MOVING
MOUNTAIN VALORIZATION THROUGH INTERCONNECTEDNESS AND GREEN GROWTH

Initial set of Policy Briefs

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Contents

Introduction

This document provides the first set of 23 Policy Briefs (PBs). Those have been compiled building on the information collected in WP4 activities, task 4.1 “Inventory of Mountain Value Chains”, and through consultation with the regional Multi-Actor Platforms (MAPs) in each case-study region. Each PB is referred to one case-study value chain addressed in the MOVING project and describe the key potential contributions of value chains to the resilience and sustainable development of the related Mountain Reference Region (MRR). The PBs do not intend to be exhaustive and provide actionable policy recommendations, but rather to emphasize the relevant aspects policymakers must consider for the formulation of innovative policy instruments for the sustainable development of European mountain areas.

In the first page, a short summary and key policy messages are presented, i) providing a short description of MRR and the case-study value chain, ii) highlighting the value chain contribution to the resilience and sustainable development of the MRR, and iii) outlining the elements of potential interests for the policy debate. This knowledge is also presented and discussed in extensive textual form.

The aim is to provide information on the critical issues policies at all scales (EU, regional, and local) must account for to foster the value chain contribution to the resilience, sustainability, and development of the MRR.

Austrian Alps: Sheep farmers from the region of Weiz

David Steinwender & Sandra Karner (IFZ)

Summary

Sheep farming on alpine pastures that are not suitable for cattle farming has a long tradition in the mountain farming areas of the Province of Styria.
After the value chain of sheep wool had lost importance, some innovative sheep farmers recognized a trend towards high-quality lamb. They founded the cooperative 'Weizer Schafbauern' in 1994 and established a successful value chain for meat and dairy products. Meanwhile the cooperative comprises ca. 300 farms.
While the marketing of meat and dairy products is well established through various channels and under an own brand, the wool is still underutilized as valuable product. Through cooperation of sheep farmers with regional climate protection initiatives, research, and regional business actors, innovative products could be developed, which add value for sheep farming as well as contribute to climate change mitigation strategies.

Figure 1: Sheep in the backyard of the head quarter of the cooperative 'Weizer Schafbauern'. Source: David Steinwender (own work, cc-by)

Key Policy Messages

- ☞ Cooperatives strengthen collective efforts and innovation capacities
- ☞ Diversification of marketing and products
- ☞ Regional embeddedness and networking for integrated regional/rural development and climate protection actions
- ☞ Cross sectorial integration of value chains

70 % of the Austrian territory is defined as mountain area ('Berggebiet') – mainly covered by the Austrian Alps. In 2016 71,4 % of total farm area (49,6 % of agriculturally used area) is in the mountain area (representing 58,1 % of all farms). 66,6 % of organic farms were mountain farms in 2019. The share of mountain area per federal states increases from east to west. Some federal states are 100% mountainous regions (Tyrol, Vorarlberg, and almost all of Carinthia and Salzburg). The MRR of the value chain is situated at the south-eastern edge of the Austrian Alps.

Some actors of the VC are situated at areas with lower altitude or in the valleys. The VC is situated within the NUTS-3 region 'Oststeiermark'(AT 224) – political district 'Weiz' (no. 617; corresponding to LAU 1 definition).

The 'Weizer Bergland' extends from the Raab Valley in the west to the Feistritz - Anger area in the east and is bordered by the Passail Basin and the Fischbacher Alps in the north and by the Tertiary of the East Styrian Basin in the south. Karst is the predominant terrain type.

The region of Weiz is characterised by an Illyrian climate. Summers are mostly hot and dry with a very high propensity for (thunder-)storms. The latter is supposed to become stronger in the course of climate change increasing the number of lightning strikes, hail and the thread of floods.

In the mountainous areas of the Weizer Bergland region pasture farming with cattle and sheep for meat, milk and dairy production prevails. The sheep are herded either on alpine pastures or on meadows at an altitude of 400 to 1270 metres above sea level. Some farmers refine herbs, sell fish or honey and other bee products, which are supported by the regional marketing of the LEADER region.

The valleys are characterized by agriculture landscapes. In addition to grassland and arable farming, fruit and wine growing also play a role. The consequences of climate change are already noticeable

What one can't do alone, many can

Sheep farming in the region of Weiz has been a tradition for centuries, even serving as staple food until the end of the 19th century. Up to the 1950s wool was the main product, later dairy and lamb meet products became increasingly important, while wool started to become a by-product. In the beginning of the 1990s some innovative sheep farmers have recognised the trend towards high-quality lamb and started to market lamb and sheep milk products together. When the local dairy was supposed to be closed, as it was not fulfilling EU standards anymore, the sheep farmers founded a cooperative to run this dairy by themselves. They also put back the local slaughterhouse into operation together with local premium beef producers, free range pork farmers and two small local butchers. Meanwhile, the sheep farmer cooperative consists of about 300 farms, most of them selling lamb meat. The number of dairy farmers is consciously limited to avoid oversupply and a subsequent drop in prices.

Founding this cooperative was crucial for the survival of the sheep farmers in Weiz for several reasons: a) the cooperative owned dairy and co-owned slaughterhouse allows independence and a fair price for the farmers; b) the joint marketing the introduction of an own brand increased their market power compared to the situation of being a single farmer; c) the cooperative has a diversified marketing strategy, including the ongoing development of new products. Their products are sold directly to consumers, to the local gastronomy and via food retailers.

However, the wool is barely used commercially, and only some of the sheep farmers are ambitious to further explore innovative ways of generating value from the wool. Currently, a LEADER project on the use of sheep wool in palliative therapy is ongoing, which is accompanied by research partners, in order to explore its usability and therapeutical effectiveness.

The embeddedness of the initiative in the LEADER region ‘Almenland & Energieregion Weiz-Gleisdorf’ is fruitful for the sheep farming cooperative in several aspects. For instance, the Local Action Group supports economic activities that contribute to climate action and adaption as well

as environmental protection and ethics. One example is the support in the marketing of food quality products, such as the label “Määh” of the sheep farmers from Weiz.

Value chain contribution to sustainability and resilience of the MMR (barriers and opportunities)

As ruminants, sheep emit more greenhouse gases per head than other livestock (e. g. pigs or chicken). Thus, and because of the relevance of the landscape which plays a central role for tourism in the region, sustainability is of high relevance for the sheep farmers from Weiz. Even if only 10% farms of the cooperative are certified organic, they are committed to high animal welfare standards and ecological sustainability characterised by extensive pasture farming, and GMO-free feed, which is mainly produced on-farm or at least regional. The cooperative has won several national competitions for sustainability awards, such as recently the ‘Trigos’ award for regional value creation. Moreover, their enterprise is also certified as Climate Alliance Austria business (‘Klimabündnis-Betrieb’).

The use of wool for commercial purposes is very limited since the 1950s. The wool is only marketed by one farmer at bigger scale, few other farmers do it at a very small scale. Wool is by many of the farmers still seen as mainly a by-product of the necessary sheep shearing. Thus, most of the wool is either sold below the costs for shearing to the “Styrian Sheep and Goat Breeding Association”, which further sells it to a Belgian producer for insolation material, or it is used for own purposes (burned for heating, soil fertilizer).

Recently, interest emerged within one of the two ‘Climate and Energy Model Region’ initiatives (‘Energieregion Gleisdorf-Weiz’) within the LEADER region to explore the local potential for wool as fertilizer (e.g., vertical greening of buildings) and insolation material as climate change adaption measures.

Thereby not only benefits concerning climate relevant aspects could be achieved, but better value could be created for the sheep farmers, and the regional economy as well. The founding of the Weizer Schafbauern cooperative had been an important initiative to secure the persistence viability of sheep farming, which is characterised by small scale extensive farming in the Weizer Bergland region. This also made an important contribution to the preservation of the cultural landscape, especially where cattle are unsuitable for grazing. The regional nature park covers an area of 25.300 ha, and the specific soil and climatic conditions result in a flora that is characterized by a variety of alpine plants. On the one hand, this special biodiversity of grasses and herbs in the forage and hay of the animals provide the unique taste of the lamb. On the other hand, the extensive grazing of the sheep contributes to the stabilization of the vegetation cover and to the improvement of the water storage capacity of the soil.

Policy relevant considerations

There is substantial awareness about role of sheep farming in the MRR, and its contribution to landscape conservation, which is linked to cultural heritage, the nature park and tourism as well. However, there is little reference to potential effects of sheep farming/management systems on other ecosystem services, such as biodiversity. This might be of interest to be further explored in the scope of MOVING. That topic could be linked to actual policy strategies, such as the EC Biodiversity Strategy 2030 (presented in 2020 as one of the central initiatives of the European Green Deal). That was considered in the Austrian government program 2020–2024 as well. The goals and measures for biodiversity protection were defined in the Biodiversity Strategy Austria 2030, and in order to support its implementation and the achievement of the goals a biodiversity fund was installed in 2021.

The second policy field of potential interest links to the very recent considerations for the use of wool as material for insolation, as soil fertilizer, and as growing substrate for vertical gardening and wall greening, which would be linked to regional climate protection efforts. Like in other European countries, in its government programme for 2017-22, the Austrian Federal Government set out a Bioeconomy Strategy in Austria in order to encourage the potential of knowledge and expertise to be used and to decarbonise the economic system. Linking with this strategy could be of high relevance for the development of innovative products/use of wool. Moreover, the exploration of a circular economy approach might be relevant as well (ref. EC Green Deal, new EC Circular Economy Action Plan), as it is gaining attention in Austria as well.

Reference

Austrian Federal Ministry for Agriculture, Regions and Tourism (2020). Grüner Bericht 2020 – Die Situation der österreichischen Land- und Forstwirtschaft.

Meeting with local key actors, Unterfladnitz, 16. July 2021

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Stara Planina: Public Goods from High Nature Value (HNV) farmland

Mark Redman and Vyara Stefanova

Summary

Traditional High Nature Value (HNV) farming in the Western Stara Planina region of Bulgaria has created and maintained a diverse range of valuable semi-natural habitats that are important for the conservation of many rare plant and animal species. Well-designed policies, especially the effective implementation of EU-funded rural development schemes and measures, have great potential to reduce the loss of HNV farmland and to maintain the supply of biodiversity-related public goods they supply. For example, HNV grasslands have been eligible for agri-environmental payments under the 2007-2013 and 2014-2020 *Bulgarian Rural Development Programmes*. Nonetheless, the supply of these public goods continues to be at risk due to various factors and much greater attention now needs to be given to more integrated and innovative approaches that more consistently address the profitability and overall socio-economic viability of the traditional HNV farming systems in the region.

Figure 2: Abandoned pastures in Western Stara Planina, Bulgaria Source: Yanka Kazakova, STEP

Key Policy Messages

- ☞ The continuation of HNV farming is essential for the conservation of valuable wildlife habitats for plant and animal species
- ☞ Agri-environment payments have a key role to play and must be maintained
- ☞ However, more integrated and innovative policy approaches are needed to support the profitability and overall socio-economic viability of HNV farming in mountain areas

This policy brief relates to overcoming the constraints on the delivery of public goods (biodiversity) from High Nature Value (HNV) farmland in the north-western region of the Stara Planina mountain range close to the border between Bulgaria and Serbia. Similar constraints are also found in many other mountain regions of Bulgaria and neighbouring countries in south-east Europe. There are around 30,700 ha of Utilized Agricultural Area (UAA) in the Western Stara Planina, of which 65% are semi-natural grasslands plus 20% mixed cropping and 15% arable land. Agriculture in the region is dominated by small-scale farming (small in terms of both physical and economic size) and many farms are below the eligibility threshold of 1 hectare for CAP support.

Depending upon altitude, the local farming systems are typically small-scale extensive grazing (sheep, cattle and goats) and low input / semi-intensive cropping, including cereals, rapeseed, perennial crops (fruit orchards) and some vegetables. Over many years traditional farming practices in the region have created and maintained a diverse range of semi-natural habitats for

valuable plant and animal species, including many rare plants and animal species included in the Red Data Book of Bulgaria and protected by international conventions. There are seven Natura 2000 sites designated in the region (5 SPAs and 2 pSCI) which contain significant areas of farmland and thereby highlight the importance of maintaining the traditional local farming systems for nature conservation.

Nature conservation through policy innovation

The concept of "HNV farming" was developed in the early 1990s from a growing recognition that biodiversity conservation in Europe depends to a great extent upon the continuation of low-intensity farming systems across large areas of countryside. The HNV concept was officially acknowledged in Bulgaria with EU accession and the inclusion of agri-environmental support for the restoration and maintenance of HNV grasslands in the 2007-2013 and 2014-2020 *Bulgarian Rural Development Programmes*.

This was a significant policy innovation at the time and established an entirely new mountain value chain involving the use of public money (EU funds) to secure public goods (biodiversity) from private providers (farmers and other land managers) via area-based compensatory payments for compliance with clearly defined management requirements. The payment rate for maintaining traditional haymaking on HNV hay meadows was €113.15/ha and €126.80/ha for maintaining extensive grazing on HNV pastures. Further policy innovation is now urgently needed to stop the continuing decline in HNV farmland, especially the on-going abandonment of HNV grasslands in mountain areas such as the Western Stara Planina.

Barriers and opportunities for sustainability and resilience

Local stakeholders have a clear vision for the future of the Western Stara Planina that involves managing the biodiversity rich landscape as the basis of a diverse and vibrant local economy. However, four main areas of constraint need to be overcome in order to enhance the profitability and socio-economic viability of HNV farming in the region:

- **Social and institutional** – depopulation and ageing of farmers is a major constraint upon the continuation of HNV farming.
- **Regulatory** – frequent changes in legislation and uncertainties regarding access to support measures is a big problem, especially for livestock farmers managing HNV grasslands.
- **Product and market** – there is huge potential to add value to the products from HNV farming, but farmers need more flexible legislation, accessible investments and relevant training and advisory services.
- **Technological** – new forms of nature-friendly mechanisation, plus other technologies, are needed to improve the management of HNV farmland.

Policy relevant considerations

There are many deep-seated challenges in the Western Stara Planina (and other mountain regions of Bulgaria and south-east Europe) that require a more innovative and integrated approach in order to foster the profitability and overall socio-economic viability of the traditional HNV farming characteristic of the region. There are multiple levels of policy intervention which could be aligned to provide more coherent and consistent support for HNV farming in the forthcoming post-2020 programming period. For example:

- **At farm level** – every opportunity should be taken to develop effective and targeted support for HNV farming using all available CAP Pillar 1 and Pillar 2 interventions ranging from different options for area-based payments (including results-based incentives) to speeding-up innovation through cooperation and on-farm experimentation.
- **At community level** – HNV farmers are predominantly small-scale and do not exist in isolation, but as communities. Well-facilitated and multi-funded community-led local development is a very powerful tool for improving the quality of life of HNV farmers, as well as addressing directly some specific agricultural needs.
- **At regional level** – regional branding and marketing schemes can be very effective if support for the necessary skills and cooperation is also provided.
- **At national level** - efforts are needed to strengthen the AKIS (Agricultural Knowledge and Innovation System) for HNV farmers and to promote more joined-up policies and institutions which aim to develop sustainable food policies and systems that embrace biodiversity conservation as a top priority.

Acknowledgements

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References

Kazakova, Y., Stefanova, V., Yunakova, M. and Peneva, M. (2017). *Learning Area "Western Stara Planina" (Bulgaria) – A Baseline Assessment*. Available to download here: http://www.hnvlink.eu/download/BulgariaBaselineAssessment.pdf

Kazakova, Y. and Stefanova, V. (2021). *CAP Strategic Plans: Support to High Nature Value Farming in Bulgaria*. Available to download here: https://www.arc2020.eu/support-to-high-nature-value-farming-in-bulgaria/

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Sumava – Cesky Les: High quality beef production

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Summary

Historically natural resources of the Šumava mountains were used in agriculture and forestry activities. Agricultural sector in the region has undergone a transition in the last 30 years after the collapse of the socialist regime. The region includes unique natural ecosystems that are protected by the status of Natural Park. One of the key challenges is finding a balance between ecology and economy activities. The local ecosystems are currently experiencing a new pressure associated with global climate change (such as overpopulation of bark beetle or extreme weather events). It is a priority to create holistic policy that would respond to emerging challenges to protect and enhance cultural and natural heritage of the Šumava region.

Figure 3: Extensive cattle farming on farm in Figure Železná Ruda (Author: Martin Jedlička)

Key Policy Messages

- ☞ Create holistic policy regulation
- ☞ Support activities that positively impact on water retention in landscape
- ☞ Create new opportunities for farmers to valorise food production on farms

Šumava mountains belongs among the eldest mountains in Central Europe. Peaks of the mountains reach from 700 to 1400 metres above sea level. The mountains are spreading across the Czech and German borders.

Historically the natural resources of the region were used in agricultural and forestry activities. The mountain region was sparsely populated by German and Czech population. After the WWII the German population was displaced. Due to this the region lost the most of its traditional population. During the socialist era (1948-1988) the region suffered from a vast economic decline. Industrialized agriculture operated by socialist collective farms paid very little respect to natural conditions. On the other hand, during this time, large areas of the mountain region were closed (due to strictly controlled borders with Western Germany) and enabled to create unique ecosystems that are now considered the most valuable natural heritage of the region.

Agricultural sector in the region has undergone a transition in the last 30 years (after the collapse of the socialist regime in 1989). The socialist farms were privatized and transformed their production. The current approach to farming is based on extensive use of natural resources that emphasize high nature value of the mountain region.

National Park Šumava (covering approx. 68,3 thousand hectares) is surrounded by Nature Protected Area (covering approx. 99,5 thousand hectares). All economic activities in the mountain region are therefore constrained by regulation aimed on protection of natural ecosystems. The mountain region has been traditionally used also for forestry. The forests mostly include spruce trees (and less fir trees and pines). The forestry has been recently struggling with a new challenge represented by overpopulation of bark beetle and draughts that have questioned sustainability of the local forest ecosystems and impacts of forestry.

Cattle farms on Šumava – back to tradition?

Farming in Šumava mountains have undergone a significant transformation in the last three decades. Most local farms have successfully profited from new trends of the agricultural policy on one side and new consumers' preferences on the other. The local farms have been positively motivated by agri-environmental measures to balance their farming methods with the interests of nature protection. Extensive farming in this way has become not only accepted, but also desired method of protecting natural resources of the region.

Most farms in Šumava mountains fulfil several functions – from landscape maintenance, over provision of ecosystem services in specific areas to a food production. Since the Šumava mountains is very popular destination for tourist in winter as well as summer season a lot of farms offer accommodation to guests. These farms are further motivated to extend the range of services and products in favour of their guests. It is not therefore uncommon to see farms that produce meat (mostly beef or sheep), eggs, honey, vegetables, and herbs that are processed on farms and sold to their guests.

The extensive approach to farming accord with organic methods that are typically implemented on farms. Some areas of the Šumava mountains include organic farms only. Successful farms in the region are far from using purely 'traditional' methods. They implement progressive methods in cattle breeding, grazing management and meat processing. Their production has been recently supported by rising interest of consumers in direct purchase of farm products. Direct marketing has therefore become one of a new source of income for many small farms in the region.

Value chain contribution to sustainability and resilience of the MMR)

Currently there are more than 60 farms that farm on treeless areas of the National Park. This area covers approx. 10 thousand hectares; however, the farms use less than 50% of the land. The ongoing discussion suggest that this area might be enlarged in future. Increasing farming activity in the high-nature areas – using sustainable approach that would protect and enhance the natural heritage of the region – is one of the key opportunities.

Since agriculture deeply impacts on local ecosystems, one the main challenges is to find a balance between agricultural activities and natural protection. The strategy of natural protection currently clashes with forestry. It is not clear to what extent the areas of Natural Park shall be left 'untouched' when forests are devastated by bark beetle.

Nowadays, it is becoming clearer that the mountain ecosystems are very sensitive to global climate changes. Further usage of the natural resources, with respect to the natural and cultural heritage, will require a sensitive and thoughtful regulation to balance the needs of engaged stakeholders in different areas.

Policy relevant considerations

The general challenge for the policy implemented in the Šumava region is to find a balance between economy and ecology to create resilient systems of farming. The new policy should consider expected changes and the associated sustainable challenges particularly related to global climate change and ageing population of farmers.

Figure 4 : Sumava National Park

It is desired to generate policy actions that would respond to these challenges in holistic way. It is important to implement measures that would motivate farmers to carry out farming activities in areas with high nature value, protect ecosystems and at the same time increase biodiversity. Specific attention needs to be given to water in landscape. Hydrologic conditions are severely changing under the climate changes and create a new threat to the region in form of extreme weather events and long-term negative impacts. It is also important to generate policy actions that would enable farmers to make their farms more attractive for tourists and valorise their production on farms to increase economic performance of their enterprises.

Reference

Šumava National Park.

Digital atlas of the disappeared landscapes.

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Corsica: Sartinesi on-farm processed cheeses.

Jean Michel Sorba, Jean Christophe Paoli - LRDE – SELMET Team (INRAE)

Figure 5: Sartinesi on farm cheese (Sorba, 2001)

Summary

In Corsica, transhumant pastoralism has given way to sedentary breeding: flocks of lowland sheep deliver their milk to around fifteen cheese factories looking to outdoor and summer markets, while sheep and goat breeders in the interior produce farmhouse cheeses sold locally. The reputation of Corsican cheeses and their commercial success give little value to the components of the traditional pastoral system (spontaneous resources, local breeds, cheese-making know-how) which are tending to weaken. The links between breeding activities and the specificity of cheeses play little part in the construction of the value chain. None of the traditional cheeses are officially recognized (Brocciu except). Likewise, the strong tourist attraction of the coast relegates livestock farming to the background and assigns a recreational function to the former pastoral mountain territories, which are closing in. The result is an erosion of livestock systems, which weakens the coupling of the value chain to the resource environment, to the ecosystem and to the attractiveness of mountain territories.

Key Policy Messages

- ☞ Coexistence of activities
- ☞ Agrosylvopastoralism
- ☞ Local governance of commons

The dual dimension, insular and mountainous of Corsica partly preserves ecosystems (population, niche, endemism) at the same time as it induces strong environmental and socio-economic vulnerabilities (fires, health, low demography, access and mobility, etc.). Recently consecrated "Mountain Island" (Mountain Law 2016), Corsica is the subject of generally conservatory public policies built according to a logic of site, protection and classification at national and regional level.

The regulatory framework struggles to support productive activities in environments that are largely shaped by human activities. The Rizzanesi and Baracci valleys, selected as support areas for the "Sartène cheese" value chain, have experienced a sharp decline in pastoralism, which has led to human abandonment and the closure of the countryside. The Viggiani Forest Trade Union

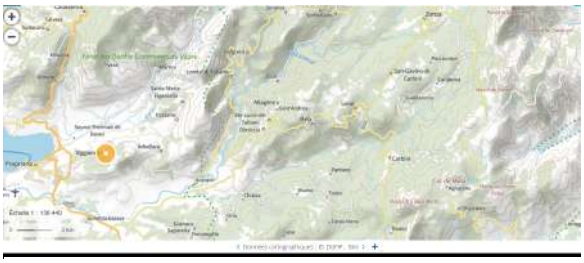

Figure 6: Rizzanesi and Baracci Valleys (IGN, screen capture, july 28, 2021)

Commission brings together four municipalities that are carrying out the project of reviving livestock (farmhouse cheeses, runner pigs / cold meats, honey), agricultural (PAM) and forestry activities. The project is part of a context of strong decline and over-frequentation of tourism (water activities and walks) causing disruption of productive activities and ecosystems. The project intends to build rules of use around the pastoral resources of a territory having common value.

Recognition of Sartinesi cheeses: towards a productive domestic forest?

The Rizzanesi and Barracci valleys make up a territory subject to multiple tensions. Agricultural areas in the process of undergrowth coexist with the unbridled growth of rental residences and companies dedicated to construction. The challenge is to conceive of the coexistence of pastoralism with other activities, particularly tourist activities, around a cheese-making identity for the territory. In this perspective, a new filing of the “casgiu sartinesu” certification file is likely to support the relaunch project. Several initiatives have been taken by public actors to preserve and revive pastoral activities around farm cheeses from the Sartène region : the municipality of Viggianello has set up a Protected Agricultural Zone, the area is home to the only public agricultural high school dedicated to livestock and the territory is the cradle of casgiu sartinesi (uncooked pressed dough), the municipalities of the upper valley (Plateau du Cuscionu) are developing the sites and working on the development of regulations for the use of summer pastures. In this context, the project of the union commission for the forest of Viggiani can serve as a point of support for the revival and the aggregation of the twenty farm producers of the two valleys.

Value chain contribution to sustainability and resilience of the MMR (barriers and opportunities)

The cover by the maquis of the former pastoral areas increases the territory's vulnerability to fires and to the food self-sufficiency of the Sartenais territories. The dynamism of ecosystems and the production of biomass cannot be controlled by mechanical means alone due to the mountainous nature of Corsica. Pastoralism combines an efficient and sustainable means of controlling vegetation and opening the environment to other agricultural activities. The coexistence of activities is made necessary by the strong potential for conflict linked to residential speculation. The role of local public actors associated with breeders and farmer producers in the constitution of commons is decisive in designing value chains that are inclusive of ecosystem issues.

Policy relevant considerations

Figure 7: Cuscionu pastures - Upper valley of Rizzanesi (Dormagen, 2011)

In the isolated context of Corsica (mountain island and mosaic of valleys), the organization of sector-type value chains is not always possible due to the small size of the activities (numbers of breeders, diversity of species, varieties of production, plurality of actors and multifunctionality of environments). Participatory research on the Sartène cheese region is expected to integrate the components of value at the level of the production area. As such, we are mobilizing the concept of "Milieu-ressources" likely to be the most integrative management unit for activities related to pastoral breeding. In this perspective, the value chain becomes the forest of Viggiani organized around the pastoral cheese of Sartène.

The construction of value is inclusive of the qualities of the encompassing ecosystems (territories of the Rizzanesi and Baracci valleys) and the characteristics of the actors. The research undertaken alongside local private and public actors aims as much at drawing up the rules of use of the environment with a view to coexistence as the qualification of the characteristics of the cheese *per se*. The organization into a pastoral land association or any other legal solutions is likely to stabilize the lasting establishment of commons.

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Drome Valley: Sheep meat locally produced and valorised

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Summary

Drome Valley extensive breeding and pastoralism within middle mountains is an example of an integrated mountain value chain providing economic, environmental, and cultural value in rural areas. In fact, this value chain is particularly well organized at the local level: most of the production is valorized and marketed in local supply channel, creating economic value and activity in the territory, and providing a qualitative and local food supply. Pastoralism practices also strongly contributes to mountain landscape management by providing ecosystem services (maintenance of natural areas and biodiversity, touristic attractiveness). However, current environmental pressures as well as the overutilization of mountain natural resources are jeopardizing pastoral practices. An integrated policy strategy at local, national, and European level must be coordinated to protect these traditional and qualitative know-how.

Figure 8: Ovine shepherd pasturing in the Drôme mountains

Key Policy Messages

- ☞ Environnement preservation
- ☞ Maintain of traditional practices
- ☞ Local food supply

The Drôme Valley is in French Pre Alps, surrounding the Drôme River that takes its source in the Diois and flows until the confluence between Drôme and Rhône rivers. The territory is characterized by important and preserved natural areas (8 remarkable natural sites including 5 Natura 2000 sites) and an important agricultural sector. The North-East of the territory is characterised by middle and high mountains (Pre Alps and Vercors Natural Park): agriculture is this area is mainly livestock and small diversified gardening. The South is characterized by aromatic and yard large cultures. The West of the territory is characterized by large cropland.

« Biovallée » is a territorial brand created in 2002 in the Drôme Valley. The aim is to promote the very diversified assets of the area in terms of geological, natural, and agricultural resources and the ability of local actors to act for the sustainable development of their territory.

Extensive sheep farming and pastoralism are characteristic of Drôme valley mountain and mid-mountain area and strongly contribute to the local sustainable development through production of local economic value, local and qualitative food supply and preservation of natural areas.

Sheep meat VC, an asset for local sustainable development in the Drome Valley

The extensive breeding and the pastoralism within middle mountains as well as the slaughter and the local valorisation of sheep meat is an important economic activity in the Drome Valley. The region counts 123 breeders (17% of the agricultural firms of the territory) and more than 8800 sheeps. Besides, 36% of the territory is dedicated to pasture with two main pasture zones (we will focus on one of them: Plateau d'Ambel).

Besides, most of the slaughtering and processing activities are organized locally in two main slaughtering houses in Die and Romans sur Isère. Second processing is also done by local butcher's shops or by the breeder himself. The marketing is mainly organized locally through direct sales and short circuit marketing in market, local products groceries, butcher shops and under the label "Agneau de sisteron". The sheep meat value chain is highly connected to sustainable landscape management, preservation of traditional know-how and local and qualitative food supply. Thus, it creates local economic, cultural and environmental value on the territory.

Value chain contribution to sustainability and resilience of the MMR (barriers and opportunities)

The sheep meat value chain provides economic, cultural, and environmental assets in this mountain area. In terms of natural assets, extensive breeding, and pastoralism practices such as sylvo-pastoralism or eco-pasture provide ecosystem services (maintenance of grassland, woodland and overgrown areas preventing fire starts) and contribute to the preservation of biodiversity (cover, environments, and species). Besides, by its connections with other agricultural activities (organic manures for farmers, fodder production), touristic activities (opening of the landscapes, reception of nature activities, gastronomy) and eco-social activities (reinforcement of the rural economic activity, human presence in deserted places, repopulation), the sheep meat value chain create local economic and cultural assets.

However, this value chain is facing strong environmental pressures: predation, pastoral land access issues, climate change, drought, lack of data on the pasture activities biodiversity impact, difficulty to retribute ecosystem services provided by pastoralism…

Besides, local shepherds are also highly dependent to public aids: national, regional, departmental and European support to the sheep pastoral activity by means of Pastoral Territorial Plan, the CAP and flocks protection measures.

Policy relevant considerations

In the Drôme valley, sheep breeders are innovative and committed: choice of rustic breeds and extensive systems, quality production often under label, direct sales or short circuits,

experimentation of innovative practices. These practices are at times very strongly supported by local and European public policies (Territorial Pastoral Plan, LEADER programs, MAEC...) and at times not sufficiently "in line" to be accepted or recognized by institutions (CAP, health regulations, installation aids...). The sector is rather strongly supported by local representatives - whether they are of agricultural origin or not - for its positive externalities: maintenance of agricultural and economic activity in all the villages of the valley (jobs and services on the territory), maintenance of the natural spaces, in particular tourist spaces and means of controlling the risk of fire, positive image of the territory and participation in the eco-tourist attractiveness (inhabited and lively villages, paths, summer pastures, meadows and grazed rangelands maintained, local quality products, ...).

In conclusion, it is important to support for the Drome Valley local sheep meat value chain in order to sustain local economy and quality food production. It is also paramount to recognize and retribute the sector for the environmental and cultural ecosystem services it provides. Finally, local, national, and European stakeholders should also consider the strong pressures that the sector is facing (climate change, predation…) and should accompany the development of solutions with the breeders at the local level.

Acknowledgements

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Reference

Drome Valley Pastoral Territorial Plan, 2017 – 2022, https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjN9ZTgzNnyAhVO1BoKHdgMD7wQFnoECAMQAQ&url=https%3A%2F%2Fwww.valdedrome.com%2Fcms_viewFile.php%3Fidtf%3D29321%26path%3DPlan-pastoral-de-la-vallee-de-la-Drome.pdf&usg=AOvVaw1YKAVbmZbVb8FeNH5kjAKe

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Crete: Carob Chain, "Central Rethymno"

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Summary

Carob trees are characteristic of the Cretan landscape. Until the 1950s carob production was closely related to the socio-economic context of mountainous and semi-mountainous areas in Crete. From then on, the production has gradually declined, and the trees have been abandoned, in favour of other crops.

Central Rethymno, a semi-mountainous area, has been selected to study carob's innovative value chain, which is based mainly on the endeavours of a local company. The lengthening of the carob value chain during the last decade has revived interest for the cultural impact of carob in the as well as for its innovative products and by-products. For these reasons, the carob VC seems particularly worthy of analyses in the context of the MRR. MOVING's outcomes can be generalized and applied throughout the Island of Crete.

Figure 9: Typical landscape of Central Rethymno

Key Policy Messages

- ☞ Involvement
- ☞ Participation
- ☞ Social Innovation
- ☞ Academia - Community Partnerships

The MRR of Central Rethymno is a hill-mountainous area between the two major massifs of Crete: White Mountains and Psiloritis Mount (Ida), consisting of a typical landscape of Crete, with steep slopes, mainly covered with shrubby vegetation, oaks, kermes oaks, carob trees and olive trees. In that landscape numerous small villages (with less than 500 residents) are scattered around. The dominant land use systems are permanent extensive and agro-silvo-pastoral, deeply connected to the way of life of the inhabitants. The area has a high level of vulnerability mainly due to the constant population aging and decline and the hitherto implemented rural development policies, which have led to land and activity abandonment. The emerging climate change seems to exacerbate the situation. A characteristic example of abandonment is the exploitation of carob trees. The carob tree (*Ceratonia siliqua*) is a species of flowering evergreen tree in the pea family. The carob tree grows widely in the arid, semi-mountainous, and rocky terrain of Crete. The trees have also been self-planted and cultivated for centuries on the island. It is a drought-resistant and hardy species that has been part of the agroforestry as well an economic resource and cultural element in Crete for hundreds of years.

In times of great need, famine or the turmoil of war, like in WWII, Cretans used carobs as a substitute for wheat. By that time the production was so high, that carob was also exported to Northern Greece. After the 1950s production declined and during 1980s many carob trees were

logged for firewood. In the 1990s the European afforestation strategy played a significant role in bolstering carob planting in Rethymno region and drove a renewed interest in carob farming and production.

Carob and its VC

Carob harvesting traditionally yielded and continues to yield a complementary revenue for farmers. The legumes or pods are collected by using a traditional process involving rods. They shake the branches to loosen the fruit, which then falls off onto canvas or cloth sheets spread out on the ground beneath the trees.

Traditionally, the legumes were sacked and brought to the mill for sale and processing. They were and continue to be used for fodder for livestock and as a source of food for humans.

Figure 10: Self-planted carob tree in Central Rethymno

Figure 11: Traditional carob harvest

The harvesting of legumes takes place in late summer to early autumn and was oftentimes a collective communal process. The carob harvest has an overlap with the grape harvest, thus the price of the product can be crucial regarding prioritization.

Nowadays, the carob legumes are processed for both human and animal consumption in modern mills with patented techniques for processing the ripe, dried, or toasted legumes into flour, chips, powder, coffee, tea, molasses type syrup, and beauty products.

These high reputation and quality by-products are in turn used in a long, but rather narrow value chain of baked goods, condiments, treats, and other food items.

Due to the nutritional value, lower calories, fat, and processed sugar the by-products have been used in the nutraceutical industries and are a part of the sustainable food movement.

The higher value carob seeds are extracted, exported and processed in Italy and other countries and are ultimately utilized in gastronomy.

Value chain contribution to sustainability and resilience of the MMR

The Cretan Carob company is currently the major actor, engaged in cultivation and processing of the carob pods in Central Rethymno. The company has patented a technique for processing carob beans and has enhanced the traditional use of carob, lengthened the value chain, and sustainably made use of the semi-natural forest land in the region. The Cretan Carob company has proven the economic value of carob cultivation and has succeeded in raising the price for the raw carob legumes. Also, in the wider area of Rethymno a "Community of Cultivation, Natural and Cultural Use of Carob in Crete" has been established and registered in the Greek List of Intangible Cultural Heritage. This cultural heritage network aims to bring together carriers of the traditions and knowledge related to the cultivation and the consumption of carob. The Community is supported by scientists and local stakeholders. Additionally, in the past decade, a growing scientific interest from the academic institutions of Crete for studying and researching carob has flourished. Carob's nutritional value and the dynamic growth of its by-products and their uses display great economic potential. Moreover, if processing to produce gum and pharmaceuticals can develop locally further advancements will materialize.

Carob farming / harvesting abandonment, land use policies, and land fragmentation are the negative driving forces in the sustainability of carob production. Policies that support innovations in farming practices and that can foster the widespread dissemination of technical knowhow and economic diversification opportunities such as agritourism, rural tourism, energy production, and ecosystem services can be considered by the stakeholders who will be interviewed.

Policy relevant considerations

The analysis of the carob value chain allows us to understand the multifunctionality of the carob tree and their environmental, economic and social role in rural mountainous communities in Central Rethymno. The valorisation and preservation of the carob trees is important for the local economic development and for the preservation and management of the semi-forest landscape and traditional village life. Further innovation can contribute to the broadening of the value chain, to increase the production and ultimately to reduce the abandonment of carob cultivation and to improve carob farming practices. This will prevent the loss of historical and cultural heritage and sustain the population in the traditional villages. Taking advantage of the manufacturing and business paradigm of the Cretan Carob Co., the support of community initiatives, along with academic interest and the expressed will of the Region of Crete to support carob production, MOVING aims to initiate the revival of carob cultivation and contribute to the sustainability and the resilience of the land use systems as well as the socio-economic activities in Central Rethymno, constructing a Community of Practice. Furthermore, MOVING's results will be exploitable towards the adoption of good practices and the development of targeted policies for the cultivation of carob throughout Crete.

Figure 12: Carob products

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Transdanubian mountains: Cold mountain shelter – Knowledge economy

Gusztáv Nemes, Éva Orbán

Summary

Cold Mountain Shelter is a small community of 8-10 families, young, educated environmentally conscious lifestyle migrants, co-operating with the neighboring local authority, a tiny village (Barnag). They produce food through permaculture, forest agriculture, contour farming, extensive animal husbandry. They also organize courses, events exhibitions in permaculture, sustainable water management, building, etc. and are creating an online knowledge platform for sharing environmental- and community friendly technology (both innovative and traditional). They run a nation-wide association of lifestyle migrants organizing courses, festivals and developing local and regional nods of environmentally conscious communities. The VC's activities are relevant for land use, saving and creating environmental and community values. It is also 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.

Figure 13: Knowledge sharing activity

Key Policy Messages

- ☞ Self help and social organisation
- ☞ Neo-endogenous approach for policies
- ☞ Integration of local producers into SFSCs

Transdanubian Mountains is the second largest mountain range in the country, covering some 7200 km², 200 km long and 30-40 km wide. The highest peak is 756 m (Pilis peak). It is a clastic mountain built mainly of sedimentary rocks, having a high forest cover, with dry oak forests (karst scrub forests, karst oak forests), hornbeam-oak forests and beech forests being the most common. Forestry mainly produce timber for buildings, furniture and firewood. Crop production is not significant in the area, for topographic and climate. Wheat and potatoes are grown on the foothills, in the lower hilly areas and in basins. Fruit growing (peaches, almonds) and vines are also important.

Our closer study is the Balaton Uplands, an uneven plateau rising 250-400 m above sea level, composed predominantly of Permian and Triassic sediments. The proximity of Lake Balaton (the largest lake in Central Europe), the beautiful landscape, old buildings and the many premium services made it traditionally a prime tourist destination. It is subject to strong visitor and urbanisation pressure, with many urban incomers and holiday homes. Therefore, property prices are rising steeply, the original inhabitants are moving away and traditional farming activities such as viticulture are declining, as the main motivation for buying property in the vineyard is no longer agricultural work but the beautiful view of the vineyard, tranquillity and relaxation.

The VC community under study is located on an abandoned, forested vine hill (Could Mountain) between two small villages (Barnag and Pécsely). An important player in the area is the Balaton-Highlands National Park, which was established in 1997 in Veszprém and Zala counties, covering an area of about 57 000 ha. Its main activities include nature conservation, landscape protection, nature management, awareness-raising and ecotourism.

Cold mountain shelter – Knowledge economy

Cold Mountain Shelter is a small community of 8-10 families, young, educated environmentally conscious lifestyle migrants. They have an emergent co-operation with the neighbouring local authority, a tiny village (Barnag) sharing similar values, already having some joint action and planning for more. They produce food through permaculture, forest agriculture, contour farming, extensive animal husbandry, etc. though most of it they consume within the community. However, 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). They also run a nation-wide association of lifestyle migrants (with many members) that organises courses, festivals and help to develop local and regional nods of environmentally conscious communities. In co-operation with the local authority, they are starting a project to use abandoned pasture for extensive husbandry, for producing milk, milk products, cheese, meet, etc. There is also an interesting small enterprise, a couple, hunting truffle with dogs, selling the experience and very high quality/price truffle products.

Value chain contribution to sustainability and resilience of the MMR (barriers and opportunities)

The VC's activities are relevant for land use, saving and creating environmental and community values. It is also 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. On the other hand, this is not a well-established project (like one of the old eco-villages), but an emerging one. The next 3-4 years (the duration of MOVING) will be crucial for their development and long-term sustainability; thus our project team has a great opportunity to engage and support their activities.

Concerning policies, marketing small scale agricultural products used to be very difficult but was significantly facilitated by the "Small produces' low"[1] in 2011, that fried small scale agricultural producers, food processors and farmers' markets from several regulations and compulsory standards. They also enjoy exemption from VAT, and some bureaucratic obligations normally

[1] http://www.fao.org/faolex/results/details/en/c/LEX-FAOC114670/

burdening agricultural enterprises. However, these exemptions only apply for direct selling (by the producer or his/her close family member), thus, the use of any kind of short food supply chains (box schemes, speciality shops, consumers' co-operatives, etc.) is rather ambiguous for small producers. This seriously limits the VC's possibilities to market their organic products too. On the other hand, support for NGOs in Hungary is very much politically biased, environmental and social sustainability, decentralisation and small sustainable communities are hardly supported by government funds. Other challenges concern: (1) climate change (warming, new pests, extreme weather conditions, etc.); (2) civilisation/urbanisation pressure on the Mountain landscape and abandonment of agricultural activities (the VC is in one of the most favourite touristic destinations of the country); (3) turning knowledge on sustainability into income and finding a balance between commercial and volunteer actions; (4) Social distancing for COVID cancelled events. (5) The nearby city of Veszprém, together with its rural hinterland will be the Cultural Capital of Europe in 2023 and the Cold Mountain Shelter community is involved in various activities. This creates both threats and opportunities for the VC.

Policy relevant considerations

Making SFSCs more available for small producers through changing the regulatory and policy framework would support the CV's activities (alongside hundreds of thousands other small producers in the country). According to the VC's general opinion, current European rural development (and agricultural) policies are still often more damaging for environmental and social sustainability than supporting it. They can achieve structural improvements only if local communities are conscious, organised, taking a strategic, long-term approach to their own future and using available central support according to that strategy. Policies should consider more the local demands and induce bottom-up participatory community action.

Giving value to the creation and spreading of knowledge on sustainable production, building and lifestyles would be a good policy direction that is currently largely lacking from the system.

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Central Apennines: Alto-Molise Dairy Chain

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Summary

Dairy productions historically characterise the socio-territorial context of Central Apennines. Woodland and pastures are natural resources interwoven with local cultural traditions linked to transhumance from inner areas of the Apennines to coastal zones and the South of Italy. The VC analysed has successfully enhanced the traditional dairy productions (such as the Caciocavallo cheese) by sustainably exploiting livestock, pastures and establishing fair contracts/relations with local breeders. The processor uses cultural tradition related to mountain farm productions in its marketing strategies. It also has been able to enter high-value market segments such as high cousin and restaurant and the slow-sustainable tourism sector. The processor is one of the older cheesemakers in the area that continuative produce and innovate its strategies along almost three centuries of cheese in the context of MRR. For this reason, the case of this VC seems particularly worthy to analyse in the context of the MRR.

Figure 14: Caciocavallo of Agnone cheese certified PAT (Italian traditional food product).

Key Policy Messages

- ☞ Involvement
- ☞ Participation
- ☞ Social Innovation

The MRR (Central Apennines) consists of a hilly-mountainous structure with a few valleys close to rivers and streams. In the most extreme Southern area of the MRR, which extends over the Northern zone of Molise Region, several natural areas are located. Here there is a rich biodiversity, and some tree species are considered rare, like the Apennines white fir woods. For this reason, a site in Alto Molise has been declared a UNESCO biodiversity reserve since 1977 (the Collemeluccio-Montedimezzo reserve). It is the only UNESCO site in the Central Apennine.

This context is also characterized by extensive pastures and wooded areas involved in the mountain economy, such as livestock (cheese and meat) and forestry-related products (wood, honey, and truffles). There is also a tradition of craftsmanship linked to the steel industry (i.e., “Fonderia Martinelli”, production of bells) and confectionery (e.g., “Confetto riccio di Agnone”).

In short, a balanced relationship between the traditional anthropic activities (livestock breeding and craft activities) and the natural context is recorded and, in this scenario, the dairy activities are worth of examining to understand the territory's resilience, sustainability, and socioeconomic development.

Dairy Resilience & Innovation

The main actor in this value chain is a very old cheesemaker family, its activity date 1662. One of their relevant productions is the typical local cheese called “Caciocavallo of Agnone”.
The production cycle is performed using only local raw materials (milk) establishing fair economic collaboration with local breeders. Breeders supply the milk according to high quality and environmental sustainability standards supported by the “Di Nucci” company. The relations between the milk producers and the cheese factory are not only economical but based also on a common values and perspective to favour the socioeconomic development and environmental quality of the mountain area preserving cultural traditions, natural resources, and landscape.
In their marketing strategy, “Di Nucci” stresses the link between the cheese factory with Alto Molise's cultural and rural tradition (like the practice of transhumance) and supporting sustainable development initiatives.
The company has also a clear vocation for internationalization, oriented towards the *haute cuisine* sector and experiential tourism (e.g., dairy crafts museum) to improve her business involving (through its VC) the socioeconomic and ecological context.
In this perspective, the VC promotes not only a possible development path innovating production and marketing strategies but also supporting resilience actions to the sustain of the territorial context.

Value chain contribution to sustainability and resilience of the MMR (barriers and opportunities)

Milk production in mountain pastures is a traditional activity developed in centuries. It established a sustainable relationship between exploiting natural resources, and the human communities need present in the territory within a specific culture (e.g., the culture of transhumance). Central Apennine societies have therefore contributed to the management of forests and water basins essential for downstream activities and ecosystem services. The industrial civilisation has disrupted this balance, favouring the depopulation with a consequent worsening of the relationship between man and nature in the Apennine contexts. The VC is a virtuous example where traditional productions innovated for the contemporary market, allows the population to persist in places where it is possible to develop a virtuous relationship between nature and man with both local and systemic economic and environmental advantages. In short, the VC enables the development of resilience initiatives to contemporary challenges (environmental, economic, etc.).

Using national and European funding is a possible opportunity to develop and support these initiatives and to replicate best practices. At the same time, the complex procedures for accessing European funding and the need to identify elements of innovation in response to contemporary challenges are limitations to the need to have or acquire skills that are not adequately present among the actors in the context.

Policy relevant considerations

The valorisation and preservation of the dairy VC cross interests on different scales. At a local level, it contributes to reducing negative trends (e.g., depopulation and loss of historical and cultural heritage in the inland areas of the central Apennines). At the regional and interregional level, the development and innovation of dairy and livestock farming practices can activate positive economic circuits (above all farm experiential tourism). They involve several actors, terroirs, and sectors (such as rural and sustainable tourism linked to transhumance routes). Understanding the virtuous relationship between economic activities and the socio-ecological system is relevant for resilience and sustainability strategies at a broader level.

Policies should support territories that present the elements mentioned above. They can reduce negative trends (depopulation, ageing, degradation due to the lack of care for the forest, historical and cultural heritage, etc.) and supporting current (social and technological) innovation processes. A lower tax burden for the residents and improved access to digital (broadband, 5G) and physical (roads, railways) infrastructures seem essential aspects to consider. Access to services (health, education, etc.) is another aspect to consider.

Policies should also improve the innovation processes of farms by fostering the widespread dissemination of technical innovations and economic diversification opportunities such as agritourism, rural tourism, energy production, ecosystem services.

The analysis of the VC allows us to understand how socio-cultural and environmental elements can be used to improve the sustainability and resilience of human communities to face challenges like climate change.

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Eastern Alps: Organic wine production for premium wines

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Summary

In Trento province grape cultivation for quality wines production covers more than 12000ha, 14% of them above 500m on seal level. The farmers behind the quality wine labels are often very small, even smaller that 1ha, but the action of a large company that collects and processes the grape, allowed to maintain small farmers' activity thanks to the good price of the grape and through technical advisory and bureaucratic assistance. The value of the final product and the market acknowledgment pushed for an increasing environmental engagement, that led to a wide adoption of organic and low input production systems. Grape production in Trento province in strongly intertwined with other agriculture production and with other economic activities, such as tourism and forestry.

Figure 15: Pergola vineyards in Trento. Source: vinideltrentino.com

Key Policy Messages

- ☞ enhance support to ecological systems and practices
- ☞ test and adapt alternative certification methods to avoid losing small farmers
- ☞ support collective and intersector actions

The MRR (Eastern Alps) includes the Alpine and pre-Alpine chains of Trentino-Alto Adige, Veneto, Friuli Venezia Giulia and Slovenia. The MRR is quite heterogenous, with higher forest coverage in the East and progressively more agriculturally managed land to the West. Agriculture activities include cattle production on pasture, manly for milk production, feeding PDO quality cheeses value chains such as Trentingrana or Montasio; fruit production, especially apples but also some berries, vegetables and grapevine. Large part of the MRR forests were devastated by a storm (Vaia) in 2019. It destroyed or intensely damaged forest stands for about 42500 ha, producing 8.5million m3 of wood that was in a limited share regained to use. The analysed value chain is in the autonomous Trento Province, where the more intense agriculture use has place but where also tourism (in winter, for skying and in other seasons for biking, climbing, hiking etc) has a relevant role in local economy and land management. The province includes 3 Natural parks, a UNESCO reserve (Dolomites) and several protected areas, about one third of the province territory is protected and offer shelter to several endangered animal species, including wolf and bear that may create some conflicts with agriculture activities, as well as thousands of plant species.

Resilience and innovation

Grapevine cultivation in Trento Province has a long tradition but it was mainly grown for family use or for a very local market. Since the XX century wine production gained a more professional role and nowadays there are about 10000ha of grape cultivation in Trentino, all for wine production. Out of then, 32% is in areas below 200m on seal level, 39% between 200 and 350m, 15% between 350 and 500m and the remaining 14% above 500m. White varieties are predominant, and it is interesting the link between the cultivation of autochthonous/local varieties the higher cultivation areas. In the early '900 the oenologist Giulio Ferrari started to produce the Metodo Classico sparkling white wine. That was the basis of the worldwide acknowledge Ferrari Vini brand. Except few large farms, the grape production takes still place in very small farms, often small than 1 ha, where also apples are often grown and many of them are organic. The wine producing company is collecting the grape and processing it into quality wines (Trentino DOC) but is also offering technical advisory and bureaucratic support to the farmers.

In the last 10 years the grape production progressively moved to organic and integrated production systems, despite some difficulties in the certification process due to the very small plots/farms. At the same time the company started to test the production in higher areas, in order to cope with climate change effects on grape characteristics.

Value chain contribution to sustainability and resilience of the MMR (barriers and opportunities)

In the MMR grape production could lead to a conflict between producers and inhabitants (as it happened in other typical wine areas), but the good technical level of public and private advisory allowed to test low input systems since decades and is now making possible the large share of organic management and the spreading low input (integrated) systems. Grapes are grown also in thousands of very small farms, as their economic value allows the survival of small-scale producers, together with the provincial rural support policies. The production is very professional, but it did not lead to a monoculture, as forest and other agriculture activities, such as apple or berries production are often intertwined. International varieties are largely grown but the share of autochthonous ones is increasing and getting the attention of quality markets. The market of Trento DOC wines is international and highly acknowledge and relays also on the promotion of the territory. Local restaurants and hotels play a relevant role in the promotion.

Vineyards are shaping the landscape of Trento Province, so forging the prerequisites for touristic activities, especially if grown with the typical "pergola" trelling system. The challenge nowadays is to maintain the wine quality traits in a changing climate and one of the options is to move the production uphill, in areas now covered by forest or used as pasture.

Policy relevant considerations

Rural development policies in the province have always supported a) small producers and their collective initiatives; 2) quality productions (mainly PDO); 3) research for the improvement of local

agriculture. A real integrated system of agriculture, tourism and other economic activities is into place, even if there is large space for improvement.

Points of further development could include:

- stronger support to ecological systems (i.e., organic farming and diversification)
- testing of alternative certification methods to avoid losing small farmers (i.e., group certification)
- support of collective and multiactor actions (I.e biodistretto), and development of the MRR, and the need to act.

Reference

https://www.palazzoroccabruna.it/sites/default/files/uploads/roccabruna/documents/osservatorio/Vitivinicoltura/Vitivinicoltura%202020%20web.pdf

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Northern Apennines: Chestnut flour

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Summary

Chestnut flour production historically characterises the socio-territorial context of Northern Apennines and more precisely the Apuan Alps. Chestnut flour is produced by secular chestnut tree planted from 500 to 1000 meters altitude. The Chestnuts are collected by small farm that process the fruit in small productions and high identity value. The chestnut tree performs various functions: productive, protective, naturalistic, landscape.
The production of chestnut flour in the municipality of Stazzema and Seravezza, both in the Hight Versilia territory, is done in a traditional way but in the last years some innovations have interested the processes of roosting and peeling, the marketing strategies (new packaging, use of social networks, etc.) and the organization of the value chain.

In the last years, this Chestnut value chain has started to successfully enhance the traditional chestnut productions (such as flour, honey, and wood) by sustainably exploiting the semi-natural forest.

Figure 16: Dry Chestnuts before to be process in flour.

The MRR (Northern Apennines) consists of three sub chains: the Ligurian (Appennino ligure), Tuscan-Emilian (Appennino tosco-emiliano), and Umbrian Apennines (Appennino umbro). The analysed value chain is in Tuscan-Emilian Northern Apennines and precisely in a separate branch of the Apuan Alps. MMR. Topographically, only the valley of the river Serchio, which runs along the coast and flows into the Tyrrhenian Sea north of Pisa, separates the MMR from the Apennines. The Apuan Alps are a highly suggestive orographic complex, with deep valleys abounding with water.

Known since the Roman age for the extraction of the precious white marble, the Apuan Alps, are a very peculiar mountain range and an extraordinary region of natural and cultural heritage in the Mediterranean basin, with many geological and biological features of national and international interest. There are very few places in Italy and Europe - as the Apuan Alps - which can boast such a natural heritage rich in landscapes, environments, and naturalistic elements. This holds true not only for flora and fauna, which are rich in endemic species, but also for rocks, minerals, fossils, tectonic structures, superficial and hypogeal morphologies, which provide unusual, varied and widespread elements of environmental value. In 1985, a Regional Park was established in the territory to try to protect all those aspects and in 2015, the regional parks obtained the status of "UNESCO Global Geopark".

The area has a high level of vulnerability caused by the abandonment and climate change. In High Versilia, there was a natural catastrophe which caused about 300 debris flows and overflows of watercourse within few square kilometres. On the 19th of June 1996, an extraordinary rainfall - amounting to more than 500 mm throughout the day, with peaks of 176 mm/per hour - destroyed many buildings and killed residents, especially in the town of Cardoso of Stazzema.

Resilience and innovation

Chestnut trees (Castanea Mill.) have been cultivated for centuries for their economic importance as nut producing trees. The current global chestnut production is estimated at 2.3 million tons, distributed across 612 thousand hectares. China is the leading producer of chestnuts, followed by Turkey, Italy, South Korea, Greece, Portugal, Japan, Spain, and North Korea.

Chestnut trees occupy almost 10% of the Italian forested surface and have been from ancient times a major source of food for rural populations in mountain regions. Italy possesses a rich source of germplasm, and the trees have a very old tradition of cultivation.

In the MMR, the production of chestnut flour is done in a traditional way but in the last ten years some innovations have involved the roasted and peeled processes, the marketing strategies (new packaging, use of social networks, etc) and the value chain's governance. The community interaction is one of the main aspects that characterised this value chain. The harvesting of chestnuts is done by each family farm member, while the roosting and peeling processes are done by small groups of farms following very specific protocols and rules.

Value chain contribution to sustainability and resilience of the MMR (barriers and opportunities)

In the MMR, chestnuts trees have historically represented the most important land use. The nutritional traits of chestnuts have always been considered valuable and have been particularly appreciated by the local population. In the MMR, many products have been obtained from the chestnut for food use, from the fruit and the flour that is ground from it. Not only the fruit was used, but also the leaves, for the bedding of livestock in stables or for mattresses, and as components of fertilizer. The softer suckers, which grow at the base the plant, were considered good forage for goats. The tannin from the bark was used for leather tanning. For this reason, the chestnut three has been defined as the "bread tree" because historically it was strategic for the mountain population.

Nowadays, debris flows in wooded areas and land abandonment in marginal areas are the main cause of increasing unmanaged woodland, linked with the decrease of traditional practices and the loss of biodiversity and cultural heritage values. For this reason, the conservation of traditional land uses, including natural and semi-natural forestry systems, is a priority.

Local foods with a traditional character or image are often perceived by consumers as of higher quality.

Small mountain municipalities as Stazzema and Seravezza, whose economy has been historically based on chestnut production, have maintained ancient genotypes and traditional recipes of typical food specialties.

Nowadays, the familiar association between geographical origin and typical food can be a useful tool for increasing the touristic appeal of these areas, if supported by recognized high quality standards. Origin information, intrinsic properties (e.g., nutritional value) and sensory traits can be conveniently explored as tools to be combined for communicating typical food quality. The value chain is a virtuous example of the combination of traditional and innovative productions for the contemporary market, allowing the population to increase the viability deriving by other economics activities.

Policy relevant considerations

The valorisation and preservation of the chestnut value chain is of interests both for the development of the local economy and for the maintenance of the local forest management. The main effects are at local level, it contributes to reduce the negative effects deriving from socio-economic trends (abandon and loss of historical and cultural heritage).

According with the outcomes of a focus group with local policymakers, population ageing, local forestry policies supporting chestnut growers' income, social and economic needs, and land fragmentation resulted as the most important negative driving forces for the conservation of the chestnut landscape. Whereas the demand from young chestnut growers and the economic crisis of intensive fruit growing are considered of secondary importance. Policies should also improve the innovation processes of farms by fostering the widespread dissemination of technical innovations and economic diversification opportunities such as agritourism, rural tourism, energy production, and ecosystem services. The analysis of this value chain allows us to understand how socio-cultural and environmental elements can be used to improve the sustainability and resilience of human communities to face challenges like climate change.

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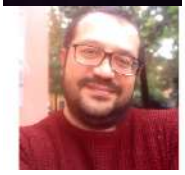

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Malashevski mountains: Rural tourism

Nehat Ramadani

Summary

The Republic of North Macedonia has a rich authentic, cultural, natural, and traditional resources, hereby offering high opportunities for rural tourism development.

In the eastern part of the country, where Maleshevski mountains are, rural tourism is characterized by hiking trails, biking, waterfalls, lakes, and a cleaned mountain environment. 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.

Rural tourism development in Maleshevija, will require government's intervention in a proactive manner, fostering the evolution of competitive tourism sector.

The rural tourism value chain is closely related to the transformation of the value elements of rural production, life, ecology, and culture.

Figure 17: Waterfalls in Pehchevo

Key Policy Messages

- ☞ Coordination
- ☞ Planning
- ☞ Promotion

Malshevski mountains covers the municipalities of Berovo and Pehchevo and is a natural entity that stands out with its natural and cultural wealth where rural tourism is a long tradition. From an administrative point of view, the municipalities of Berovo and Pehchevo belong to the East Planning Region and are part of the catchment area of the river Bregalnica. The area is a plateau whose relief border includes three mountain massifs, such as: Vlaina, Maleshevski mountains and Obozna. Part of the slopes of the mountains Ograzden which extends to the north-northeast and Plachkovica with the direction extending to the east are part of the borders of the Maleshevski mountains. The direction of the Maleshevski mountains is south-southwest to north-northeast whose ridge is 32 km long. The border between Republic of North Macedonia and Republic of Bulgaria passes along the ridge of the Maleshevski mountains, intersecting the rounded ridges, the peaks of Jami Tepe (1801 m), Chengino Kale (1748 m) and others. In terms of altitude range, the lowest point in the Maleshevo region is 660 m. and is in the bed of Bezgashchovska Reka, and the highest point is in 1932 m. on the top of Kadiica on the mountain Vlaina.

Resilience & Innovation

According to the analysis of WTO (World Tourism Organization) and ETC (European Travel Commission), Europe as the number one tourist destination in the world, shows a tendency to increase the number of tourists who use extended weekends to avoid stressful living in urban areas. When choosing tourists destinations on extended weekends for 3-4 days, tourists choose nearby destinations available by car and bus or transport organized by low-cost airlines. When choosing destinations for short stays, destinations that offer various forms of rural, mountain tourism and spa tourism have an advantage in the analysis. The primary factors that influence the choice of destination are a) promotion of the destination on the Internet, comments from visitors to the destination and their recommended experiences, b) authenticity of the destination c) price of the package service (transport, accommodation, catering services, tickets and other accompanying costs) d) quality of service as a total perception from all points of contact with the local population, culture and way of life. Increased competition in the areas of rural tourism as well as the large number of available tools for comparing the tourist offer on the Internet (websites, portals, blogs), impose high standards for attracting the attention of potential tourists.

The total contribution of tourism in North Macedonia is at around 5.2% of the national GDP. The rural concept, which integrates the concepts of eco-tourism, hunting tourism, fishing, rural (farm) tourism, ensures the preservation of natural resources and biodiversity in the environment. Moreover, rural tourism is becoming an integrating factor for like-minded people who are increasingly raising their voices against the disruption of natural resources.

Value chain contribution to sustainability and resilience of the MMR (barriers and opportunities)

The rural tourism value chain is closely related to the transformation of the value elements of rural production, life, ecology and culture. The Republic of Northern Macedonia has a rich authentic, cultural, natural and traditional resources, hereby offering high opportunities for socio-economic development. In the eastern part of the country, where Maleshevski mountains are, rural tourism is characterized by hiking trails that are made for recreation mountain biking, waterfalls, and also 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.

Maleshevija is part of the National strategy for tourism development of North Macedonia. It is emphasized for its s a big potential for rural tourism. The region has a very clear identity and very good natural resources for further rural tourism development. The hospitality of inhabitants in the area of Malleshevija, makes the region very attractive for tourists. The private accommodation in addition to the hotels in the region, offers traditional memorable moments to those who visit the region.

In the immediate vicinity of the waterfalls there is the tourist settlement Ravna Reka. The combination of the traditional and the modern is mostly reflected in few hotels in the region that have their own fish, offering delicious specialties prepared according to the "grandmas" recipes. With the Maleshevski mountains, is the lake of Berovo, which lies within 7 km near town of Berovo. The lake is surrounded by evergreen and deciduous types of forests. Many local go swimming, fishing or saling in the lake. This site also has private villas for accommodation, sports field for football and basketball, swimming pool within few hotels such as Aurora, Manastir, Idila, etc. make the place very attractive for picnic (summer cottages), bicycle paths and hiking trails. Some of the trails are used also for mountain biking.Under the source part of the river Bregalnica, about 17 km from Pehchevo, at Chengino Kale, there is the highest Pehcevski waterfalls.

Nature protection and climate change are the two most important challenges for tourism in the long run. Businesses and individuals who undertake rigid activities in tourism, should be aware that their actions might impact negatively to environment. The development of large tourist facilities that cause the destruction of the natural environment is increasingly being condemned by the public. The trends for preservation of the natural environment and the characteristics of the region are especially in favor of the development of rural tourism.

Policy relevant considerations

North Macedonia has identified tourism as an industry with the potential to promote important economic goals, such as enhancing the foreign export demand for domestic goods and services, generating foreign currency earnings and new employment opportunities, contributing to the repayment of foreign debt, and increasing national revenue, Supporting rural tourism development will require government intervention in a proactive manner, particularly by fostering the evolution of a more competitive tourism sector and by facilitating systematic change through the improvement of the tourist product and the strengthening of the role of the private tourism and hospitality sector. Policy efforts should be focused on promotion, mainly through the introduction of new innovative approaches. Measures for improving tourism competitiveness to strengthen the coordination between the central and local governments is of high importance. Concrete policy measures would help such as: a) a specific Law on Rural Tourism b) Strengthening of the role of municipalities in the rural tourism development c) Tax regulations and financial transactions system revision d) Introduction of efficient mechanisms to solve property issues and rural space planning; e) Emphasized engagement of local people in the business, etc.

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Cordilheira Central: Serra da Estrela PDO Cheese

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Figure 18: Shepherd of Bordaleira da Serra da Estrela sheep breed with his flock (Credits: Elvira Sales-Baptista)

Summary

Cordilheira Central is a mountain range which crosses the centre of the Iberian Peninsula. In Portugal, its maximum altitude is reached at Serra da Estrela (1993 m) where Serra da Estrela PDO Cheese, a traditional product made with milk from two autochthonous sheep breeds and highly connected to land use, is produced in small to medium scale cheese production plants.
This product is directly interconnected with two other PDO products, namely Cottage Cheese and Lamb, and with Burel (a wool fabric).
Nowadays, the VC is facing important challenges, such as the reduction in the number of shepherds and the increase in number of animals of non-autochthonous sheep breeds, as many shepherds have the perception the later are more profitable.
At this preliminary stage, some potential critical links in the policy debate were identified.

Key Policy Messages

- ☞ Value shepherds and provide support to breeders
- ☞ Support autochthonous breeds
- ☞ Create strategies to achieve VC independence from imported feed
- ☞ Make public aware of the distinction between PDO Cheese and non-PDO Cheese
- ☞ Involve local common's associations in the management of pastures
- ☞ Improve communication and integration among public organizations

Cordilheira Central is a mountain range which crosses the centre of the Iberian Peninsula longitudinally and reaches its highest altitude at Pico Almanzor (2592 m), located in the Sierra de Gredos (Spain). In Portugal, its highest point is located at Serra da Estrela (1993 m). It is mainly covered by Shrub and /or herbaceous vegetation associations and Forests according to CORINE Land Cover 2018 (European Union – Copernicus Land Monitoring Service, 2018). Grasslands, alone or in mosaic, are the more represented land systems in this MRR (van Assenlen and Verburg, 2012; Levers et al., 2018) and are an essential resource for Serra da Estrela PDO Cheese value chain (VC). Other VCs also relevant at this MRR, and closely linked to the cheese as also derived from the sheep, is the Burel fabric (made from wool) and the lamb and the cottage cheese. Furthermore, there is the VC of nature tourism, which takes advantage from mountain forests, grasslands, landscape and culture.

Serra da Estrela PDO Cheese

Serra da Estrela PDO Cheese is a traditional sheep's milk cheese made with milk from autochthonous sheep breeds (Bordaleira da Serra da Estrela and/or Churra Mondegueira), thistle flower (Cynara cardunculus) and salt, and resorting to traditional knowledge, passed down from generation to generation, on cheese manufacture techniques. This cheese is highly characteristic of the region where it is produced and is highly connected to land use. Animals may feed from two types of local pastures: 1) natural pastures – made up of spontaneous vivacious grasses and 2) cultivated pastures – constituted by white clover and underground clovers. 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. Currently, at the geographical production area o Serra da Estrela PDO Cheese, there are 27 small to medium PDO Cheese production plants, about 125 dairy farms producing Bordaleira da Serra da Estrela and Churra Mondegueira milk and a cheese producers cooperative – EstrelaCoop – which is mainly dedicated to technical assistance to members and to the defence of the Protected Designation of Origin – Serra da Estrela. Sheep breeders work pretty much on their own and the associations are used mainly to provide the required administrative support. Therefore, the negotiation power of sheep breeders, in relation to the price of milk, wool and meat, is weak. Most sheep breeders deliver milk for processing companies who produce the PDO Cheese (and PDO Cottage Cheese), as well as they deliver wool to other buyers, and lamb to other. This VC is therefore directly interconnected with two other PDO products – Serra da Estrela PDO Cottage Cheese and Serra da Estrela PDO Lamb – and with Burel fabric (made from wool exclusively from Bordaleira da Serra da Estrela sheep breed) – but only at the production level and at the farm scale. Further down the value chain there is no connection. Nor is there any intervention of public authorities or private companies to better link the different VCs.

Value chain contribution to sustainability and resilience of the MMR (barriers and opportunities)

Serra da Estrela PDO Cheese is a product linked to territorial identity that resorts to endogenous resources, namely, local pastures, both lowland pastures and mountain pastures, and autochthonous sheep breeds, as well as local knowledge on sheep breeding and cheese making. Even though these characteristics may be linked to the sustainability and resilience of mountain land use systems, this VC is facing important challenges and there seems to lack a territorial approach that could better link the use of resources, the VC and associated VCs, as well as other VCs profiting from the preservation of biodiversity and the landscape, as tourism VC. Nowadays, the number of shepherds is decreasing, as this job is often seen as unattractive, due to being physically demanding (in sometimes harsh weather conditions) and leading to low wages. And seriously affecting the resilience of the VC is the lack of advisory tuned to shepherds as well as the low level of collective organization, being each shepherd pretty much alone and isolated. Moreover, even though autochthonous breeds are more adapted to the territory than introduced ones (e.g.: Lacaune or Awassi), and the only ones to produce the milk which can be transformed

into the PDO Cheese, the later are increasing in number as they, on average, produce more milk and many shepherds have the perception they are more profitable. Additionally, although sheep use local pastures, they also receive feed, for example, during milking. Therefore, the sustainability of feed import into the system must be further investigated.

Policy relevant considerations

At the beginning of the VC analysis, some potential critical links in the policy debate were identified:

- Value shepherds as landscape managers and biodiversity protectors and promote the use of highland pastures to preserve priority habitats.
- Provide detailed technical and administrative support to breeders, both from the production side as well as from natural resources side.
- Support autochthonous breeds to the detriment of introduced ones.
- Create strategies to achieve VC independence from imported feed.
- Make public aware of the distinction between PDO Cheese and non-PDO Cheese (made with milk from other breeds or imported).
- Create higher involvement of the managers of the commons, the local common's associations, in the management of pastures; these associations have a key role in the region as managers of forestry areas and preventing fire risks; however, they do not interfere with grazing areas, if not specifically asked to do so by shepherds, and as such large share of the former grazing areas register scrub encroachment and cannot be used for grazing nor as eco-tourism asset.
- Better communication and integration among the public organizations of the different sectors: farming, forestry and nature conservation, tourism and hiking.

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"University of Évora team thanks all actors involved in the regional MAP of Serra da Estrela for their active collaboration."

Reference

European Union – Copernicus Land Monitoring Service, 2018. CORINE Land Cover (CLC) 2018, Version 2020_20u1. European Environment Agency (EEA).
Levers, C., Müller, D., Erb, K., Haberl, H., Jepsen, M.R., Metzge, M.J., Meyfroidt, P., Plieninger, T., Plutzar, C., Stürck, J., 2018. Archetypical patterns and trajectories of land systems in Europe. *Regional Environmental Change* 18: 715-732.
van Asselen, S., Verburg, P.H., 2012. A Land System representation for global assessments and land-use modeling. *Global Change Biology* 18: 3125-3148.

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Maciço Noroeste: Wine Value Chain

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Summary

Looking at Port wine success story and equally promising cases like still and sparkling wines, the Value Chain (VC) that we are looking to explore as a case study is the wine value chain. Wine is a very distinctive product, with growing markets all over the world. However, specific wine regions, such as Maciço Noroeste Mountain Reference Region (MRR), are facing challenges throughout the Value Chain in all its components: agricultural and ecosystem's management in the vineyard, natural, historic and cultural heritage, tourism, art, and literature, alongside the problematic accessibilities and a very institutional framework. This study case intends to characterise the MRR and give answers to these needs by highlighting the various evidence of the region and its most relevant products so we can understand how to make this MRR conquer some maturity within the VC, and through a time leap achieve this purpose the most quickly as possible.

Figure 19: Vineyards in the Alto Douro region. Source: https://www.cm-fozcoa.pt

Key Policy Messages

- ☞ Environmental education
- ☞ Technological innovation
- ☞ Land restructuring
- ☞ Collaborative Platforms

This mountainous region provides ideal conditions to cultures like wine, olive, chestnuts, or almonds, due to its rocky soil, altitude, and freshness, all engaging in very peculiar Terroirs, creating a virtuous example of cohabitation, and promoting economic and landscaped diversity. In terms of wine, we will focus on a particular region: NUT III Douro (Nomenclature of Territorial Units for Statistical Purposes III Douro) that contains a major part of the Douro Demarcated Region (DDR), the most significative area of wine production. This region is rich in biodiversity (ecosystems, species, and genes), which is even bigger than the rest of European mountains. Many of the species in mountain areas are endemic or rare (for example, the flora of the ultrabasic rock outcrops of the Northeast). MRR represents, in an exemplary way, major social challenges with the emergence of new conflicts due to the use of the natural resources they contain, and of new concepts associated with ways of valuing territories, although still lacking adjusted metrics.

Follow the Wine

The presence of grapes in the MMR dates from the 20th century B.C, and charred seeds have been found in archaeological sites in the region. The growing of vines in the Douro region can be traced back to at least the Roman occupation in the 1st century B.C. The Douro Demarcated

Region (DDR) is the eldest demarcated and regulated region in the world, since 1756. It was elevated to “World Heritage of Humanity” by UNESCO for Cultural, Evolutive and Living Landscape in 2001. Another point of interest can be the cave engravings of Vila Nova de Foz Côa, classified as World Heritage, by UNESCO, in 1998, that can be found displaced over an area of 200km2.

The DDR includes in its total surface of vineyard (250 000 ha) two Designation of Origin (DO) Douro wine and Port wine. This region is characterised, in general, by hot temperate climates, of Mediterranean type. We highlight the hot to very hot summers, with maximum temperatures frequently above 30ºC, but reaching over 40ºC during heat wave episodes. Precipitation is rare in the summer months, with occasional events of intense rainfall, frequently associated with thunderstorms and hailstorms. These heat waves and hailstorms have intensified in recent years most likely due to climate change, creating harsh barriers in the sector, further increasing the difficulty of outdoor work, and leading to higher production losses in the most productive period of vineyard. Characterising the Terroir needs a particular explanation of its soil, which is mostly compound by schists and granite with different textures, and physical and chemical characteristics. In all area one can find important differences in its different altitudes, however there is a similar feature to all, which is its poor composition of organic matter and carbon sources. It´s very important to refer the huge and wide number of native wine grape varieties in Portugal, particularly in this MRR. NUT III Douro embraces different administrative regions like Vila Real, Bragança, Guarda and Viseu. All these regions have in common the enormous influence of the mountainous environment that approaches them in many ways. By the East side NUT III Douro is flanked by Spain, that has always been an important trading and touristic partner to this region, helping it find some balance.

Value chain contribution to sustainability and resilience of the MMR (barriers and opportunities)

The low-level indicators in the OCDE Better Life Index such as: life satisfaction, income, jobs, education, civic engagement and health for 2019 given for NUT II level (which include MRR) could help to make an evaluation. Some of the farms that still exist today were created in the 12th and 13th centuries proving their resilience, although some population exodus from the MRR to more interesting areas. From the 70's, and due to the shortage of labour, mechanization was implemented. Thus, not only vines were built on terraces, but also “uphill vines” (maximum slope of 35%), which allowed for more effective mechanization, but not sufficient. This problem persists and, currently, 40% of Douro vineyards (± 17 000 ha) are still not mechanized. Another gap felt in the region is the loss, over the years, of the corporativism that existed in the past, probably because the corporativism of other times was not strong or adequate. However, we still find some cases of scattered cooperatives in the region. Examples are the existence of some kind of "private corporativism" that associate individual productions to join brands taking advantage of the sum of production and the articulation of resources. Other producers join only to gain market share, after producing their own wines, and thus saving resources in internationalization.

In the context of MRR we highlight the presence of companies with solid export volumes, with international recognition, with a documented environmental and viticultural conduct, which are beginning to integrate in their activity concerns at the level of ecosystem management in the Vineyard, application of good practices for the preservation of nature and biodiversity; Where organic farming is practiced, maintaining the existence of a living ecosystem, with flora, auxiliaries and pollinators, precision viticulture is being used as a innovative management tool for soil preservation and to give producers enough knowledge to better preserve the biodiversity and, at the same time, be more efficient, environmentally and economically, with less waste. These innovative technologies are also a solution to this MRR by giving producers the opportunity to optimise their human resources.

Another indisputable aspect is wine tourism and rural tourism supported by MRR's resources (wine, chestnut, almond, olive oil, schist and rock carvings and biodiversity), fundamental parameters for the region's development. Landscapes, heritage, culture, traditions and gastronomy are some of the bases for the development of this sector. The promotion of creative and nature tourism at MRR is effectively an opportunity to maintain the dynamism of this active area, bringing new business opportunities and differentiation of existing products. It should be noted, however, that there is a gap in terms of catering and customer service that reveals a lack of creativity and professionalism. The distribution of wealth in the value chain must be made more equitably in terms of the exploitation of human resources.

Other relevant aspects that ought to be reflected upon are road accessibilities, which have improved in recent years but remain difficult in some places. About technological resources, like access to the internet and mobile networks, in many areas is still difficult or even non-existent. It represents a fundamental requirement for the development of any economy/region and specially to attract and retain the younger population.

Policy relevant considerations

In this section are described some of the potential aspects of interest to discuss for a more promising future in MRR. **Environmental education** (in all age groups) and urgency in the effective creation of environmental policies for an increasingly sustainable agriculture, not only in the region but worldwide, so that the fight against climate change is a reality. **Policies that support technological innovation**: study and development of machinery adapted to the rugged orography of the region to facilitate agricultural work; improvement of technological resources such as the 5G network for internet access and mobile communication networks, since these resources are fundamental to the promotion and dissemination of innovation, development, and economic diversification in the region. Land restructuring/land parcelling and the consequent shaping of the landscape to the needs of efficient work is not an easy process, but all the rules applied to new plantations, while respecting the extraordinary beauty and heritage of the region, cannot fail to consider and allow the necessary mechanization, just as existing examples of new plantations that attempt to reconcile the advantages of traditional vineyards with some mechanization. The Douro area still lacks adequate machinery to the existing planting systems,

which makes it urgent to promote the connection and the effort to create close business partnerships between the technological development companies and producers, to allow the emergence of adequate solutions. In the MRR, the working conditions are hard, and the service providers do not deliver an efficient service and not certainly, cost attractive. As the working conditions are not similar in all the plots, it is not easy to manage human resources in an efficient way, not only for the producers but also for the service providers. However, these companies could be more professional, with better prepared human resources, and producers could associate to minimize the labour issues generated by seasonality and the upper referred lack of manpower. **Training professionals** for the sector should result from a collaborative position between companies and training institutions in the establishment of curricula and on-the-job training. On another level, it is essential that viticultural experimentation is validated by the produced wines and although the result obtained in microvinifications does not completely correspond to that obtained on an industrial scale, it is a very important step for an institution to be able to propose a new method or new ways of working to the sector. **Policies to support awareness on the importance of associations**, especially among small producers. Economic benefits for companies, generated by cooperation between the various stakeholders, bringing new business opportunities, differentiation of existing products and resolution of problems faced by the sector. Policies to support the HORECA channel for a better provision of services, mainly in training, which is very deficient in the entire context of MRR. As a conclusion, the richness of landscape, terroirs, welcoming people and great wines make this MRR one of the most beautiful and attractive wine regions in the world. Although its particularities may make it difficult to innovate in technology and methods, great advances are being implemented which have allowed for good environmental practices, increased resilience and sustainable tourism to be implemented without losing its unique features.

Man's work in this landscape of rare beauty made the settlement of populations possible, and resulted in an evolutionary and living reality, proof of the past and a driving force for the future, strongly anchored in the optimization of natural and human resources and in the preservation of the environment.

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Reference

VINIDEAs, 2018. “Estudo para identificação de um número alargado de casos de sucesso de regiões produtoras de vinhos em altitude, espumantes, castanha e amêndoa”.
VINIDEAs, 2019. “Estudo e análise de casos de sucesso selecionados”.

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Southern Romanian Carpathian mountains: Certified Ecotourism

Mark Redman and Alina Alexa

Summary

The Piatra Craiului National Park is a high-quality tourist destination which is widely considered as one of the "jewels in the crown" of the Southern Romanian Carpathians. Unfortunately, the National Park and surrounding area is under pressure from growing visitor numbers and inappropriate patterns of development and there is an urgent need to develop more sustainable, lower impact forms of tourism whilst also maintaining the valuable income provided for the local community. Ecotourism is very well-suited to the sustainable development of the local economy of the park and the Zărneşti – Piatra Craiului region is one of 10 'eco-destinations' promoted by the Association of Ecotourism in Romania (AER). However, certified ecotourism cannot exist in isolation, it must be integrated into in the strategic planning of rural / mountain tourism development at local, regional and national level.

Figure 20: Piatra Craiului National Park, Romania
Source: Association of Ecotourism Romania

Key Policy Messages

- ☞ Ecotourism is well-suited to the sustainable development of local economies in the mountain areas of Romania
- ☞ Certification is essential for maintaining trust in the quality and integrity of ecotourism services
- ☞ However, certified ecotourism cannot exist in isolation, it needs to be to be embedded into the strategic planning of rural / mountain tourism development at local, regional and national level – which unfortunately still needs much improvement in Romania!

This policy brief relates to the need to embed the principles and practice of ecotourism into local, regional and/or national strategies for sustainable tourism development. This is a key issue for popular tourist destinations in the Southern Romanian Carpathians and more widely for other mountain areas at risk from the negative impacts of tourism.

The Piatra Craiului National Park is a high-quality tourist destination which is widely considered as one of the "jewels in the crown" of the Southern 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, but it is also a fragile landscape and vulnerable ecosystem that is under growing pressure. The National Park is only accessible by gravel roads and hiking trails but attracts over 110,000 visitors per year and this is putting increasing pressure upon the local environment, including inappropriate "spill-over development" from the neighbouring villages of Bran and

Moeciu (see below). These pressures are likely to increase and there is an urgent need to develop more sustainable, lower impact 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.

Ecotourism for sustainable local development

Ecotourism is a form of tourism where the main motivation of the tourist is to observe and enjoy both nature and the traditional local customs regarding nature. This is a well-established concept in the international tourist market and has been very effectively adapted to the Romanian context by the Association of Ecotourism in Romania (AER). Ecotourism is well-suited to the sustainable development of the local economy of the Piata Craiului National Park. The Zărneşti – Piatra Craiului region is one of 10 'eco-destinations' promoted by AER (under the 'Discover ECO-ROMANIA' brand) with a range of ecotourism services that are offered locally in partnership with the National Park Authority and local businesses that have certified by AER. These services 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 / low impact accommodation. AER operates an Ecotourism Certification System according to clearly defined international principles and a set of verifiable standards adapted to the Romanian context. This certification system is considered essential for maintaining trust in the quality and integrity of ecotourism services in Romania.

Barriers and opportunities

However, ecotourism is not the only form of tourism encountered in the Southern Romanian Carpathians. Mountain / rural tourism in the region 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. The neighbouring villages of Bran and Moeciu especially have been one of several 'hotspots' for mountain tourism in Romania for many years and are typical of the low- to mid-range tourism experience offered in many regions catering primarily for the Romanian market with some international visitors. Bran, for example, sits in a beautiful mountain landscape and is internationally famous for its supposed 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 very popular local tourist attraction. Bran is an easily accessible village with relatively good infrastructure and 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). 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.

The traditional rural identity of the area has been increasingly eroded by an 'urban-type' over-development which increasingly discourages more discerning foreign visitors whilst continuing to appeal to the domestic visitor. A major challenge now is how to manage continued development without risk of negative impact upon its valuable assets.

Policy relevant considerations

Tourism is both a blessing and a curse for the Southern Romanian Carpathian mountains – it is hugely important for local economic development, but if the current pattern of tourism development continues it is at risk of impacting negatively on the quality of the natural assets upon which it depends. Significant improvements in the strategic planning of tourism development are needed at local, regional and national level. Organisations such as the National Association for Rural Tourism, Ecology and Culture (ANTREC) which was originally set-up to channel EU pre-accession funds into the rural tourism sector now need a substantial overhaul to update their vision, objectives and activities. A high-level strategy with a new brand image for rural and mountain tourism in Romania needs to be developed and administered that takes account of the considerable diversification of the market in recent years and the need now to balance the contribution of tourism to economic development with its immense importance for the resilience and sustainability of the mountain regions.

Certified ecotourism is a key component of the strategic planning and management of rural / mountain tourism at all levels – and needs to be actively promoted as such.

Acknowledgements

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References

Piatra Craiului National Park Authority: https://www.pcrai.ro/
The Association of Ecotourism in Romania (AER): https://asociatiaaer.ro/en/
Zărneşti – Piatra Craiului Eco Destination: https://www.eco-romania.ro/en/eco-destinations/zarnesti-piatra-craiului/

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Dinaric Alps: Sjenica lamb PDO

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Summary

Sjenica sheep, autochthonous breed of Sjenica/Pester plateau is well adopted breed for harsh climate conditions of the region. It is characterized by quality meat, good milk yields and fine wool. Production of Sjenica lamb meat (PDO) is traditional, and it is one of the key VCs, interconnected with other high quality product VCs – Sjenica cheese and stelja, both PDOs. Sjenica lamb VC is deeply rooted in the tradition of the region, due to different social, economic, and natural aspects. Multi-cultural and multi-national community of Sjenica (ethnic Muslim/Bosniaks and Orthodox Serbs/Montenegrins) prevailingly live from agriculture (around 55%), namely from sheep and cattle breeding. Sheep are grazed on natural pastures, using traditional seasonal "katun" grazing (herds are in the mountains, with family members as shepherds). Parts of the Pester plateau where sheep are grazed belong to the Ramsar protected area.

As already being very important economic activity, production of Sjenica lamb has a potential to be the driver and bring Sjenica to the international map of high-quality products. Still, many aspects bring vulnerability to this production – from endangered natural resources to high migrations and delicate political situation, and centralized national policies, not adequate for this specific region.

Figure 21: Picture of Sjenica/Pester landscape with natural pastures and partial forests.

Key Policy Messages

- ☞ Sjenica lamb meat (PDO) is the main potential for regional development
- ☞ Co-creating policies and better living conditions with and for young people of the region is crucial for its survival
- ☞ Reaching sustainability of natural resources while developing Sjenica lamb value chain should be a long-term goal
- ☞ Relevant actors from the local and regional level to be involved in co-development of important policies at national level, taking in consideration specificity of Sjenica and Pester plateau area

The MRR (Dinaric Alps/ Western Serbia) belongs to the Dinarides (Dinaric Alps), a great mountain range of South-eastern Europe, with an area of approximately 100,000 km2 naturally connecting eight countries: Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, Serbia, Kosovo*, Albania and North Macedonia. The area of MRR presented here (Sumadija and Western Serbia) belongs to Western Serbia, more precisely to the area from the river of Drina on the west to the West Morava on the south, bordering with Montenegro, Kosovo* and North Macedonia. The area includes some of the most beautiful and wild mountains in Serbia, like Tara, Zlatar and Golija, as well as highland areas of severe beauty like Sjenica and Pester plateau (LAU area). Numerous karst relief forms characterise these areas, representing habitat for diverse flora and fauna, out of which many are endangered and protected species.

There are several Natural protected areas in the MRR, including Special Nature Reserve Pestersko polje (plateau), the largest and highest karst field of the Balkan Peninsula. This site is included into Ramsar site in 2006. The site originated as a lake, which vanished due to the karst erosion. This process left peat bogs and small flooded areas exposed, creating a diverse landscape. Peatlands are a rare and endangered habitat in Serbia, and the Site features several of them, including the biggest one in the country.

Sjenica/Pester Plateau is a multi-cultural and multi-national area, comprised of Serbian orthodox and Muslim Bosniaks. Even the area is rural and underdeveloped comparing to the rest of the country, population is young and there is a positive natural increase. Families are multi-generational, often with several families of different generation living in the same household (family “cooperative communities). Prevailing economic activity is agriculture, accenting on livestock production (cattle and sheep).

Natural environment, nomadic/free range livestock systems and grazing on natural pastures with many medical herbs give high quality meat and milk. There are several PDO products protected from the area, including the Sjenica lamb meat, PDO selected as the VC to be studied.

The area is known for its extreme winter temperatures (up to -40°C), while summers are with pleasant temperatures. In last couple of years, the area became more popular as a touristic destination, especially for nature based tourism, hiking, cycling, etc.

Lack of infrastructure (especially absence of regional waste management sites), uncontrolled exploitation of peat, uncontrolled illegal construction, and water supply problems are becoming significant threat to this area of a high natural value.

Tradition and quality in search for global recognition

Sjenica lamb is a PDO (fresh lamb meat) coming from **Sjenica sheep**, a local autochthonous breed. This sheep is known at local, regional and international markets for its high quality meat. In addition to the quality meat, these sheep give good quality milk that is mostly processed into white sheep cheese in brine (also a PDO Sjenica cheese). The third product protected as PDO is Sjenica stelja (dried sheep meat / specific as drying the whole animal), specific for a cross border region too (Montenegro and Bosnia and Herzegovina). Wool is of a good quality, usually only used by local women making handcrafts and knitting. There were attempts to develop market for wool from Sjenica and Pester, but these attempts were not very successful.Sjenica sheep is highly resilient to the harsh weather conditions of Sjenica and Pester plateau.

Livestock husbandry is the main agricultural activity in the area of Pester plateau. In 2020 there were about 30.000 sheep in Sjenica municipality, but this number is declining. It varies from year to year, depending on the prices and sources/supply of food (hay and fodder for winter). Sheep farms are owned by farmers and registered as agriculture households. There are a couple of meat processing units (companies) and small dairies in the area of Pester plateau and Sjenica.

Pester plateau is rich in natural pastures with different specific and medical herbs, where sheep are grazed. This results in high quality sheep meat, as well as sheep milk. Sjenica lamb meat production is the main VC, having male sheep solely sold for meat, mostly as live animals to the middleman or local slaughterhouses. Female sheep are kept for breeding, as well as for milk production. As a part of the production systems, the three PDOs afore mentioned are products from the same sheep farms – Sjenica lamb, Sjenica stelja (dried deboned sheep) and Sjenica sheep cheese. These VC are interlinked and should be analysed as interconnected value chains.

Due to the prevailing livestock production, cattle breeding, beef meat production and processing of mixed cheese (cow and sheep mixed cheese) can also be closely interconnected with Sjenica sheep meat VC. There are a few processing companies and slaughterhouses in the area with capacities not big enough to buy and process all sheep. Middlemen still make an important link to the markets (domestic and international), leaving livestock farmers in a very vulnerable and passive position, as they are fully dependant on these channels and intermediaries

On-farm processing is traditional. Products are mostly sold on local and regional markets (South Serbia, Kosovo* and Montenegro), while there is a rising interest for export that used to be very prominent. There are new policies on the national level that can make more possible for small households to register their processing units and be active as market players. Due to the local habits and demand, processing companies has Halal certification, creating additional advantage in aiming markets and customers with specific request for this standard (Turkey, Middle East, UAE, etc.). Small share of fresh meat is sold through registered processing establishments, mostly to large retail chains and butcher shops.

Value chain contribution to sustainability and resilience of the MMR (barriers and opportunities)

Tradition is strongly rooted in all elements of the Sjenica sheep VC organisation and production. Due to the climatic conditions, sheep livestock production is a perfect match to maximize economic opportunities, providing the good governance systems work towards its full sustainability and maintaining the production. The images of vast natural and pristine pastures, meat and dairy high-quality products produced there, are transformed into market reputation and later protected designations of origin. These factors have been driving the demand. However, many elements are necessary to sustain such production and reduce risks ad vulnerabilities.

The Sjenica sheep production depends on supply of green feed in the short summer season. Robust and less demanding, this sheep is also a good choice for the fragile but rich pastures and meadows, and its management is crucial to secure enough supply of food. Also, water management is one of the key elements for maintaining production, while observing changes in precipitation and water supply for the flock. Outmigration and maintaining social and family structures that enable year-round production either through large family cooperatives or other ways of sustaining labour force represent a key pillar. The dairy production is part of the gender job division and female labour involvement is in decline. Strong dependence on middleman and

lack of access to end market, leave farmers with little margin, and VC organisation that exposes them to market risks. There is little formalisation and cooperation established, so that the external actors continue to have the upper hand.

Rural infrastructure needs improvement of living conditions in the summer farms (katun) where majority of production is done, and enabling improvement of food safety standards and regimes.

Practically no diversification within the livestock production and little linkages with rural tourism and outdoor activities leave this to opportunities not yet explored.

Policy relevant considerations

Further innovation and investment along the VC are needed to capture added value in the region. The possibilities for labelling meat and milk products by origin or quality are not used, as most products are finalized elsewhere and there are small capacity of local facilities and knowledge on such opportunities. The effort to formalize production to be able to differentiate and access other markets either retail, HoReCa, etc., and to inform on the properties of products, is needed.

Overall local development measures that would support infrastructure and production investment need improvement, coupled with space planning and usage that would further recognize such production as valuable despite its extensiveness and keep the space to the nature and agriculture, but also acknowledge vulnerabilities to the management and extensive use of resources and climate change.

Acknowledgements

Esad Hodzic, Director of Regional Centre for agriculture and rural development Sjenica.

Reference

- *Sjenica Development Plan 2020-2028, Municipality of Sjenica*
- *Center for preservation of indigenous breeds*
- *www.dinarskogorje.com*
- *Network of Protected Areas of Dinarides www.parkdinarides.org*
- *Ramsar areas Serbia, Institute for Nature Conservation Republic of Serbia https://www.zzps.rs/wp/ramsarska/?lang=en&script=lat*

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Slovak Carpathian Mountains: Bio-honey

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Summary

Bees present a crucial part of the environment as plant pollinators, and their disappearance would significantly endanger food production and consequently human health. Moreover, bees produce honey, which has been demanded since ever also for human consumption. Regarding the increasing demand of consumers for healthy food products, bio-honey is highly valued on the market.
In the Slovak Carpathian Mountains, bio-honey production is a new niche that involves innovative thinking and practices. Beekeeping, however, also faces challenges resulting from climate change and other changes in the landscape. It may be interesting to learn about this value chain for the MOVING project and help find solutions for increasing the resilience of bee colonies in mountain areas. Vice versa, the project may help improve a network between stakeholders who have been involved in this value chain.

Figure 22: Slovak Carpathian Mountains

Key Policy Messages

- ☞ Support ecological systems and practices
- ☞ Systematic (territorial) approach
- ☞ Collaborative governance

The MRR (Slovak Carpathians) is a part of the Carpathian region, which is the second most extensive mountain system in Europe besides the Alps. Like other mountain areas, the Carpathians in Slovakia form a living environment for unique wildlife with vital biodiversity, important freshwater sources, and human culture. Simultaneously these areas are threatened by a variety of natural and human impacts.

Agriculture and forestry have an essential effect on the landscape and biodiversity of this region. However, over the last decades, crop and livestock production has been declining, and abandoned cropland lies fallow. Pastures in the Carpathians are especially vulnerable through the combined impacts of climate change and socio-economic dynamics. Forests cover a significant part of Slovak Carpathians and are vulnerable to drought and windstorms, triggering pest outbreaks. In this region, drought-induced forest decline can be expected to increase in the future, affecting adversely wood production, biodiversity, and other ecosystem services.

Several value chains relate to the Slovak mountains, including agricultural products such as cheese and meat, forest wood and non-wood products, medicinal herbs, horse breeding, and beekeeping. From the non-production economic activities, tourism and recreation are vital in the region. Apart from the popular active winter tourism, other types of recreational activities report an increasing demand all year round.

Bio-honey – a sweet challenge

Bio honey production is a new niche in the Slovak mountains that follows many innovations. Comparing to lowlands, the honey in the mountains gets higher quality due to the lack of intensive agriculture and more forests and meadows. Apart from a clean environment, bio honey production requires manual bee panels preparation from local resources, bees winter feeding by their honey, and natural medicines for bees instead of the conventional ones. These conditions result in lower honey yields than conventional production and make bio honey relatively expensive and rare. All these specificities simultaneously bring less invasive practices of honey production and higher quality of bee products. One of the specificities in the Slovak mountains is honeydew honey, which is rare and demanded. Its exclusivity allows the higher price of this honey on the market.

However, there are also high risks because its production depends on many factors. There is no fixed time in a year when this honey is produced. It requires mild climatic conditions, without too high temperatures, drought but also without too much precipitation. These conditions are met on average once in five years. Currently, honeydew honey and other kinds of honey in the Slovak mountains face challenges with bears simply because they find honey as tasty as people and try to get to this delicious product from beehives. Another critical challenge for beekeepers nowadays is to maintain bee colonies healthy. In this regard, the year-round monitoring and treatment of bee colonies from parasites that transmit other viruses are essential. Bee colonies without parasites in Slovakia practically do not exist. The positive aspect in Slovakia is that antibiotic medicine is prohibited in beekeeping, and there are numerous bio-methods to eliminate parasites from bee colonies.

Value chain contribution to sustainability and resilience of the MMR (barriers and opportunities)

Bees present a crucial part of the environment as plant pollinators, and their disappearance would significantly endanger food production and consequently human health. Moreover, bees produce honey as their food supply for the winter. This product is since ever also been demanded by humans for their consumption. A healthy landscape for bees means a territory with clean water and rich diversity of autochthonous plants, flowering in different periods of vegetation time and not being chemically treated. However, a healthy, diversified landscape with clean water is not a matter of course nowadays. On the global scale the agriculture and forestry lead towards monocultural crops and forests. Additionally, the increasing use of pesticides inevitably influences water quality. These changes cause a decrease in bee nutritional diversity, negatively impact their immune system, and decrease their ability to resist diseases, such as parasites and viruses.

Moreover, the honey containing residuals of pesticides has lower quality and consequently is losing its reputation as a clean natural product, causing dramatic price decrease. Climate change causes irregular temperature fluctuation, which disrupts the natural annual cycle of bees. Additionally, increasing temperature and drought cause higher weaknesses of bee colonies for diseases.

Policy relevant considerations

Occurring changes at environmental and social dimensions bring new challenges to beekeeping and require new approaches and practices beekeepers need to adopt if they want to succeed. One of the urgently required necessities is the systematic (territorial) approach to beekeeping practice and healing bee colonies. Similarly, to farmers, honey production is also dependent on weather conditions, and not all years are equal in honey production. The new policies should consider the fundamental interconnectedness between the health of bees, landscapes, and humans. In this regard, the new policies should insist on diversified and unpolluted crops, pastures and meadows, and forests with rich undergrowth for bee pasture. A good collaboration between farmers, foresters, and beekeepers to achieve accessible and diversified fields for bees would be helpful at the local level. For this goal, education of all involved actors about bees' importance is needed.

The new policies should also be aware that small-scale beekeeping has several positive aspects for both ecology and society. It can, in practice, better adapt to an ecological way of beekeeping, can also contribute to more evenly distributed bee colonies across a territory, and can be favourable also for the cultural ecosystem services, such as increase of public awareness about the bees' importance, by activities involved in agrotourism, bee-farm educational visits, workshops and so on.

Up to date, bio honey production represents a very moderate proportion of honey production in Slovakia. It may be interesting to learn about this innovative niche in the Slovak mountains for the MOVING project. Vice versa, the project may help improve a network between stakeholders who have been involved in this value chain.

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Betic System: Organic Olive Oil

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Summary

The olive tree is a crop with a long tradition in Andalusia. It has a notable presence in the mountainous areas of the interior of the provinces of Jaén and Córdoba. The characteristic traditional management of these crops, with steep slopes and high varietal diversity, has seen in recent decades how organic and origin schemes certifications attempt to compensate for the high production costs and inherent management difficulties with their valorisation measures.

Betic Systems have seen a constant increase in the production of olive oil certified as organic over the last two decades.

Together with others that may be tried, both strategies can alleviate the risks of abandonment of crops in mountain areas with steeper slopes and mechanization difficulties. They can contribute to the development of more sustainable agricultural policies and the fight against climate change.

Figure 23: Pigs grazing and eating acorns in the dehesa of Los Pedroches (Sierra Morena)

Key Policy Messages

- Organic production
- Land abandonment and sustainability loss
- Depopulation and social crisis
- Rural tradition
- Landscape territorial identity
- Common Agriculture Policy

The Betic mountain ranges are one of the main relief groups in Spain. They extend for more than 600 km along the south-southeast of the Iberian Peninsula, subdivided into the Prebetic, Subbetic, and Penibetic mountain ranges. The south of Cordoba is a geographically and geomorphologically representative unit of the Cordilleras Béticas. Cordoba is one of the provinces with the largest area of mountain olive groves. The Organic Mountain Olive Oil Value Chain encompasses a wide range of interlinked activities and functions, from the cultivation of olive trees and the tasks associated with the production of olives, their processing into olive oil, distribution, and marketing to the final consumer. Other associated charges are related to the maintenance of the soil, biodiversity, and landscape. Different by-products obtained throughout the value chain give rise to new products in compost or energy.

Spain ranks first in Europe in terms of organic farming (2018), while Andalusia represents 45.6% of the total area under organic agriculture in Spain. The national area dedicated to organic olive groves is 209,288 hectares (in 2019, showing an increase of 4.57% over the previous year), 9,760.9 hectares of which in Andalusia. We can say that the south of the province of Cordoba, where the Sierras Subbéticas Cordobesas Natural Park is located, contributes a significant part of the province's organic olive groves. The three municipalities selected for the VC analysis occupy the centre of the mountain spur. Carcabuey and Priego de Córdoba are part of the Priego

de Córdoba Olive Oil Designation of Origin, while Zuheros is included in the Baena Olive Oil Designation of Origin. The organic cultivation of olive groves is combined with the traditional system features, sometimes with difficulties of accessibility and mechanisation. Mountain olive groves have a notable presence in these municipalities, distributed on steep slopes and at altitudes of between 400 and 1000 metres. The effects of climate change, significantly associated with reduced rainfall and temperature changes, together with the problematic management of traditional mountain olive groves, are sometimes provoking the abandonment of crops, and in other cases, the plowing and shift from the traditional management systems, with the loss of biodiversity of local varieties and other environmental impacts.

Mountain olive groves, between survival and ecological regeneration

Olive growing, alone or in association with other crops, has been an important economic activity in the Betic mountain ranges in recent centuries. In the last years, the organic mountain olive oil sector has grown notably in terms of certified production. It generates a qualification of organic olive oils representing an added value in the market. In the processing sector, the three municipalities offer contrasts. Other synergies are taking place as new products are being developed based on collaboration between different sub-sectors.

The three municipalities have a high potential to take advantage of the mountain's attractiveness as a complementary value for developing sporting, cultural and gastronomic activities. This is also associated with the high number of local varieties of olives, which contributes to the production of olive oil with very particular sensory characteristics. The cultivation of mountain olive groves is also associated to a great extent with the abandonment of plots at higher altitudes for extensive sheep and goat farming. This abandonment also contributes to a decline in the pressure of cultivated land. The result is that the natural environment finds optimal conditions for the recovery of habitats adapted to the flora and fauna conditions typical of this mid-mountain area.

Despite this, in socio-economic terms, competitiveness of traditional mountain olive groves is under serious threat. Outstanding challenges related to this VC are linked to the achievement of: 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.

Value chain contribution to sustainability and resilience of the MRR (barriers and opportunities)

The challenge of keeping the mountain olive grove alive lies in the non-productive functions carried out by this crop. Thanks to this, it contributes to shaping the high landscape and heritage value areas and maintaining the vitality of rural areas by creating employment and being a source of economic wealth for farmers who manage more than 200,000 ha. in Andalusia. On the other

hand, mountain olive groves generate environmental public goods by maintaining biodiversity, slowing erosion, reducing water pollution, or being relevant to climate change mitigation or fire prevention. At the same time, in the context of the search for alternative solutions to the survival of this low-yield olive grove, organic production is proving to be an interesting option to consider. On the one hand, because of the price differential between organic and conventional oil. On the other hand, because the management of organically produced olive groves is better adapted to the conservation of the environment and aims to increase the supply of public goods by agriculture. In particular, the Sierras Subbéticas olive grove is an element that contributes to defining the identity of a unique landscape, as reflected in its inclusion in the nomination for inscription on the UNESCO World Heritage List.

The Sierras Subbéticas Cordobesas Natural Park and UNESCO Geopark agriculture and livestock 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, mark a trend to which only an innovative process can provide resilience against climate change and other actual critical risks.

Policy relevant considerations

The organic olive farming can contribute to the conservation of mountain ecosystems, protecting soils, biodiversity and generating social, cultural 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. Rural development support schemes from the European Agricultural Fund for Rural Development (EAFRD), articulated in Andalusia through the Rural Development Programme 2014-2020, include two measures aimed at supporting organically oriented mountain farming in olive groves as well as encouraging the conversion and maintenance of organic olive grove practices. The survival of the traditional European olive grove requires urgent conversion for agronomic and ecological reasons. The European Agricultural Policy has an important role to play in this respect, as does national and regional policy, which in Andalusia includes a Master Plan for olive groves.

Different accompanying measures (training, research, etc.) have been tested in this regard, but it is undoubtedly the implementation of the support measures or incentives derived from the CAP that represents the most coherent alternative. Anticipating and monitoring their impact, as well as experimenting with other policy initiatives are some of the tasks guiding this reconversion. At the same time, analysing how the sector itself and the territory can become involved with positive responses is essential too. The relevance of the proposed case is thus linked to the integrated European approach that recognises the importance of mountain olive groves in many areas of southern Europe. Sanz-Pagés, A., Estévez-

Reference

María, M., & Manrique-Gordillo, T. (2021). Identificación de necesidades tecnológicas en los procesos productivos de la agroindustria del cerdo ibérico. *Revista Española de Estudios Agrosociales y Pesqueros*, *257*, 33–60.

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Sierra Morena: Iberian Ham PDO – Los Pedroches

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Summary

Iberian pigs' breeding has historically characterized the social-ecological system of *dehesa* in Sierra Morena. *Dehesa* is an accurate representation of a domesticated Mediterranean forest, providing pastures and acorns for the pigs and other types of livestock. *Dehesa* is also the scenario for other value chains like livestock rearing, cork extraction, and more recently, sky observation by astronomic tourism. In addition, *dehesa* produces other ecosystem services such as recreation, water harvesting and climate change mitigation, not highly valued yet. The cultural, social, and ecological values of the region highly depend on these landscapes that are firmly embedded in the daily life of the villages and towns of the territory.

A more in-depth study is needed for the analysis of the threats faced by this sector that will have a decisive impact on the sustainability of the socio-ecosystem.

Figure 24: Pigs grazing and eating acorns in the dehesa of Los Pedroches (Sierra Morena)

Key Policy Messages

- ☞ Territorial identity
- ☞ Uniqueness of the landscape
- ☞ Differentiation
- ☞ Collaborative governance

The MRR (Sierra Morena) locates in the south of Spain and separates the central plateau from the Guadalquivir valley. It extends through four Andalusian provinces, giving them a specific landscape identity. *Dehesa* represents one of the main bio-cultural landscapes of Sierra Morena. The *dehesa/montado* of Spain/Portugal is a savannah-like pasture that is the result of prolonged human action that creates a multi-functional agrosilvopastoral system where agriculture, forestry and grazing are combined in a sustainable manner (Bélair et al., 2010). The main tree components are oaks, usually holm and cork.

Dehesa represents the connection between the cultural, natural, and social dimensions of the social-ecological system. From a cultural perspective, *dehesa* preserves different types of traditional knowledge and practices associated with cattle, sheep and pig grazing, fresh and cured meat, dairy and honey productions, cork extraction, and other products such as mushrooms or aromatic herbs. Additionally, other novel and innovative value chains such as astronomic tourism which takes place in these locations can be found. The area has been declared as Starlight Reserve due to the absence of light pollution.

The cultural impact of the *dehesa* goes far beyond. It shapes the daily lives of the people of the area, and it fosters community cohesion through *dehesa* related linguistic expressions, cooking recipes, and local and regional festivities. Considering all these unique socio-cultural and

biophysical interrelationships, we believe that the *dehesa* of Sierra Morena can work as a fundamental element to support resilience, socio-economic development, and sustainability of the territory.

Iberian Ham, the taste of dehesa

Our selected value chain to be analysed in-depth is Iberian ham. Acorn-fed Iberian ham is one the of profitable products of the *dehesa* system. Due to its healthy and organoleptic properties, nationally and internationally recognised, this value chain produces considerable economic benefits that influence the resilience of the social-ecological system where it is produced.

In Los Pedroches region, a cooperative with more than 60 years of tradition is the entity that brings together producers, entrepreneurs, researchers, and processors. In addition to the Iberian pig products, this cooperative also supplies other animal products, making it this way a key point of confluence of several stakeholders in the region. *Dehesa* has positive connotations, being associated with animal welfare, scenic landscape, sustainability, and collective identity. So, several products of the *dehesa* (including the Iberian ham) use this element as a marketing strategy to promote the quality of the product. Iberian PDO certification ensures a series of features related to the livestock loads on the farms and the pig's genetic breed. For the ham to be of optimum quality, it is also necessary for the pigs to be fed mainly on acorns and pasture during the winter season (before being slaughtered), while freely moving and exercising in the *dehesa*. If all these conditions are met, the product will be premium, and the ecosystem balance will also be maintained. However, *dehesa* faces problems related to its sustainability and the exploitation of its resources. Many of these problems have to do with the grazing intensity and other factors related to the climate change (droughts, diseases, increased temperatures, etc.)

Value chain contribution to sustainability and resilience of the MMR (barriers and opportunities)

Iberian ham production in the *dehesa* is a traditional activity, which has been developed over millennia. It has established a sustainable relationship between the conservation of the Mediterranean forest and the exploitation of its natural resources through a specific cultural practice rooted in the territory. It has fostered a collective identification with the environment from generation to generation. Iberian ham has so far played a key role in the resilience and sustainability of the *dehesa*. Its profitability has been key in keeping alive the related traditional practices and in grounding the population to the territory. However, at the same time, the profitability of Iberian ham has leaded to an increased grazing intensity in the region, which is now one of the key factors affecting the sustainability of this landscape.

Beside the overexploitation of the resources, *dehesa* is currently facing additional problems such as climate change, regeneration of its vegetation, and the lack of generational replacement. Moreover, a significant part of the Iberian ham production is still traditionally developed in family businesses with limited skills or resources to implement innovative approaches in the

management and processing of the hams. On one hand, this aspect contributes to the maintenance of the traditional practices; and on the other hand, it hinders the application of novel measures. Finally, the sector struggles to differentiate itself in the market and to compete in the same market niche with other industrialised products, and this blurs its specific characteristics regarding its sustainable production (Sanz-Pagés et al., 2021). Considering the great importance of the Iberian ham in the resilience of the region, it is worth analysing the future of this value chain, the key drivers that may affect it, and the policy recommendations that can guarantee a resilience and sustainable future of the region.

Policy relevant considerations

- The uniqueness of the *dehesa* landscape is not recognised by the European policies, mainly CAP.
- Limited incentives for generational replacement.
- Better regulations of the carrying capacity of farms to avoid land degradation and quality loss of the products.
- Family businesses with difficulties to modernize and innovate.
- Local traditional production with problems to be industrialized.
- Remote areas with lack of connectivity that prevent digitalization of the processes and procedures.

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Reference

Bélair C., Ichikawa K., Wong B.Y. L., and Mulongoy K.J. (Editors) (2010). Sustainable use of biological diversity in socio-ecological production landscapes. Background to the '*Satoyama* Initiative for the benefit of biodiversity and human well-being'. Secretariat of the Convention on Biological Diversity, Montreal. Technical Series no. 52, 184 pages.
Sanz-Pagés, A., Estévez-María, M., & Manrique-Gordillo, T. (2021). Identificación de necesidades tecnológicas en los procesos productivos de la agroindustria del cerdo ibérico. *Revista Española de Estudios Agrosociales y Pesqueros*, *257*, 33–60.

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Spanish Pyrenees: Intense and special wines production

Antonio Palacios, Alex Ascaso Sarasa

Summary

The wine is a intrinsic part of culture and gastronomy in Aragon (Spain), historically characterized the socio-territorial area of pre-Pyrenees. Wine, olive oil, almonds, cereals and pastures for sheep used to coexist along centuries, they are natural resources interwoven with local cultural traditions and linked to an area used to be a transit region from high Pyrenees to Zaragoza and the desert of Monegros in central Aragon.
The evolution of the region is expressed in the quality of the wines. Innovations impacted the winemaking, the choice and use of local varieties as well as the marketing strategies (new packaging, use of social networks, etc.). Obtained new wines managed to enter high-value market segments such as high-quality restaurants and the slow-sustainable tourism sector, linked to Slow Food movement. For this reason, the VC case is worthy to be analyzed as representative of the MRR.

Figure 25: Diploma to a wine from Ayerbe in 1857, the signature is of the Spanish Queen Isabel II

Key Policy Messages

- Cutural and traditional values
- Depopulation and social crisis
- Strong community interactions
- Typical food and recognised high quality stardards increase the touristic appealing of the area
- Lower tax burdens and improve digital and physical infrastructures
- Uptake of economic diversification opportunities

The “Somontano” or the pre-Pyrenees from Huesca are the mountains close to the Pyrenees, composed by 2 sub chains: external sierra and inner sierra. The analysed value chain is in the pre-Pyrenees (around Huesca) in a separate branch of the high Pyrenees. Edaphically, and topographically the pre-Pyrenees are a highly suggestive orographic complex, with deep valleys rich in water, where canyoning is practised. Adventure sports are practised in Sierra de Guara, in Riglos and in Murillo de Gállego. Loarre Castle XI century (best conserved Romanic castle in Europe).

Known since the Roman age for the extraction of copper and the Ebro River, which flows into the Gállego river, coming from Sabiñánigo in high Pyrenees. The mountain chain is very peculiar and an extraordinary region of natural and cultural heritage in the Mediterranean basin, with many geological and biological features of national and international interest thanks also to their natural heritage, rich in landscapes, environments, and naturalistic elements. This holds true not only for flora and fauna, which are rich in endemic species, but also for rocks, minerals, fossils, tectonic structures, superficial and hypogeal morphologies, which provide unusual, varied and widespread

elements of environmental value. One of the main problems of the region is the depopulation. The area has a high level of vulnerability caused by the abandonment, emigration, and climate change.

Wine between tradition and innovation

The vineyards and the winemaking have been cultivated for centuries for their economic importance, and for self-consumption, as wine is part of the Mediterranean diet and culture. The vineyards of the region are included in the I.G.P. Indicación Geográfica Protegida Ribera del Gállego/cincoVillas, (www.vinosdelatierradearagon.es), occupying around the 4% of the Aragon vineyards, which total over 30.000 has. Aragon owns a rich source of germplasm, and the plants of different varieties have a very old cultivation tradition. Wine making follows the tradition, but in the last thirty years some were applied in the vineyards and in wines processing, the marketing strategies (new packaging, use of social networks, etc) and in the value chain's governance. The community interaction is one of the main aspects that characterised the value chain.

Value chain contribution to sustainability and resilience of the MMR (barriers and opportunities)

The Wine production in pre-mountain areas is a traditional activity developed along centuries. It established a sustainable relationship between natural resources exploitation and the human communities needs and their culture. Hoya de Huesca, the door from Pyrenees, since Romans time, have therefore contributed to the management of forests and water basins essential for downstream activities and ecosystem services. The depopulation in XX century (1950-1980), due to the emigration towards industrialized areas, has disrupted the balance, favouring the depopulation with a consequent worsening of the relationship between man and nature in the rural environment. Vineyards are a clear example where traditional productions innovated for facing contemporary market, so allowing local population to stay in places where it is possible to develop a virtuous relationship between nature and man with both local and systemic economic and environmental advantages. It allowed the development of resilience initiatives, fit to face contemporary challenges (environmental, economic, etc.). The use of National and European funds offers an opportunity to develop and support such initiatives and to replicate best practices. At the same time, the complex procedures for accessing European funding and the need to identify elements of innovation in response to contemporary challenges are limiting factors, requiring skills that are often not present among the actors in the area. Local wines and foods with a traditional character or image are often perceived by consumers as of higher quality. This region has maintained ancient genotypes and traditional recipes of typical food specialities.

Nowadays, the combination of geographical origin and typical food is a useful tool to increase the touristic appeal of the area, if supported by acknowledged high quality standards. Information on the origin, intrinsic properties (e.g., nutritional value) and sensory traits can be conveniently explored as tools to be combined for communicating typical food quality. The value chain is a virtuous example of the combination of traditional and innovative productions for the

contemporary market, allowing the population to integrate agricultural incomes with other economics activities.

Policy relevant considerations

The valorisation and preservation of special varieties of grapes crosses the interests on different scales: at local level, it contributes to reducing negative trends (e.g., depopulation and loss of historical and cultural heritage); at regional and interregional level, the development and innovation of dairy and livestock farming practices can activate positive economic circuits (above all, farm experiential tourism). They involve several actors, terroirs, and sectors (such as rural and sustainable tourism linked to enological routes). Understanding the virtuous relationship between economic activities and the socio-ecological system is relevant for resilience and sustainability strategies at a broader level.

Policies should support territories that present the elements mentioned above. They can reduce negative trends (depopulation, ageing, degradation due to the lack of care for the forest, historical and cultural heritage, etc.) and supporting current (social and technological) innovation processes. A lower tax burden for the residents and improved infrastructures, such as access to digital (broadband, 5G) and physical (roads, railways) infrastructures are essential aspects to be considered together with access to services (health, education, etc.). The analysis of the VC allows to understand how socio-cultural and environmental elements can be used to improve the sustainability and resilience of human communities to face challenges like climate change. Policies should also improve the innovation processes of winegrowers by fostering the uptake of technical innovations and economic diversification opportunities such as enotourism, rural tourism, energy production, ecosystem services. According with the outcomes of a focus group with local policymakers, population ageing, social and economic needs, and land fragmentation resulted as the most important negative driving forces for the conservation of the environment landscape.

Reference

Land Use and Land Cover Change After Agricultural Abandonment Authors: Poyatos, Rafael, Latron, Jérôme, and Llorens, Pilar Source: Mountain Research and Development, 23(4) : 362-368 Published By: International Mountain Society

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Swiss Alps: Mountain grain

Anna Geiser, Isabel Jaisli, Emilia Schmitt

Summary

The mountain grain value chain in the canton of Grisons in the Swiss Alps is characterized by difficult growing conditions and innovative producers. Here we present the challenges of grain cultivation on steep slopes and how strengthening actor networks along the value chain could potentially improve resilience to climate change and emigration.
The main issues policy will have to address are related to infrastructure investments and facilitation of niche opportunities for innovative products.

Key Policy Messages

- ☞ Provide opportunities for niche products to enter the market.
- ☞ Networks provide opportunities for development and foster innovation.
- ☞ Infrastructure is lacking despite high demand in the value chain and from the market.

The Grisons Alps – ranging from around 200 to over 4000 m.a.s.l. – form the entire south-eastern part of the Swiss Alps and have several borders with other cantons and foreign countries, such as Val Poschiavo on the Italian border and Prättigau on the Austrian border. They also provide an important traffic route connecting southern Germany with Northern Italy. Grisons is both the biggest canton of Switzerland and the one with the lowest population density with around 28 people per km2. The most important economic sectors are energy production (mainly water), tourism, secondary industry, and agriculture (BFS, 2021). The Swiss federal government's New Regional Policy (NRP) identifies 15 "low-potential areas" in Grisons, i.e., these areas show a negative employment and value generating development, an unfavourable development of the age structure (e.g. emigration), a reduction of basic services (e.g. schools, shops, medical infrastructure) and unfavourable financial ratios at the municipal level (see Cavelti and Kopainsky, 2006).

For the permanent settlement of some valley communes, mountain farming is essential. However, farming in the Grisons Alps is demanding: In the higher regions, growing seasons are up to two months shorter than in the valleys and yields are comparatively low. Poor accessibility is a challenge, and some farmers cultivate land with slopes of 50 degrees or more, which requires special equipment and infrastructure as well as a lot of manual labour. Nevertheless, agriculture has a long tradition in the Grisons Alps and plays a major role in forming the typical Swiss landscape. Around 5% of the canton's population is involved in agriculture and forestry, which allows for the cultivation of grapes and chestnuts in the south, alpine farming in the highest mountains (mostly ruminants) and the cultivation of all kinds of arable crops in the northern Rhine valley (BFS, 2021).

In Switzerland there is a complex system of subsidies and direct payments for the agricultural sector which strongly directs agricultural production. This financial support is linked to a cadastre of 7 agricultural zones, which are classified based on climate, accessibility, and slope. For our MRR, we will examine specifically the higher mountain zones (Mountain Zone II – IV, without the summering zones; see figure 26).

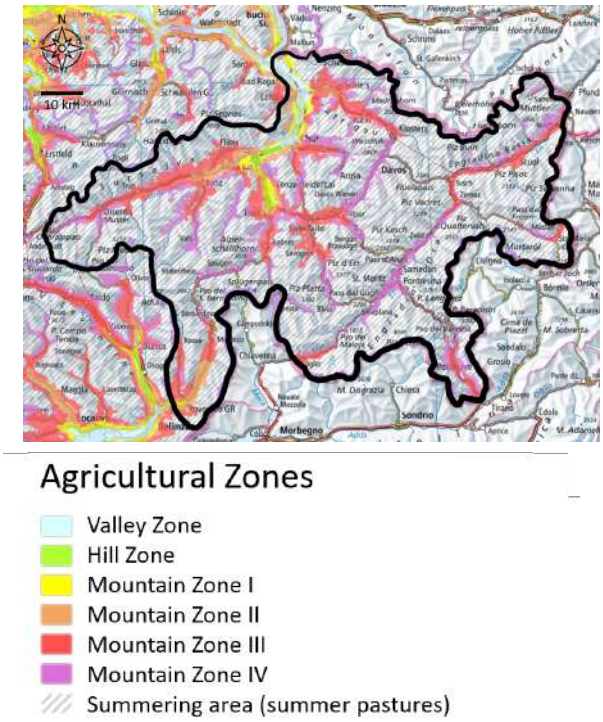

Figure 26: Distributions of agricultural zones in the canton of Grisons, source: Swisstopo, 2021, own

The challenges faced by agricultural producers in mountain areas have led to special support to agriculture in mountain areas by the federal government. This includes higher contributions for the construction of agricultural infrastructure, higher subsidies for keeping animals in difficult terrain and slope contributions. As farming in Grisons is often located in the higher mountain zones, Grison's farmers receive a higher share of income from subsidies compared to other farmers in Switzerland. In addition, due to the terrain, the land is mainly managed extensively. In fact, Grisons is the canton with the highest number of organic farms in Switzerland per canton with 65% of farms producing organically (see BFS, 2021).

Agricultural production in the mountain zones is dominated by ruminant keeping, as large areas of land are only suitable for grass cultivation. However, one-sided business models (like a focus on livestock) are increasingly becoming risky, as the climate changes and e.g., dry years – by no means a rarity anymore – lead to heavy losses in hay yields.

Mountain-grains rediscovered

While animal-based agriculture is the predominant production system, the value chain for grains in the mountain area of Grisons is an example of traditional forms of farming practice at high altitudes, mixed with innovative approaches of new production methods and marketing.

In mountain areas 2 and 3, grain production declined by almost 70% between 1999 and 2006 (see figure 2 and Bardsley and Bardsley, 2014). The reasons are mainly financial, as mountain grains are of high quality, but the labour input is immense and the yield rather meagre. Recently, however, grain cultivation has been rediscovered somewhat, mainly thanks to the founding of the "GranAlpin" cooperative, which unites mountain grain farmers and helps Grison's grain stand out from the rest of the market (Schilperoord, 2014).

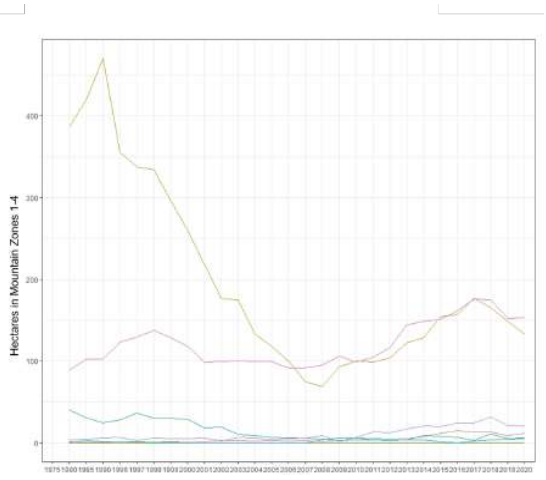

Figure 27: Grain Production in the Mountain Zones of the canton of Grisons (in ha). Source: Own graph based on BFS 2021

Grison's mountain grain is grown almost exclusively organically and differs from grain from lower altitudes because of its later ripening time. It is also claimed that the higher position of the sun and the resulting more intense sun exposure helps the grain to store more solar energy, making it more nutritious and sweeter. Grain cultivation provides additional income to farming families, increases their economic independence and reduces the risk of a one-sided focus on livestock. By using diversified and adapted grain varieties, farmers enable versatile and ecological mountain farming, which ultimately leads to better fertiliser management and more sustainable care of fields and meadows. The main grains grown in the MRR are wheat, spelt, rye, barley, oats, and millet. Also of importance are some pseudo-grains or grain relatives such as buckwheat, maize, and hemp (see Schilperoord, 2017). There are around 90-100 grain farmers in the mountain areas concerned who produce mainly for GranAlpin. As soon as they can harvest their grain, it is transported to GranAlpin's warehouses, the main one located in Landquart in the Rhine Valley. In these warehouses (grain silos) the grain is stored, packed and distributed according to current demand. Some of the grain is then delivered to mills - both in the region and outside the canton - or directly to end producers such as breweries. The mills then produce and package either whole grains, flours, or flakes, which requires a lot of manual labour due to the characteristics of some grain types and the small quantities. In cooperation with local bakeries and dairies, breads and pasta are also produced. The finished products are then delivered to larger distributors (supermarkets) or smaller shops (e.g. on farm) for direct sales.

Value chain contribution to sustainability and resilience of the MRR (barriers and opportunities)

As described in the first chapter, the challenges facing the MRR are related to both social factors and the natural environment (see also Moschitz and Oehen, 2020). The social factors include declining employment opportunities, low level of value creation and the development of an uneven age structure, leading to young people migrating to other parts of the country. In addition, there is an unfavourable financial situation of the political municipalities, which leads to a neglect of basic service infrastructures.

Figure 28: Malting barley and wheat harvest in Tartar (around 990masl), source: still from Cuci-Hof, 2020.

As far as the natural environment is concerned, the challenging topography of the terrain is a major problem (see figure 3), as well as climate change, which leads to more frequent dry periods during the growing season and a sharp decline in water availability in general, especially due to the melting of glaciers.

With this in mind, we aim to find ways for the MRR to produce alternative agricultural products that do not rely on livestock farming. The production of niche products or products where the market is not yet saturated can create significant additional value for MRR. This can be achieved, for example, by promoting innovative products.

Furthermore, it is well known that livestock farming is a major contributor to climate change. While alpine grassland-based livestock production is comparatively "sustainable", the demand for animal products is likely to decrease in the future, reducing the market for mountain farmers. Therefore, a plant-based alternative is in demand. Finally, it has become apparent that GranAlpin products (especially flour) are in great demand, as the trend in Switzerland is increasing towards local, artisanal, and organic products. The mountain grain value chain has great potential to increase value creation in the Grisons Alps, create jobs and thus reduce the emigration of young people. It also offers the chance to positively meet the threat of climate change by choosing the right grain varieties and profiting from warmer temperatures. However, there are several obstacles that we have been able to identify so far to achieving sustainable development of the MRR. The most important obstacles are economic. There is a lack of infrastructure along the growing value chain and investments are not possible either for financial reasons or, more often, because there is a lack of labour power, time and knowledge to plan the constructions.

One of the most pressing infrastructural problems is the low number of mills in the region. There are three small traditional mills in the MRR, but all are already reaching their production limits. In addition, the larger, more commercialised mills usually do not have the specialised equipment needed for some of the rarer grains, e.g., to produce traditional rolled barley. Another weakness is the low availability of grain collection points. In contrast to the grain farmers in the valleys and hills, the grain farmers in the mountains produce only comparatively small quantities of each variety. These all must be stored separately, so that the number of available silos is quickly exhausted. In addition, the grain collection points are owned by large companies with little interest in storing such small quantities. However, there are also obstacles that are more related to social factors, such as a lack of knowledge - or knowledge that is concentrated in a few people - and a lack of exchange between the relevant actors.

One example highlighting the problem of lack of knowledge is the choice of the right grain variety. In particular, the reintroduction of rye in Grisons has proved difficult because the old varieties have been lost and a more "commercial" variety has proved unsuitable. There have also been problems with the correct sequence of sowing, as much knowledge has been forgotten. Buckwheat has proved particularly successful as an intercrop and is also an important component of traditional Grison's pasta dishes (Schilperoord, 2017). While the GranAlpin cooperative coordinates and does administrative work, there is still little exchange of knowledge within the network of the mountain grains value chain and especially not with external partners. Finally, there are also natural obstacles. As already mentioned, the persistent dry periods are a problem. But almost more important are the constraints imposed by the nature of the landscape. Currently, the market demand for GranAlpin grain is greater than what can be produced. Some increase in production is still possible, but a limit will be reached where it is no longer viable to further increase production, as the right terrain is exploited to the maximum and the costs of labour and machinery become too high. We hope that with our value chain analysis we can show the importance and potential of this value chain for the region to put it on the political agenda and convince bigger players to support these mountain entrepreneurs. We believe that this value chain will also help to show how innovative projects can accelerate development and are often mixed with originally traditional approaches that are reinvented for current demands.

Policy relevant considerations

Although the analysis of the policy-relevant considerations is still in its infancy, the following observations can already be made. In Switzerland today, there are already many policy measures regulating agriculture, a large part of which are specifically targeted at mountain agriculture. Moreover, in the Alps in general and in the Canton of Grisons in particular, there are several regional development projects at different levels, all trying to contribute to a liveable future in the Grisons Alps. With the MOVING project we have the important opportunity to apply and analyse all these different projects and policy inputs in relation to a single value chain. This gives us the opportunity to make the following suggestions for policy considerations: The challenges facing the land use system, communities and subsequently economic development need to be addressed in a holistic way. How can innovation contribute to accelerating resilience development?

The MRR network of value chain actors, stakeholders, political and economic actors need to be made visible. Attention should be paid to strengthening these linkages. Higher value creation along the value chain can take place in the MRR, this has already been proven. Policymakers need to address the lack of investment opportunities in the necessary infrastructure. Locals, especially young people, need to find attractive employment opportunities within the value chain

Finally, policy should also focus on linking the mountain grain value chain (or any other mountain value chain) with other local value chains. As demonstrated in this policy brief, the value chain in the Grisons Alps has the potential to play an important role in spearheading sustainable regional

development by addressing natural and social challenges and strengthening inter- and intra-regional resilience.

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Reference

Bardsley, D. K. and Bardsley, A. M. (2014) 'Organising for socio-ecological resilience: The roles of the mountain farmer cooperative Genossenschaft Gran Alpin in Graubünden, Switzerland', Ecological Economics, 98, pp. 11–21. doi: 10.1016/j.ecolecon.2013.12.004.

BFS (2021) 'Landwirtschaft', Bundesamt für Statistik BFS. https://www.bfs.admin.ch/bfs/de/home/statistiken/land-forstwirtschaft/landwirtschaft.html (Accessed: 30 July 2021).

Cavelti, G. and Kopainsky, B. (2008) 'Strategien zum Umgang mit potenzialarmen Räumen, Erarbeitet am Beispiel der Kantone Graubünden und Uri', Bericht Graubünden, Regiosuisse. Available at: https://regiosuisse.ch/sites/default/files/2016-08/studie-potenzialarme-raeume.pdf (Accessed: 30 July 2021).

Cuci-Hof (2020) 'Video: Getreideernte auf dem Cuci-Hof 2020 – Bio Braugerste & Weizen – Schweizer Landwirtschaft', Youtube. Available at: https://www.youtube.com/watch?v=x0xeFBaQuME (Accessed: 30 July 2021).

Moschitz, H. and Oehen, B. (2020) 'Creating value(s) by integrating local and extra-local resources in cereal production in the Swiss Alps', International Journal of Sociology of Agriculture and Food, 26(1), pp. 48–68. Available at: http://ijsaf.org/index.php/ijsaf/article/view/62 (Accessed: 18 June 2021).

Schilperoord, P. (2014) 'Erfahrungen im Bergackerbau', Report, Bundesamt für Landwirtschaft. Available at: http://www.berggetreide.ch/Erfahrungen_im_Bergackerbau.pdf (Accessed: 30 July 2021).

Schilperoord, P. (2017) 'Kulturpflanzen in der Schweiz – Buchweizen', publication series Kulturpflanzen in der Schweiz,Verein für alpine Kulturpflanzen. http://dx.doi.org/10.22014/97839524176-e7 (Accessed: 30 July 2021).

Swisstopo (2021) 'Landwirtschaftliche Zonengrenzen der Schweiz', Web-based map. Available at: https://s.geo.admin.ch/6ee4f215a7 (Acessed: 30 July 2021).

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Swiss Jura : Tête de Moine PDO cheese.

Sirine Johnston

Summary

The Tête de Moine cheese production represents an emblematic product of the Jura massif, helping to maintain milk production and feeding the regional fabric of the region. The value chain has been able to organise itself and mobilise its territorial resources to form a controlled designation of origin and bounce back from the constant fall in the price of milk that Switzerland has experienced since the 1990s. It has made it possible to offer a reasonable price for milk and thus maintain the use of pastures and woodlands by cattle livestock.

Today, the Tête de Moine value chain faces other threats such as the maintenance of woodland pastures and fodder production as well as its high dependency on public support linked to the Swiss Agricultural Policy.

More policy support for better environmental integration in PDOs, as well as the promotion of diversification at farm and territorial level, is therefore needed to increase the resilience of the cheese production and of dairy farmers.

Key Policy Messages

- ☞ Economic resilience
- ☞ Extensive pasture
- ☞ Consideration of the environment directly at the inter-professional level
- ☞ Recognize the importance and accentuate research wooded pastures

The Swiss Jura is a medium altitude mountainous region, culminating at 1720m. It consists of five cantons: Vaud, Neuchâtel, Jura, Bern and Solothurn and shares a large border with France, where the Jura massif continues. The Jura massif has a long tradition of artisanal and industrial production. Indeed, the region has been industrialised since the 18th century, specialising in the luxury watch industry, particularly in *La Chaux-de-Fonds* and the *Vallée de Joux*, and in the machine industry in the Bern and Jura canton. The Swiss Jura has experienced strong de-industrialisation but has managed to rebound and maintain its high-quality watch production, based on its human and organisational resources.

The Jura is mainly composed of limestone, which has difficulty retaining water and can experience droughts when rainfall drops. To compensate for this, rain falls abundantly (1000 to 2000 mm/year) and this is distributed more or less evenly throughout the year. It is mainly covered by forest, pasture, wooded pasture and arable land, creating a landscape mosaic specific to the Jura as well as a heterogeneity that is beneficial for biodiversity. This MMR is therefore particularly vulnerable to fluctuations in rainfall or high temperatures and has already experienced severe summer droughts affecting pastures and forests with a high loss of fodder production and the death of many trees. Several regional nature parks are present in the MRR with the aim of preserving the ecological, cultural, historical and economic wealth of their region.

Resilience and innovation

The MMR's main agricultural production is cattle milk production, in line with Swiss mountain agriculture, where the slopes prevent all other agricultural production. Indeed, 70% of Switzerland is covered by mountains (Alps and Jura) and 70% of its useful agricultural area is pastureland (Confédération suisse, 2017). Livestock and the derived products such as milk, cheese and meat are therefore of major importance to Swiss agriculture. Overproduction of milk led to the introduction of a milk quota in 1977, which was abolished in the 2007 Agricultural Policy. Since the 1990s, the price of milk has fallen steadily, no longer covering the production cost and forcing many farmers to abandon production. To compensate for the difference between the sales and the production price, Swiss farmers can rely on the system of direct payments, which are subsidies that represent about half of their income, in order to compensate for their protection of the rural landscape, the environment and the biodiversity. Agricultural production and income are thus decoupled, which changes profoundly the role of farmers (Barjolle, 2010).

Faced with the loss of yield due to climate change, the opening of markets with Europe, demographic and economic growth and the increasing scarcity of fossil fuels, production costs are constantly increasing. Switzerland cannot compete with the European market because of its geomorphology and its high cost of living. In addition, there is a duopoly in Switzerland between the two largest retailers (Migros and Coop) who apply high profit margins and strongly influence the pressure on milk prices. Cheeses with a protected designation of origin (PDO) such as the *Tête de Moine* value chain have helped to secure a better milk price for the farmer and have long been seen as a solution to the milk crisis. This hard cheese is a niche product of high quality, thus justifying its label and relatively high price. It is a unique product because it is consumed with a girolle (invented in 1970), which cuts the cheese into a very thin slice resembling a rose ("La filière tête de moine AOP," n.d.). This innovation has led to a strong increase in sales and production and made it possible to register the product as a luxury and high-quality product. The value chain currently generates 370 jobs in the region and has an annual turnover of 70,000 feeding the regional economic fabric. The *Tête de Moine* value chain is organized from the *interproffesion*, which manages the quality and volumes produced by assigning upstream production volumes to the milk producers, the cheese factories and the refiners. There are nine cheese factories and two refiners, which are part of the two largest cheese factories. Refining requires significant infrastructure and investment which implies an imbalance of power between the two large cheese factories, on which the smaller ones depend on. The *interproffession* is also responsible for recording and managing the PDO with quality control and promotes the sales. About 60% of the production is exported, mainly to France and Germany which implies a high dependency to the European market and the Euro-Swiss franc exchange rate. The economic crisis of 2008 and the fall in the exchange rate in 2015 have significantly reduced exports. The *Tête de Moine* production is strongly linked to *Gruyère*, another major Swiss cheese PDO, to compensate the seasonal mismatch between production and consumption (Magnan, 2015).

Value chain contribution to sustainability and resilience of the MMR (barriers and opportunities)

Due to its quality, its innovative character and its PDO label, the *Tête de Moine* is perceived as a resilient value chain, especially in economic terms. Indeed, it is highly organized and supported and has many legal and organizational tools at its disposal to limit the effects of market liberalization and the fall in milk prices. Farmers receive four types of economic support: direct payments, support for milk processed into cheese, support for milk produced without silage and an income per hectare for PDO value chains. This sector is therefore extremely well supported but is also highly dependent on this funding, which could weaken its resilience, if they tend to decrease or change. The economic success of the PDO cheese value chains has led to an intensification of extensive pastures and wooded pastures, thus calling into question the sustainability of these value chains. Moreover, there is an uncertainty about the evolution of forage production due to contemporary climate change. Wooded pastures could limit the effects of droughts through the shade of the trees, maintaining moisture. On the overhand, increasing summer droughts seriously undermine the health of trees, thus weakening the resilience of this land use system and of the *Tête de Moine* value chains which depends on it (Buttler et al., 2012). This decrease in forage production could lead to an increase in nutrient imports, but also to an intensification of grassland use with a negative impact on biodiversity. There is also uncertainty about the health of animals in the face of rising temperatures.

PDOs may have been a temporary solution to increase the economic resilience of dairy farmers facing the milk crisis, but this form of organization remains vulnerable to climate change and highly dependent on support from Swiss agricultural policy and the European context.

Policy relevant considerations

The *Tête de Moine* value chain has made it possible to cope with the milk crisis in the Swiss Jura, by better remunerating dairy farmers and ensuring that their production is sold. In the face of the current climate crisis and the intensification of pastures, efforts to preserve this land use must be made. We suggest including a better consideration of the environment directly at the inter-professional level. In its vision 2035 for mountain regions, the Swiss Association for Mountain Regions (SAB) invites regional actors to strengthen collaboration, to identify and exploit development and innovation potentials and to proactively shape the processes of change (Kadelbach, 2019). A response from regional stakeholders such as the *interproffesion* could be a first step towards adaptation to present and future threats.

At a higher level such as cantonal or federal, policies should also give a special status to woodland pastures, firstly to recognize their importance, and secondly to accentuate research for a better adaptation to climate change, such as diversifying the tree species. To limit the dependence on public support and exports, policies should also promote diversification, innovation and small circuit. Indeed, the diversification of agricultural activities directly on farm, such as through the

development of agri-tourism or the promotion of other agricultural products, could limit these dependencies a thus increase resilience.

Reference

Barjolle, D. (2010). La politique agricolesuisse entre économie, écologie et société. *Économie Rurale*, (315), 6–8. https://doi.org/10.4000/economierurale.2510

Buttler, A., Gavazov, K., Peringer, A., Siehoff, S., Mariotte, P., Wettstein, J. B., … Spiegelberger, T. (2012). Preservation of wooded pastures in the Jura: climatic and agricultural policy challenges. *Agrarforschung Schweiz*, *3*(7–8), 346–353. Retrieved from https://www.agrarforschungschweiz.ch/archiv_11de.php?id_artikel=1789

Confédération suisse. (2017). Géographie. Retrieved April 22, 2020, from https://www.eda.admin.ch/aboutswitzerland/fr/home/umwelt/geografie.html

Kadelbach, T. (2019). *Die Berggebiete und ländlichen Räume 2035 Herausforderungen und Chancen*. Bern.

La filière tête de moine AOP. (n.d.). Retrieved July 1, 2020, from Tête de moine website: https://www.tetedemoine.ch/fr/infos/filiere

Magnan, A. (2015). *AOP, Élevage et Soutiens publics : Diagnostic-Agraire des Franches-Montagnes Suisses*. ETHZ Ecole Polytechnique Fédérale de Zurich.

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Beydaglari: Greenhouse Tomato

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Summary

Tomato is most grown vegetable with more than 40% share in total vegetable production. This includes around 70% for fresh table tomato and the rest is for industrial process. Industrial tomato produces in open field conditions during the summer season and fresh table tomato produces in all over the year mainly in greenhouse conditions. Most of the greenhouses are existed in south-west Anatolia-Antalya. This region produce tomato for export oriented and the region has comparable micro-climatic advantage which creates minimum production cost without/minimum heating expenses through the longest daylight period and highest daily temperature.

Greenhouse farming is speeded-out the plains at the sea level but the last decades have been expanded to the steep-slopes in Beydaglari. Greenhouse production provides 3-5 months cash flows and double circulation in a year which is differ from the other type of product such as some field crops-annual crops. The region is also a most popular touristic destination for summer holiday (15 million tourists, 2019) which foster agricultural sector as a major consumption source. This is the case which explains the interconnectedness between the sectors with the mutual support.

Figure 29: A view of tomatoes growing in greenhouse

The Beydaglari (MRR), one of the western extensions of the Taurus Mountains, are within the borders of Antalya. The Beydaglari extends in the west of the Antalya Bay, in a north-south direction parallel to the bay. 600–3086 m. Mountains located between altitudes offer many different opportunities for geologists and geographers. Teke dorugu, Bakirli mountain, Tahtali mountain and Kizlar Sivrisi are important peaks. Its highest peak is 3086 m. and Kizlar Sivrisi. Mountaineers reach this peak from Çamçukuru Valley, which is covered with cedar forests. The easiest access to the valley is via the Antalya-Elmalı (LAU) road. The mountain climb can be completed in one day. Tahtalı Mountain to the west of Kemer is decorated with interesting slopes. Its elevations extend to 2360 m. Pine and mixed forests extend up to 2000 m. The climb to Tahtalı Mountain starts from Soğukpınar and offers unique views when done over the ridges overlooking the Mediterranean. You can reach the camping area with a short walk and climbing from Soğukpınar. It is possible to organize excursions to the Bey Mountains throughout the year. However, the months of April, May and June are more suitable due to the suitability of the climate and the period when the flora

richness of the region appears. Beydağları Coastal National Park (Olympos Beydagları National Park) is a national park in Antalya Province, southern Turkey. The national park was established on March 16, 1972, by a decret of the government. It stretches over an area of 34,425 ha (132.92 sq mi) beginning in Sarısu, located southwest of Antalya and reaching out to Cape Gelidonya parallel to the Mediterranean Sea across the Kemer-Kumluca shoreline. The Park has a great biodiversity, it has over 865 plant species, 25 of which are endemic, from rare mammals can be found mountain goat, bobcat, caracal, and wolf.

Resilience and innovation

In Beydaglari-Antalya, the district with the highest annual total sunshine duration is Elmalı (LAU). In addition, the air is cool and dry because of high mountain region. Both the high annual sunshine duration and the favorable climatic conditions played an important role in the development of greenhouse cultivation in Elmalı (LAU). Especially greenhouse tomato cultivation is very common in the region. Due to the favorable 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 (LAU) have a better appeal than those grown in the plain.

The total area under greenhouse tomato cultivation in Elmalı (LAU) is about 835 hectares. The average farm size per household is between 0.4 and 0.5 hectares. Greenhouse tomato cultivation has been carried out in Elmalı (LAU) 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 (LAU).

Value chain contribution to sustainability and resilience of the MMR (barriers and opportunities)

Greenhouse tomato cultivation is an innovative production activity for the Elmalı (LAU). Disease and pest density is low in the region due to climatic and topographic factors. Therefore, less pesticides are used. Using less input increases the income of producers. In addition, greenhouse tomato growers in Elmalı (LAU) produce higher quality tomatoes than the ones in the plain. Quality tomato production provides an opportunity for tomato growers to obtain high prices for their products. The price advantage in the product positively affects the producer income. As a result, greenhouse areas have increased rapidly in recent years in Elmalı (LAU) as greenhouse cultivation activities provide high income. In addition, healthier products are supplied to the market due to the use of less pesticides. There are three major challenges for growers growing tomatoes in greenhouse. These are respectively; low crop selling prices, crop diseases and labor 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 (LAU) 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.

Policy relevant considerations

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 (LAU) do not have a farmer's organization. On the other hand, the fact that the tomato produced in Elmalı (LAU) 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. High quality and healthy product image is an important advantage in greenhouse tomato marketing. However, marketing innovations are needed to turn this advantage into an opportunity. This value chain analysis will give us an idea about how to innovate, especially in product and marketing methods. This value analysis will also provide the opportunity to examine the main resilience for marketing innovation. In this context, the possible effects of climate change will be analysed as well as socio-cultural and environmental factors.

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Reference

https://en.wikipedia.org/wiki/Beyda%C4%9Flar%C4%B1_Coastal_National_Park

https://en.wikipedia.org/wiki/Taurus_Mountains

https://tr.wikipedia.org/wiki/Bey_Da%C4%9Flar%C4%B1

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Highlands and Islands: Speyside Malt Whisky

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Summary

Speyside malt whisky is a global value chain with strong cultural and geographical links to natural assets originating in the mountains. Whisky draws attention to water, often an unvalued natural asset in mountain regions. Speyside Whisky depends on mountain and lowland inputs. Whisky is produced by multi-national organizations but marketed using place-based and family brands. Climate change effects the water quality and quantity. The upstream land uses that impact on water are often managed by different social groups to those working in, and visiting, distilleries, setting up interesting socio-economic dynamics in the value chain. Finally, the Cairngorms National Park Authority and other stakeholder groups are focused on ensuring more of the values generated by land use, whisky and tourism remain in the local area.

Figure 30: Cairngorms Mountain Plateau (source of River Spey, mainly heather moorland and peat).

Key Policy Messages

- ☞ Scotch Whisky (PGI) is Scotland's most exported food and drink commodity.
- ☞ The Whisky value chain depends on water, impacted by climate change.
- ☞ The Whisky value chain illustrates the interaction between production and consumption (food and drink tourism) in mountain areas.
- ☞ The Whisky value chain requires a Green Recovery that considers natural, human, social and economic capital assets.

The Highlands and Islands are defined as an area of naturally constrained land capability for agriculture and forestry. Farmers claiming agricultural payments get a 'less favoured area' payment in recognition of these biophysical limitations. The upper Speyside catchment, which is the focus of the Value Chain (VC) analysis, has many large estates (often a mixture of forestry, livestock, mainly sheep, grazing, some forestry and sporting – deer stalking and grouse shooting – land use). Estates can be profit-orientated or managed for public good outcomes. Upper Speyside is also part of the wider Cairngorms National Park (CNP), one of two Scottish National Parks. The CNP was designated due to the mix of nationally important natural and cultural heritage and comprises an important alpine montane system in the UK. The Cairngorms Mountains are the source of several major Scottish Rivers that are threatened by climate change through impacts on quality (soil erosion, dissolved organic carbon) and quantity (with concerns over low flows and high-water temperatures). The upland catchment consists predominantly of heather moorland, a mosaic of habitats, including dry and wet heath, blanket bog and rough grasslands. Peat soils can act as

both source and sink for Greenhouse gases. Much of the area is designated under EU or national biodiversity regulations. Much of upper Speyside is classified as very remote, or remote, rural but areas of the catchment are pressurised due to the inward migration and investment associated with the National Park. Despite being remote and sparsely populated, the area has a relatively high (positive) socio-economic profile compared with more socio-economically fragile areas in the Highlands and Islands. However, there are considerable differences within the local population. Currently economic value tends to accrue further down the value chains within lowland urban regions.

A Taste of Place?

There are about 24 distilleries in the area, with more downstream (outside the mountain boundary). Some distilleries have (re)opened due to the sustained upturn in the popularity of Scotch Whisky over the past decade. These distilleries produce malt whisky (whisky made from malted barley), including single malts (premium products) from individual distilleries.

Whisky production requires:

- Malted barley (some barley is grown and malted locally, but the value chain is tele-coupled with other lowland barley producers)
- Peat may be added to the fire used in malting.
- Water (the quality of water affects the specific flavour, whilst considerable quantities are needed for cooling).
- A specific climate for maturation (Scotch must be matured for at least three years).
- Distillery specific 'pot stills' and local, often familial, knowledge.

Distilleries are popular visitor attractions for tourists. Most Speyside distilleries, particularly those with visitor centres, market themselves as unique brands based on individual combinations of place, history and culture. However, many are owned by multi-nationals such as Diageo and Pernod-Ricard.

Value chain contribution to sustainability and resilience

The rural population are predominantly employed in the tertiary economic sector. Increasingly, rural development opportunities result from interlinkages between land used for production (food, fibre) and land used for recreation, amenity and tourism consumption. There is an emerging policy focus on a green recovery from Covid-19 and a just transition to a low-carbon economy. Some distillery operators contribute to upstream restoration (natural flood management and peatland restoration) to protect their assets. The connections between whisky and other value chains can be positive but there are some potential conflicts to be managed. By-products from the distilling process (draff, pot-ale) have traditionally been part of the local livestock supply chain. Recent developments in bioenergy means there is competition for these by-products increasing their cost. Water scarcity and elevated temperatures can exacerbate a decline in Atlantic salmon and trout, on which the fly-fishing industry depends (and for which the Spey is designated a Special Area of

Conservation), as well as competition with domestic use. Transportation remains a problem in remote areas. The case considers the sustainability and resilience challenges of a biophysically fragile region dealing with socio-economic success. Increased visitor numbers due to Covid-19 travel restrictions have resulted in corresponding visitor management problems; and staff shortages in the agricultural, forestry, environment and service sectors mean that opportunities may not be fully realised. Landowners and distillery operators hold valuable financial capital, but waged labour tend to earn lower than national average income. Finally, there are wider questions about the social costs of alcohol, and the use of arable land for alcohol rather than food production.

Policy relevant considerations

There is currently little reference to 'mountains' – Scottish policy is focussed on upland habitats, remoteness, or land capability for agriculture or forestry. Policy implications of our study include:

- How to better link upstream ecosystem services with downstream beneficiaries (polluter pays, payment for public goods and/or private investment in carbon markets);
- How to improve opportunities for local, including young, people in the whisky value chain; and
- How to improve the local rural development outcomes linking whisky with other local value chains.

Connections between land use, conservation, communities and economic development underpin the Cairngorms National Park Partnership Plan and Scotland's approach to a Green Recovery.

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References

Cairngorms National Park Authority (2017) National Park Partnership Plan 2017-2022
Scottish Government (2020) Programme for Government 2020-21
Scotch Whisky Association (2019) Scotch Whisky Economic Impact Report 2018

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