000 metres altitude) located in the south-eastern part of Transylvania. The relief is a diverse mix of mountainous (35%), hilly (50%) and lower altitude plain areas (15%) with an associated land use of forests (mainly in the mountain areas), permanent grasslands (mainly in the hilly areas), cultivated arable fields (in the hilly areas and lower altitude plains and hill areas) – plus some urban, industrial and water surfaces (lakes and reservoirs).

### Reference mountain landscape statistics (A: Data from NUTS3 RO122)

Reference mountain chain	Southern Romanian Carpathian Mountains		
Reference mountain landscape	Moeciu		
Size of the area (km <sup>2</sup> )	110	Average per capita income (€)/year	12,600 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	6,260 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	42.9	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	2.4% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	17,795 <sup>A</sup>	Secondary:	35.8% <sup>A</sup>
		Tertiary:	61.8% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	-	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	47,980 <sup>A</sup>	Primary:	8.8% <sup>A</sup>
Protected areas	Yes	Secondary:	40.3% <sup>A</sup>
		Tertiary:	51.2% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The main actors in the ecotourism value chain of the Piatra Craiului National Park are local business and residents providing accommodation, local food, and meals, guiding services and rental facilities (notably mountain bikes). The area has been an official ecotourism destination in Romania since 2014 certified by the Association of Ecotourism in Romania (AER). AER aims to

improve the quality of ecotourism services and to develop the infrastructure from ecotourism destinations across the whole of Romania. It is a membership organisation and works to bring together the public and private sectors in innovative ways to create partnerships for nature conservation and sustainable tourism development. AER operates an Ecotourism Certification System for putting into practice clearly defined ecotourism principles. The touristic destination associated with the Piatra Craiului National Park encompasses a total of six LAUs: Oraş Zărneşti (40492), Moeciu (41471) and Bran (40633) in Braşov county (RO122) plus Rucăr (18527), Dragoslavele (16472) and Dâmbovicioara (16329) in Argeş county (RO311)

### Key local assets

Piatra Craiului is a mountain massif that is widely considered a “jewel in the crown” of the Romanian Carpathians. Land use is a combination of traditional semi-subsistence pastoralism and deciduous forest, but the landscape is dominated by a 25 km long limestone ridge (highest elevation is 2,238 metres) with deep gorges and caves. This creates a unique mountain landscape that is highly appreciated nationally and internationally. For example, the 2003 movie Cold Mountain was filmed in and around the "Prăpăstiile Zărneştilor" gorge which is one of the most visited sights in the massif.

### Challenges

Rural tourism is very well-established in and around the Piatra Craiului National Park and the region has been a touristic ‘hot-spot’ since the previous communist period. The National Park alone attracts over 110,000 visitors per year, and this has put considerable pressure upon the local environment. These pressures are likely to increase and there is an urgent need to develop more sustainable, lower impacts forms of tourism whilst also maintaining the valuable income provided for the local community. There are also specific challenges associated with climate change, notably the increasing vulnerability of the domestic water supply due to over-exploitation by tourism combined with the increasing frequency of drought.

### Innovation

The concept of ‘ecotourism’ has emerged more recently in the area to cater for tourists wishing to experience the natural environment of the National Park more responsibly without damaging it or disturbing its habitats – as well as supporting the well-being of local people. The ecotourism services that are offered locally in partnership with the National Park Authority and local businesses are fully certified (by AER – see below) and include: 'Eco-tours' with experienced local guides to visit wolf, lynx, and bear tracks; Specialist hiking trips for nature photography; Low impact mountain biking trails, and small scale-accommodation structures (eco-lodges and guesthouses). The concept of ecotourism is highly relevant for the mountain areas of Romania. It is a well-established concept in the international tourist market and is being effectively adapted to the Romanian context.



## Firewood

Wood continues to be very important fuel for heating and cooking in many households in mountain communities in Romania, including in Moeciu commune in the western extreme of Braşov County where households are very dispersed and basic services such as a public gas supply are poorly developed. This dependence upon firewood puts the local forest resources under great pressure - notably from unregulated and often illegal harvesting and collection of firewood for personal use and/or sale.

Braşov county is a hilly mountainous region (500 - 2000 metres altitude) located in the south-eastern part of Transylvania. The relief is a diverse mix of mountainous (35%), hilly (50%) and lower altitude plain areas (15%) with an associated land use of forests (mainly in the mountain areas), permanent grasslands (mainly in the hilly areas), cultivated arable fields (in the hilly areas and lower altitude plains and hill areas) – plus some urban, industrial and water surfaces (lakes and reservoirs).

### Reference mountain landscape statistics (A: Data from NUTS3 RO122)

Reference mountain chain	Southern Romanian Carpathian Mountains		
Reference mountain landscape	Moeciu		
Size of the area (km <sup>2</sup> )	110	Average per capita income (€)/year	12,600 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	6,260 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	42.9	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	2.4% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	17,795 <sup>A</sup>	Secondary:	35.8% <sup>A</sup>
		Tertiary:	61.8% <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	-	Primary:	8.8% <sup>A</sup>
Number of agricultural holdings	47;980 <sup>A</sup>	Secondary:	40.3% <sup>A</sup>
Protected areas	Yes	Tertiary:	51.2% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

In the reference landscape chosen the key actors in the certified value chain are private forest owners (in other regions there is more state- and/or church-owned forest), professional

woodcutters and firewood traders. The professional woodcutters have the expertise to select the most appropriate trees to harvest for firewood, plus the experience of working on the steep mountain slopes characteristic of the area. The firewood traders have storage space, transportation, and a reliable supply of available labour for the intensive work of cutting and splitting the firewood.

### **Key local assets**

Mixed deciduous forest, especially areas which are most accessible for motorised or horse-drawn vehicles.

### **Challenges**

The harvesting / collection of firewood (beech and birch with some oak, ash, spruce, and fir) has been much more strictly regulated in the last few years and commercial sales must be accompanied by a certificate of origin. The records of registered firewood traders are regularly inspected and spot-checks by the police and environmental inspectors ('Garda de Mediu') are also common. However, the increased regulation of firewood (and reduced supply) has contributed to a significant increase in price - around 250% in 10 years - which now provides additional incentive for the illegal trade in firewood to continue and flourish.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.

## Live sheep and lambs

Romania is Europe's largest exporter of live sheep and lambs for slaughter with an estimated market value of 175 million EUR / year. This is an important value chain for sheep farmers in the Carpathians, especially for supporting the financial viability of many small farms and thereby ensuring their continued existence and contribution to the maintenance of the traditional farming practices that are important for biodiversity conservation and the valued mountain landscapes.

Braşov county is a hilly mountainous region (500 - 2000 metres altitude) located in the south-eastern part of Transylvania. The relief is a diverse mix of mountainous (35%), hilly (50%) and lower altitude plain areas (15%) with an associated land use of forests (mainly in the mountain areas), permanent grasslands (mainly in the hilly areas), cultivated arable fields (in the hilly areas and lower altitude plains and hill areas) – plus some urban, industrial and water surfaces (lakes and reservoirs).

### Reference mountain landscape statistics (A: Data from NUTS3 RO122)

Reference mountain chain	Southern Romanian Carpathian Mountains		
Reference mountain landscape	Caţa		
Size of the area (km <sup>2</sup> )	119.7	Average per capita income (€)/year	12,600 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	6,260 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	23.1	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	2.4% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	17,795 <sup>A</sup>	Secondary:	35.8% <sup>A</sup>
		Tertiary:	61.8% <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	-	Primary:	8.8% <sup>A</sup>
Number of agricultural holdings	47;980 <sup>A</sup>	Secondary:	40.3% <sup>A</sup>
Protected areas	Yes	Tertiary:	51.2% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Specialist trading companies such as 'Seradria' have a network of partners managing collection points in the main sheep producing regions in Romania. 'Seradria' has annual capacity to expert up to 150,000 live animals per year (including cattle and bulls for breeding). Collection points

include 'Agratransilvania' in the commune of Cața in Brașov county (<https://agratransilvania.ro>). There is a clear distinction between the value chains for sheep and those for lambs. Most sheep are exported to the Middle East (Libya and Jordan) with a particular focus upon the Islamic ritual called Eid al-Adha (the "Festival of the Sacrifice"). Exports of live lambs are targeted more at EU countries - notably Greece and Italy. Exports are authorised by the Romanian sanitary veterinary authorities who aim to ensure that: All livestock accommodation is in accordance with EU welfare standards; Sanitary & veterinary certificates are available, and Effective traceability systems are in place.

### **Key local assets**

The live sheep and lambs collected from local farms for export are usually from the most two common breeds found in the Carpathians - the Tsurcana breed (a traditional indigenous breed that was favoured by Romanian transhumance shepherds and is still very popular in mountain villages) and the Tsigai breed (a more recently introduced breed that is more common in the hilly sub-mountainous areas of the Carpathians).

### **Challenges**

The live export of sheep and lambs is highly controversial because of the animal welfare issues associated with transporting live animals over long distances. This tragically was brought to the attention of the global media in November 2019 when a cargo ship carrying 15,000 sheep capsized in the Black Sea shortly after leaving Romania for Saudi Arabia - for more details see here: <https://www.nytimes.com/2019/11/24/world/europe/romanian-sheep-cargo-ship.html>

### **Innovation**

This VC is a traditional one, where no innovations have been identified.

## “Mozzarella”

Successful introduction of a new high quality dairy product onto the Romanian market using a combination of local expertise from Romania plus expertise and investment capital from the UK.

Braşov county is a hilly mountainous region (500 - 2000 metres altitude) located in the south-eastern part of Transylvania. The relief is a diverse mix of mountainous (35%), hilly (50%) and lower altitude plain areas (15%) with an associated land use of forests (mainly in the mountain areas), permanent grasslands (mainly in the hilly areas), cultivated arable fields (in the hilly areas and lower altitude plains and hill areas) – plus some urban, industrial and water surfaces (lakes and reservoirs).

Reference mountain landscape statistics  
(A: Data from NUTS3 RO122)

Reference mountain chain	Southern Romanian Carpathian Mountains		
Reference mountain landscape	Oraş Rupea		
Size of the area (km <sup>2</sup> )	75.5	Average per capita income (€)/year	12,600 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	6,260 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	80.9	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	2.4% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	17,795 <sup>A</sup>	Secondary:	35.8% <sup>A</sup>
		Tertiary:	61.8% <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	-	Primary:	8.8% <sup>A</sup>
Number of agricultural holdings	47;980 <sup>A</sup>	Secondary:	40.3% <sup>A</sup>
Protected areas	Yes	Tertiary:	51.2% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

'Transylvania Lactate' pursues an integrated production-processing-marketing concept based upon managing as much of the value chain as possible from maintaining the High Nature Value pastures that the buffalo graze; making supplementary animal feed for buffalo; ensuring the health of the buffalo; managing all aspects of dairy production and processing, and product distribution. The aim of this approach is to ensure the 'premium' nature of the Mozzarella, particularly the commitment to freshness, quality and “excellence in taste.” The processing unit is based in the

small town of Rupea with good access to a main road. It is 30 km from the buffalo farm in the neighbouring commune of Bunești. The processing unit is state-of-the-art, fully automated, and compliant with all national and EU standards. Production teams are carefully trained - including in the specific manufacture of the Mozzarella which requires some manual processing. There is a well-equipped laboratory providing product analysis for each phase of production. A fleet of vehicles distributes products daily to selected retail outlets in central Romania.

### **Key local assets**

Buffalo have been present in the Carpathians for at least 1500 years. They originate from the Mediterranean type of water buffalo and have become well-adapted to the mountain environment. Carpathian Buffalo are most found on smallholdings and are valued for their sturdiness and high productivity / milk quality. Although valued locally, there are few buffalo products on the market. Where they do exist, they are versions of well-known products such as yoghurt, sour cream and salted white cheese that are made with buffalo milk rather than sheep, cow, or goat.

### **Challenges**

Maintaining the visibility and profitability of a premium product on the Romanian market is an ongoing challenge, especially in the face of cheaper imports of a speciality product such as Mozzarella. The dairy company, 'Transilvania Lactate' (<https://www.transilvanialactate.ro/en/>), therefore works in partnership with external experts from a management consultancy company (also providing communication services) and a lifestyle brand.

### **Innovation**

Mozzarella is a completely new mountain product for Romania. In particular, 'Transilvania Lactate' is the first Romanian dairy company to successfully produce a consistent Mozzarella product from 100% Carpathian Buffalo milk. Mozzarella is a completely new mountain product for Romania and is being produced by one of the largest commercial buffalo herds in Romania. They have invested significantly in both developing i) their Mozzarella (especially perfecting the process in accordance with the specific characteristics of the buffalo milk produced by their herd in the Carpathians) and ii) an effective marketing strategy for a new premium dairy product.

## “Gastro local”

"Local Gastronomic Points" offer a family-type culinary experience based upon the hospitality of local households and the traditional food they commonly prepare according to their own local culture and using their own local ingredients. This form of intimate 'gastronomic tourism' started in one community in the Carpathians (Vama Buzăului) in Braşov county and is now spreading to other communities. In addition to Braşov there are currently Local Gastronomic Points in three other counties (Covasna, Sibiu and Tulcea) and together this growing network is known as "GASTRO LOCAL".

Braşov county is a hilly mountainous region (500 - 2000 metres altitude) located in the south-eastern part of Transylvania. The relief is a diverse mix of mountainous (35%), hilly (50%) and lower altitude plain areas (15%) with an associated land use of forests (mainly in the mountain areas), permanent grasslands (mainly in the hilly areas), cultivated arable fields (in the hilly areas and lower altitude plains and hill areas) – plus some urban, industrial and water surfaces (lakes and reservoirs).

### Reference mountain landscape statistics (A: Data from NUTS3 RO122)

Reference mountain chain	Southern Romanian Carpathian Mountains		
Reference mountain landscape	Vama Buzăului		
Size of the area (km <sup>2</sup> )	116.04	Average per capita income (€)/year	12,600 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	6,260 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	22.2	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	2.4% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	17,795 <sup>A</sup>	Secondary:	35.8% <sup>A</sup>
		Tertiary:	61.8% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	-	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	47;980 <sup>A</sup>	Primary:	8.8% <sup>A</sup>
		Secondary:	40.3% <sup>A</sup>
Protected areas	Yes	Tertiary:	51.2% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The value chain is very short and very simple. Visitors to a village can enhance their holiday or day-trip experience in a rural mountain setting to be enhanced by being served a meal in a local household that has been prepared with fresh traditional local products. Whilst at the same time being fully confident that all food safety and hygiene rules required by national / EU law have been being complied with.

### **Key local assets**

Local hospitality at the level of individual households and the quality of the local food and drink they serve to their visitors.

### **Challenges**

The main challenge remains the consistency of the 'product' offered to tourists. This can be highly variable within the households cooperating within one Local Gastronomic Point (i.e., at village / commune level) and between Points. There are also issues with food safety and hygiene (a common challenge also for many small food businesses) and an important additional activity has been to form an alliance with the public health authorities in Braşov county to jointly prepare a good practice guide for establishing a "Local Gastronomic Point" that is fully compliant with all national and EU legislation.

### **Innovation**

The concept of Local Gastronomic Points is a very new approach for Romania and grew from recognition that the traditional hospitality of the Romanian village could be exploited collectively by the community as a source of income - in other words, it combines tradition with an innovative new business opportunity. A form of 'retro-innovation'. The first Local Gastronomic Point was established in 2019 in Vama Buzăului commune in response to the need to offer the increasing number of tourists visiting the area a real, safe, unique culinary experience in the local villages. This need exists in many other mountain areas and the concept of a Local Gastronomic Point is very straightforward to replicate. It is also a very good way to build community spirit and social capital through cooperation - whilst improving household incomes and selling increased quantities of local food and drink.



## All season tourism

Mountain tourism in the Carpathians is typically all-season with similar visitor numbers in both winter and summer. There is a wide variety of accommodation available (both catered and self-catering) and an increasingly diverse range of leisure pursuits available. Bran commune in Braşov county has been one of several 'hotspots' for mountain tourism in Romania for many years and it remains typical of the low- to mid-range tourism experience offered in many regions catering primarily for the Romanian market with some international visitors.

Braşov county is a hilly mountainous region (500 - 2000 metres altitude) located in the south-eastern part of Transylvania. The relief is a diverse mix of mountainous (35%), hilly (50%) and lower altitude plain areas (15%) with an associated land use of forests (mainly in the mountain areas), permanent grasslands (mainly in the hilly areas), cultivated arable fields (in the hilly areas and lower altitude plains and hill areas) – plus some urban, industrial and water surfaces (lakes and reservoirs).

### Reference mountain landscape statistics (A: Data from NUTS3 RO122)

Reference mountain chain	Southern Romanian Carpathian Mountains		
Reference mountain landscape	Bran		
Size of the area (km <sup>2</sup> )	79.17	Average per capita income (€)/year	12,600 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	6,260 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	67	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	2.4% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	17,795 <sup>A</sup>	Secondary:	35.8% <sup>A</sup>
		Tertiary:	61.8% <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	-	Primary:	8.8% <sup>A</sup>
Number of agricultural holdings	47,980 <sup>A</sup>	Secondary:	40.3% <sup>A</sup>
		Tertiary:	51.2% <sup>A</sup>
		Protected areas	Yes

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Farming in the Bran commune is traditionally a form of small-scale semi-subsistence pastoralism and many of these farming households have diversified into some form of "agro-touristic farm"

(ATF). The concept of ATFs was promoted first in the mid-1990s by Law 145 / 1994 defining a national strategy for development of a rural tourism industry in the mountains. At the same time, a National Association for Rural Tourism, Ecology and Culture (ANTREC) was set-up in Bran to channel EU pre-accession funds into the rural tourism sector. ATFs were required to conform with the requirements of the 1994 Law, to register with their local council and to join ANTREC as a means of accessing training, information, advice, and funding. ANTREC were responsible for developing a brand image for rural and mountain tourism and administering a centralised reservation system and quality rating scheme. Although the market has diversified in recent years, ANTREC (<https://www.antrec.ro/>) remains a key actor in the value chain for mountain tourism in the Bran area - as well as operating nationally with 16 regional branches and 2,500 members. ANTREC is now based in Bucharest.

### Key local assets

Bran Castle sits in a beautiful mountain landscape between the Bucegi Natural Park and Piatra Craiului National Park. It is internationally famous for its links with Vlad the Impaler who is widely regarded as the inspiration for Bram Stoker's Count Dracula. Consequently, Bran Castle is commonly known as 'Dracula's Castle' and is a huge tourist attraction! The mountain landscape is highly appreciated by visitors - as is the temperate climate in summer. As the importance of agriculture and forestry for rural employment have declined many local small-holdings have diversified into offering traditional local food, accommodation, and some recreational activities - so-called "agro-touristic farms" (ATFs) that serve both seasonal and weekend visitors.

### Challenges

The Bran area offers a considerable number of attractions for tourists, but the pattern of development during the last 30 years has come to threaten its future viability and sustainability as an attractive and profitable tourist destination. Bran is very well located and easily accessible with good infrastructure. It has developed as a multi-purpose recreational resource with some good accommodation / restaurants combined with a proliferation of rustic-styled "agro-touristic" farms and second homes (the majority of which are newly constructed). Consequently, the traditional rural identity of the area has become lost to an 'urban-type' over-development which increasingly discourages foreign visitors whilst still appealing to the domestic visitor. A major challenge is how to manage continued development without further negative impact upon its valuable assets.

### Innovation

This VC is a traditional one, where no innovations have been identified.

## Therapeutic bee products

It is common for beekeepers in mountain areas to also produce and market Propolis and Pollen products. These are especially appreciated on the Romanian market for their natural therapeutic qualities. There are over 30 such products registered to use the Optional Quality Term (OQT) and label their products with the "Mountain product" logo. This beekeeper in Brezoi (167794) in the mountain area of Vâlcea County (RO415) produces a very specific product that combines a Poliflora Honey with Propolis and is registered as a "Mountain Product".

The relief of Vâlcea County (RO415) is around one-third mountain area in the north of the county with a mixed land cover of forest and semi-natural grasslands. Two mountain groups dominate the region - the Făgăraș Mountains in the east with heights over 2,200 m and the Lotru Mountains in the west with heights over 2,000 m. These are separated by the Olt River valley (one of the most accessible routes through the Southern Carpathians), along which there are smaller groups of mountains - the most spectacular being the Cozia Mountains. The central region of the county is sub-mountainous hilly area with a diverse mosaic landscape of fruit orchards, vineyards and semi-natural grasslands - and in the south there is high plain area cultivated with cereals and vegetables.

### Reference mountain landscape statistics (A: Data from NUTS3 RO415)

Reference mountain chain	Southern Romanian Carpathian Mountains		
Reference mountain landscape	Oraș Brezoi		
Size of the area (km <sup>2</sup> )	226.8	Average per capita income (€)/year	8,300 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	2,652 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	31.4	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	5.5% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	11,526 <sup>A</sup>	Secondary:	38.0% <sup>A</sup>
		Tertiary:	54.7% <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	-	Primary:	34.6% <sup>A</sup>
Number of agricultural holdings	119,190 <sup>A</sup>	Secondary:	28.7% <sup>A</sup>
Protected areas	Yes	Tertiary:	36.7% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

In 2019 there were a total of 126,122 bee families / hives registered in Vâlcea County - around three times the amount registered in 1990 (INSSE data, 2021). The owners of these hives range from private households to commercial honey producers selling via many different value chains. Romania has been one of the most active Member States in developing and adopting the Optional Quality Term (OQT) for products from its mountain areas. It is also currently the only country that has decided not to use any derogation for the registration of "Mountain Products" - thereby strictly requiring that products originate from within a designated mountain area (reducing the distance to 0km). The National Mountain Area Agency (part of the Ministry of Agriculture and Rural Development) has overall responsibility for co-ordination of the OQT, including maintenance of the National Registry of Mountain Products (<https://produse.produsmontan.ro/>). Processing and approval of requests to use the OQT and associated "Mountain products" logo is undertaken locally by 30 Mountain Development Offices located in mountain communes. The National Consumers Protection Authority is responsible for regulating the market in "Mountain Products" and checks if producers have been granted the authorisation to use the OQT and if the labelling is following the national regulation.

### **Key local assets**

There are many different types of honey produced in Vâlcea County depending upon the season and the vegetation that is flowering. Polyflora is the most common type derived from multiple sources of flowering plant and is consequently the most common basis for therapeutic bee products.

### **Challenges**

There is growing concern about the on-going threat of disease, invasive species, and loss of habitats / feeding sources due to the abandonment of grasslands in the mountain areas and the intensification of arable cropping (including the misuse of pesticides) at lower altitudes. The long-term effects of climate change and climate variability remain unknown but are likely to have negative impacts upon productivity of honeybees. Additional interventions are therefore needed to strengthen the capacity of beekeepers to adapt through integrating climate services with available indigenous knowledge and local practices.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.

## Hydroelectric power station

Hydroelectricity is the 2nd most important source of electricity in Romania after fossil fuels and contributes around one-third of the national energy mix. There are a total of 220 hydropower stations in Romania with a significant number (of varying capacity) in the mountain areas.

The relief of Vâlcea County (RO415) is around one-third mountain area in the north of the county with a mixed land cover of forest and semi-natural grasslands. Two mountain groups dominate the region - the Făgăraș Mountains in the east with heights over 2,200 m and the Lotru Mountains in the west with heights over 2,000 m. These are separated by the Olt River valley (one of the most accessible routes through the Southern Carpathians), along which there are smaller groups of mountains - the most spectacular being the Cozia Mountains. The central region of the county is sub-mountainous hilly area with a diverse mosaic landscape of fruit orchards, vineyards, and semi-natural grasslands - and in the south there is high plain area cultivated with cereals and vegetables.

### Reference mountain landscape statistics (A: Data from NUTS3 RO415)

Reference mountain chain	Southern Romanian Carpathian Mountains		
Reference mountain landscape	Malaia		
Size of the area (km <sup>2</sup> )	392.4	Average per capita income (€)/year	8,300 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	2,652 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	4.6	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	5.5% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	11,526 <sup>A</sup>	Secondary:	38.0% <sup>A</sup>
		Tertiary:	54.7% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	-	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	119,190 <sup>A</sup>	Primary:	34.6% <sup>A</sup>
Protected areas	Yes	Secondary:	28.7% <sup>A</sup>
		Tertiary:	36.7% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The majority (209) are managed by the state-owned 'Hidroelectrica' company (<https://www.hidroelectrica.ro/>). The Vidra Lake and the Lotru-Ciunget Dam and Hydro Power

Plant are located on the Lotru River near Malaia commune (171021) in Vâlcea County (RO415). It is the most important facility managed by 'Hidroelectrica' and is one of the biggest hydroelectric complexes in Europe. The Lotru-Ciunget HydroElectric Power Station is a complex of three hydroelectric power plants constructed over a period of 17 years 1965 to 1982. The first and most productive is an underground plant at Ciunget powered by water from Vidra Lake (one of the biggest artificial lakes in Romania with a 140-metre-high clay core dam) via an 800 metre drop underground pipe. All the used water is recollected via an underground piping system and flows to the Malaia dam where is there is an aboveground power plant. Malaia dam is a smaller dam, and the power plant produces less electricity. From the second dam, the used water collects into the Bradisor dam. This final dam is larger and supplies another larger capacity underground power plant. The total installed capacity of the three power plants is 510 MW and they supply around 1.15 billion kWh of electricity per year.to the Romanian national grid.

### **Key local assets**

The Lotru River fills the three dams in the hydroelectric complex. Its source is in the Parâng Mountain group in the central Southern Romanian Carpathians.

### **Challenges**

Romania has significant energy resources and hydroelectricity from the mountain areas has historically been of great importance both to the country's economy and to its security policy. This will obviously continue with the trend towards decarbonisation of the energy sector and increased focus on renewables. The immediate challenge for the state-owned Hidroelectrica is adjusting to the recently liberalised (from 1 January 2021) market for electricity in Romania and the need to compete for customers now faced with a diverse offer of prices and contractual conditions from a broad range of different suppliers.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.

## Telemea

"Telemea" is a salted white cheese most made from sheep or cows' milk, but sometimes also from goats' milk. Varying degrees of ageing. Widespread traditional mountain product in Romania. Like Greek "feta". This specific value chain is for a "Telemea" made from cows' milk by a small-scale producer in Vaideeni commune (174021) in Vâlcea County (RO415). It is registered as a "Mountain Product".

The relief of Vâlcea County (RO415) is around one-third mountain area in the north of the county with a mixed land cover of forest and semi-natural grasslands. Two mountain groups dominate the region - the Făgăraș Mountains in the east with heights over 2,200 m and the Lotru Mountains in the west with heights over 2,000 m. These are separated by the Olt River valley (one of the most accessible routes through the Southern Carpathians), along which there are smaller groups of mountains - the most spectacular being the Cozia Mountains. The central region of the county is sub-mountainous hilly area with a diverse mosaic landscape of fruit orchards, vineyards and semi-natural grasslands - and in the south there is high plain area cultivated with cereals and vegetables.

### Reference mountain landscape statistics (A: Data from NUTS3 RO415)

Reference mountain chain	Southern Romanian Carpathian Mountains		
Reference mountain landscape	Vaideeni		
Size of the area (km <sup>2</sup> )	159.2	Average per capita income (€)/year	8,300 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	2,652 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	24.7	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	5.5% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	11,526 <sup>A</sup>	Secondary:	38.0% <sup>A</sup>
		Tertiary:	54.7% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	-	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	119,190 <sup>A</sup>	Primary:	34.6% <sup>A</sup>
		Secondary:	28.7% <sup>A</sup>
Protected areas	Yes	Tertiary:	36.7% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

"Telemea" cheese is made by adding rennet to milk to curdle it. The resulting curd is removed into cheesecloth, drained, and pressed overnight, then cut into square pieces. This first very fresh cheese is called "Caş" and has its own market / value chain (usually very local because it does not store for very long). Telemea is produced by leaving the fresh cheese to mature in brine. Once mature it is sold via different value chains. Depending upon the specific market targeted these maybe very short and local (e.g., roadside or farmgate sales), or more sophisticated (e.g., vacuum packed and distributed more widely). Most of the large dairy companies produce their own "Telemea" and this is professionally packaged and distributed to supermarkets via their 'cool chain' operations. There are numerous types of "Telemea" depending upon their region of production - two of these types are already registered with geographical indications (PGI - Telemea de Sibiu and PDO - Telemea de Ibanesti). Telemea de Vâlcea does not yet have a geographical indication, but it has been applied for. Romania has been one of the most active EU Member States in developing and adopting the Optional Quality Term (OQT) for products from its mountain areas. It is also currently the only country that has decided not to use any derogation for the registration of "Mountain Products" - thereby strictly requiring that products originate from within a designated mountain area (reducing the distance to 0km). The National Mountain Area Agency (part of the Ministry of Agriculture and Rural Development) has overall responsibility for co-ordination of the OQT, including maintenance of the National Registry of Mountain Products (<https://produse.produsmontan.ro/>).

### **Key local assets**

The natural asset used for producing "Telemea" in the mountain areas of Vâlcea County (RO415) is semi-natural grasslands (private meadows for hay-making and common pastures for communal grazing).

### **Challenges**

Value chains for artisanal products such as the "Telemea" produced in the Vaideeni commune are vulnerable since they command a premium price and there are many lower quality / 'counterfeit' products on the market that undermine their sales. Registration as a "Mountain Product" helps to promote the product and ensure consumer confidence, but such products still rely heavily upon direct sales which can be interrupted / disrupted by external factors beyond the control of the producers (e.g., COVID). This vulnerability could be overcome to a great extent by inclusion into better established value chains (e.g., there are now many supermarkets in Romania with sections selling local dairy products), but this also brings additional challenges for small-scale farms. Lack of labour due to rural depopulation is also a very specific challenge which puts local farmers under increasing pressure.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.



## “Brânză de Burdu”

"Brânză de Burduf" is a traditional salted cheese with a strong flavour and unique texture. It is a very specific mountain product associated with the Southern Romanian Carpathians and there are numerous variants according to local tradition. This specific value chain is for a "Brânză de Burduf" made from sheeps' milk by a farming family based in Vaideeni commune (174021) in Vâlcea County (RO415).

The relief of Vâlcea County (RO415) is around one-third mountain area in the north of the county with a mixed land cover of forest and semi-natural grasslands. Two mountain groups dominate the region - the Făgăraș Mountains in the east with heights over 2,200 m and the Lotru Mountains in the west with heights over 2,000 m. These are separated by the Olt River valley (one of the most accessible routes through the Southern Carpathians), along which there are smaller groups of mountains - the most spectacular being the Cozia Mountains. The central region of the county is sub-mountainous hilly area with a diverse mosaic landscape of fruit orchards, vineyards, and semi-natural grasslands - and in the south there is high plain area cultivated with cereals and vegetables.

Reference mountain landscape statistics  
(A: Data from NUTS3 RO415)

Reference mountain chain	Southern Romanian Carpathian Mountains		
Reference mountain landscape	Vaideeni		
Size of the area (km <sup>2</sup> )	159.2	Average per capita income (EUR)/year	8,300 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (EUR million)/year	2,652 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	24.7	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	5.5% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	11,526 <sup>A</sup>	Secondary:	38.0% <sup>A</sup>
		Tertiary:	54.7% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	-	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	119,190 <sup>A</sup>	Primary:	34.6% <sup>A</sup>
		Secondary:	28.7% <sup>A</sup>
Protected areas	Yes	Tertiary:	36.7% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The family is part of an agricultural cooperative with 13 members and trades under the brand name of "Stâna de Vaideeni" ("Vaideeni Sheepfold"). The family produces around 10 different types of cheese from sheep and cows' milk, plus liquid milk, and butter. All the cheeses produced are registered as a "Mountain Product" All the cheeses, including the "Brânză de Burduf", that are marketed under the "Stâna de Vaideeni" brand are produced in a licenced processing unit in the village. Cattle and sheep are milked in sheepfolds on the mountain pastures, but in the summer months these are very high, and the milk can take up to 3 hours to get to the processing plant. The "Brânză de Burduf" is made by adding rennet to the sheep's milk to curdle it. The resulting curd is removed into cheesecloth, drained, and pressed overnight, then cut into pieces. Salt is added and the fresh cheese is kneaded by hand to achieve its characteristic texture and then placed into a sheep's stomach (or more commonly now an artificial substitute) for maturation. As explained above, the cheeses and other dairy products from "Stâna de Vaideeni" are sold via a mix of direct marketing channels, including a farm shop, home-delivery scheme in neighbouring towns and online sales. Romania has been one of the most active Member States in developing and adopting the Optional Quality Term (OQT) for products from its mountain areas. It is also currently the only country that has decided not to use any derogation for the registration of "Mountain Products" - thereby strictly requiring that products originate from within a designated mountain area (reducing the distance to 0km). The National Mountain Area Agency (part of the Ministry of Agriculture and Rural Development) has overall responsibility for co-ordination of the OQT, including maintenance of the National Registry of Mountain Products (<https://produse.produsmontan.ro/>).

### Key local assets

The natural asset used for producing "Brânză de Burduf" in the mountain areas of Vâlcea County (RO415) is semi-natural grasslands (private meadows for hay-making and common pastures for communal grazing). Many of the communal pastures are high in the mountains only grazed in the summer months.

### Challenges

Value chains for traditional products such as the "Brânză de Burduf" produced by the farming family in Vaideeni are vulnerable since there are many lower quality 'industrial' products on the market that undermine their sales. Registration as a "Mountain Product" helps to promote the product and ensure consumer confidence, but the business must remain competitive in the marketplace. This farming family relies heavily upon direct sales but have chosen to diversify their outlets to mitigate against the risk of interruption / disruption. The ongoing depopulation of local villages and consequent loss of labour is a major challenge for the farming family, and they work with other cooperative members to support each other with haymaking; communal grazing of their sheep and cattle, and the transport of milk from their sheepfolds in the high mountain pastures.

### Innovation

This VC is a traditional one, where no innovations have been identified.

## Hoewzu' ceramics

A unique type of Romanian pottery (painted clay pots and plates) that is traditionally produced by hand around the town of Horezu (168041) in Vâlcea County (RO415). Horezu is the only centre of ceramic production in Romania in which this trade remains the main source of income for a significant number of local families.

The relief of Vâlcea County (RO415) is around one-third mountain area in the north of the county with a mixed land cover of forest and semi-natural grasslands. Two mountain groups dominate the region - the Făgăraş Mountains in the east with heights over 2,200 m and the Lotru Mountains in the west with heights over 2,000 m. These are separated by the Olt River valley (one of the most accessible routes through the Southern Carpathians), along which there are smaller groups of mountains - the most spectacular being the Cozia Mountains. The central region of the county is sub-mountainous hilly area with a diverse mosaic landscape of fruit orchards, vineyards, and semi-natural grasslands - and in the south there is high plain area cultivated with cereals and vegetables.

Reference mountain landscape statistics  
(A: Data from NUTS3 RO415)

Reference mountain chain	Southern Romanian Carpathian Mountains		
Reference mountain landscape	Oraş Horezu		
Size of the area (km <sup>2</sup> )	116.3	Average per capita income (€)/year	8,300 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	2,652 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	59.8	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	5.5% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	11,526 <sup>A</sup>	Secondary:	38.0% <sup>A</sup>
		Tertiary:	54.7% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	-	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	119,190 <sup>A</sup>	Primary:	34.6% <sup>A</sup>
Protected areas	Yes	Secondary:	28.7% <sup>A</sup>
		Tertiary:	36.7% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Production is divided between men and women with everyone involved respecting the specific sequence of operations. The men are the potters. They select and dig the earth they clean, water, knead, trample, and mix to transform it into the 'clay' from which they produce a red pottery with distinctive shape. Each potter has his/her own method of shaping the clay using traditional tools: a potter's wheel and comb for shaping, a hollowed-out bull's horn and a fine wire-tipped stick for decoration, and a wood-burning stove for firing. Women then decorate the fired pots using specific techniques and tools to draw traditional motifs. Their skill in combining decoration and colour defines the personality and uniqueness of these ceramics. The colours are vivid shades of dark brown, red, green, blue and 'Horezu ivory.' This craft is transmitted through families, in workshops from master to apprentice, and at fairs and exhibitions.

### **Key local assets**

The traditional knowledge and craftsmanship associated with the pottery have been inscribed on the UNESCO list of 'Intangible Cultural Heritage' since 2012 thereby indicating the existence of a craft-based cultural value chain in addition to the product value chain. This cultural value chain gives the community a sense of identity, while also providing a day-to-day social function.

### **Challenges**

Most of the ceramics are sold locally in the galleries of individual families. Tourists and day-trippers are the main customers and for many years have provided a stable demand for the local ceramics and a guaranteed source of income. However, the covid crisis has highlighted that this traditional method of direct sales can be severely interrupted / disrupted by external factors beyond the control of the pottery families. The challenge now is to develop more robust value chains for marketing these very traditional mountain products and there is growing interest in online sales, plus the possibility of some form of cooperation between families to access better established and more resilient value chains.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.

## Dlceață

A traditional homemade "jam" made from various fruits, flowers, and vegetables. Production is commonly small-scale (artisanal), but some larger-scale commercial processing may also be found. Very popular and very diverse. There are three types of Dulceață (Sweet Chilli, Elderberry and Raspberry) produced in the Valea Doftanei commune (136107) in Prahova County that are registered as "Mountain Products" under Romania's adoption of the Optional Quality Term (OQT).

The relief of Prahova County (RO316) is split equally between mountains / hills in the north and plain in the south. The mountainous zone is characterised by a deep forested valley (the Prahova River Valley) that transects the so-called Carpathian Bend and divides the southern end of the Eastern Carpathians eastern end of the Southern Carpathians. The landscape of the Prahova Valley is dominated by the steep rocky slopes of the Bucegi mountains which rise to 2,505 metres. The Prahova valley is 1.5 hours north of the capital city of Bucharest and is an important tourist destination with popular ski resorts at Sinaia and Busteni. There are also important cultural locations such as Peles and Cantacuzino Castles.

Reference mountain landscape statistics  
(A: Data from NUTS3 RO316)

Reference mountain chain	Southern Romanian Carpathian Mountains		
Reference mountain landscape	Valea Doftanei		
Size of the area (km <sup>2</sup> )	285.9	Average per capita income (€)/year	10,900 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	7,119 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	23.8	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	2.3% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	10,339 <sup>A</sup>	Secondary:	51.8% <sup>A</sup>
		Tertiary:	45.9% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	-	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	156,790 <sup>A</sup>	Primary:	14.4% <sup>A</sup>
		Secondary:	37.5% <sup>A</sup>
Protected areas	Yes	Tertiary:	48.2% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The Dulceață made in the Valea Doftanei commune is an artisanal product manufactured on a small-scale by a single household business. All ingredients are grown or hand-picked locally according to the season. The Dulceață is sold in small 200 - 350 gramme jars that are labelled in full accordance with national legislation, including prominent display of the "Mountain Product" logo. Sales of the Dulceață are the primary source of household income for the producer and contribute positively to the local village economy. Romania has been one of the most active Member States in developing and adopting the Optional Quality Term (OQT) for products from its mountain areas. It is also currently the only country that has decided not to use any derogation for the registration of "Mountain Products" - thereby strictly requiring that products originate from within a designated mountain area (reducing the distance to 0km). The National Mountain Area Agency (part of the Ministry of Agriculture and Rural Development) has overall responsibility for co-ordination of the OQT, including maintenance of the National Registry of Mountain Products (<https://produse.produsmontan.ro/>). Processing and approval of requests to use the OQT and associated "Mountain products" logo is undertaken locally by 30 Mountain Development Offices located in mountain communes. The National Consumers Protection Authority is responsible for regulating the market in "Mountain Products" and checks if producers have been granted the authorisation to use the OQT and if the labelling follows the national regulation.

### **Key local assets**

Cultivated fruits (and some vegetables), plus wild collected flowers and berries are the main natural assets. The traditional recipes, knowledge and techniques that are used to make the Dulceață can also be considered as cultural assets.

### **Challenges**

Value chains for artisanal products such as the Dulceață produced in the Valea Doftanei commune are vulnerable since they command a premium price and there are many lower quality / 'counterfeit' products on the market that undermine their sales. Registration as a "Mountain Product" helps to promote the product and ensure consumer confidence, but such products still rely heavily upon direct sales which can be interrupted / disrupted by external factors beyond the control of the producers (e.g., COVID). This vulnerability could be overcome to a great extent by inclusion into better established value chains (e.g., there are now many supermarkets in Romania with sections selling local products), but this also brings additional challenges for small-scale businesses.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.

## Farmed and processed mountain trout

Aquaculture in Romania is dominated by semi-extensive production of common carp in the lowland regions. Farming and processing of trout in the mountains is a more recent development but enjoys a growing market for fresh trout and processed products, as well as integration with various forms of mountain tourism (e.g., "catch-and-cook").

The relief of Prahova County (RO316) is split equally between mountains / hills in the north and plain in the south. The mountainous zone is characterised by a deep forested valley (the Prahova River Valley) that transects the so-called Carpathian Bend and divides the southern end of the Eastern Carpathians eastern end of the Southern Carpathians. The landscape of the Prahova Valley is dominated by the steep rocky slopes of the Bucegi mountains which rise to 2,505 metres. The Prahova valley is 1.5 hours north of the capital city of Bucharest and is an important tourist destination with popular ski resorts at Sinaia and Busteni. There are also important cultural locations such as Peles and Cantacuzino Castles.

Reference mountain landscape statistics  
(A: Data from NUTS3 RO316)

Reference mountain chain	Southern Romanian Carpathian Mountains		
Reference mountain landscape	Oraş Busteni		
Size of the area (km <sup>2</sup> )	75.5	Average per capita income (€)/year	10,900 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	7,119 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	128	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	2.3% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	10,339 <sup>A</sup>	Secondary:	51.8% <sup>A</sup>
		Tertiary:	45.9% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	-	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	156,790 <sup>A</sup>	Primary:	14.4% <sup>A</sup>
Protected areas	Yes	Secondary:	37.5% <sup>A</sup>
		Tertiary:	48.2% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The "Păstrăvăria Bușteni" is a good example of a trout farm (<https://www.pastravariabusteni.ro/>) located in a mountain area (the Prahova River Valley) that is popular with tourists and therefore has a thriving business in direct sales of fresh trout and trout products - all registered as "Mountain Products" under Romania's adoption of the Optional Quality Term (OQT). The "Păstrăvăria Bușteni" began selling fresh (eviscerated) Rainbow Trout in 2018 and has since diversified into the processing and sale of a broad range of additional products, including smoked Trout, Trout cavier, several different types of Trout pate, marinated Trout and Trout in various forms of sauce. In total the business has registered 15 different products as "Mountain Products" under Romania's adoption of the Optional Quality Term (OQT). All sales are direct to consumers via two farm shops in Bușteni, plus an online shop. Romania has been one of the most active Member States in developing and adopting the Optional Quality Term (OQT) for products from its mountain areas. It is also currently the only country that has decided not to use any derogation for the registration of "Mountain Products" - thereby strictly requiring that products originate from within a designated mountain area (reducing the distance to 0km). The National Mountain Area Agency (part of the Ministry of Agriculture and Rural Development) has overall responsibility for co-ordination of the OQT, including maintenance of the National Registry of Mountain Products (<https://produse.produsmontan.ro/>). Processing and approval of requests to use the OQT and associated "Mountain products" logo is undertaken locally by 30 Mountain Development Offices located in mountain communes. The National Consumers Protection Authority is responsible for regulating the market in "Mountain Products" and checks if producers have been granted the authorisation to use the OQT and if the labelling follows the national regulation.

### Key local assets

The key natural asset for a trout farm such as this is a clean (unpolluted) source of water - in this case, a local mountain stream draining a forested catchment area.

### Challenges

Value chains for mountains products such as the trout and trout products produced in the Busteni commune are vulnerable since they command a premium price and there are many lower quality products on the market that undermine their sales. Registration as a "Mountain Product" helps to promote the product and ensure consumer confidence, but such products still rely heavily upon direct sales which can be interrupted / disrupted by external factors beyond the control of the producers (e.g., COVID). This vulnerability could be overcome to a great extent by inclusion into better established value chains (e.g., there are now many supermarkets in Romania with sections selling local products), but this also brings additional challenges for small-scale businesses.

### Innovation

This VC is a traditional one, where no innovations have been identified.



## Public Goods from High Nature Value (NHV) grasslands

Provision of public goods (notably biodiversity and mountain landscapes) through the traditional management of semi-natural grasslands (pastures and meadows) with high biodiversity and landscape value.

Braşov county is a hilly mountainous region (500 - 2000 metres altitude) located in the south-eastern part of Transylvania. The relief is a diverse mix of mountainous (35%), hilly (50%) and lower altitude plain areas (15%) with an associated land use of forests (mainly in the mountain areas), permanent grasslands (mainly in the hilly areas), cultivated arable fields (in the hilly areas and lower altitude plains and hill areas) – plus some urban, industrial and water surfaces (lakes and reservoirs).

### Reference mountain landscape statistics

Reference mountain chain	Southern Romanian Carpathian Mountains		
Reference mountain landscape	Braşov county (NUTS3 RO122)		
Size of the area (km <sup>2</sup> )	5,363	Average per capita income (€)/year	12,600
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	6,260
Population density (Inhabitants/km <sup>2</sup> )	103.6	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.08%	Primary:	2.4%
Total bed places (BPs) in tourist accommodations/year:	17,735	Secondary:	35.8%
		Tertiary:	61.8%
Road distance from Urban Poles* <sup>1</sup> (km)	-	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	47,980	Primary:	8.8%
Protected areas	Yes	Secondary:	40.3%
		Tertiary:	51.2%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The dominant production system on these High Nature Value (HNV) grasslands is a form of traditional pastoralism that integrates subsistence and semi-subsistence small-holdings (typically less than 3-4 hectares) with the extensive – often communal - grazing (sheep and cattle) of common and private pastures. This traditional system is – for multiple reasons - in decline and the grasslands are increasingly under threat of intensification and/or abandonment. o help secure

the supply of public goods / ecosystem services provided by the HNV grasslands they have targeted by agri-environment payments under the 2007-2013 and 2014-2020 Romanian Rural Development Programmes. However, they continue to decline in area and greater attention needs to be given to a more integrated approach that addresses the overall socio-economic viability of the traditional pastoral systems in the region.

### **Key local assets**

There are around 240,000 ha of Utilised Agricultural Area in Braşov county (RO122) which is predominantly (66%) occupied by permanent grasslands (private meadows for hay-making and common pastures for communal grazing). These grasslands occur on the poorer soils and / or steeper slopes of the hilly and mountainous areas and the great majority are semi-natural grasslands that: a) support very high levels of floral / faunal diversity and b) contribute to the traditional mosaic landscape of the mountain areas. These are commonly referred to as High Nature Value (HNV) grasslands.

### **Challenges**

Semi-natural grasslands in the mountainous areas of Braşov county are under increasing risk of abandonment in the short- to medium-term. A specific situation exists whereby total livestock numbers in the county are increasing, but the number of animals grazing on the higher altitude is decreasing due to long-term depopulation and the loss of the traditional workforce needed to maintain the animals in the mountains. This includes a shortage of experienced shepherds for communal grazing and a more general lack of labour for manual haymaking. Abandonment is currently most obvious in those grasslands that are least productive and/or most difficult to access. At the same time grasslands at lower altitude are under increasing pressure of over-grazing due to the increased numbers of animals.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.

## Forest with protection function

Forests have a major role to play in the protection and resilience of mountain areas in Romania. A total of 89% of all forests in Romania are in the mountainous and sub-mountainous hilly areas and 38% of these forests are designated as PRIMARILY having a "special protection function" - these are divided into five sub-groups according to the priority function: hydrology protection (13%), soil protection (14%), recreation (7%), biodiversity and scientific interests (3%) and protection against climatic and industrial damages (1%)

Braşov county is a hilly mountainous region (500 - 2000 metres altitude) located in the south-eastern part of Transylvania. The relief is a diverse mix of mountainous (35%), hilly (50%) and lower altitude plain areas (15%) with an associated land use of forests (mainly in the mountain areas), permanent grasslands (mainly in the hilly areas), cultivated arable fields (in the hilly areas and lower altitude plains and hill areas) – plus some urban, industrial and water surfaces (lakes and reservoirs).

### Reference mountain landscape statistics

Reference mountain chain	Southern Romanian Carpathian Mountains		
Reference mountain landscape	Braşov county (NUTS3 RO122)		
Size of the area (km <sup>2</sup> )	5,363	Average per capita income (€)/year	12,600
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	6,260
Population density (Inhabitants/km <sup>2</sup> )	103.6	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-0.08%	Primary:	2.4%
Total bed places (BPs) in tourist accommodations/year:	17,735	Secondary:	35.8%
		Tertiary:	61.8%
Road distance from Urban Poles* <sup>1</sup> (km)	-	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	47,980	Primary:	8.8%
Protected areas	Yes	Secondary:	40.3%
		Tertiary:	51.2%

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Forest areas are listed as having a "special protection function" when they provide one or more of the following functions: soil protection, water protection, flood protection, recreation, and

scientific interest. These functions must be recognised and maintained in Forest Management Plans implemented by the owners of the forest land including the National Forest Administration 'RomSilva' that manages state-owned forest and the Forest Associations and Private Forest Districts co-ordinating the management of privately-owned forest lands.

### **Key local assets**

There are 202,400 ha of forested land in Braşov county, of which 66% is broad-leaved trees and 34% coniferous forest trees. Of this total area 50% (101,200 ha) is designated and managed as having a "special protection" function, with the remaining area classed as production forest. There is only a limited area (288 ha) currently under afforestation.

### **Challenges**

Maintaining the "special protection function" of forests in Romania is very challenging. Although the regulatory framework is clearly defined, its enforcement is weak and compliance can be limited, especially in private forests. It is especially difficult to motivate private forest owners to comply with environmental legislation (e.g., Natura 2000) or requirements for sustainable management - consequently there is much inappropriate management and damage caused. Furthermore, in all forestry areas there is the on-going issue of illegal cutting and theft of both high value timber and/or lower value firewood.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.

## “Brănză Horezu”

"Brănză Horezu" is a hard-pressed cheese made from pasteurised / fermented sheep's milk with a characteristic patterned rind. It is registered as a "Mountain Product" under Romania's implementation of the Optional Quality Term (OQT) - see more details below.

The relief of Vâlcea County (RO415) is around one-third mountain area in the north of the county with a mixed land cover of forest and semi-natural grasslands. Two mountain groups dominate the region - the Făgăraş Mountains in the east with heights over 2,200 m and the Lotru Mountains in the west with heights over 2,000 m. These are separated by the Olt River valley (one of the most accessible routes through the Southern Carpathians), along which there are smaller groups of mountains - the most spectacular being the Cozia Mountains. The central region of the county is sub-mountainous hilly area with a diverse mosaic landscape of fruit orchards, vineyards, and semi-natural grasslands - and in the south there is high plain area cultivated with cereals and vegetables.

### Reference mountain landscape statistics (A: Data from NUTS3 RO415)

Reference mountain chain	Southern Romanian Carpathian Mountains		
Reference mountain landscape	Oraş Horezu		
Size of the area (km <sup>2</sup> )	116.3	Average per capita income (€)/year	8,300 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	2,652 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	53.8	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	5.5% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	11,526 <sup>A</sup>	Secondary:	38.0% <sup>A</sup>
		Tertiary:	54.7% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	-	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	119,190 <sup>A</sup>	Primary:	34.6% <sup>A</sup>
Protected areas	Yes	Secondary:	28.7% <sup>A</sup>
		Tertiary:	36.7% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

"Brănză Horezu" was first produced in the town of Horezu in the mountainous region of northern Vâlcea County (RO415) in 2001. All milk used for cheese production is collected daily from fixed

'milk collection' points where local sheep farmers and shepherds can bring their milk. Uncommonly for Romania, "Brânză Horezu" is matured for a minimum of 5 months - most other cheeses are sold relatively fresh. In addition to being marketed under the "Five Continents" label, it is also sold under the "Cămara Noastră" (Our Larder) private label of Lidl Romania and the "Gusturi Romanesti" (Romanian Tastes) brand launched the Mega Image supermarket network in 2009. The effective integration of the product into these mainstream value chains now offsets much of the vulnerability commonly associated with mountain products in Romania. The country has been one of the most active Member States in developing and adopting the Optional Quality Term (OQT) for products from its mountain areas. It is also currently the only country that has decided not to use any derogation for the registration of "Mountain Products" - thereby strictly requiring that products originate from within a designated mountain area (reducing the distance to 0km).

### Key local assets

The natural asset used for producing "Brânză Horezu" in the mountain areas of Vâlcea County (RO415) is semi-natural grasslands (private meadows for hay-making and common pastures for communal grazing). Many of the communal pastures are high in the mountains and only grazed in the summer months.

### Challenges

Sheep are kept in Romania for their milk and traditional dairy products. With the increased purchasing power and changing preferences of Romanian consumers there has been an increase in consumption of these dairy products, but also a clear demand for more sophisticated 'gourmet / speciality' cheeses (especially in urban areas and amongst young professionals). In part this demand has been met by imported cheeses, but it has also opened a niche for Romanian speciality cheeses such as "Brânză Horezu" which is also widely known under the brand name "Five Continents" (<http://www.five-continent-srl.ro/index.html>). The challenge now is maintaining this place in the market, especially since many new and interesting Romanian cheeses have entered the market in the last few years - including gourmet mature cheeses, blue cheeses, and goat cheeses.

### Innovation

This VC is a traditional one, where no innovations have been identified.

## “Pastrama de Oaie”

"Pastrama de Oaie" is a very traditional and widespread mountain product. This example is produced by a family farming in the mountains above the town of Novaci (78258) in Gorj County (RO412).

The relief of Gorj County (RO412) is around 20% mountain area (the Parâng Mountain group) in the north of the county with an altitude up to 2,519 metres and a mixed land cover of forest, semi-natural and alpine grasslands. To the south of the mountains there is a sub-mountainous hilly area with a diverse mosaic landscape of fruit orchards, vineyards, and semi-natural grasslands, whilst the majority of the county is a plain area cultivated with cereals and vegetables.

### Reference mountain landscape statistics (A: Data from NUTS3 RO412)

Reference mountain chain	Southern Romanian Carpathian Mountains		
Reference mountain landscape	Oraş Novaci		
Size of the area (km <sup>2</sup> )	169.4	Average per capita income (€)/year	10,500 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	3,010
Population density (Inhabitants/km <sup>2</sup> )	33.5	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	4.4% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	2,255 <sup>A</sup>	Secondary:	45.5% <sup>A</sup>
		Tertiary:	50.1% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	-	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	95,790 <sup>A</sup>	Primary:	29.0% <sup>A</sup>
Protected areas	Yes	Secondary:	36.4% <sup>A</sup>
		Tertiary:	34.6% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

"Pastrama de Oaie" is produced from boneless mutton (sheep meat), preserved, and smoked according to a special recipe with very characteristic aroma and taste. It is commonly sold direct to consumers by sheep farmers, including the passing trade of tourists and day visitors to mountain areas. Romania has been one of the most active Member States in developing and adopting the Optional Quality Term (OQT) for products from its mountain areas. It is also currently

the only country that has decided not to use any derogation for the registration of "Mountain Products" - thereby strictly requiring that products originate from within a designated mountain area (reducing the distance to 0km).

### **Key local assets**

The natural asset used for producing "Pastrama de Oaie" is the semi-natural and alpine grasslands (private meadows for hay-making and common pastures for communal grazing) in the mountain areas of Gorj County (RO412). Many of the communal pastures used for grazing sheep and cattle are high in the mountains and only grazed in the summer months.

### **Challenges**

Sheep are kept in Romania for their milk and associated dairy products and the consumption of sheep meat is steadily declining due to changing consumer preferences. "Pastrama de Oaie" continues to maintain a very specific niche in the market since it is very seasonal and especially sought after for traditional summer barbecues / grills. However, products such as this rely heavily upon direct sales which can be interrupted / disrupted by external factors beyond the control of the producers (e.g., covid). This vulnerability could be overcome to a great extent by inclusion into better established value chains (e.g., there are an increasing number of specialist butcher shops looking for good quality local meat products), but this also brings additional challenges for traditional small-scale businesses - including compliance with food hygiene and safety rules.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.



## “Salam Montan Angus”

The production of this Aberdeen Angus Salami in the Schela commune (81987) in Gorj County (RO412) is very innovative for the Romanian charcuterie market. Combined with its image and registration as a 'Mountain Product'.

The relief of Gorj County (RO412) is around 20% mountain area (the Parâng Mountain group) in the north of the county with an altitude up to 2,519 metres and a mixed land cover of forest, semi-natural and alpine grasslands. To the south of the mountains there is a sub-mountainous hilly area with a diverse mosaic landscape of fruit orchards, vineyards, and semi-natural grasslands, whilst the majority of the county is a plain area cultivated with cereals and vegetables.

Reference mountain landscape statistics  
(A: Data from NUTS3 RO412)

Reference mountain chain	Southern Romanian Carpathian Mountains		
Reference mountain landscape	Schela		
Size of the area (km <sup>2</sup> )	87.1	Average per capita income (€)/year	10,500 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	3,010
Population density (Inhabitants/km <sup>2</sup> )	19.6	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	4.4% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	2,255 <sup>A</sup>	Secondary:	45.5% <sup>A</sup>
		Tertiary:	50.1% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	-	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	95,790 <sup>A</sup>	Primary:	29.0% <sup>A</sup>
Protected areas	Yes	Secondary:	36.4% <sup>A</sup>
		Tertiary:	34.6% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

This creates a strong brand image with potential to be very profitable value chain and thereby help ensure the continued maintenance of the valuable semi-natural (HNV) grasslands being grazed by Aberdeen Angus cattle in the Southern Romanian Carpathians. The Aberdeen Angus cattle breed was first introduced into Romania in the 1960s but has become increasingly popular in the Carpathians because of its suitability for the pedoclimatic conditions and extensive breeding

systems that exist in the mountains. As the cattle breed has become more established the range of processing meat products has become more diverse and this salami is the most recent new products to appear on the market. This new Aberdeen Angus Salami is a "raw-dried" salami - this is the most popular type of salami in Romania because of its high % content of meat and ingredients used. Romania has been one of the most active Member States in developing and adopting the Optional Quality Term (OQT) for products from its mountain areas. It is also currently the only country that has decided not to use any derogation for the registration of "Mountain Products" - thereby strictly requiring that products originate from within a designated mountain area (reducing the distance to 0km).

### **Key local assets**

The natural asset used for producing Angus beef and beef products, such as "Salam Montan Angus", is the semi-natural and alpine grasslands (private meadows for hay-making and common pastures for communal grazing) in the mountain areas of Gorj County (RO412). Many of the communal pastures used for grazing sheep and cattle are high in the mountains and only grazed in the summer months.

### **Challenges**

With good branding and marketing an innovative and high-quality product such as this has much potential in the rapidly growing market for "raw-dried" salami, but it also inevitably faces much competition. For example, 'Salam de Sibiu' from the neighbouring country of Sibiu is an emblematic Romanian product with PGI status and unprecedented popularity (over 50% market share) based on 100 years of market presence. On the other hand, there are also many other cheaper (lower quality) brands which dominate the remaining proportion of the market.

### **Innovation**

Pork meat and pork meat products are most popular in Romania, followed by chicken. Beef is increasing in popularity, but as fresh cuts. It is very unusual to find processed beef products, especially a beef salami. Salami is very popular in Romania and accounts for the majority (40%) of all processed meat products consumed, followed by sausages.

## 19. Bulgaria

### Wild collected medical plant

Wild-growing medicinal plants are a major renewable resource of Bulgaria, and they are an important traditional export product which is well placed on international markets. A special regime for the protection and use of wild medicinal plants has been in place for 30 years and the National Park Authorities play an important role in its implementation. This value chain is focused upon the Central Balkan National Park which is one of the most important collection areas in Bulgaria. The Park touches upon the territory of five provinces and is administered by the Park Directorate based in Gabrovo Municipality (GAB05) in Gabrovo Province (BG322).

Gabrovo Province (BG322) is a small province lying on the northern slopes of the Central Stara Planina mountain range with altitudes up to around 1,500 metres. The mountain landscape is open, rugged, and very scenic - approximately 50% semi-natural and alpine grasslands and 50% broadleaf and mixed forest, including ancient beech, spruce, fir, oak and hornbeam.

Reference mountain landscape statistics  
(A: Data from NUTS3 BG322)

Reference mountain chain		Stara Planina	
Reference mountain landscape		Gabrovo	
Size of the area (km <sup>2</sup> )	555.6	Average per capita income (€)/year	6,900 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	655 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	103.7	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	4.4% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	2,895 <sup>A</sup>	Secondary:	46.8% <sup>A</sup>
		Tertiary:	48.8% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	-	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	6,880 <sup>A</sup>	Primary:	11.5% <sup>A</sup>
Protected areas	Yes	Secondary:	46.1% <sup>A</sup>
		Tertiary:	42.4% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

To ensure the sustainable use of medicinal plant resources in the Central Balkan National Park (i.e., to keep them available for extraction without endangering their locations or depleting their stocks) specific rules and restrictions are enforced. Medicinal plants can be widely gathered for personal use within the park provided that basic regulations and standards are observed, but commercial extraction is only allowed within a clearly defined 'Multifunctional Zone'. Bulgaria has adopted conditions and procedures for use of the optional quality term (OQT) "Mountain Product" and a national logo has been approved. However, uptake of the OQT is currently very low.

### **Key local assets**

Wild-growing medicinal plants are a major renewable resource of Bulgaria. A total of 166 medicinal plant species (12 are protected by law) have been identified in the Central Balkan National Park, representing three-fourths of all medicinal plants widely used in alternative medicine. Particularly common species include thyme, St. John's wort, raspberry, wild strawberry, eyebright, common speedwell, cowslip, and mouse-ear hawkweed. Hazelbush, ramsons, common geranium, and woodruff-asperule flourish in wooded areas. Mullein, broad- and narrow-leaf plantain, nettle, milfoil, common tansy, and common wormwood are found in high mountain pastures and along trails, chalets, lodges, shelters, and other areas of increased human presence. Siberian juniper, black and cranberry are common species in the subalpine zone.

### **Challenges**

The main challenges with wild collected foods (herbs, berries, or mushrooms), especially when working with large networks of (often untrained) collectors, are a) correctly identifying the relevant species / type; b) avoiding contamination (e.g., with soil or other species); c) maintaining a consistent standard of quality, and d) sustainable harvesting to ensure the continued viability of the harvested populations. Unsustainable harvesting and overexploitation of the most accessible sites is a major problem in Bulgaria and there have been several initiatives and communication campaigns to address this.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.

## Wild collected mushrooms

Bulgarian-UK company established since 2003 that is collecting, processing, and exporting a wide variety of wild (and some exotic) collected mushrooms (fresh, dried, and frozen) for chefs and gourmets in Europe and further afield under the "Mushrooms Bulgaria" brand.

Sofia City Province (BG411) is predominantly urban and sits at the base of Vitosha Mountain and to the south of the Western Stara Planina. It contains one municipality (Stolichna) with its administrative centre being the city of Sofia. Altitude is 500-700 metres. The province is a very important commercial centre and provides a hub for many value chains linked to the surrounding mountains.

Reference mountain landscape statistics  
(A: Data from NUTS3 BG411)

Reference mountain chain	Stara Planina		
Reference mountain landscape	Stolichna		
Size of the area (km <sup>2</sup> )	1,348.9	Average per capita income (€)/year	17,100 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	19,669 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	984.6	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	0.2% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	12,548 <sup>A</sup>	Secondary:	11.3% <sup>A</sup>
		Tertiary:	88.6% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	-	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	4,690 <sup>A</sup>	Primary:	1.5% <sup>A</sup>
Protected areas	Yes	Secondary:	16.1% <sup>A</sup>
		Tertiary:	81.7% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

Extensive network of collectors working in the mountain ranges closest to Sofia. Commercial collection of mushrooms is allowed in National Parks with a special permit issued by the Park Directorate. Wild collection provides an important source of income for local mountain communities, especially in more marginal areas with few other employment opportunities. Storage and processing facilities 50km from Sofia airport for quick and easy distribution by air to international customers. Bulgaria has adopted conditions and procedures for use of the optional



quality term (OQT) "Mountain Product" and a national logo has been approved. However, uptake of the OQT is currently very low.

### **Key local assets**

Wild populations of mushrooms - depending upon the type of fungi these are usually found in a forest environment. The main types collected are: Black Trumpet, Chanterelle, Fairy Ring, Morel, Porcini, Saffron Milk Caps and St. George.

### **Challenges**

The main challenges with wild collected foods (herbs, berries, or mushrooms), especially when working with large networks of (often untrained) collectors, are a) correctly identifying the relevant species / type; b) avoiding contamination (e.g., with soil or other species); c) maintaining a consistent standard of quality, and d) sustainable harvesting to ensure the continued viability of the harvested populations. Unsustainable harvesting and overexploitation of the most accessible sites is a major problem in Bulgaria and there have been several initiatives and communication campaigns to address this.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.

## Wild collected forest fruits

Bulgarian-UK company established since 2003 collecting, processing, and exporting 6 types of frozen wild forest berries for chefs and gourmets in Europe and further afield under the "Mushrooms Bulgaria" brand.

Sofia City Province (BG411) is predominantly urban and sits at the base of Vitosha Mountain and to the south of the Western Stara Planina. It contains one municipality (Stolichna) with its administrative centre being the city of Sofia. Altitude is 500-700 metres. The province is a very important commercial centre and provides a hub for many value chains linked to the surrounding mountains.

### Reference mountain landscape statistics (A: Data from NUTS3 BG411)

Reference mountain chain	Stara Planina		
Reference mountain landscape	Stolichna		
Size of the area (km <sup>2</sup> )	1,348.9	Average per capita income (€)/year	17,100 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	19,669 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	984.6	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	0.2% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	12,548 <sup>A</sup>	Secondary:	11.3% <sup>A</sup>
		Tertiary:	88.6% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	-	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	4,690 <sup>A</sup>	Primary:	1.5% <sup>A</sup>
Protected areas	Yes	Secondary:	16.1% <sup>A</sup>
		Tertiary:	81.7% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Extensive network of collectors working in the mountain ranges closest to Sofia. Commercial collection of wild berries is allowed in National Parks with a special permit issued by the Park Directorate. Wild collection provides an important source of income for local mountain communities, especially in more marginal areas with few other employment opportunities. Storage and processing facilities 50km from Sofia airport for quick and easy distribution by air to international customers. Bulgaria has adopted conditions and procedures for use of the optional



quality term (OQT) "Mountain Product" and a national logo has been approved. However, uptake of the OQT is currently very low.

### **Key local assets**

Wild populations of forest berries - notably: blackberries, blueberries, elderberries, lingonberries, rose hips and strawberries. Wild berries are thought to be qualitatively superior to equivalent cultivated stock and therefore remain in very high demand.

### **Challenges**

The main challenges with wild collected foods (herbs, berries, or mushrooms), especially when working with large networks of (often untrained) collectors, are a) correctly identifying the relevant species / type; b) avoiding contamination (e.g., with soil or other species); c) maintaining a consistent standard of quality, and d) sustainable harvesting to ensure the continued viability of the harvested populations. Unsustainable harvesting and overexploitation of the most accessible sites is a major problem in Bulgaria and there have been several initiatives and communication campaigns to address this.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.



## “Chiprovisti” carpets

Chiprovitsi kilims are handmade flat tapestry woven carpets / rugs. Their production is closely linked to the traditional farming practised in the Western Stara Planina with wool from sheep grazing in mountain pastures and herbs, flowers and minerals collected locally to colour the wool.

The relief of the Montana province (MON36) varies greatly. The majority (65%) of the province is a fertile plain area in the north bordering the Danube River. This area is dominated by intensive arable cropping. In contrast, there are four mountainous municipalities in the south-west of the province that encompass much of the Western Planina Stara mountain range (with highest peak of 2,016 metres). Most grasslands and livestock are found in this region, together with forest land on the steeper slopes. Chiprovtsi is a small municipality close to the Bulgarian border with Serbia. The altitude is around 500 metres, and the region is dominated by small-scale mixed farming (subsistence and semi-subsistence). The main land use is extensively grazed pastures and meadows (many of which are public) with some plots of cultivated arable land and many traditional orchards.

Reference mountain landscape statistics  
(A: Data from NUTS3 BG312)

Reference mountain chain		Stara Planina	
Reference mountain landscape		Chiprovtsi	
Size of the area (km <sup>2</sup> )	286.9	Average per capita income (€)/year	4,600 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	524 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	10.9	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	13.4% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	1,497 <sup>A</sup>	Secondary:	30.0% <sup>A</sup>
		Tertiary:	56.6% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	-	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	19,010 <sup>A</sup>	Primary:	30.8% <sup>A</sup>
Protected areas	Yes	Secondary:	26.6% <sup>A</sup>
		Tertiary:	42.7% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Furthermore, Kilim weaving in Chiprovtsi Municipality (MON36) is considered an important part of Bulgarian national heritage and was inscribed on the UNESCO list of 'Intangible Cultural Heritage' in 2014. Kilim production is also clearly linked to the traditional farming systems practised in the region – sheep grazing in the mountainous pastures, the processing of their wool to produce the carpets and the collection of local herbs, flowers, and minerals to colour the wool. Every household in the town contains a vertical handloom which the local women use to make the kilims, whilst men of the town typically engage in wool production, processing, and the dyeing of the wool yarn.

### **Key local assets**

A combination of assets is used: the semi-natural and natural mountain grasslands (meadows and pastures) plus the cultural heritage of the Kilim weaving tradition.

### **Challenges**

Whilst local sheep production remains a reliable source of wool, the local kilim industry has declined in recent years because of the loss of important markets - especially the lucrative, but very competitive, international market. Consequently, the town and municipality have above average levels of unemployment with associated population loss and on-going demographic decline. **Innovation**

This VC is a traditional one, where no innovations have been identified.

## High Nature Value (HNV) grassland

Provision of public goods through the traditional management (low inputs and extensive grazing) of semi-natural grasslands (pastures and meadows) and mixed cropping systems with high biodiversity and landscape value

The relief of the Montana province (MON36) varies greatly. The majority (65%) of the province is a fertile plain area in the north bordering the Danube River. This area is dominated by intensive arable cropping. In contrast, there are four mountainous municipalities in the south-west of the province that encompass much of the Western Planina Stara mountain range (with highest peak of 2,016 metres). Most grasslands and livestock are found in this region, together with forest land on the steeper slopes. Chiprovtsi is a small municipality close to the Bulgarian border with Serbia. The altitude is around 500 metres, and the region is dominated by small-scale mixed farming (subsistence and semi-subsistence). The main land use is extensively grazed pastures and meadows (many of which are public) with some plots of cultivated arable land and many traditional orchards.

Reference mountain landscape statistics  
(A: Data from NUTS3 BG312)

Reference mountain chain		Stara Planina	
Reference mountain landscape		Chiprovtsi	
Size of the area (km <sup>2</sup> )	286.9	Average per capita income (€)/year	4,600 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	524 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	10.9	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	13.4% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	1,497 <sup>A</sup>	Secondary:	30.0% <sup>A</sup>
		Tertiary:	56.6% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	-	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	19,010 <sup>A</sup>	Primary:	30.8% <sup>A</sup>
Protected areas	Yes	Secondary:	26.6% <sup>A</sup>
		Tertiary:	42.7% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

National policies, especially the implementation of the EU-funded rural development policy, has great potential to reverse the loss of public goods due to the abandonment of the HNV grasslands

in the region. For example, HNV grasslands have been eligible for agri-environmental payments under the 2007-2013 and 2014-2020 Bulgarian Rural Development Programmes. However, they continue to decline in area and greater attention needs to be given to a more integrated approach that addresses the profitability and overall socio-economic viability of the traditional pastoral systems in the region.

### **Key local assets**

There are around 30,700 ha of Utilised Agricultural Area (UAA) in the Western Stara Planina – of which the majority (65%) is pastures and meadows (72% are common grasslands) plus 20% mixed land use associated with the small farms and 15% arable land at lower altitude. Agriculture is traditionally low input and extensive. Together with the low population density and mountain relief this means that the majority of farmland is considered as High Nature Value. This ranges from mosaics of low intensive arable plots and orchards at lower altitude to the alpine grasslands at high altitude with semi-natural meadows and pastures at medium altitude. The low intensity grazing and mowing of these grasslands creates habitats for valuable plant and animal species. The biodiversity richness of these agricultural landscapes is recognised with a total of seven Natura 2000 sites (5 SPAs and 2 pSCI) including significant areas of farmland.

### **Challenges**

Depopulation has been on-going since the 1960s and has impacted upon traditional livestock breeding with fewer people interested in shepherding. This has been a major driving force for the long-term abandonment of grasslands with scrub encroachment leading to a loss of valuable habitats, especially in more inaccessible areas. At the same time this puts increasing pressure upon those grasslands which are most accessible.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.

## “Sirene” cheese

Traditional salted white cheese that is very characteristic of the Balkan Mountains. Widespread traditional mountain product in Bulgaria. Like Greek "feta".

The relief of the Montana province (MON36) varies greatly. The majority (65%) of the province is a fertile plain area in the north bordering the Danube River. This area is dominated by intensive arable cropping. In contrast, there are four mountainous municipalities in the south-west of the province that encompass much of the Western Planina Stara mountain range (with highest peak of 2,016 metres). Most grasslands and livestock are found in this region, together with forest land on the steeper slopes. Chiprovtsi is a small municipality close to the Bulgarian border with Serbia. The altitude is around 500 metres, and the region is dominated by small-scale mixed farming (subsistence and semi-subsistence). The main land use is extensively grazed pastures and meadows (many of which are public) with some plots of cultivated arable land and many traditional orchards.

Reference mountain landscape statistics  
(A: Data from NUTS3 BG312)

Reference mountain chain		Stara Planina	
Reference mountain landscape		Chiprovtsi	
Size of the area (km <sup>2</sup> )	286.9	Average per capita income (€)/year	4,600 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	524 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	10.9	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	13.4% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	1,497 <sup>A</sup>	Secondary:	30.0% <sup>A</sup>
		Tertiary:	56.6% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	-	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	19,010 <sup>A</sup>	Primary:	30.8% <sup>A</sup>
Protected areas	Yes	Secondary:	26.6% <sup>A</sup>
		Tertiary:	42.7% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

Mostly made from sheep, cow, or goat milk, or sometimes a mixture of these. Varying degrees of ageing. Most farmers do not have a problem with selling their products locally, but the price tends to be low, and income is often limited because of the small-scale of production. Bulgaria has

adopted conditions and procedures for use of the optional quality term (OQT) "Mountain Product" and a national logo has been approved. However, uptake of the OQT is currently very low.

### **Key local assets**

The natural assets used are the semi-natural and natural mountain grasslands (meadows and pastures) of the region. Many of these are publicly owned and were historically used as common grasslands under the control of the local municipality. After Bulgaria joined the EU and CAP Pillar, I support payments were introduced, the pattern of use of these natural assets has changed. When allocating use of the common grasslands to local farmers, municipalities now frequently give priority access to the best grasslands to those livestock farmers eligible to receive CAP payments and who can therefore pay a higher rent. The pastures in worse conditions in terms of scrub / tree encroachment are designated for common use by subsistence farmers in the villages that do not apply for CAP payments.

### **Challenges**

For very traditional products, like "Sirene" cheese, that are produced by small-scale farmers the main challenge is how to 'add value' to the product to increase farm / household income. This is a particular problem in locations such as Chiprovtsi Municipality where a) infrastructure is poor and the opportunity to regularly visit organised farmers' markets in the main cities is very limited; b) there is a lack of commercial processing units to produce higher quality products; c) knowledge of direct marketing is limited, and d) there is no regional brand - or 'mountain products' brand (see below).

### **Innovation**

This VC is a traditional one, where no innovations have been identified.

## “Linbul Farm”

Innovative farm enterprise grazing an Aberdeen Angus suckler herd on rough high-altitude pastures in the Berkovitsa Municipality (MON02) in Montana Province (BG312).

The relief of the Montana province (MON36) varies greatly. The majority (65%) of the province is a fertile plain area in the north bordering the Danube River. This area is dominated by intensive arable cropping. In contrast, there are four mountainous municipalities in the south-west of the province that encompass much of the Western Planina Stara mountain range (with highest peak of 2,016 metres). Most grasslands and livestock are found in this region, together with forest land on the steeper slopes. Berkovitsa is a small municipality which is predominantly (60%) forest with 40% agricultural land consisting mainly of rough upland grazing (natural high mountain pastures, riparian meadows, stony or rocky terrain). here are also some semi-natural (secondary) grasslands created by the clearance of patches of forest. Some small plots of cultivated land also exist, including permanent plantations of strawberries and raspberries.

Reference mountain landscape statistics  
(A: Data from NUTS3 BG312)

Reference mountain chain		Stara Planina	
Reference mountain landscape		Berkovitsa	
Size of the area (km <sup>2</sup> )	16,343	Average per capita income (€)/year	4,600 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	524 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	35.1	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	13.4% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	1,497 <sup>A</sup>	Secondary:	30.0% <sup>A</sup>
		Tertiary:	56.6% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	-	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	19,010 <sup>A</sup>	Primary:	30.8% <sup>A</sup>
Protected areas	Yes	Secondary:	26.6% <sup>A</sup>
		Tertiary:	42.7% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

Linbul Farm (<https://petrohan.wordpress.com/>) is an innovative farm enterprise in the Petrohan area of in the Berkovitsa Municipality (MON02) in Montana Province (BG312). Average altitude is 1,400 metres and the farm manages 40 hectares of rough upland pastures with 60 suckler beef

cows. The pastures are High Nature Value (HNV) and rented from the municipality. The farm has applied for - and has been receiving - both agri-environment and Natura 2000 payments to support maintenance of the grasslands through appropriate grazing management. Bulgaria has adopted conditions and procedures for use of the optional quality term (OQT) "Mountain Product" and a national logo has been approved. However, uptake of the OQT is currently very low.

### **Key local assets**

The natural assets used are the semi-natural and natural mountain grasslands (meadows and pastures) of the region. Many of these are publicly owned and were historically used as common grasslands under the control of the local municipality. After Bulgaria joined the EU and CAP Pillar I support payments were introduced, the pattern of use of these natural assets has changed. When allocating use of the common grasslands to local farmers, municipalities now frequently give priority access to the best grasslands to those livestock farmers eligible to receive CAP payments and who can therefore pay a higher rent. The pastures in worse conditions in terms of scrub / tree encroachment are designated for common use by subsistence farmers in the villages that do not apply for CAP payments.

### **Challenges**

At such high altitude, the pastures are increasingly liable to abandonment (due to their inaccessibility, low productivity, and poorly targeted policy support) leading to scrub encroachment (by juniper) and the consequent loss of biodiversity value.

### **Innovation**

There are four innovations associated with this value chain: a) Setting up a NEW farm holding in the high mountains at a time when people are leaving the region not settling there – plus good dialogue and cooperation with other farmers in the region; b) Introduction of suckler beef cows (Aberdeen Angus) – there no tradition of grass-fed beef production in the region; c) Establishment of a rotational grazing system using electric fences, and; d) Direct online sales of beef and processed beef products (notably to customers in Sofia) supported by an effective marketing campaign on social media (Facebook and blog). This is a very unusual, but potentially very profitable, value chain for this region that combines new products, new farm management practices / production processes and new marketing strategies.



## Mountain milk

"Mogila" dairy is in Godech Municipality (SFO09) in Sofia Province (BG412) and is one of 4 commercial dairies collecting liquid milk from dairy farmers in the 5 municipalities covered by the Western Stara Planina mountains.

Sofia Province (BG412) is the second-largest province in Bulgaria with 22 municipalities. The overall relief of the province is highly diverse, and it has an altitude range from 350 - 2,925 metres. Within its territory, the province encompasses parts of three mountain ranges: the Western Stara Planina in the north, Sredna Gora in the east and Rila mountains in the south-west. It also fully encompasses the individual Plana and Vitosha mountains. All mountains are separated by fertile valleys. The local economy is heavily industrialised with a long history of mining and manufacturing. Tourism is also very important, whilst agriculture is a relatively minor sector of the economy. The Godech municipality (SFO09) in the north of the province and is one of the 5 municipalities covered by the Western Stara Planina mountains.

### Reference mountain landscape statistics (A: Data from NUTS3 BG412)

Reference mountain chain	Stara Planina		
Reference mountain landscape	Godech		
Size of the area (km <sup>2</sup> )	374.7	Average per capita income (€)/year	8,000 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	1,598 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	12.6	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	4.6% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	5,959 <sup>A</sup>	Secondary:	55.4% <sup>A</sup>
		Tertiary:	40.0% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	-	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	22,710 <sup>A</sup>	Primary:	1.2% <sup>A</sup>
Protected areas	Yes	Secondary:	16.1% <sup>A</sup>
		Tertiary:	82.6% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The profitability of dairy farms in the region depends upon the price paid for the raw milk produced - which in turn depends upon the milk quality. The key quality indicators that farmers must achieve

when supplying raw milk are: i) clean and unadulterated; ii) not containing veterinary substances e.g., antibiotics; iii) free of pathogenic microorganisms, and iv) not containing colostrum (i.e., not sold until 7 days after calving). Achieving these basic standards - and thereby meeting the food safety and hygiene regulations - remains a challenge for many farmers in the Western Stara Planina and this impacts upon their farm and household income. Common problems at farm level in the mountains are lack of well-trained and motivated staff, poor veterinary services and unguided use of veterinary medicines, low quality livestock and inadequate nutrition, lack of investment in modernisation of buildings and equipment, and overall poor management. It is for these reasons that the Mountain Milk Association was formed in 2008 as a professional body to represent the interests of both farmers and dairies supplying raw milk in the challenging conditions of the Bulgarian mountain areas. Bulgaria has adopted conditions and procedures for use of the optional quality term (OQT) "Mountain Product" and a national logo has been approved. However, uptake of the OQT is currently very low.

### **Key local assets**

The natural assets used are the semi-natural and natural mountain grasslands (meadows and pastures) of the region. Many of these are publicly owned and were historically used as common grasslands under the control of the local municipality. After Bulgaria joined the EU and CAP Pillar I support payments were introduced, the pattern of use of these natural assets has changed. When allocating use of the common grasslands to local farmers, municipalities now frequently give priority access to the best grasslands to those livestock farmers eligible to receive CAP payments and who can therefore pay a higher rent. The pastures in worse conditions in terms of scrub / tree encroachment are designated for common use by subsistence farmers in the villages that do not apply for CAP payments.

### **Challenges**

A key challenge for the dairy is achieving and maintaining a consistent supply of clean high-quality milk that meets the requirements of all EU and national legislation. Whilst the dairy has invested in its own premises, equipment, and staff in Godech, the problem remains the variable quality of the raw milk collected from farms which is affected by four main factors: 1) health status of the animals; 2) quality of milking machines; 3) maintenance of good hygiene in the cattle sheds, especially during milking, and; 4) storage conditions at the collection points where individual farmers take their fresh milk to be picked-up by the dairy.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.

## “Food from the mountain” farmers’ association

Group of 9 farmers from 4 municipalities - Chiprovtsi (MON36), Georgi Damyanovo (MON14), Berkovitsa (MON02) and Varshets (MON12) - in Montana Province (BG312) created an association in 2016 to jointly market their products under a common brand: "Food from the Mountain".

The relief of the Montana province (MON36) varies greatly. The majority (65%) of the province is a fertile plain area in the north bordering the Danube River. This area is dominated by intensive arable cropping. In contrast, there are four mountainous municipalities in the south-west of the province that encompass much of the Western Planina Stara mountain range (with highest peak of 2,016 metres). Most grasslands and livestock are found in this region, together with forest land on the steeper slopes.

### Reference mountain landscape statistics (A: Data from NUTS3 BG312)

Reference mountain chain		Stara Planina	
Reference mountain landscape		Berkovitsa	
Size of the area (km <sup>2</sup> )	465	Average per capita income (€)/year	4,600 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	524 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	35.1	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	13.4% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	1,497 <sup>A</sup>	Secondary:	30.0% <sup>A</sup>
		Tertiary:	56.6% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	-	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	19,010 <sup>A</sup>	Primary:	30.8% <sup>A</sup>
Protected areas	Yes	Secondary:	26.6% <sup>A</sup>
		Tertiary:	42.7% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

The 9 founding members of the association currently offer their customers a very broad range of products: sheep cheese and yogurt, lamb, and sheep meat; cow's milk hard cheese, several types of kashkaval, cream, butter, and yoghurt; goats' milk pressed cheese and white ("Sirene") cheese; honey; jams and marmalades from forest fruits, and distinctive regional wines. This is a very

diverse offer that encourages their customers to return regularly to buy the association's products from the farmers' markets they participate in. The normal arrangement is for one or two members of the association to travel (in turn) to the market location and sell the products of all their colleagues. This makes much more efficient use of their time. Bulgaria has adopted conditions and procedures for use of the optional quality term (OQT) "Mountain Product" and a national logo has been approved. However, uptake of the OQT is currently very low.

### **Key local assets**

The natural assets used are the semi-natural and natural mountain grasslands (meadows and pastures) of the region. Many of these are publicly owned and were historically used as common grasslands under the control of the local municipality. After Bulgaria joined the EU and CAP Pillar I support payments were introduced, the pattern of use of these natural assets has changed. When allocating use of the common grasslands to local farmers, municipalities now frequently give priority access to the best grasslands to those livestock farmers eligible to receive CAP payments and who can therefore pay a higher rent. The association is also making use of some of the small plots of cultivated land that exist locally.

### **Challenges**

The main problem of people living and working in this mountain region is diversifying their business activities to add value and receive a fair payment for their high-quality products and adequate compensation for their hard work. The association is intended as an entity which will both: i) help producers to produce better quality, innovative products and selling them at a competitive price, and ii) facilitate further innovation in diversifying the sources of income of the members e.g., developing a tourist product such as a 'Western Stara Planina Food & Wine Trail'.

### **Innovation**

Members of the association participate together in a weekly farmers' market in Sofia, plus national fairs, and events. Longer term they aim to develop their region as an alternative tourism destination offering clean food, traditional products, food, and wine tasting. The innovation is currently focused upon the implementation of the association's strategy for the joint marketing of members' products.

## All season mountain tourism

Bansko Resort in Bansko Municipality (BLG01) in Blagoevgrad Province (BG413) is the newest and most rapidly developing 'luxury' mountain resort in Bulgaria catering for both winter and summer mass tourism.

Blagoevgrad Province (BG413) occupies the south-west corner of Bulgaria bordering both Greece and North Macedonia. The relief is mainly mountainous / hilly since the province includes parts of the Rila, Pirin and Rhodope Mountain ranges. The land use is predominantly forest (52%) with cultivated agricultural land (32% arable and permanent crops) in the fertile valleys of the Struma and Mesta rivers. The remaining area (10-15%) is mainly semi-natural and alpine grasslands. The climate varies from temperate continental to Mediterranean in the most southernmost parts. Bansko Municipality (BLG01) is in the centre of the province in the Prin mountains.

Reference mountain landscape statistics  
(A: Data from NUTS3 BG413)

Reference mountain chain		Pirin Mountains	
Reference mountain landscape		Bansko	
Size of the area (km <sup>2</sup> )	475.8	Average per capita income (€)/year	5,000 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	1,323 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	27.0	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	8.6% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	14,739 <sup>A</sup>	Secondary:	26.7% <sup>A</sup>
		Tertiary:	64.7% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	-	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	35,160 <sup>A</sup>	Primary:	21.2% <sup>A</sup>
Protected areas	Yes	Secondary:	31.8% <sup>A</sup>
		Tertiary:	47.0% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

During the period of 2000 - 2010 Bansko rapidly developed as a ski resort to take advantage of Bulgaria's growing share of the European winter tourism market. The ski area now has 75 km of ski runs, 14 lifts and drags serving up to 24,500 persons per hour. The upper ski runs start an an

altitude of 2,600 metres and drop around 1,000 metres to a mid-altitude service area and over 1,600 metres when skiing all the way down to the town. Bansko is a popular winter destination in the 'Balkan Holidays' (tour operator) portfolio and increasingly competes with resorts in France and Switzerland due to its lower costs. More recently, the resort has increased its summer tourism offer with a wide range of activities, including trekking, mountain biking, horseback riding, fishing, golfing, sightseeing, rafting and much more - all at very competitive prices, including via 'Balkan Holidays'.

### **Key local assets**

The town of Bansko is located at the foot of the Pirin Mountains at an altitude of 1,200 metres above sea level and close to the UNESCO designated Pirin National Park. It was originally established and developed as a centre for the breeding / trading of mountain livestock, but with its spectacular scenery, numerous lakes, and pine forests it became popular for recreation.

### **Challenges**

During its first 10 years of rapid growth and development the Bansko Resort suffered major infrastructure problems and (with the global financial crisis) the withdrawal of many investors leading to many hotels, apartments and other facilities being left unfinished / abandoned. This situation is now improved, but in common with many other ski resorts (especially low-medium altitude) the main challenge faced now is the negative impact of climate change and the increasing frequency of snow-deficient winters. Because Bansko is dominated by larger hotels and complexes with much higher capacity to offer diverse all-season tourist products (such as meetings, spas, and non-snow sports) - including conference facilities etc. for the business community - the resort is more resilient than some others in Bulgaria.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.

## Skiing

Borovets in the Samokov Municipality (SFO39) in Sofia Province (BG412) is the oldest and largest ski resort in Bulgaria. It has World Cup class slopes for downhill skiing, plus many cross-country and biathlon tracks too, and is an important part of the Balkan Holidays (tour operator) portfolio.

Sofia Province (BG412) is the second-largest province in Bulgaria with 22 municipalities. The overall relief of the province is highly diverse, and it has an altitude range from 350 - 2,925 metres. Within its territory, the province encompasses parts of three mountain ranges: the Western Stara Planina in the north, Sredna Gora in the east and Rila mountains in the south-west. It also fully encompasses the individual Plana and Vitosha mountains. All mountains are separated by fertile valleys. The local economy is heavily industrialised with a long history of mining and manufacturing. Tourism is also very important, whilst agriculture is a relatively minor sector of the economy. Samokov municipality (SFO39) is in the south-west of the province in the Rila mountains which reach an altitude of 2,925 metres and are the highest mountains in Bulgaria and the Balkan Peninsula.

Reference mountain landscape statistics  
(A: Data from NUTS3 BG412)

Reference mountain chain		Rila Mountains	
Reference mountain landscape		Samokov	
Size of the area (km <sup>2</sup> )	374.7	Average per capita income (€)/year	8,000 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	1,598 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	12.6	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	4.6% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	5,959 <sup>A</sup>	Secondary:	55.4% <sup>A</sup>
		Tertiary:	40.0% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	-	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	22,710 <sup>A</sup>	Primary:	1.2% <sup>A</sup>
Protected areas	Yes	Secondary:	16.1% <sup>A</sup>
		Tertiary:	82.6% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Borovets is the oldest Bulgarian winter resort with a history that dates to 1896. It gradually developed into a modern ski resort with hotels, restaurants, bars, and a network of ski runs and lifts along the slopes of the Rila Mountains providing for a whole range of winter sports. During the previous communist regime, the resort twice hosted World Cup Alpine Skiing rounds in 1981 and 1984. There are a total 58 km of marked slopes on north facing slopes up to an altitude of 2,560 metres. The longest run is a gentle 12 km return to the resort along the maintenance road. There is a well-developed lift infrastructure with drag lifts, baby tows, seat chain lifts, plus a gondola lift. 1 six-seat Gondola lift, 2 High Speed Quad Chair lifts, 1 Fixed Grip Quad Chair lift, 10 Surface ski lifts and 9 tow lifts. The resort also offers biathlon facilities for training and competitions with 35 km of cross-country trails designed according to the requirements of the Federation Internationale de Ski (FIS).

### **Key local assets**

Located on the northern slopes on the northern slopes of the Rila mountains at an altitude of 1,350 metres.

### **Challenges**

Favourable winter weather conditions and especially snow availability and depth are clearly crucial for the satisfaction of visitors to ski resorts and a key factor for the maintained viability of winter tourism in mountain regions. In common with many other ski resorts (especially low-medium altitude) it is anticipated that Borovets will be negatively affected by the future impact of climate change and the increasing frequency of snow-deficient winters in the next 20-25 years. It is anticipated that the likelihood of reduced visitor numbers will pose the most immediate threat to the small accommodation establishments that offer limited services, such as bed and breakfast only. Larger hotels with qualified staff, flexible marketing abilities and the capacity to offer diverse tourist products (such as meetings, spas, and non-snow sports) are currently assessed to be more resilient.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.



## “Meadows in the mountain” festival

Well-established music festival and counter-culture event that is organised annually in a small village in the Rhodope mountains. It has an international reputation for its unique location, beautiful mountain landscapes, good music, and wholesome experience.

Smolyan Municipality (SML31) is in the far south of Bulgaria on the border with Greece. Smolyan Province (BG424) lies in the Western Rhodopes which are the largest part (around 70%) of the Rhodope Mountain range that forms the border between southern Bulgaria and northern Greece. This part of the Rhodopes contains more than 10 peaks over 2,000 metres (maximum altitude is 2,191 metres) and the relief is a complex system of peaks, ridges, and deep valleys with large areas of coniferous forest. The region is particularly notable for its karst landscape with deep river gorges and large caves, and biodiversity value. An important factor contributing to the large number of conserved natural habitats and endangered species in the region is that the Rhodopes were part of the former 'Iron Curtain' separating eastern and western Europe for 40 years and were under military control until the 1990s.

Reference mountain landscape statistics  
(A: Data from NUTS3 BG324)

Reference mountain chain	Rhodope Mountains		
Reference mountain landscape	Smolyan		
Size of the area (km <sup>2</sup> )	859.6	Average per capita income (€)/year	5,400 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	500 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	42.4	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	8.4% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	10,138 <sup>A</sup>	Secondary:	38.8% <sup>A</sup>
		Tertiary:	52.8% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	-	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	20,890 <sup>A</sup>	Primary:	20.5% <sup>A</sup>
Protected areas	Yes	Secondary:	38.0% <sup>A</sup>
		Tertiary:	41.4% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The Western Rhodopes are a popular tourist destination appreciated for their forested mountain landscape, rich cultural heritage and favourable climate of mild summers and snowy winters. There are two major winter resorts in the region, but during the summer it is also very popular with both Bulgarian and foreign tourists to camp or stay in the villages. The "Meadows in the Mountains" festival was organised in Smolyan Municipality in 2011 (<https://www.meadowsinthemountains.com/>) in grasslands on a small plateau above the village of Polkovnik Serafimovo. It is a small and independent two-day music and counter-culture festival that has an international reputation and loyal following. It is organised from the UK but is hosted by local village residents with around 20 families accommodating and feeding up to 160 festivalgoers in their own homes - in addition to the camping offered on the festival site. Consequently, the festival has a very positive impact upon the local economy and continues to be warmly welcomed by local people.

### Key local assets

The Rhodope mountains have a very mystical appeal resulting from the complex and beautiful landscape of forested mountains, abundance of lush vegetation and wildlife, and rich cultural heritage. In Greek mythology, Queen Rhodope of Thrace offended the gods and was changed into a mountain by Zeus and Hera as a punishment along with her husband, the King Haemus of Thrace. The mountains are also associated with the mythical figure of Orpheus. This specific value chain also builds upon an important social asset - the friendliness, open-mindedness and hospitality of the local village people.

### Challenges

At the time of writing in 2021 the greatest challenge faced by the festival is the covid public health crisis. The festival was postponed in June 2020 until June 2021 - but due to the continuing uncertainties about international travel has been postponed again until June 2022. As a small independent festival with most of its working capital tied up in practical arrangements to organise the event, it cannot afford to provide refunds to the people who had booked for 2020. Therefore, it currently depends greatly upon the goodwill and support of the community of loyal festivalgoers that it has built up over the years.

### Innovation

Festivals are common in Bulgaria and there are several well-established popular music festivals, but no counter-culture festivals such as this focused upon offering a diverse selection of great music in combination with such an alternative experience of the mountain environment and the hospitality of local people.

## “Iskar Gorge” day trips

The Iskar Gorge in Svoge Municipality (SFO43) in Sofia Province (BG412) is the main pass through the Western Stara Planina mountains and connects Sofia with other major cities in the north-west of Bulgaria. It is renowned for its spectacular landscape and is a popular tourist / day visitor destination.

Sofia Province (BG412) is the second-largest province in Bulgaria with 22 municipalities. The overall relief of the province is highly diverse, and it has an altitude range from 350 - 2,925 metres. Within its territory, the province encompasses parts of three mountain ranges: the Western Stara Planina in the north, Sredna Gora in the east and Rila mountains in the south-west. It also fully encompasses the individual Plana and Vitosha mountains. All mountains are separated by fertile valleys. The local economy is heavily industrialised with a long history of mining and manufacturing. Tourism is also very important, whilst agriculture is a relatively minor sector of the economy. Svoge Municipality (SFO43) is in the north of Sofia Province towards the Western Stara Planina. The municipality has a mountainous and hilly relief and is one of the largest municipalities by area in Bulgaria.

Reference mountain landscape statistics  
(A: Data from NUTS3 BG412)

Reference mountain chain	Stara Planina		
Reference mountain landscape	Svoge		
Size of the area (km <sup>2</sup> )	868.6	Average per capita income (€)/year	8,000 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	1,598 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	22.3	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	4.6% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	5,959 <sup>A</sup>	Secondary:	55.4% <sup>A</sup>
		Tertiary:	40.0% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	-	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	22,710 <sup>A</sup>	Primary:	20.2% <sup>A</sup>
		Secondary:	35.7% <sup>A</sup>
Protected areas	Yes	Tertiary:	44.1% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The gorge is about 50 km north of the city of Sofia and day trips for short hikes, photography etc. are very popular - especially with international visitors to the city who take advantage of numerous tourist agencies and guides providing multi-lingual tours, transfers, hotel pick-up & drop-off and a range of other services (e.g., <https://www.freetour.com/sofia/iskar-gorge-day-trip>).

### **Key local assets**

A deep limestone and sandstone gorge created over thousands of years by the Iskar River. It is 70 km long and renowned for its spectacular scenery consisting of rugged crags and towers / pillars of rock along its entire length. In places the walls of the gorge are up to 300 metres high.

### **Challenges**

The challenges associated with this value chain are the typical issues with visitor management experienced by popular touristic hotspots in mountain areas. Because of the landscape there are few good viewing points along the gorge, and these quickly become congested by parked vehicles. Consequently, on a busy summer day (for example), the actual visitor experience can be disappointing.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.

## Mountain health/spa tourism

Bulgaria has a well-developed health tourism industry based upon 30-40 spa resorts, many of which were developed initially during the communist period and then more recently modernised. Most of these spas are mountain (rather than coastal) resorts. Devin Municipality (SML09) in Smolyan Province (BG424) is one of the most well-known centres for mountain health / spa tourism in the Rhodope mountains of southern Bulgaria.

Smolyan Municipality (SML31) is in the far south of Bulgaria on the border with Greece. Smolyan Province (BG424) lies in the Western Rhodopes which are the largest part (around 70%) of the Rhodope Mountain range that forms the border between southern Bulgaria and northern Greece. This part of the Rhodopes contains more than 10 peaks over 2,000 metres (maximum altitude is 2,191 metres) and the relief is a complex system of peaks, ridges, and deep valleys with large areas of coniferous forest. The region is particularly notable for its karst landscape with deep river gorges and large caves, and biodiversity value. An important factor contributing to the large number of conserved natural habitats and endangered species in the region is that the Rhodopes were part of the former 'Iron Curtain' separating eastern and western Europe for 40 years and were under military control until the 1990s.

Reference mountain landscape statistics  
(A: Data from NUTS3 BG424)

Reference mountain chain	Rhodope Mountains		
Reference mountain landscape	Devin		
Size of the area (km <sup>2</sup> )	573.7	Average per capita income (€)/year	5,400 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	500 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	19.1	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	8.4% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	10,138 <sup>A</sup>	Secondary:	38.8% <sup>A</sup>
		Tertiary:	52.8% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	-	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	20,890 <sup>A</sup>	Primary:	20.5% <sup>A</sup>
Protected areas	Yes	Secondary:	38.0% <sup>A</sup>
		Tertiary:	41.4% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Devin is both a popular tourist attraction and recovery centre for people suffering ill-health. In addition to the favourable mountain environment, there is an abundance of hot springs and spa resorts in the area which are renowned for the healing properties of the mineral water. The waters have been claimed to treat and heal a variety of maladies: conditions of the skeletal, peripheral nervous, cardiovascular, and pulmonary systems, skin disorders and others. In addition to these, the water is drunk or inhaled in the treatment of respiratory diseases, allergies, and infections. The spas typically offer a seven-day programme that includes spa services, physical fitness activities, wellness education, healthy local food plus some special interest activities. Pleasant accommodation and good hospitality are an important part of the value chain and overall spa experience. A popular brand of Bulgarian mineral water sold under the name 'Devin' is also bottled there. Health / spa tourism in Bulgaria is well-organised and supported by the Bulgarian Union of Balneology and SPA Tourism (BUBSPA). This is a non-profit tourism association partnered with the Bulgarian Ministry of Tourism. Members of the association comprises municipalities with mineral water / spa facilities; private investors and the owners of spa facilities; makers of wellness products; officially certified spa therapists; physicians and other qualified experts specialising in physical medicine, rehabilitation, and natural therapies.

### **Key local assets**

A variety of healing mineral waters ranging in temperature from cold (12°C) to hot (103°C) and from lightly mineralised (120mg/l) to highly mineralised (over 5g/l). The highly mineralised are only used for very specific medicinal purposes under expert supervision.

### **Challenges**

Health and wellness are fast growing sectors of the Bulgarian and international tourist market. However, the market is very competitive with multiple destinations in competition for business. The biggest challenge for individual spas is to stay competitive with an appropriate balance between price and quality of services. Facilities and services must be continually modernised and improved; it is not enough to rely upon historical reputation (there are many famous spas which are now abandoned because of outdated facilities). Most recently the covid public health crisis has a major impact upon spas with many forced to close for extended periods or severely restrict the number of guests and/or services offered.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.

## "Strandzhanski manov med" (Strandzha manna honey)

Many different types of mountain honey are produced in Bulgaria depending upon the season and the vegetation that is flowering, but one of the most famous is the dark brown "manna honey" produced in the Strandzha mountains in south-east Bulgaria. Tsarevo Municipality (BGS13) in Burgas Province (BG341) is one of the centres of production of this speciality honey.

Burgas Province (BG341) lies in south-east Bulgaria against the Black Sea coast and is the largest province in the country. The Strandzha mountains are in the south of the province on the border with and rise to an altitude of around 1,000 metres. The Strandzha Nature Park lies within the mountain massif and is the largest protected area in Bulgaria spanning a territory of 1,161 square kilometres and including five nature reserves and 14 other protected areas. The relief of the Strandzha mountains is characterised by mild rolling ridges covered with dense woods. To the west the mountain slopes are steeper and more rugged.

Reference mountain landscape statistics  
(A: Data from NUTS3 BG341)

Reference mountain chain	Strandzha Mountains		
Reference mountain landscape	Tsarevo		
Size of the area (km <sup>2</sup> )	513.4	Average per capita income (€)/year	6,400 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	2,293 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	17.6	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	4.0% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	103,875 <sup>A</sup>	Secondary:	24.6% <sup>A</sup>
		Tertiary:	71.5% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	-	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	16,170 <sup>A</sup>	Primary:	18.7% <sup>A</sup>
Protected areas	Yes	Secondary:	21.5% <sup>A</sup>
		Tertiary:	59.8% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Beekeeping has always been a common activity in the Strandzha region, and the design of the bee skeps (baskets) and stumps used in the region today date from the end of the 19th century. The honey is collected during the months of June, July, and August when the bees are foraging on the thick, sweet juice called 'honeydew' ('manna') that is emitted from the leaves of the oak trees under the very specific climatic conditions of the Strandzha massif. "Strandzhanski manov med" has been registered as a PDO since April 2019. It has a very specific reddish colour, thick consistency, and slight acidity bitter taste. Most honey is sold locally, but there are significant sales throughout Bulgaria (including by online sales / mail order) - plus demand from abroad. Other therapeutic bee products are also made by the same beekeepers. Bulgaria has adopted conditions and procedures for use of the optional quality term (OQT) "Mountain Product" and a national logo has been approved. However, uptake of the OQT is currently very low.

### **Key local assets**

The very specific natural asset used to produce "Strandzhanski manov med" (Manna honey) is the Natura 2000 designated oak forests of the Strandzha mountains in the south of Burgas Province. Due to their proximity to the Black, Marmara, and Aegean Seas, the Strandzha mountains have high air humidity and mild temperatures which, combined with the local soil conditions, creates a very specific flora in the oak forests.

### **Challenges**

As in most other countries, there is growing concern amongst Bulgarian beekeepers about the on-going threat of disease, invasive species, and loss of habitats / feeding sources. The long-term effects of climate change and climate variability remain unknown but are likely to have negative impacts upon productivity of honeybees. Specific interventions are therefore needed to strengthen the capacity of beekeepers to adapt e.g., by integrating climate services with available indigenous knowledge and local practices.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.



## Essential oils and cosmetics

The Rose Valley is a region located on the southern slopes of the Central Stara Planina. It is famous for the local rose-growing industry and the distillation of rose oil, however the region is also a centre to produce other essential oils from cultivated crops - including most recently lavender - plus those from wild species collected in the nearby mountains.

Plovdiv Province (BG421) is in central Bulgaria and includes territory in the mountains of the Central Stara Planina to the north and Rhodopes to the south - separated by the Thracian Plain. It is a relatively well-developed province. Agricultural production in the plain area is intensive with high levels of irrigation. The major crops in the hilly and mountainous areas are fruits (apples, plums, pears, cherries) and vineyards - with some semi-natural grasslands that are grazed by sheep and cattle. Tourism is a growing industry with the rich cultural heritage of the province and the numerous mineral springs which are of international importance. Karlovo Municipality (PDV13) is in the north of the province occupying the foothills of the Central Stara Planina.

### Reference mountain landscape statistics (A: Data from NUTS3 BG421)

Reference mountain chain		Stara Planina	
Reference mountain landscape		Karlovo	
Size of the area (km <sup>2</sup> )	1,040	Average per capita income (€)/year	6,700 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	3,989 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	46.4	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	3.4% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	9,279 <sup>A</sup>	Secondary:	35.8% <sup>A</sup>
		Tertiary:	60.8% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	-	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	41,960 <sup>A</sup>	Primary:	18.6% <sup>A</sup>
Protected areas	Yes	Secondary:	32.4% <sup>A</sup>
		Tertiary:	49.0% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Essential oils have a wide range of applications. In cosmetics, they are used as fragrances and for their active properties. Successful essential production begins with the selection of the most appropriate species / varieties to grow and concludes with the distillation of oils to exceptionally high standards. Typical chemical and physical measures of purity relate to colour; aroma; flavour (if appropriate); density; optical rotation; refractive index, and solubility in water (how easily the essential oil dissolves). The International Standards Organisation (ISO) provides standards for several major essential oils which specify physical and chemical properties. Buyers may also have their own specifications which can differ from the ISO standards depends upon their specific application for the essential oil.

### **Key local assets**

A broad range of cultivated and wild-collected plants are used to produce essential oils - some of the most common oils produced in the Rose Valley of Plovdiv Province (BG421) are from cultivated rose, lavender and melissa.

### **Challenges**

The main challenge is maintaining market share and profitability. Although some specialist companies in the Rose Valley - and elsewhere in Bulgaria - are starting to add value by producing a range of cosmetic products using oils from the region, most essential oils produced are exported to Germany, France, Austria, and Italy. Consequently, they face tough competition on the international market e.g., from oils produced on a much larger scale in the US. There are also new market opportunities emerging those Bulgarian producers need adapt to. For example, there is a growing demand for niche essential oils in the cosmetics sector. Consumers are also seeking sustainable cosmetic products that have a low environmental impact, but this also implies a growing need for transparency and traceability of supply chains which can be challenging for Bulgarian producers.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.

## Strawberries and raspberries

The Berkovitsa Municipality (MON02) in Montana Province (BG312) was well-known during the communist period for strawberry and raspberry production.

The relief of the Montana province (MON36) varies greatly. The majority (65%) of the province is a fertile plain area in the north bordering the Danube River. This area is dominated by intensive arable cropping. In contrast, there are four mountainous municipalities in the south-west of the province that encompass much of the Western Planina Stara mountain range (with highest peak of 2,016 metres). Most grasslands and livestock are found in this region, together with forest land on the steeper slopes. Berkovitsa is a small municipality which is predominantly (60%) forest with 40% agricultural land consisting mainly of rough upland grazing (natural high mountain pastures, riparian meadows, stony or rocky terrain). There are also some semi-natural (secondary) grasslands created by the clearance of patches of forest. Some small plots of cultivated land also exist, including the permanent plantations of strawberries and raspberries mentioned above.

Reference mountain landscape statistics  
(A: Data from NUTS3 BG312)

Reference mountain chain		Stara Planina	
Reference mountain landscape		Berkovitsa	
Size of the area (km <sup>2</sup> )	465.0	Average per capita income (€)/year	4,600 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	524 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	35.1	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	13.4% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	1,497 <sup>A</sup>	Secondary:	30.0% <sup>A</sup>
		Tertiary:	56.6% <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	-	Primary:	30.8% <sup>A</sup>
Number of agricultural holdings	19,010 <sup>A</sup>	Secondary:	26.6% <sup>A</sup>
Protected areas	Yes	Tertiary:	42.7% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

After the political reforms and economic crises of the 1990s many plantations were abandoned but have now been re-established and are flourishing again through their connection with well-established value chains into the (organic) food markets of western Europe. Production of soft fruit in Berkovitsa declined immediately after the collapse of the communist regime in 1989 but has now been re-established. Many of the restored strawberry and raspberry plantations are now organically certified to take advantage of the significant export opportunities that exist, and many foreign companies have established collection points and processing units for exporting a range of frozen organic soft fruits all over Europe. These plantations of high value soft fruit are economically very important for the local community. Meanwhile some niche markets also exist for other celebrated local products, such as 'malinovo vino' (raspberry wine) and 'yagodovo vino' (strawberry wine).

### **Key local assets**

The combination of climate, soils, and altitude on the northern slopes of the Western Stara Planina is very favourable for soft fruit production.

### **Challenges**

The rural population in the region is 50% of what it used to be in the 1960s and the remaining inhabitants are increasingly elderly. Maintenance of an active workforce is therefore a major challenge which puts soft fruit growers under increasing pressure.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.

## Certified timber and wood products

Forest covers 37% of the territory of Bulgaria, of which 38% is timber producing and 62% is protective - notably for biodiversity. Forests are owned by state enterprises.

Smolyan Municipality (SML31) is in the far south of Bulgaria on the border with Greece. Smolyan Province (BG424) lies in the Western Rhodopes which are the largest part (around 70%) of the Rhodope Mountain range that forms the border between southern Bulgaria and northern Greece. This part of the Rhodopes contains more than 10 peaks over 2,000 metres (maximum altitude is 2,191 metres) and the relief is a complex system of peaks, ridges, and deep valleys with large areas of coniferous forest. The region is particularly notable for its karst landscape with deep river gorges and large caves, and biodiversity value. An important factor contributing to the large number of conserved natural habitats and endangered species in the region is that the Rhodopes were part of the former 'Iron Curtain' separating eastern and western Europe for 40 years and were under military control until the 1990s.

Reference mountain landscape statistics  
(A: Data from NUTS3 BG424)

Reference mountain chain	Rhodope Mountains		
Reference mountain landscape	Smolyan		
Size of the area (km <sup>2</sup> )	859.6	Average per capita income (€)/year	5,400 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	500 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	42.4	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	8.4% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	10,138 <sup>A</sup>	Secondary:	38.8% <sup>A</sup>
		Tertiary:	52.8% <sup>A</sup>
		Employment by sector* <sup>3</sup>	
Road distance from Urban Poles* <sup>1</sup> (km)	-	Primary:	20.5% <sup>A</sup>
Number of agricultural holdings	20,890 <sup>A</sup>	Secondary:	38.0% <sup>A</sup>
		Tertiary:	41.4% <sup>A</sup>
		Protected areas	Yes

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The South-Central State Enterprise - Smolyan - was registered in 2011 and manages 717,192 ha of state-owned forest (83% of total) in four districts. The Bulgarian Forest sector has developed

rapidly in recent years with growing timber production from better managed stands, increased forest certification, introduction of more efficient and transparent trade mechanisms (e.g., electronic public timber tenders) and reforms addressing illegal logging and improving timber traceability. Around 20% of forest land in Bulgaria, including in Smolyan Province, is FSC-certified (see below) and this is increasing rapidly due to the strong export orientation of the timber processing and manufacturing sector. In 2019 there were 19 forest management enterprises which had received the FSC forest management certificate in Bulgaria - three of which were in Smolyan Province producing a range of timber products. These included: roundwood logs; processed solid wood (beams, planks, poles, slats etc.) - both untreated and treated; solid wood boards; pallets; slabs and edgings; wood shavings; sawdust briquettes, and firewood. Forest certification can play an important role in supporting and ensuring sustainable forest management. It is a voluntary instrument, which uses a set of standards to evaluate and validate the practices of forest management. It ensures and promotes economically viable forest management, in compliance with social standards, while protecting the environment. Forest certification is a direct economic instrument to ensure the sustainable use and management of forest resources. FSC (Forest Stewardship Council) certification was one of the earliest multi-stakeholder eco certification schemes. Since its inception in 1994, FSC certification has grown steadily, and it now is now operated in 79 countries covering over 180 million hectares of forests worldwide.

### **Key local assets**

The forest stand in Smolyan Province (BG424) is coniferous (55% pine and spruce) with an altitude range from 100 to over 2000 metres. Approximately 60% is designated as Natura 2000.

### **Challenges**

Promoting the sustainable management of forest resources is a global challenge. It is especially difficult in Bulgaria to motivate private forest owners to comply with environmental requirements, such as Natura 2000, and consequently there is much inappropriate management and damage caused. A large proportion of the forest in Smolyan Province (BG424) is designated as Natura 2000 and there are three practical challenges to ensuring habitat conservation and sustainable management in these areas: a) initiating a constructive dialogue and interaction between all relevant stakeholders; b) synchronizing local forestry practices with the conservation objectives of Natura 2000, and c) establishing the necessary local capacity for the appropriate management of the Natura 2000 sites.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.

## Hunting

Forestry is one of the most important economic activities in Kardzhali Province (BG425), but in addition to timber production the Rhodope forests also support other economic activities, including hunting.

Chernoochene Municipality (KRZ35) is in Kardzhali Province (BG425) in the Eastern Rhodopes. These are part (around 30%) of the Rhodope Mountain range that forms the border between southern Bulgaria and northern Greece. Maximum altitude in the Rhodopes is 2,191 metres, but the Eastern Rhodopes are significantly lower than this. The region is particularly notable for its karst landscape with deep river gorges and large caves, and biodiversity value. The region is also rich in thermal mineral springs. An important factor contributing to the large number of conserved natural habitats and endangered species in the region is that the Rhodopes were part of the former 'Iron Curtain' separating eastern and western Europe for 40 years and were under military surveillance / control until the 1990s.

Reference mountain landscape statistics  
(A: Data from NUTS3 BG425)

Reference mountain chain	Rhodope Mountains		
Reference mountain landscape	Chernoochene		
Size of the area (km <sup>2</sup> )	327.1	Average per capita income (€)/year	4,300 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	571 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	26.9	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	12.9% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	754 <sup>A</sup>	Secondary:	33.5% <sup>A</sup>
		Tertiary:	53.5% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	-	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	21,240 <sup>A</sup>	Primary:	41.9% <sup>A</sup>
Protected areas	Yes	Secondary:	24.8% <sup>A</sup>
		Tertiary:	33.2% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The 'South-Central State Enterprise - Smolyan' manages the state-owned forest in Kardzhali Province and maintains and administers 7 forest areas ('grounds') specifically for the purpose of

hunting, one of which is near Zhenda village in Chernoochene Municipality (KRZ35) in the north of the province. Hunting in the Bulgarian mountains is strictly restricted to designated "state hunting grounds" with an online system of registration / application for licences for Bulgarian hunters. Each "hunting ground" usually has a hunting lodge offering accommodation and meals. The hunting ground 'Zhenda' in Chernoochene Municipality (KRZ35) has a total area 16,118 ha, the terrain is low mountainous with an altitude in the range of 400 - 1,100 metres. The main species hunted at 'Zhenda' are red deer, Roe deer, Mouflon and Wild boar. Hunters from other countries have access to the hunting grounds / lodges via specialist agencies, such as Bulgarian Hunting Tours (<http://huntinbulgaria.com/>). The hunting ground 'Zhenda' is popular with foreign hunters and two hunting lodges have been built, offering good facilities with single rooms and private bathrooms. Taxidermy services are also available, plus assistance with the necessary documentation for export.

### **Key local assets**

The most commonly hunted species in Kardzhali Province (BG425) are red deer, Roe deer and Fallow deer; Wild Boar, and; Mouflon.

### **Challenges**

No specific challenges have been identified for this VC.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.



## Culinary Guidebook to the Eastern Rhodopes

A Culinary Guidebook promoting popular traditional local dishes with 28 recipes (using local ingredients) collected from the region of the Eastern Rhodopes.

Kardzhali Municipality (KRZ16) is in the far south of Bulgaria on the border with Greece. Kardzhali Province (BG425) lies in the Eastern Rhodopes which are part (around 30%) of the Rhodope Mountain range that forms the border between southern Bulgaria and northern Greece. Maximum altitude in the Rhodopes is 2,191 metres, but the Eastern Rhodopes are significantly lower than this. The region is particularly notable for its karst landscape with deep river gorges and large caves, and biodiversity value. The region is also rich in thermal mineral springs. An important factor contributing to the large number of conserved natural habitats and endangered species in the region is that the Rhodopes were part of the former 'Iron Curtain' separating eastern and western Europe for 40 years and were under military control until the 1990s.

Reference mountain landscape statistics  
(A: Data from NUTS3 BG425)

Reference mountain chain	Rhodope Mountains		
Reference mountain landscape	Kardzhali		
Size of the area (km <sup>2</sup> )	574.7	Average per capita income (€)/year	4,300 <sup>A</sup>
Altimetry (m; min-max)	-	Total Gross Value Added (GVA) (€ million)/year	571 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	119.6	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-	Primary:	12.9% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	754 <sup>A</sup>	Secondary:	33.5% <sup>A</sup>
		Tertiary:	53.5% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	-	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	21,240 <sup>A</sup>	Primary:	41.9% <sup>A</sup>
Protected areas	Yes	Secondary:	24.8% <sup>A</sup>
		Tertiary:	33.2% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

As described above - the Guidebook aims to provide information about - and recipes for - a range of traditional food products plus to list: a) farms where the ingredients can be bought, and b)

places (B&B's, hotels, restaurants) where the dishes are also offered / available for sale. The Guidebook was available for sale locally in the tourist office in Kardzhali and in several guest houses in the Eastern Rhodopes.

### **Key local assets**

The 28 recipes collected represent both traditional knowledge and cultural heritage from the region. The recipes are quite diverse and use local ingredients from a range of different land use systems and natural assets - there are meat- and dairy-based dishes (grasslands), vegetable- and cereal-based dishes (cropland), honey- and wild fruits-based dishes (forest) plus one dish with trout (freshwater rivers and lakes).

### **Challenges**

This is a nice concept that attempted to promote local mountain produce by combining a recipe book and guide to where the ingredients can be purchased from local farmers. However, the book was produced by a project (funded by the Dutch government) and the typical challenge faced by such project-based initiatives is how to make them viable / sustainable after the project finishes. In this case the book was only produced in a printed / hard copy format and with a limited number printed. Consequently, the longer-term impact of this specific initiative upon the value chains it aimed to promote was very limited. If a business model had been developed for sustaining the on-going production (and updating) of the Guidebook, then this value chain might have been maintained.

### **Innovation**

The combination of cookbook and guidebook is a very innovative form of direct marketing. The idea is to provide information about - and recipes for - a range of traditional food products plus to list: a) farms where the ingredients can be bought, and b) places (B&B's, hotels, restaurants) where the dishes are also offered / available for sale. The Guidebook is a novel form of marketing.

## 20. Turkey

### Goat and sheep milk and dairy products

Korkuteli is one of the areas with high concentrations of endemic plants in Turkey. The milk of the animals fed on endemic herbs in the pastures in the region is both high quality and aromatic. The quality of milk increases the demand for milk and dairy products.

Korkuteli is a district of Antalya Province in the Mediterranean region of Turkey, 56 km (35 mi) north-west of the city of Antalya. Korkuteli is an area of small plains and hills in the Bey Dağları, the western range of the Taurus Mountains, overlooking the Mediterranean Sea. There are two distinct geographical areas of Korkuteli, of equal size: the lowland area nearer the coast has a hot Mediterranean climate, while the larger area of lakes higher up is cooler and less humid. The high country is covered with pine forest, while the lowland is used for agriculture; crops include grains, pulses and vegetable oil-seeds. There are trout in Korkuteli reservoir and other small lakes (Wikipedia, 2021).

Reference mountain landscape statistics  
(A: Data from NUTS3 "TR611")

Reference mountain chain		Bey Mountains, Antalya	
Reference mountain landscape		Korkuteli	
Size of the area (km <sup>2</sup> )	2,471	Average per capita income €/year	9,553.01 <sup>A</sup>
Altimetry (m; min-max)	1020- 2000	Total Gross Value Added (GVA) (€ million)/year	22,425.10 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	22.5	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	10.23%	Primary:	8.2% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	599,838 <sup>A</sup>	Secondary (including construction):	19.3% <sup>A</sup>
		Tertiary:	69.0% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	60	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	39,533 <sup>A</sup>	Primary:	Medium <sup>A</sup>
Protected areas	Yes	Secondary:	Low <sup>A</sup>
		Tertiary:	High <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

There is a particularly high demand for goat's milk. A special ice cream known as "burnt ice cream" is produced in the region. This ice cream has a reputation both in the region and throughout the country. The raw material of this ice cream is provided from goat milk produced in Korkuteli. 99% of goat breeders are smallholder farms. The number of farmers engaged in goat and sheep breeding in the region is 1179 and 1572, respectively. Since pasture areas are insufficient, goat and sheep breeders purchase feed from feed suppliers. However, high feed prices increase the cost of production. The most frequently used marketing channels for product sales are usually retailers, companies, and traders from outside the region. In addition, it is observed that the producers make direct sales to consumers and hotels. However, direct sales are not at a high level. One of the most important problems in the value chain is the marketing of high-quality products at low prices. The producers are trying to avoid this problem by selling directly. It is seen that the producers are members of the Sheep and Goat Breeders' Association in Antalya. This union takes part in the implementation of animal breeding programs at the regional level to increase productivity.

### Key local assets

Key local assets in this VC are:

- Natural: There are many endemic plant species in the region. <https://www.dogadernegi.org/wp-content/uploads/2018/11/akd018-beydaglari-onemli-doga-alanlari-kitabi.pdf>
- Social: Sheep and goat breeding are very common in the region. Especially goat breeding has been carried out in the region for a long time. 99% of goat and sheep breeders are smallholder farms.
- Cultural: Goat breeding is a traditional production activity in the region. For this reason, it fully fits the definition of cultural heritage. Goat breeding is transferred from families to children as a cultural heritage.

### Challenges

The inadequacy of pasture and high feed costs in the region are the most important challenges faced by sheep and goat breeders. In addition to these, there are other important challenges facing producers. Although the sheep and goat breeders supply high quality products to the market, they cannot get high prices for their products. The farmers have not transportation facilities to carry their produce to the markets. The animal diseases mostly affect sheep and goat breeders. This is a challenge for goat and sheep breeders. Moreover, there is no farmer organization in the form of an agricultural cooperative for goat and sheep breeders in the region.

### Innovation

This VC is a traditional one, where no innovations have been identified.

## Fresh Vegetable (Greenhouse tomatoes)

Antalya is one of the regions with the highest annual total sunshine duration in Turkey (3,011 hours of sunshine per year) (<https://www.gnssolar.com/icerik/860/turkiye-gunes-haritasi>). In Antalya, the district with the highest annual total sunshine duration is Elmalı (<https://gepa.enerji.gov.tr/MyCalculator/pages/7.aspx>).

Elmalı is a town and district in Antalya Province, the Mediterranean region of Turkey. It lies about 35 km inland, near the town of Korkuteli and 110 km (68 mil) west of the city of Antalya. In 2020, the population for the whole district was 39365. Elmalı is a small plateau at the head of a long upland valley in the Beydağları range of the western Taurus Mountains, surrounded by high peaks including the 2500m Elmalı Mountain. Aside from the town of Elmalı, the district includes two other small towns (Akçay and Yuva) as well as villages. The area is watered by streams running off the mountains. Although close to the Mediterranean, Elmalı is high in the mountains and has an inland climate of cold winters and hot summers, (although still much cooler than the coast). Near to Lake Avlan there is an area of cedar forest, rare in Turkey (Wikipedia, 2021).

### Reference mountain landscape statistics (A: Data from NUTS3 "TR611")

Reference mountain chain	Bey Mountains, Antalya		
Reference mountain landscape	Elmalı		
Size of the area (km <sup>2</sup> )	1,658	Average per capita income €/year	9,553.01 <sup>A</sup>
Altimetry (m; min-max)	1150- 2503	Total Gross Value Added (GVA) (€ million)/year	22,425.10 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	23.74	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	4.26%	Primary:	8.2% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	599,838 <sup>A</sup>	Secondary (including construction):	19.3% <sup>A</sup>
		Tertiary:	69.0% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	110	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	39,533 <sup>A</sup>	Primary:	Medium <sup>A</sup>
Protected areas	Yes	Secondary:	Low <sup>A</sup>
		Tertiary:	High <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

In addition, the air is cool and dry because of high mountain region. Both the high annual sunshine duration and the favourable climatic conditions played an important role in the development of greenhouse cultivation in Elmalı. Especially greenhouse tomato cultivation is very common in the region. Due to the favourable conditions in the region, greenhouse tomato producers produce higher quality tomatoes compared to the producers located in the plain. Tomatoes produced in greenhouses in Elmalı have a better appeal than those grown in the plain.

The most common marketing channel used by greenhouse tomato growers is the wholesale markets brokers. The traders are used moderately in product sales. The direct-to-consumer sales are low. The greenhouse tomato growers sell to exporter companies less frequently. Although tomatoes produced in the region are of high quality, producers cannot get high prices for their products. This is one of the negative aspects of the value chain. Also, the greenhouse tomato growers in Elmalı do not have a farmer's organization. On the other hand, the fact that the tomato produced in Elmalı is a highland product creates a positive effect in terms of the product's value chain. As a matter of fact, tomatoes grown in the highland have a higher quality and healthier product image.

### Key local assets

Key local assets in this VC are:

- Natural: The total area under greenhouse tomato cultivation in Elmalı is about 835 hectares. The average farm size per household is between 0.4 and 0.5 hectares.
- Social: Greenhouse tomato cultivation has been carried out in Elmalı since 2000. The number of greenhouse tomato growers is 1850. Approximately 95% of greenhouse tomato growers are smallholder farms. Community interaction has had an important effect on the spread of greenhouse tomato cultivation in Elmalı.

### Challenges

There are three major challenges for growers growing tomatoes in greenhouse. These are respectively; low crop selling prices, crop diseases and labour shortages. Greenhouse tomato production is very common in Antalya. There are many greenhouse tomato growers especially in the plain region of Antalya. The high supply of tomatoes causes the prices to fall. Although greenhouse tomato growers in Elmalı produce higher quality tomatoes compared to the producers in the plain, they cannot obtain high prices. Producers encounter crop diseases. However, crop diseases are less common than in lowland areas (plain). This is also an important advantage.

### Innovation

Apple and grape are traditionally produced in Elmalı. Greenhouse tomato cultivation in Elmalı has developed later as a more profitable production activity compared to other enterprises. In addition, the products grown are healthier because less input is used in highland greenhouse cultivation.

## Cultivated Mushroom

Korkuteli Region has a regional reputation with cultivated mushroom. In 2020, 60.44 % of the Turkey's cultivated mushrooms (55455 tons) are grown in Korkuteli Region (TurkStat, 2020). Mushroom cultivation is carried out by modern mushroom companies with fully automated climate systems.

Korkuteli is a district of Antalya Province in the Mediterranean region of Turkey, 56 km (35 mi) north-west of the city of Antalya. Korkuteli is an area of small plains and hills in the Bey Dağları, the western range of the Taurus Mountains, overlooking the Mediterranean Sea. There are two distinct geographical areas of Korkuteli, of equal size: the lowland area nearer the coast has a hot Mediterranean climate, while the larger area of lakes higher up is cooler and less humid. The high country is covered with pine forest, while the lowland is used for agriculture; crops include grains, pulses and vegetable oil-seeds. There are trout in Korkuteli reservoir and other small lakes (Wikipedia, 2021).

Reference mountain landscape statistics  
(A: Data from NUTS3 "TR611")

Reference mountain chain		Bey Mountains, Antalya	
Reference mountain landscape		Korkuteli	
Size of the area (km <sup>2</sup> )	2,471	Average per capita income €/year	9,553.01 <sup>A</sup>
Altimetry (m; min-max)	1020- 2000	Total Gross Value Added (GVA) (€ million)/year	22,425.10 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	22.5	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	10.23%	Primary:	8.2% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	599,838 <sup>A</sup>	Secondary (including construction):	19.3% <sup>A</sup>
		Tertiary:	69.0% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	60	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	39,533 <sup>A</sup>	Primary:	Medium <sup>A</sup>
Protected areas	Yes	Secondary:	Low <sup>A</sup>
		Tertiary:	High <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

In addition to this, the climate in the region is suitable for high quality mushroom production and enables mushroom farming without climate control. Therefore, there are many small-scale farmers in the region. Also, substrate needed for cultivation is easily available, and tourism in the region increases mushroom demand.

Key actors: mushroom compost or compost material suppliers, spawn suppliers, companies, small-scale farmers, traders; producer union; retailers; consumers

Key activities: Input supply, growing, harvesting, processing, packaging, logistics; marketing; sales; purchasing. It is stated that 96% of mushroom production in Korkuteli is carried out by small family farms. 94% of the mushrooms produced in the region are sold to traders. The rate of producers trained in mushroom production is 9.4% (Şahin, 2019).

The value chain has positive effects on the environment. Agricultural wastes (wheat stalk, chicken manure, cotton pulp, etc.) are used in compost production. These wastes are transformed into a product with high economic and nutritional value. The fact that the climate of the region is suitable for mushroom cultivation reduces the costs of acclimatisation. The region is close to raw material sources for mushroom cultivation. This reduces logistics costs.

The short shelf life of the product is a major disadvantage for small family farms, because most of them do not have the necessary infrastructure for the processing and distribution of the product.

### Key local assets

Key local assets in this VC are:

- Social: Cultivated mushroom production has been started with a few enterprises at the beginning of 1980s in the region. Both mushroom production and number of enterprises have been extended by community interactions.

### Challenges

Shelf life of fresh mushrooms is very short. Cooling for transportation is needed but the possibility of cooling transportation for small farms in the area is limited. Value added products such as canned and dried mushrooms products can be produced by only modern farms. Small-scale farmers procure the mushroom compost (or substrate) required for production from modern companies. This increases the production cost.

### Innovation

This VC is a traditional one, where no innovations have been identified.



## Fresh Fruit (Apple)

Elmalı is an important district in apple production in the Bey Mountains and the district takes its name from that product (literally apple-town). According to data for 2020 released by the Turkish Statistical Institute (TurkStat), in Elmalı, which covers 13.18 % of national apple production (4300386 tons), 566668 tons of apples are produced.

Elmalı is a town and district in Antalya Province, the Mediterranean region of Turkey. It lies about 35 km inland, near the town of Korkuteli and 110 km (68 mil) west of the city of Antalya. In 2020, the population for the whole district was 39365. Elmalı is a small plateau at the head of a long upland valley in the Beydağları range of the western Taurus Mountains, surrounded by high peaks including the 2500m Elmalı Mountain. Aside from the town of Elmalı, the district includes two other small towns (Akçay and Yuva) as well as villages. The area is watered by streams running off the mountains. Although close to the Mediterranean, Elmalı is high in the mountains and has an inland climate of cold winters and hot summers, (although still much cooler than the coast). Near to Lake Avlan there is an area of cedar forest, rare in Turkey (Wikipedia, 2021).

Reference mountain landscape statistics  
(A: Data from NUTS3 "TR611")

Reference mountain chain		Bey Mountains, Antalya	
Reference mountain landscape		Elmalı	
Size of the area (km <sup>2</sup> )	1,658	Average per capita income €/year	9,553.01 <sup>A</sup>
Altimetry (m; min-max)	1150- 2503	Total Gross Value Added (GVA) (€ million)/year	22,425.10 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	23.74	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	4.26%	Primary:	8.2% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	599,838 <sup>A</sup>	Secondary (including construction):	19.3% <sup>A</sup>
		Tertiary:	69.0% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	110	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	39,533 <sup>A</sup>	Primary:	Medium <sup>A</sup>
Protected areas	Yes	Secondary:	Low <sup>A</sup>
		Tertiary:	High <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

The most widely cultivated varieties in Elmalı are Starking, Golden, Gala, and Granny Smith. The most grown apple variety is Starking. The Starking Apple production in Turkey was 1675197 tons in 2020. 26.86% of the Starking apples produced in Turkey (449980 tonnes) was produced in Elmalı district (TukStat, 2020). 90% of the farmers dealing with apple cultivation in Elmalı district are smallholder farms. The most common marketing channels used by apple farmers are brokers, traders, exporters, and fruit juice companies. The supermarket retailers are used moderately in product sales. The direct-to-consumer sales are low. The prevalence of diseases and pests in the region reduces the quality of the product. Diseases and pests cause the appeal of the product to deteriorate. This negatively affects the demand of the product. The decrease in the market demand for the product causes the prices to decrease. The apple producers in the region do not have a farming organization. Despite these negativities, it can be considered as a positive development that the farmers continue to produce apples traditionally.

### Key local assets

Key local assets in this VC are:

- Natural: The total area under Apple cultivation in Elmalı is 9800 hectares. The average farm size per household is between 0.7 and 0.8 hectares. Apples are grown in orchards.
- Social: Apples have been cultivated for a long time in Elmalı. 90% of apple growers are smallholder farms. Apple's cultivation has been extended by community interactions.
- Cultural: Apples are traditionally produced in the Elmalı. For this reason, it fully fits the definition of cultural heritage. Apple cultivation is transferred from families to children as a cultural heritage.

### Challenges

The three most important challenges faced by producers in apple production are, respectively, the high number of diseases, the difficulty of finding market outlets and the high input costs. Due to the high number of diseases in apple cultivation, productivity is low. Climate change also influences low productivity. Especially the negative impact of drought on apple production is mentioned. Since apple producers have problems in finding market outlets, the produced apple cannot be sold at high prices. In addition, it is emphasized that the family labour is insufficient in apple producing family farms.

### Innovation

This VC is a traditional one, where no innovations have been identified.

## Fresh Fruit (Grapes)

Elmalı is a district in Antalya that is famous for its vineyards. Elmalı is also one of Turkey's major grape production centres. Elmalı is especially famous for Tilki Kuyruğu grape variety (*Vitis vinifera* L.), which is an endemic species.

Elmalı is a town and district in Antalya Province, the Mediterranean region of Turkey. It lies about 35 km (22 mil) inland, near the town of Korkuteli and 110 km (68 mil) west of the city of Antalya. In 2020, the population for the whole district was 39365. Elmalı is a small plateau at the head of a long upland valley in the Beydağları range of the western Taurus Mountains, surrounded by high peaks including the 2500m Elmalı Mountain. Aside from the town of Elmalı, the district includes two other small towns (Akçay and Yuva) as well as villages. The area is watered by streams running off the mountains. Although close to the Mediterranean, Elmalı is high in the mountains and has an inland climate of cold winters and hot summers, (although still much cooler than the coast). Near to Lake Avlan there is an area of cedar forest, rare in Turkey (Wikipedia, 2021).

Reference mountain landscape statistics  
(A: Data from NUTS3 "TR611")

Reference mountain chain		Bey Mountains, Antalya	
Reference mountain landscape		Elmalı	
Size of the area (km <sup>2</sup> )	1,658	Average per capita income €/year	9,553.01 <sup>A</sup>
Altimetry (m; min-max)	1150- 2503	Total Gross Value Added (GVA) (€ million)/year	22,425.10 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	23.74	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	4.26%	Primary:	8.2% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	599,838 <sup>A</sup>	Secondary (including construction):	19.3% <sup>A</sup>
		Tertiary:	69.0% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	110	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	39,533 <sup>A</sup>	Primary:	Medium <sup>A</sup>
Protected areas	Yes	Secondary:	Low <sup>A</sup>
		Tertiary:	High <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

Tilki Kuyruğu grape varieties grown in other regions of Turkey are white-colored, while Tilki Kuyruğu grape variety grown in Elmalı is only red-coloured. The red-coloured Tilki Kuyruğu grape is grown at an altitude of 1100 in Elmalı. Elmalı is one of the important settlements of the Lycian civilization in the ancient period. It is stated that Elmalı region, whose history dates to 2000 BC, is the first wine production centre of the world. Tilki Kuyruğu grapes are consumed both as fresh and as processed products such as wine and vinegar. Approximately 4517 tons of grapes were produced in Elmalı in 2020. 45% of the grape production in Elmalı is fresh table grape, 40% wine grape and 15% dried grape. There are two main marketing channels used by grape growers. The grape growers have problems in marketing fresh table grapes. The growers prefer to sell directly to consumers to get a high price for fresh table grapes. The growers sell wine grapes to wine companies. The problem in the grape value chain can be seen in the marketing of fresh grapes. One of the negative aspects of the value chain is that the grapes produced are supplied to the market without being processed. Also, it is observed that the grape growers in Elmalı do not have a farmer organization. On the other hand, the fact that the grape grown in the region is a quality and special variety is an important opportunity to improve the value chain.

### Key local assets

Key local assets in this VC are:

- Natural: The total area under grape cultivation in Elmalı is about 335 hectares. The average farm size per household is 0.4 hectares.
- Social: Grapes have been cultivated for a long time in Elmalı. Most grape growers are smallholder farms. The average age of the farmers engaged in grape farming is between 35 and 50. Currently, the number of farmers dealing with grape cultivation in the region is 223. Grape cultivation has been extended by community interactions.
- Cultural: Grapes are traditionally produced in the Elmalı. For this reason, it fully fits the definition of cultural heritage. Grape cultivation is transferred from families to children as a cultural heritage.

### Challenges

The main problems faced by the grape growers are difficulties in finding markets and low productivity. Especially the grape growers face difficulties in marketing fresh table grapes. Therefore, they obtain low market prices for their products. Climate change and diseases influence the decrease in productivity in grape cultivation. However, climate change has a greater impact on yields. There is an intensive labor requirement in grape cultivation. It is stated that the family labour of grape growers in Elmalı is insufficient. Besides, it is emphasized that the government support and incentives for the grape growers in the region are insufficient.

### Innovation

This VC is a traditional one, where no innovations have been identified.

## Fresh Fruit (Pears)

Korkuteli Karyağdı Pear is grown in Antalya-Korkuteli district at an altitude range of 844 to 1010 m. Geographical Indication (GI) was obtained for Korkuteli Karyağdı Pear in 2018 (<https://www.ci.gov.tr/cografya-isaretler/detay/38437>).

Korkuteli is a district of Antalya Province in the Mediterranean region of Turkey, 56 km (35 mi) north-west of the city of Antalya. Korkuteli is an area of small plains and hills in the Bey Dağları, the western range of the Taurus Mountains, overlooking the Mediterranean Sea. There are two distinct geographical areas of Korkuteli, of equal size: the lowland area nearer the coast has a hot Mediterranean climate, while the larger area of lakes higher up is cooler and less humid. The high country is covered with pine forest, while the lowland is used for agriculture; crops include grains, pulses and vegetable oil-seeds. There are trout in Korkuteli reservoir and other small lakes (Wikipedia, 2021).

Reference mountain landscape statistics  
(A: Data from NUTS3 "TR611")

Reference mountain chain		Bey Mountains, Antalya	
Reference mountain landscape		Korkuteli	
Size of the area (km <sup>2</sup> )	2,471	Average per capita income €/year	9,553.01 <sup>A</sup>
Altimetry (m; min-max)	1020- 2000	Total Gross Value Added (GVA) (€ million)/year	22,425.10 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	22.5	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	10.23%	Primary:	8.2% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	599,838 <sup>A</sup>	Secondary (including construction):	19.3% <sup>A</sup>
		Tertiary:	69.0% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	60	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	39,533 <sup>A</sup>	Primary:	Medium <sup>A</sup>
Protected areas	Yes	Secondary:	Low <sup>A</sup>
		Tertiary:	High <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

The most important distinguishing feature of Korkuteli Karyağdı Pear from other pear varieties is the absence of a sandy structure around the core. Another distinctive feature is that high

productivity can be obtained without the need for any kind of pollinator. Approximately 11% of the pear production in Turkey (59405 tonnes) is produced in Korkuteli district (TurkStat, 2020). The leading marketing channels of Karyağdı Pear used by the farmers are local merchants, followed by non-local merchants and companies. It is seen that they do not sell to the supermarket retailers. However, other retailers are used moderately in product sales. It is seen that the farmers also sell pears directly to the hotels since it is in the tourism region of Korkuteli. However, direct sales are very low. One of the marketing channels used less frequently by the farmers is the brokers in the wholesale market. Although Karyağdı Pear is a quality product, there is no awareness regarding the product. In other words, there are problems in generating demand. In 2018, a geographical indication certificate was obtained for Karyağdı Pear. It is expected that the geographical indication will help increase the demand of Karyağdı Pear. However, some initiatives are needed to increase the demand for the product. In addition, it is observed that Karyağdı Pear producers do not have a farmer organization.

### Key local assets

Key local assets in this VC are:

- Natural: Karyağdı Pear is grown in an area of 2000 hectares in Korkuteli. Average farm size per household is 1 hectare. Karyağdı Pear is grown in orchards.
- Social: It is known that Korkuteli Karyağdı Pear has been produced since the 1950s and that there are pear trees over 65 years old in Korkuteli. Social interaction has a great effect on the growing of Karyağdı Pear farms in the region. Currently, the number of farmers dealing with Karyağdı pear cultivation in the region is 550.

### Challenges

Korkuteli Karyağdı Pear producers have three major challenges. These are climate change, insufficient market demand and low product price. The biological balance in the region has been adversely affected due to climate change. For this reason, the pest population has increased in the region. Although Korkuteli Karyağdı Pear is a very high quality and special product, it is less known on the market. In other words, market recognition of the product is poor. Therefore, the demand of Korkuteli Karyağdı Pear in the market is insufficient. This causes the product to be offered to the market at low prices.

### Innovation

This VC is a traditional one, where no innovations have been identified.

## Extra virgin olive oil

Olive trees, a special and valuable type, are grown in south part of Mount IDA which is convenient to climatic conditions. It takes its distinctive features from the geographical structure and climate of this region and its unique elements such as soil structure.

Edremit is a city and district of Balıkesir Province in the Aegean region of Turkey. It is settled in the Mount Ida which is a mountain in northwestern Turkey. Edremit's economy relies largely on the production of olives, as well as on tourism. Edremit is known as the olive capital of Turkey. Kaz Dağı National Park, extending around the ancient Mount Ida (mentioned in Homer's epic poems such as the Iliad), is situated within the boundaries of Edremit district and is an important tourist attraction with its natural scenery and a number of picturesque small villages around it (Wikipedia, 2021).

Reference mountain landscape statistics  
(A: Data from NUTS3 "TR221")

Reference mountain chain		Edremit, Balıkesir	
Reference mountain landscape		Edremit	
Size of the area (km <sup>2</sup> )	682	Average per capita income €/year	6,800 <sup>A</sup>
Altimetry (m; min-max)	0-1767	Total Gross Value Added (GVA) (€ million)/year	7,377.60 <sup>A</sup>
Population (Inhabitants/km <sup>2</sup> )	density 236.28	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	28.90%	Primary:	12.9% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	40,805 <sup>A</sup>	Secondary (including construction):	44.7% <sup>A</sup>
		Tertiary:	50.1 <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	87	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	42,000 <sup>A</sup>	Primary:	Low <sup>A</sup>
Protected areas	Yes	Secondary:	Medium <sup>A</sup>
		Tertiary:	High <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

North Aegean olive oils are high priced in the market due to their special organoleptic qualities. North Aegean olive oil is an aromatic virgin olive oil that has Geographical indication (GI). GIs are used for rural development (structuring of supply chain around product reputation, formation of

stable and higher product prices, value creation in all stages of supply chain, improvement of regional tourism etc.) as well as preserving regional knowledge, knowhow, and culture. In the area 85 % of olives are used for olive oil production. Harvested period of the fruit is between mid-October and mid-February. Entrepreneurs in the traditional olive producing regions are either in the high end of the value chain i.e., people from big cities trying to enjoy country life and olive culture or the merchants creating and benefiting from scale economies by organizing small-scale producers and processors. Regarding value chain actors, the Sales Cooperative Unions Marmarabirlik and Tariş are both main big players in the sector.

### **Key local assets**

The Aegean region is an important area for olive production with the North and South Aegean regions producing around 60–65 % of the total amount of olive oil manufactured in Turkey. North Aegean olive oils obtained from Ayvalik cultivar have received the registered geographical indication. The unique climate and natural resources ensure in the region for olive trees development.

### **Challenges**

The sector faces challenges specific to agricultural and food sectors, such as climate change. High periodicity, high production costs, existence of informal olive oil production in the sector are the main problems.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.



## Chestnut

Bozdağ chestnut trees are seen from 500 meters to 1200 meters. Bozdağ candied chestnuts are distinguished from the desserts made from chestnuts produced in other regions with their large bright, unbroken integrity, pleasant taste, and taste. It is value added product. 80% of candied chestnut is provided from Bozdağ/Ödemiş. Small scale family farmers pick up chestnuts (predominantly women labour) and sell to processors. Bozdağ candied chestnut has Geographical Indications (GI) and is important to gastronomy tourism. Agriculture and tourism sectors are interconnected in the area.

Ödemiş is located on a fertile plain watered by the Bozdağlar River in the north and Küçük Menderes River lying between Aydın Mountains in the south. Bozdağ is a part of Ödemiş district of İzmir province. It is at the east of the province on Bozdağ Mountains which it is named after. At high altitude, the town is cooler than the surrounding and some houses are used as resort (summer resort houses) for İzmir or Ödemiş citizens. Winter tourism also seems to be promising (Wikipedia, 2021).

Reference mountain landscape statistics  
(A: Data from NUTS3 "TR310")

Reference mountain chain	Bozdağ, Ödemiş, İzmir		
Reference mountain landscape	Ödemiş		
Size of the area (km <sup>2</sup> )	1,019	Average per capita income €/year	9,600 <sup>A</sup>
Altimetry (m; min-max)	123-2157	Total Gross Value Added (GVA) (€ million)/year	37,093.10 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	131.19	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	2.86%	Primary:	4.4% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	51,356 <sup>A</sup>	Secondary (including construction):	53.6% <sup>A</sup>
		Tertiary:	54.6% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	109	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	49,788 <sup>A</sup>	Primary:	9.3% <sup>A</sup>
Protected areas	No	Secondary:	31% <sup>A</sup>
		Tertiary:	59.7% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

Turkey is among the world's leading producers and exporters of chestnuts (*Castanea sativa*). Turkey ranks 2nd in the world export quantity (14383 tonnes), and 4th in the world production (72655 tonnes) (FAO, 2019). The pickup activity of chestnuts is done by small family farms using special pole/stake while the roasted, peeled, and candied process is done by cooperatives and firms, with specific rules. The perspectives of the product bring together the farmers, the local government, cooperatives, the local catering and tourism, and small firms of standardization, packaging, promotion, and marketing.

### Key local assets

Bozdağ chestnuts are unique and special variety and distinguished from the desserts made from chestnuts produced in other regions with their large bright, unbroken integrity, pleasant taste, and taste. The aim is to increase the production of candied chestnuts without to loss the special taste. Chestnut festival is organized by local government, which brings many visitors to the area. This is enforced the social bonds.

### Challenges

Chestnut is both picked up naturally and done agriculture in Bozdağ. The major problem is chestnut blight (*Cryphonectria parasitica*). These diseases are seen especially picked up chestnut naturally. Access to chestnut trees is tough because of roads. Cold storages are not enough so farmers have to sell products quickly. This decrease selling price. Chestnut processing plants are not enough. Three companies produce chestnut packaging and chestnut candy in Ödemiş district (Ödemiş Commodity Exchange Chestnuts report, 2019). Mostly, chestnuts are picked up by women and children. This is shown that lack of professionalism. Disease and pest in chestnut trees increase due to climate change.

### Innovation

The production of chestnut candy is done in a traditional way. But in the last years, chestnuts cultivation system was changed (improvement of rural economy by leasing the bare-degraded (unproductive) forest and treasure land). Most farmers abandon picking up chestnut naturally because of chestnut blight. Instead of picking up chestnuts in the forest, farmers have started to establish chestnut orchards. Marketing strategies are changed from traditional to modern (e-commerce).

## Tulum cheese (from goat and sheep milk)

İzmir Tulum cheese is made from milk obtained from cows, sheep and goats fed by natural vegetation and water sources of higher parts of Kiraz. The difference from other cheese is İzmir brined cheese has high level of salt and ripened under brine. This adds to this cheese high quality and high reputation.

Kiraz is a district in the Aegean region in the plain overlooking near Bozdağ. All the villages except the district centre and a few lowland villages are usually located on Bozdağ and other mountains and on the foothills. Since it is located on a mountainous land, the transportation and social facilities of the villages are limited.

### Reference mountain landscape statistics (A: Data from NUTS3 "TR310")

Reference mountain chain		Kiraz, İzmir	
Reference mountain landscape		Kiraz	
Size of the area (km <sup>2</sup> )	573	Average per capita income €/year	9,600 <sup>A</sup>
Altimetry (m; min-max)	312-2152	Total Gross Value Added (GVA) (€ million)/year	37,093.10 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	365.86	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-2.29%	Primary:	4.4% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	51,356 <sup>A</sup>	Secondary (including construction):	53.6% <sup>A</sup>
		Tertiary:	54.6% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	137	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	49,788 <sup>A</sup>	Primary:	9.3% <sup>A</sup>
Protected areas	No	Secondary:	31% <sup>A</sup>
		Tertiary:	59.7% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

The feeding and milking activity of sheep and goat are done by small family farms. Some breeders make cheese by using dried goat or sheep skin. This production method is unique and traditional and adds very special taste to cheese. Some breeders sell raw milk to cooperatives or dairy firms



to be processed. The perspectives of the product bring together the farmers, the local government, cooperatives, and firms.

### **Key local assets**

The altitude, local animals, traditional process, give to this cheese a lot of character, that it has got outstanding taste. The aim is to increase the production of tulum cheese, protection of pastoral farming and traditional taste.

### **Challenges**

When compare mountain villages to plain village that main challenges are low education, lack of hygiene, the decreasing of grazing animals in pasture lands, high production costs etc. In addition to them, the aging of farmers and the lack of a public strategy to marketing problems add to the difficulties of their survival.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.

## Tulum Cheese

Erzincan Tulum is a traditional cheese. It has been produced in the highlands of the region for hundreds of years. It requires a special process for production which involves the use of White Karaman sheep's milk. These sheep graze in the highlands of Erzincan Province. Small-scale sheep breeders remain in the plateau for about 5 months of the year.

Erzincan Province is located in the eastern region of Turkey. The city is situated 1185 meters above sea level. It has a terrestrial climate. Mountains constitute approximately 60% of Erzincan Province.

Reference mountain landscape statistics  
(A: Data from NUTS3 "TRA12")

Reference mountain chain	Esence and Munzur mountains		
Reference mountain landscape	İliç		
Size of the area (km <sup>2</sup> )	1,406	Average per capita income €/year	6,900 <sup>A</sup>
Altimetry (m; min-max)	1064- 3150	Total Gross Value Added (GVA) (€ million)/year	1,456.3 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	6.42	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	33.60%	Primary:	10.9% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	2,713 <sup>A</sup>	Secondary (including construction):	36.1% <sup>A</sup>
		Tertiary:	46.4% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	114	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	7,000 <sup>A</sup>	Primary:	Medium <sup>A</sup>
Protected areas	No	Secondary:	Low <sup>A</sup>
		Tertiary:	High <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

Cheese is produced on the plateaus and pastures of Erzincan where there are nearly half a million sheep. Cheese is produced from the milk of the White Karaman sheep which graze at high altitude in Erzincan Province between the fifth and ninth months of the year. The cheese is shaped by the plant and animal biodiversity of the region. Breeders remain on the plateau for about 5 months of the year. Cheese is produced by traditional methods, with nothing added except rennet and salt.



Cheeses are ripened originally in Tulum or other plastic packages for at least three months. With its unique taste and aroma, Erzincan Tulum cheese is important for the development of the region.

### **Key local assets**

The sheep graze on the plateaus of Erzincan Province where there is a rich variety of 90-100 different kinds of plants. Sheep breeding has been the traditional activity of the area for generations. Cheese is produced using traditional methods. Erzincan Tulum Cheese has Geographical Indication from the Turkish Patent and Trademark Office.

### **Challenges**

Cheese is mostly produced on small-scale farms. There is not any standard production method. There is a lack of infrastructure on the plateaus.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.

## Pine Honey

Turkey is an important pine honey producer and exporter. Pine honey has a regional reputation and has a Geographical Indication from the Turkish Patent and Trademark Office. It is a high-quality product. Pine honey can be stored for a long time without its texture being affected. Since the honey does not crystallize for a long time and has a functional food feature, it is wide scope for its use in the medicine and food sectors. Agriculture and tourism are closely interconnected in this area.

Muğla province has a Mediterranean climate. It has excellent ecological conditions for agricultural production. Muğla has the longest coastline in Turkey. It is one of the most-visited tourist destinations for both foreign and domestic tourists, due to its unique nature and climate.

Reference mountain landscape statistics  
(A: Data from NUTS3 "TR323")

Reference mountain chain		Menteşe Mountains	
Reference mountain landscape		Ula	
Size of the area (km <sup>2</sup> )	1,695	Average per capita income €/year	8,500 <sup>A</sup>
Altimetry (m; min-max)	479-600	Total Gross Value Added (GVA) (€ million)/year	7,265.2 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	54.4	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	11.18%	Primary:	13.1% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	174,249 <sup>A</sup>	Secondary (including construction):	22.7% <sup>A</sup>
		Tertiary:	60.1% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	17	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	27,000 <sup>A</sup>	Primary:	Medium <sup>A</sup>
Protected areas	Yes	Secondary:	Low <sup>A</sup>
		Tertiary:	High <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

According to the 2020 TURKSTAT data, the number of enterprises engaged in beekeeping in Muğla is 4741 and the total number of hives is 900,583. It is the preferred region for migratory beekeepers. The beekeeping sector provides employment opportunities for many people.

### **Key local assets**

Pine honey has been produced in this region for a long time. 75-80% of Turkey's pine honey is produced in Muğla Province. 68% of Muğla's land area is covered by forests and pine honey production takes place in only 8% of these forested areas. There are 385 forest villages in Muğla and 260 of these are pine honey production areas.

### **Challenges**

Honey yield is reduced when climatic conditions are unfavourable. Accommodation is a problem for migratory beekeeper. Young people are not much interest beekeeping.

### **Innovation**

The innovation in this VC is represented by the conversion to the organic honey production scheme.



## Tea Leaves

Rize has a high reputation for its black tea. Tea is produced all over Rize Province, including the mountain areas. Rize Tea takes its most basic characteristics from climatic conditions. Tea production is the most important source of income for farmers.

Rize Province is in the eastern part of the Black Sea Region of Turkey. It has a humid, subtropical climate. The province is characterized by very rugged and mountainous terrain. Annual average temperature is 14 °C and average annual rainfall is more than 2300 mm. Rize is the rainiest city in Turkey. The natural vegetation of the region consists of broad-leaved forest due to the high humidity and rainfall.

Reference mountain landscape statistics  
(A: Data from NUTS3 "TR904")

Reference mountain chain	Eastern Black Sea Mountains		
Reference mountain landscape	Güneysu		
Size of the area (km <sup>2</sup> )	1,796	Average per capita income €/year	6,200 <sup>A</sup>
Altimetry (m; min-max)	159-152	Total Gross Value Added (GVA) (€ million)/year	1,890.4 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	95.34	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	17.97%	Primary:	16.5% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	4,627 <sup>A</sup>	Secondary (including construction):	39% <sup>A</sup>
		Tertiary:	46.4% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	16	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	11,000 <sup>A</sup>	Primary:	High <sup>A</sup>
Protected areas	No	Secondary:	Low <sup>A</sup>
		Tertiary:	Medium <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

Most tea plantations are small-scale family farms. In the province, 91% of all farmers are engaged in the cultivation of tea and for many it is their livelihood. Tea production is important for the economic and social development of the region and for preventing migration. The first tea processing plant was established in Rize in 1947. Processing and marketing of tea is carried out



by General Directorate of Tea Enterprises (Çay-Kur) and by private companies. The tea sector is the most important source of employment in the region.

### **Key local assets**

Geological and climatic conditions give the tea from Rize region a distinctive character. A large part of the region is covered with mountains. Rize tea has Geographical Indication from the Turkish Patent and Trademark Office. Tea plays an important part in Turkish culture and daily life. It is the most consumed beverage in Turkey. Serving tea to guests is part of Turkish tradition.

### **Challenges**

High production costs, ageing of tea plantations, difficulties in finding local and qualified labourers for harvesting, logistics problems in transporting tea leaves to processing plants due to the geography of the region and effects of climatic change.

### **Innovation**

The innovation in this VC is represented by the participation to the organic and Rainforest Alliance certifications which is increasing in the region.

## Anzer honey

Anzer is a flower honey. It is produced from different types of flowers on the Anzer Plateau. It is obtained from a 13 km long valley at an altitude of 1750- 3150 meters. The rich flora and fauna of the region also attracts many tourists to the Anzer plateau. Anzer honey has a strong reputation in the region and is famous around the world. It is a high-quality honey.

Anzer Plateau is located in the district of İkizdere, which is part of Rize Province in the Black Sea region. Anzer plateau is 35 Km from the town of İkizdere and 90 Km from Rize. In winter, roads are closed due to snow. Villagers generally live in the centre of Rize or its districts during winter. The plateau is a popular tourist attraction.

Reference mountain landscape statistics  
(A: Data from NUTS3 "TR904")

Reference mountain chain	Kaçkar Mountain		
Reference mountain landscape	İkizdere		
Size of the area (km <sup>2</sup> )	855	Average per capita income €/year	6,200 <sup>A</sup>
Altimetry (m; min-max)	570~3000	Total Gross Value Added (GVA) (€ million)/year	1,890.4 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	7.70	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	18.23%	Primary:	16.5% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	4,627 <sup>A</sup>	Secondary (including construction):	39% <sup>A</sup>
		Tertiary:	46.4% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	53	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	11,000 <sup>A</sup>	Primary:	High <sup>A</sup>
Protected areas	No	Secondary:	Low <sup>A</sup>
		Tertiary:	Medium <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

Beekeepers come to the region for Anzer Honey production between 20th May and 30th June. There is a capacity of approximately 3000 hives. Producers who are not members of an Anzer honey cooperative in the region can only be accommodated if there is a quota remaining after the cooperative members have finished. The beekeepers and the cooperatives are the key actors.

### **Key local assets**

The vegetation of the Anzer Plateau has a rich plant diversity which includes endemic plants. The production locations are surrounded by high mountain ranges exceeding 3000 meters to the east, west and south. This creates a natural ecosystem which is differentiated from surrounding places in terms of climate, flora, and other natural features. These differences are reflected in the nectar and the honey. Anzer honey has Geographical Indication from the Turkish Patent and Trademark Office. An annual İkizdere Anzer Honey and Plateau festival is organized in the first week of August.

### **Challenges**

The quantity of honey produced is limited and therefore the price is high. The amount of Anzer honey production varies according to climatic conditions. Grazing by small ruminants also reduces the yield of Anzer honey.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.

## Gruyere and Kashar Cheeses

The village of Boğatepe is located at an altitude of 2667 meters. There are wide-ranging pastures around the village. These contain a broad diversity of alpine plants. The first Kars Gruyere cheese enterprise was established in Boğatepe village in Turkey. Pasture-based dairy cows' milk is used in cheese production which is important as grazing affects the quality of the cheese. The cheeses are produced using only traditional methods.

Boğatepe is located in Kars Province, in the north-eastern region of Turkey. It lies approximately 52 Km from the city of Kars. It has favourable ecological conditions for dairy farming and cheese production. The village also attracts attention in terms of tourism.

Reference mountain landscape statistics  
(A: Data from NUTS3 "TRA22")

Reference mountain chain		Allahuekber Mountains	
Reference mountain landscape		Merkez (Kars)	
Size of the area (km <sup>2</sup> )	2,048	Average per capita income €/year	4,000 <sup>A</sup>
Altimetry (m; min-max)	1768- 3120	Total Gross Value Added (GVA) (€ million)/year	1,028.6 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	57.72	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	6.48%	Primary:	25.6% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	3,895 <sup>A</sup>	Secondary (including construction):	11.9% <sup>A</sup>
		Tertiary:	54.6%
Road distance from Urban Poles* <sup>1</sup> (km)	135	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	22,000 <sup>A</sup>	Primary:	High <sup>A</sup>
Protected areas	No	Secondary:	Low <sup>A</sup>
		Tertiary:	Medium <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

Dairy cattle enterprises are small scale. Cows graze in the highlands. Livestock provides the main livelihood for households. Kars Gruyere and Kashar are the most-produced cheeses in the village. There are five cheese production plants, though only two of them produce Gruyere cheese. The production of Gruyere and Kashar cheeses are important for the sustainable development of the

region. Boğatepe's Environment and Life Association was founded in 2000 to revive the village life. It is an exemplary model for rural development. Women play an active role in the activities. Imece culture continues in the village.

### **Key local assets**

Zavot cow's milk is used in the production. The quality of the cheese is dependent on altitude, pasture-based animal farming and the traditional production process. Kars kashar has a Geographical Indication from Turkish Patent and Trademark Office. The first cheese museum was established in Boğatepe.

### **Challenges**

Immigration is a problem for the region. But depending on the economic development of the village, remigration has started to Boğatepe in recent years. It is important to increase the production and promotion of gruyere and kashar cheeses.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.

## Fig

Aydın has a regional reputation for fig farming. Aydın fig is grown as organic and conventional on lowland and highland in Germencik/Aydın. Sarılop fig, which is a special and high-quality variety of Aydın, is alluring, sweet and pleasantly fragrant.

Aydın Province is a province of southwestern Turkey, located in the Aegean Region. The central and western parts of the province are fertile plains watered by the largest river in the Aegean region the Büyük Menderes River, with the Aydın Mountains to the north and the Menteşe Mountains to the south. The major sources of income are agriculture and tourism. Aydın is Turkey's leading producer of figs and chestnuts. Figs are a very important local crop and fig trees are grown widely on the fertile land surrounding Germencik. Germencik is a town and a district of Aydın Province in the Aegean region of Turkey. The economy of Germencik depends on agriculture, the main crops are figs and olives (Wikipedia, 2021).

Reference mountain landscape statistics  
(A: Data from NUTS3 "TR321")

Reference mountain chain		Germencik, Aydın	
Reference mountain landscape		Germencik	
Size of the area (km <sup>2</sup> )	394	Average per capita income €/year	5,800 <sup>A</sup>
Altimetry (m; min-max)	0-1732	Total Gross Value Added (GVA) (€ million)/year	5,629.60 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	112.32	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	2.86%	Primary:	16.3% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	41,220 <sup>A</sup>	Secondary (including construction):	31.9% <sup>A</sup>
		Tertiary:	52.8%
Road distance from Urban Poles* <sup>1</sup> (km)	23	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	51,000 <sup>A</sup>	Primary:	Medium <sup>A</sup>
Protected areas	No	Secondary:	Low <sup>A</sup>
		Tertiary:	High <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

The Sarılop fig variety, which is the most suitable for drying, accounts more than 90% of the total fig production, and it is an important export product for the country. Fig is consumed fresh and dried. Dried fig is generally exported. Small family farmers are growing and harvesting fig, while cooperatives and firms processing, packaging and sell. The fig cultivation is done by small family farms while the dried and processing is done by cooperatives and firms, with specific rules. It has Geographical indications which add distinctive character to local products, and so officially registered authenticity and added value of products create value for local economy. Regarding value chain actors, the Sales Cooperative Unions "Tariş" are both main big players in the sector. The perspectives of the product bring together the farmers, the local government, cooperatives, and small firms.

### **Key local assets**

Aydın/Sarılop fig is very valuable and important for export. The altitude, soil type, climatic characteristics give this fig variety a lot of character. Both fig cultivation and number of enterprises have been extended by community interactions. The fig activities enforce the social bonds and have a positive impact on the conservation of the local population and their activities. Fig cultivation is an important activity in the Northeast Aegean region; apart from its economic value fig has a pronounced mark on the sociocultural of the region.

### **Challenges**

High production cost, disease and pests, drought, geothermal energy waste are main challenges of the VC. High aflatoxin risk is one of the most important food safety problems in dried fig. Geothermal energy waste problem: geothermal energy plants near distance, located in the fig orchards quality and yield are negatively affected. Drought caused by climate change causes degradation of quality.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.



## Chestnut

Chestnut trees thrive in the north mountain areas of Aydın, from 650 meters to 1 500 meters. The “size of the fruit” which is an important criterion, chestnuts that are grown in Aydın, are considerably big in size.

Aydın Province is a province of southwestern Turkey, located in the Aegean Region. The rich flora of the province provides significant opportunities for plant observation by botanists and enthusiasts. The central and western parts of the province are fertile plains watered by the largest river in the Aegean region the Büyük Menderes River, with the Aydın Mountains to the north and the Menteşe Mountains to the south. The major sources of income are agriculture and tourism. Aydın is Turkey's leading producer of figs and chestnuts (Wikipedia, 2021).

Reference mountain landscape statistics  
(A: Data from NUTS3 “TR321”)

Reference mountain chain		Aydın	
Reference mountain landscape		Bozdoğan	
Size of the area (km <sup>2</sup> )	859	Average per capita income €/year	5,800 <sup>A</sup>
Altimetry (m; min-max)	350-1792	Total Gross Value Added (GVA) (€ million)/year	5,629.60 <sup>A</sup>
Population (Inhabitants/km <sup>2</sup> )	density 38.48	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-6.48%	Primary:	16.3% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	41,220 <sup>A</sup>	Secondary (including construction):	31.9% <sup>A</sup>
		Tertiary:	52.8%
Road distance from Urban Poles* <sup>1</sup> (km)	74	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	51,000 <sup>A</sup>	Primary:	Medium <sup>A</sup>
Protected areas	No	Secondary:	Low <sup>A</sup>
		Tertiary:	High <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

In addition to that, Aydın chestnut which is registered with geographical indications makes Turkey one of the most important chestnut suppliers in the world. Small scale family farmers pick up chestnuts (predominantly women labour) and sell to wholesale market. Chestnut trees grown up

naturally are not used pesticides or artificial fertilizers. The chestnut tree performs various functions such as naturalistic, high quality product, high reputation product, territorial identity, cultural identity. The pickup activity of chestnuts is done by small family farms using with special pole/stake while the roasted, peeled and the process is done by cooperatives and firms, with specific rules. It has Geographical indications which add distinctive character to local products, and so officially registered authenticity and added value of products create value for local economy. The largest chestnut market of the region is in Köşk district. There are local festivals dedicated to chestnut. The perspectives of the product bring together the farmers, the local government, cooperatives and small firms of standardization, packaging, promotion, and marketing.

### **Key local assets**

The storage of chestnuts in Aydın Province is a cultural process that is different from other regions. The chestnuts are traditionally collected from the orchards with their burrs under the trees and are stored in environments called 'pile' by covering them with plants such as ferns. Chestnut is very important and valuable fruit for local people says that chestnuts are "bread of mountains.

### **Challenges**

Chestnut is both picked up naturally and done agriculture in Aydın. The major problem is chestnut blight (*Cryphonectria parasitica*). These diseases are seen especially picked up chestnut naturally. Since about 30 years, the yield of chestnut trees has started to decline due to diseases (especially *Cryphonectria parasitica* and *Phytophthora cambivora*). Mostly, chestnuts are picked up by women and children. This is shown that lack of professionalism. Chestnut trees are mostly organic, but farmers have not got an organic certificated.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.

## Pine Nuts

Peanut pine (*Pinus pinea L.*), a characteristic tree of Mediterranean climate, is commonly grown in Bergama-Kozak plateau in Turkey. The most efficient peanut pines in Turkey are in the Kozak plateau (Madra Mountains).

Kozak is located northwest of Bergama and rises up to 500 m above sea level. Soil structure is suitable for peanut pine has high permeability, granular, granite, gneiss, crystallized schists on the common structure has the soil. In Kozak Plateau of Madra Mountains region *Pinus pinea* production is essential.

Reference mountain landscape statistics  
(A: Data from NUTS3 "TR310")

Reference mountain chain	Bergama, İzmir		
Reference mountain landscape	Bergama		
Size of the area (km <sup>2</sup> )	1,544	Average per capita income €/year	9,600 <sup>A</sup>
Altimetry (m; min-max)	0-1344	Total Gross Value Added (GVA) (€ million)/year	37,093.10 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	67.97	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	3.74%	Primary:	4.4% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	51,356 <sup>A</sup>	Secondary (including construction):	53.6% <sup>A</sup>
		Tertiary:	54.6% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	107	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	49,788 <sup>A</sup>	Primary:	9.3% <sup>A</sup>
Protected areas	No	Secondary:	31% <sup>A</sup>
		Tertiary:	59.7% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

There are pine forests up to 740 meters high on granite soils in Bergama, Kozak. Farmers living in Bergama/Kozak pick up pine nuts/cones from October to April every year. The main livelihood of farmers is pine nuts agriculture in this region. The pine nuts agriculture is done in two ways. The first is to pick up in forests which are grown by Ministry of Forestry or local administration. The second is farmers' plant in orchards as a culture. Pine nut is very special and very valuable.

It is niche market and associated with mountain farming, especially in higher region. Kozak type pine nuts are a very special and valuable type in terms of export. Turkey is very important country to producers and exporters of pine nuts (*Pinus pinea L.*) (Çetin, 2003; Öztürk and Küçükerdem, 2017). The pickup activity of pine nuts is done by small family farmers using with special pole/stake while the processing is done by cooperatives and firms, with specific rules. The cooperative activities have an important impact on the regional SES. The perspectives of the product bring together the farmers, the local government, cooperatives, and firms.

### **Key local assets**

30% of the pine nut areas of Turkey are in Kozak/Bergama. Kozak type pine nuts are full body, large, light cream colour, soft structure, pointed tip cream coloured and blunt pine nut. The altitude, climatic characteristics, traditional process, give to these pine nuts a lot of character, that it has a Geographical Indication by Turkish Patent and Trademark Office.

### **Challenges**

In recent years, the yield of pine seedlings of Kozak plateau has decreased considerably. The most important problems are pests and diseases, lack of qualified personnel, education, inadequate advertisement, and marketing. For the processing, marketing and promotion of pine nuts product, the number of establishments such as cooperative should be increased.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.

## Cheese

Transhumance in Turkey is widely seen as a form of livestock. Small scale farmers who have got average 150-200 sheep/goat herds produce cheese in Highland of Madra Mountains and sell in district bazaar while some farmers sell raw milk to processors like cooperatives or dairy firms. Bergama Tulum cheese originates in Turkish culture and is traditionally made by being placed into handmade dried goat or sheep skin.

Bergama is district of İzmir Province in western Turkey. Bergama centre is situated at a distance of 118 km (73 mi) to the north from the point of departure of the traditional centre of İzmir (Wikipedia, 2021).

Reference mountain landscape statistics  
(A: Data from NUTS3 "TR310")

Reference mountain chain		Bergama, İzmir	
Reference mountain landscape		Bergama	
Size of the area (km <sup>2</sup> )	1,544	Average per capita income €/year	9,600 <sup>A</sup>
Altimetry (m; min-max)	0-1344	Total Gross Value Added (GVA) (€ million)/year	37,093.10 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	67.97	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	3.74%	Primary:	4.4% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	51,356 <sup>A</sup>	Secondary (including construction):	53.6% <sup>A</sup>
		Tertiary:	54.6% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	107	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	49,788 <sup>A</sup>	Primary:	9.3% <sup>A</sup>
Protected areas	No	Secondary:	31% <sup>A</sup>
		Tertiary:	59.7% <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

The feeding and milking activity of sheep and goat are carried out by small family farms. Cheese is ripened originally in dried goat or sheep skin. This is unique and traditional production method that gives special taste to cheese. Some breeders sell raw milk to cooperatives or dairy firms to

be processed. The perspectives of the product bring together the farmers, the local government, cooperatives and firms, packaging, promotion, and marketing.

### **Key local assets**

Bergama is an important district to sheep and goat farming associated with mountain farming, especially in higher regions in İzmir. Totally 140387 sheep and 21938 goats exist in Bergama (TurkStat, 2021). The altitude, local animals, traditional process, give to this cheese a lot of character, that it has got outstanding taste award which is important to gastronomy tourism. Agriculture and tourism sectors are interconnected in the area. The aim is to increase the production of Bergama tulum cheese, protect of pastoral farming and traditional taste.

### **Challenges**

In recent years, the decreasing importance of grazing animals in pasture lands due to changing social, cultural, and economic conditions and the perpetual decline in the population of rural settlements through immigration; have caused the traditional transhumance to lose its importance. Sheep and goat farming in pasture lands is decreasing because of economic conditions. High feed costs in the region are the most important challenges. The local people are willing and insistent on sustaining traditional transhumance; a longer-term preservation of the traditional culture itself against modernization process is not to be seen possible.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.

## Almond

Almond production is a very ancient activity in Turkey. Datça peninsula has a mountainous terrain. Datça region is home to several varieties of almonds. “Nurlu”, “Ak” and “Sıra” almonds are the commonly produced varieties. The Datça Nurlu almond is ranked among the very best almonds in terms of quality and taste. Agriculture and tourism are closely interconnected in the district.

Datça is a district of Muğla Province in the south-west of Turkey. It is situated approximately 122 Km from the city of Mugla. It is surrounded by the sea on three sides. The terrain is rugged and mountainous. In Datça, 66% of the land is forest area, 18% is sparse scrub and rocky. Only 16% is land suitable for agricultural use. It has a Mediterranean climate. Datça is a one of major tourism centre in Turkey.

Reference mountain landscape statistics  
(A: Data from NUTS3 “TR323”)

Reference mountain chain		Datça mountains	
Reference mountain landscape		Datça	
Size of the area (km <sup>2</sup> )	436	Average per capita income €/year	8,500 <sup>A</sup>
Altimetry (m; min-max)	0-1162	Total Gross Value Added (GVA) (€ million)/year	7,265.2 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	54.38	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	39.44%	Primary:	13.1% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	174,249 <sup>A</sup>	Secondary (including construction):	22.7% <sup>A</sup>
		Tertiary:	60.1% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	119	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	27,000 <sup>A</sup>	Primary:	Medium <sup>A</sup>
Protected areas	Yes	Secondary:	Low <sup>A</sup>
		Tertiary:	High <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

The cultivation of the almond is mostly carried out in family farms. Almonds are generally collected in the traditional method. The main livelihoods of the people in the region are agriculture, fishing,



and tourism. The restricted agricultural areas in the district are used extensively for almond production. The agriculture and tourism sectors are closely interconnected in the region.

### **Key local assets**

The main resource is the range of local almond varieties produced in the Datça peninsula. There are approximately 13 thousand declared planted almond orchards in Datça region. Collecting and crushing almonds are traditional activities which enable families to come together. The Datça Almond Flower Festival was launched in February 2018, to be held annually.

### **Challenges**

Lack of marketing organization, failure to create a brand, yield loss due to hail during the flowering period, disease, climate change, costs of production and marketing.

### **Innovation**

The innovation in this VC is represented by the conversion to the organic honey production scheme.



## Hazelnut

Turkey is one of the world's biggest producers and exporters of hazelnuts. They are produced mainly in the mountainous east Black Sea region. Hazelnuts are cultivated up to an altitude of 750-1000 meters. It is a high reputation product. Hazelnut production dates to ancient times and contributes greatly to regional and cultural identity. There are many small-scale farmers in the region and the hazelnut is a major source of income for them.

The Black Sea Region of Turkey has highly favourable ecological conditions for hazelnut production, particularly in the east. This is the most mountainous part and very cloudy, with the highest precipitation and the highest humidity. Ordu Province located in the Black Sea Region. It is the top hazelnut producer in the region, with 29.66% of Turkey's total production. Province higher altitudes are covered with forest.

Reference mountain landscape statistics  
(A: Data from NUTS3 "TR902")

Reference mountain chain		Eastern Black Sea Mountains	
Reference mountain landscape		Ulubey	
Size of the area (km <sup>2</sup> )	295	Average per capita income €/year	4,400 <sup>A</sup>
Altimetry (m; min-max)	586~1600	Total Gross Value Added (GVA) (€ million)/year	2,966.5 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	61.65	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	3.68%	Primary:	17.6% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year	4,609 <sup>A</sup>	Secondary (including construction):	30.8% <sup>A</sup>
		Tertiary:	52.9% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	22	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	125,000 <sup>A</sup>	Primary:	High <sup>A</sup>
Protected areas	No	Secondary:	Low <sup>A</sup>
		Tertiary:	Medium <sup>A</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment/year

Hazelnut farmers, The Union of Hazelnut Agricultural Sales Cooperatives (FİSKOBİRLİK), traders, processors and exporters are the main actors in this sector. Hazelnuts are cultivated

mostly on small-scale family farms and harvesting is a highly labour-intensive activity. Farmers require assistance from seasonal agricultural workers, mainly migrant workers, for the harvest period. Hazelnuts are widely used in confectionery, especially in the chocolate industry. Hazelnut production is crucial to the economic activity of the region and affects many people directly or indirectly.

### **Key local assets**

Hazelnuts have been grown in the Black Sea Region for approximately 2500 years. For this reason, they have an important place in the culture of the region. There are many proverbs, idioms, folk songs etc. about the hazelnut. The hazelnut provides a livelihood for many farmers in the region and is vital for the sustainability of rural development. The hazelnut is cultivated on the steep slopes of the mountains and makes an important contribution in combating soil erosion.

### **Challenges**

The level of hazelnut production varies with climatic conditions, particularly with the prevalence of frost and drought. The imbalance between hazelnut supply and demand causes price instability. Hazelnut orchards are generally old and small in scale. Development of value-added hazelnut production is not currently at the desired level.

### **Innovation**

This VC is a traditional one, where no innovations have been identified.

## 21. Additional VCs

### Wines of Winningen - Germany

Wines from extremely steep, terraced vineyards (70% slope) with low yields and high quality.

Winnigen is located on the Lower Moselle only about 10 km from Koblenz, where the Moselle flows into the Rhine. Many years ago, terraces were built by hand to cultivate vines on the extremely steep slopes. The terroir is characterised by Devonian slate of various formations and is mainly known as the home of powerful Riesling wines, which in the 19th century were as expensive as the top crus from Bordeaux and Burgundy.

Reference mountain landscape statistics  
(A: Data from the NUTS2: DEB1; B: Data from the NUTS3 DEB17)

Reference mountain chain	Rhenish Massif		
Reference mountain landscape	Winnigen		
Size of the area (km <sup>2</sup> )	6.65	Average per capita income (€)/year	34,600 <sup>A</sup>
Altimetry (m; min-max)	75-210	Total Gross Value Added (GVA) (€ million)/year	6,043 <sup>B</sup>
Population density (Inhabitants/km <sup>2</sup> )	364	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-1.80	Primary:	0.8% <sup>B</sup>
Total bed places (BPs) in tourist accommodations/year:	254	Secondary:	36.3% <sup>B</sup>
		Tertiary:	63% <sup>B</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	10	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	706	Primary:	1.2% <sup>B</sup>
Protected areas	Yes	Secondary:	26.8% <sup>B</sup>
		Tertiary:	72.0% <sup>B</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

The vineyards are characterised by many small plots with their own microclimates and different slate formations (red, blue, and grey slate) and are habitats for rare animals such as the Apollo butterfly. The planted vineyard area is around 89 ha and is cultivated by 44 wineries - so the structures are quite small. Like the Moselle in general, Winningen is known for white wine (about 90% of the vineyard area) and especially for Riesling. Unlike other sections of the growing region, many more dry wines are produced here. This is thanks to the village's most famous winegrower Heymann-Löwenstein, who has been producing mainly dry wines since the early 1980s and was thus one of the pioneers on the Moselle. In 2005, one of his wines was named best foreign wine in Paris. He also worked to ensure that the "Uhlen" vineyard was the first one in Germany to receive three small appellations contr l es within only one vineyard. Comparable terraced vineyards can be found on the Moselle and its tributaries the Saar and Ruwer. The most famous example is certainly the "Calmont" in the village of Bremm which is the steepest vineyard in Europe. In addition, terraces have also been created in other mountainous regions such as Baden, Rheingau and the Middle Rhine.

#### Key local assets

Winningen is in a nature reserve. This winegrowing municipality has won several awards, making it one of the most beautiful villages in Germany. It is famous for the "Moselfest", the oldest wine festival in Germany.

#### Challenges

The vineyards cannot be mechanised. For many wines produced there, apart from a few well-known wineries, no adequate prices are achieved in relation to the production effort. Organic viticulture is therefore not or hardly possible.

#### Innovation

For some years now, the municipality has been receiving more attention through the activities of the young generation of winemakers. In 2020, a young winemaker from Winningen was named Rising Star of the Year by Germany's most important wine guide. Due to climate change, the comparatively warm slopes are heating up. The careful work of the winegrowers enhances the reputation of the wines and ensures a clear and unique style. They are distinguished from the rest of the Moselle wines by their mix of opulence and delicacy.

## Vipava valley orange wines - Slovenia

Karst is a peculiar mountain landscape which hosts the orange wines value chain. This VC developed spontaneously as a retro-innovation driven by the international acknowledgment of orange wines pushed for a fast development of organic and biodynamic viticulture in the area (part of the innovation).

The Karst plateau and the related valleys are in proximity of highly populated areas but preserved a special level of wilderness. Forests are highly present, agriculture still plays a relevant role (also thanks to many part-time farmers or hobby farmers), high mountains (Triglav) are nearby. Besides, Slovenian population is very keen to sport and outdoor activities (trekking, kayaking, biking) and as a consequence these are not only assets for tourism but also for residents' quality of life.

Reference mountain landscape statistics  
(A: Data from the Country level; B: Data from the NUTS2 SI04)

Reference mountain chain		Karst Plateau	
Reference mountain landscape		Ajdovščina	
Size of the area (km <sup>2</sup> )	245	Average per capita income (€)/year	1,668
Altimetry (m; min-max)	100-1,100	Total Gross Value Added (GVA) (€ million)/year	47,402 <sup>A</sup>
Population density (Inhabitants/km <sup>2</sup> )	19.2	GVA by sector* <sup>2</sup>	
Population changes in the last 10 years	-3.60%	Primary:	2.0% <sup>A</sup>
Total bed places (BPs) in tourist accommodations/year:	-	Secondary:	41.3% <sup>A</sup>
		Tertiary:	55.8% <sup>A</sup>
Road distance from Urban Poles* <sup>1</sup> (km)	60	Employment by sector* <sup>3</sup>	
Number of agricultural holdings	69,902 <sup>A</sup>	Primary:	1.2% <sup>B</sup>
Protected areas	Yes	Secondary:	26.8% <sup>B</sup>
		Tertiary:	72.0% <sup>B</sup>

\*<sup>1</sup> Nearest settlement with population > 100,000

\*<sup>2</sup> share of total GVA/year

\*<sup>3</sup> share of total employment)/year

Several farmers of the valley produce organic and biodynamic grapes from autochthonous varieties and process them into several wine types (certified organic/biodynamic) but a specific wine type they produce is orange wine (white grape must macerated on skins). This wine type got high attention on international markets and became a driver of local viticulture on high quality wines markets. The production is based on a group of independent winemakers, owning small scale farms. It is a quite specific situation: small country, special valley on the border with Italy and close to the sea, special type of wine, produced in small quantity in small farms but with an international market.

### Key local assets

Key local assets for this VC are associated with:

- Environmental resources: organic viticulture can well fit with the high-quality landscape and contribute to its maintenance.
- Cultural resources: orange wines, autochthonous varieties and organic viticulture are partly retro innovation, based on local culture and skills.

### Challenges

The challenges for this VC are associated with:

- Competition of other economic sectors
- Economic sustainability in the long run
- Climate change will probably affect the area and compel changes in the agricultural practices.

### Innovation

Viticulture is traditional in the area but under the Socialist period I was not allowed to private farmers to process the grape into wine individually. Wine-making could develop in the '90s but since the start, local small-scale winegrowers looked for more natural methods. Organic and Biodynamics viticulture and the use of autochthonous grape varieties started to gain more and more space and interest among private cellars. At the same time, a retro innovation process started, with the technically reviewed practice of white grapes must maceration on skins, to obtain oxidized wines, named orange wines, due to their colour.

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