



**INSTYTUT ZOOTECHNIKI
PAŃSTWOWY INSTYTUT BADAWCZY**

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Monograph

**European structural measures
for mountain farming in the context
of domestic needs and expectations**

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INSTYTUT ZOOTECHNIKI PAŃSTWOWY INSTYTUT BADAWCZY

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Development challenges for mountain and foothill agriculture in Poland and how to overcome them

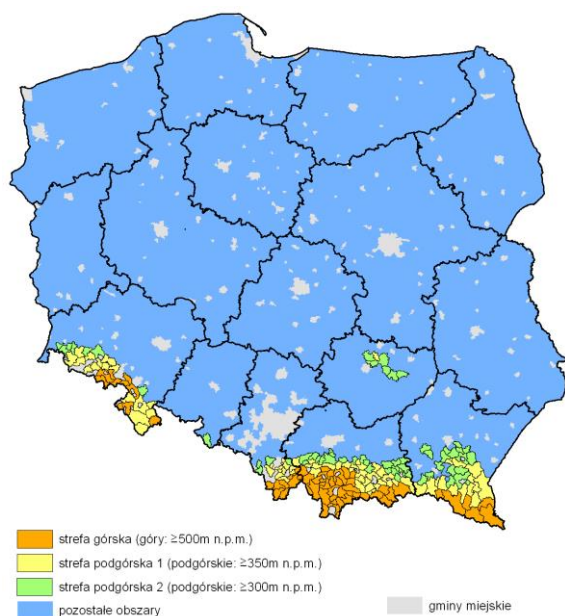
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Mountains are located in the peripheral areas of Poland (Map 1). For centuries, they have stood out as economically, agriculturally, socially, culturally and mentally unique. Farming and breeding remain the natural and traditional forms of economic activity in these areas. The mountain areas are not a major producer of food, but the local agricultural sector provides a wide range of services to the community and the environment. This is important because the areas come under various forms of nature conservation, such as national parks, landscape parks, Natura 2000 sites. The topography and natural resources of the mountains make them predisposed to developing quality food production, landscape protection, tourism, recreation and health services, which extend the range of activities performed by the mountain farms.

Due to the specific climate conditions of the mountain areas, namely altitudinal zones, the selection and yielding of species and varieties are very limited. The slope of the land is also a constraint to the use of machinery, especially for crop production. The terrain makes the soil vulnerable to erosion, which can be reduced through proper use of land, in particular grassland and forests. These and other circumstances resulted in the need for far-reaching adjustment processes, often the need to reshape the proportions of factors of production, while contributing to increasing mechanization costs, labour requirements, and total agricultural production costs (Musiał et al., 2018).

Map 1. Spatial distribution of mountain and foothill areas in Poland



Source: *Rolnictwo na obszarach specyficznych. Powszechny Spis Rolny 2010. GUS 2013.*

Agricultural policy has been adapted to solving the structural problems of mountain and foothill agriculture in Poland since the recovery of independence. Specific legislative solutions to land management were introduced in 1925¹, and agricultural tax regulations (tax exemption or reduction) in 1984. In 1985, the Council of Ministers adopted a Resolution² introducing milk, beef livestock and wool purchase price allowances. Subsequent solutions (including LFA) were adopted after the Polish accession to the European Union.

¹ The Agrarian Reform Law of 28 December 1925, art. 50.

² Resolution No 4 of the Council of Ministers of 21 January 1985 concerning the economic and social activation, and agricultural development in mountain and hilly areas.

Despite the above, Poland is witnessing consistent abandonment of farming in mountain areas, which is reflected in a reduction in livestock production, setting aside land from production, migration of young people, and labour shortages.

Work on the mountain farming support scheme in Poland

The current Strategy for Responsible Development until 2020 (with prospects until 2030) states that every region should develop in a sustainable way, and rural areas must mobilize their endogenous economic potential.

On this basis, work has been conducted since 2018 to develop an adequate support scheme for mountain farming, which would improve the profitability of agricultural production and preserve the environmental and economic uniqueness of these areas. The scheme should also help maintain the farming use of farmland in the mountain areas.

The work involves representatives of the mountain and foothill regions, agricultural organizations, farmers, marshal offices, scientists, the teams for analysis of opportunities and threats, and potential directions of rural development until 2030³, and the team for agricultural recovery in mountain areas as part of the Agriculture Agreement⁴.

Development deficits of mountain agriculture were determined and opportunities for development were identified as part of the activities. Changes for the current and planned EU policies were proposed to better reflect the needs of the agricultural sector.

When diagnosing the barriers and opportunities for development, it was assumed that social and economic development of mountain agriculture is stimulated by multiple factors. Spatial planning specialists agree

³ The teams were set up in each voivodeship. Their aim is to analyse opportunities and threats, and to outline the potential directions of rural development in different regions. Their tasks include: assessing and identifying the developmental needs of rural areas and the agri-food sector; determining desirable directions of rural development; determining priority projects until 2030; drawing up guidelines and outlining the general framework of the rural development strategy document.

⁴ The agriculture agreement was launched on 20 February 2019 upon the request of Polish agricultural organizations affiliated to Copa-Cogeca. The main objective of the Agreement is to carry out social dialogue concerning rural issues, agriculture, and the entire food chain: from producer to consumer. Ten project teams were set up as part of the Agreement including the team for agricultural recovery in mountain areas.

on the individual identification of these factors. Every territorial unit or sector has its own resource of opportunities and barriers (Zegar, 2008; Pomianek, 2018). At the same time, barriers to the development are factors that hamper or prevent local development, including general (systemic) factors⁵, which generally concern all municipalities, and spatially differentiated factors (Myna, 1998). Based on these assumptions, the teams *for analysis of opportunities and threats, and potential directions of rural development until 2030 in regions with mountain areas* were surveyed to ask “*What development deficits can you identify in the context of mountain farming?*” and “*What opportunities for development of mountain agriculture can you see in the context of agricultural production?*”. The answers are given in Tables 1 and 2.

Table 1. Barriers to the development of mountain agriculture

Selected examples for the Podkarpackie voivodeship	Selected examples for the Dolnośląskie voivodeship
<ul style="list-style-type: none"> - little scope for changing the production profile based on market information; natural conditions impose the way of utilizing farmland, directions of animal husbandry, and selection of crop plants, - the ageing population and the concurrent migration of young people, lack of successors to continue to operate farms. Mountain depopulation does not allow fulfilling the basic functions of mountain areas associated with 	<ul style="list-style-type: none"> - lack of land consolidation – lack of favourable space solutions for the crops, - environmental – natural conditions. The large proportion of permanent grassland and the limited choice of crop plants on arable land determine the directions of agricultural production that are not always economically profitable, - road and transport infrastructure – limited availability, bad repair, or lack of mountain communications routes,

⁵ According to Myna (1998), **general** (systemic) factors are: institutional barriers, budget system barriers, financial system barriers; **spatially differentiated** factors are: weakly developed technical infrastructure, low quality of municipal services, environmental degradation, low level of education, weakly developed economic infrastructure, low tax potential of the municipalities.

<p>water management, forest management, tourism, and agricultural production,</p> <ul style="list-style-type: none"> - permanent income disparity of mountain agriculture; it hampers the capital accumulation of farms and causes a growing disproportion in the development of mountain and non-mountain agriculture, - lack of marketing strategies for food products and agricultural raw materials from the mountain areas, - lack of efficient food distribution chains gathering farmers, agri-food processors, retail and catering, which make high-quality products available to demanding consumers, - inadequate area structure of farms and unregulated ownership which limits the transfer of land between farms 	<ul style="list-style-type: none"> - cultural and traditional – despite the multi-annual activities, especially with regard to food production, the continued lack of identification with land and no continuation of crop or breeding traditions. Despite harsher climate in places, its characteristics are not used in traditional breeding. This may be due to the lack of good practices (generational change), inadequate financial outlays and greater probability of losses (lack of safeguard mechanisms causes farmers to make conservative decisions when choosing the production orientation), - socio-demographic – migration to cities, increased costs of rural living, decrease in rural families. Abandonment of production in favour of more rapid development of a business model often connected with retail or services of other sectors.
<p>Selected examples for the Małopolskie voivodeship</p> <ul style="list-style-type: none"> - Loss of agricultural land due to inadequate spatial policy. This concerns suburbanization of agricultural land, which in the mountain areas most often takes the form of disordered, scattered individual housing and social, road and tourist infrastructure. At the same time, the adverse natural phenomena such as natural succession on agricultural land as well as water and landslide erosion, result in degradation of agricultural production space and environmental and biodiversity imbalance. - Ongoing abandonment of land cultivation. Specifically, some farm owners consciously abandon agricultural use of the land. The reasons behind this phenomenon are complex, often personal, but a special role here is played by the evolving socio-economic conditions of rural families. Non-farm income of the rural population is gaining in importance. 	

- **Displacement of local products by cheap food products.** Competition from cheap standard products offered by large retail chains is a growing threat for local agri-food production. Food products from mountain farms, which are generally of above-average quality, are produced on a small scale and with a high degree of manual work, which makes them more expensive than their standard counterparts. Furthermore, for many years there has been a relative decrease in the prices of food products in relation to prices of inputs and labour costs, a phenomenon known as price scissors.
- **Constraints to agricultural space management in the mountain areas.** The land use plans are repeatedly amended to meet the immediate needs (mainly investment needs) without taking account of the interests of rural inhabitants and the environment, as evidenced by ignoring the need for agricultural land arrangement plans.

Source: author's own elaboration based on diagnoses of the teams for analysis of opportunities and threats, and potential directions of rural development until 2030 in the Podkarpackie, Małopolskie and Dolnośląskie voivodeships.

The need to identify opportunities for development of mountain and foothill agriculture stems from the belief that entities which can diagnose and strengthen their endogenous and exogenous potential stand a better chance to develop and secure a strong competitive position. The endogenous potential is found in the local system and spreads from the local resources (demography, infrastructure, economy) and favourable environmental and spatial conditions. These components, often unique, are relevant to the economy of a given area. The exogenous potential is of a macro-economic nature (indeed of a global nature in light of the socio-economic phenomena taking place) and reflects the decisions and solutions adopted outside the local system, e.g. on a regional, country, or international organization (EU) scale (Gęsina, 2015; Warczak, 2015).

Table 2. Opportunities for development of mountain agriculture

Selected examples for the Podkarpackie voivodeship	Selected examples for the Dolnośląskie voivodeship
<ul style="list-style-type: none"> - growing demand for food products with unique taste and geo-cultural qualities, 	<p>The main function of mountain farming should be a positive impact on the natural environment, which is the</p>

<ul style="list-style-type: none"> - growing public awareness about the function of mountain areas and the role of agriculture in fulfilling these functions. This mainly concerns: (i) collection and proper allocation of water resources, (ii) multiplication of forest resources, (iii) using the appeal of the mountain environment for development of tourism and agricultural tourism, (iv) production of agricultural products in line with local specifics, - scope for provision of agri-environmental services (e.g. protection of mountain landscape values, environmental conservation, protection of waters), - scope for activation of non-farming functions of mountain areas through proper determination of the place and role of agriculture in developing other fields of economic activity in the mountain areas (water management, forestry, tourism), - productive use of grassland by raising grass-eating animals, as exemplified by the programme Natural Grazing in the Podkarpacie Region, - regular events, events promoting the region and the region's mountain agriculture, e.g. Regional Exhibition of Farm Animals organized by the Podkarpacie Agricultural Advisory Centre in Boguchwała, Agrobieszczady in Lesko, Horse Fair in Lutowska, Farewell to Holidays in Rudawka Rymanowska 	<p>most important resource and asset of mountain regions. The primary role of agriculture is to maintain and enrich the unique natural and landscape value of the mountains and thus provide the goods important for the whole mountain region. This means concern for environmental biodiversity and landscape values, protection against negative effects of soil erosion, concern for the quality of water resources, supply of lowland areas with water, creating conditions for development of tourism, prevention of excessive migration from villages, maintaining the cultural identity of mountain inhabitants.</p> <p>The opportunities for development of mountain agriculture include multifunctional development of farms with regard to:</p> <ul style="list-style-type: none"> - beef cattle production and sheep farming, - environmental practices, including agri-environment-climate measures, and organic production farms, - agritourism and rural tourism, - acquisition of energy from renewable sources, using the potential of mountain rivers and streams, production of electrical energy from wind, and use of surplus biomass from agricultural production for bio-energy production, - small and medium-sized enterprises in respect of services to the public
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including the National Exhibition of Simmental Cattle.	
<p>Selected examples for the Małopolskie voivodeship</p> <ul style="list-style-type: none"> - Development of grass-eating animal husbandry and breeding. Particular attention should be given to sheep farming and Polish Red cattle breeding. Sheep production has a long-standing tradition in the region and the economic dimension (meat, wool, skins, cheeses) is integrated with the culture-forming and pro-environmental function. Polish Red cattle husbandry and breeding is a valuable resource maintained in livestock production in the mountain areas. This breed is also a valuable material for organic agriculture, and as in the case of sheep, is an important cultural asset in preserving the national farming tradition and the local rural landscape. - Development of horticultural production. Commercial horticultural production is concentrated in southern, mountain regions of Małopolska. It is favoured by natural topography, microclimate and favourable soil conditions. This sector has promising prospects, because exports of high quality fruits shows a steady increasing trend, similar to domestic consumption. - Development of high quality food production, including organic foods. The unique natural and climatic conditions of the mountain regions and the low consumption of yield-forming factors, coupled with large labour resources in smallholder farms are conducive to the development of ecological, regional and traditional production. - Development of niche-market and unconventional agricultural production. In the mountain farms, which have low production potential and face many environmental constraints, it is often impossible to intensify traditional production directions and specializations. In this case it is necessary to develop unconventional forms of agricultural activity, such as wine-making, beekeeping, aquaculture, growing of herbs, lavender, cranberry, etc. 	

Source: author's own elaboration based on diagnoses of the teams for analysis of opportunities and threats, and potential directions of rural development until 2030 in the Podkarpackie, Małopolskie and Dolnośląskie voivodeships.

Based on the diagnoses presented above and a number of discussions⁶, it can be stated that mountain agriculture should focus on developing **beef cattle production** and **sheep farming, creating quality products** typical for the mountain regions, developing **high quality production**, including organic production, developing **horticultural production**, developing **niche-market production** (winemaking, beekeeping, cheese-making, aquaculture, herb growing) coupled with **tourism**, provision of **environmental services** (e.g. landscape protection, environmental conservation) and **services to the public** (e.g. rental of rooms, care farms), and **acquisition of renewable energy sources**.

All of the above made it possible to prepare the draft of the mountain farming support scheme (Table 3).

Table 3. Mountain farming support scheme – a proposal based on consultations with experts

<i>Area 1. Improving production Profitability</i>			<i>Area 2. Environmental services</i>	<i>Area 3. Facilitating diversification</i>
<i>Improve-ment of efficiency</i>	<i>Development of markets</i>	<i>Targeted support</i>		
full use of permanent grasslands	restoration and development of processing operations (including local ones)	direct payments, including those related to production, redistribution	protection of: soil, valuable habitats, conservation breeds, old varieties	development of rural tourism, including agricultural tourism
new technologies and knowledge transfer	development of short supply chains, agricultural retail trade	LFA payments	cultural grazing	agriculture-related services

⁶ Examples include the conferences: Support for mountain agriculture – 6 March 2019 in Balice [<https://www.gov.pl/web/rolnictwo/wsparcie-rolnictwa-gorskiego>], Innovations strengthening the potential of mountain agriculture – 17 July 2019 in Warsaw [<https://www.gov.pl/web/rolnictwo/gory-bez-rolnictwa-beda-martwe>] and work of the Agriculture Agreement – 17 September 2019 [<https://www.gov.pl/web/rolnictwo/porozumienie-rolnicze--efekty-prac>]

involve- ment of young farmers	production of high qual- ity foods	agri-envi- ron-ment-climate payments and organic agricul- ture	conservation of traditional land- scapes	leisure time economy
group activ- ities (coop- eratives, groups)	promotion of mountain products	support for in- vestments in mountain farms	collection and good management of water	care farms
improve- ment of area struc- ture, land consolida- tion	development of niche- market pro- duction	agricultural tax relief	development of forest resources	development of bio-economy

Source: author's own elaboration.

It was assumed that mountain and foothill agriculture should take the path of multifunctional, and at the same time sustainable, development. The maintenance of mountain (and foothill) agriculture should be based on revenue generated from well organized production and sale of properly priced products of high quality. It is also necessary to provide adequate support to mitigate unfavourable climate and structural conditions. This should be undertaken in parallel to efforts to preserve a high degree of biological, landscape and cultural diversity. Another opportunity for development of the mountain areas are entities providing services to tourists but also to the local community. In this context, the development of bio-economy and niche products is extremely important.

Examples of changes in domestic agricultural policy and CAP in support of the transformation of mountain agriculture

Parallel to the work on the Programme, analysis was made of the possibility to better focus the Rural Development Programme (RDP) 2014-2020⁷ and of the changes in domestic legislation so as to better use the potential of mountain and foothill agriculture. On this basis:

⁷ Generally, as part of RDP 2014-2020, measures can be implemented in the mountain and foothill areas. The most important of these include: **area measures** – organic agriculture,

- **amendments to the regulations on direct sales and agricultural retail trade** were elaborated. Among others, tax free allowance was increased to 40,000 zloty. Income in excess of this amount is subject to 2% tax. Retail sites (shops, restaurants, canteens and similar establishments) were expanded. Farmers were allowed to conduct retail sales on the local market without permission,
- **solutions for agricultural slaughterhouses** were developed. The purpose of small-scale abattoirs is to make it easier for agricultural producers to conduct direct sales and agricultural retail based on products of animal origin,
- **science and advisory services** were supported to improve the efficiency of agricultural production,
- The Rural Development Programme for 2014-2020 was amended by linking **LFA payments to livestock production**. Through this revision, agricultural holdings with a minimum stocking rate of 0.5 LU/ha will receive higher payments: (i) 450 zloty/ha/year was increased to 750 zloty/ha/year – mountain LFAs, (ii) 264 zloty/ha/year was increased to 550 zloty/ha/year – foothill LFAs, (iii) importantly for the mountain areas, LFA support now includes agricultural land in cities, (iv) the *Bonus for young farmers* was increased from 100,000 to 150,000 zloty. ***Bonus to start non-agricultural activities and the Restructuring of small farms*** were facilitated, and **rates were increased as part of the agri-environment-climate and organic agriculture measures**, which was requested by the mountain regions.

Support of mountain and foothill agriculture during the programming period 2021-2027

The post-2020 CAP legislative package proposes for the new CAP to be better adjusted to local conditions, which will be favoured by removal of the eligibility condition for EU-level support. Member States

agri-environment-climate programme, LFAs, afforestation of agricultural land, **investments** – modernization of farms, land consolidation, **bonus measures** – bonuses for young farmers, restructuring small farms, **group measures** – support of agricultural producer groups, and **training-advisory measures**. Likewise, agricultural holdings may apply for direct support (first pillar of CAP).

will be able to determine most of the eligibility conditions at national level so as to adapt them to specific circumstances. At the same time, the administrative burden related to checks will be decreased by reducing the requirement that final beneficiaries should meet the eligibility conditions set out at UE level.⁸

Member States will present their proposals for intervention, aimed to implement the above specific EU objectives in the CAP Strategic Plans. These plans will include most of the support instruments financed by the European Agricultural Guarantee Fund (including direct payments and sectoral programmes) and the European Agricultural Fund for Rural Development. In this way, each Member State will develop a coherent and unified intervention strategy. By using EU-wide result indicators in the CAP Strategic Plans, Member States will determine the objectives they want to achieve in a given programming period.

The work so far on the Polish CAP Strategic Plan included diagnosis, SWOT analyses, determining the needs as well as proposals for intervention, which would allow implementing priority needs. This was paralleled by analytical work as well as discussions with farmers and organizations affiliated to the Agriculture Agreement on how to include the development challenges facing mountain and foothill agriculture into the future CAP Strategic Plan. For this reason, it seems justified to consider continuing current CAP interventions while searching for new solutions, notably regarding:

- **organic agriculture.** Production of agricultural products in mountain areas should be considered as a specific form of generating income; it should focus on organic production (regions with extensive agriculture, unpolluted environment),
- **agri-environment-climate** measure. Production of agricultural products in mountain areas should be considered as a specific form of caring for environmental resources including soil, water, biodiversity, as well as mitigation of climate change. As part of the **agri-environment-climate** measure, it is important to support: (i) **reducing erosion and nutrient runoff**, (ii) **soil retention in lands used for agricultural**

⁸ Modernising & simplifying the common agricultural policy. Targeted, flexible, effective (2018). European Commission. [https://ec.europa.eu/commission/sites/beta-political/files/budget-may2018-modernising-cap_en.pdf]

purposes, (iii) conservation of mountain landscape through pasture management, restoring farmland to production, **(iv) conservation of valuable natural habitats** (NATURA 2000 sites and outside), **(v) preserving conservation breeds of animals**, which are crucial for the mountain areas (cattle, horses, sheep, goats, bees), **(vi) preserving old varieties of plants**, which are crucial for the mountain areas (traditional varieties of cultivated plants: agricultural, vegetable, fruit, spice, medicinal and industrial plants),

- efforts to retain **production-related direct support**, which is highly important in farms with **grass-eating** animals: cattle, sheep, goats,
- **investment support to farms**, especially as regards construction and modernization of livestock buildings, machinery and equipment adapted to suit mountain management conditions **as well as improvement of the area structure** of mountain agriculture – e.g. consolidation, group activities,
- support for **small farms** engaged in agricultural activities in the mountain and foothill areas so as to strengthen their links with the market through development of (i) agricultural production of food products, **including agricultural slaughterhouses, direct sales, niche production** or (ii) **agricultural production for non-food purposes**.

Summary and conclusions

1. Due to ongoing processes of globalization, production concentration and specialization in the agricultural sector, deagrarianization has been observed in mountain and foothill agriculture. This issue has cultural, environmental and production aspects. Agricultural income continues to decrease in importance in favour of non-agricultural income. Generally, the growing importance of other functions in rural areas must be regarded as the right course due to specific characteristics of the mountain regions. However, a lack of control over this situation poses risks to following the philosophy of sustainable development, especially in valuable natural areas and landscapes. One example are landscape changes resulting from a large decline in the number of ruminants in the mountains.

2. Since 2018, the Ministry of Agriculture has taken actions to prepare the mountain farming support scheme. A set of barriers and opportunities for development as well as proposals for action were elaborated. Concurrently, selected RDP 2014-2020 instruments as well as national legislation were adapted to better support the endogenous potential of mountain areas.
3. Because mountain and foothill agriculture provides vital public goods (water management, conservation of biodiversity, landscape, traditional grazing, others), it is essential that it is further supported with public funds, especially since improving or maintaining competitiveness of mountain farming in the future remains an important issue. Because the problems of agriculture in the mountains considerably differ from those in other areas of Poland, it seems inappropriate to apply a uniform approach to the design of instruments of the CAP Strategic Plan.

Key words: mountain and foothill areas, agriculture, sustainable development, agricultural policy

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Local initiatives to promote products from mountain and foothill regions in Poland

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Department of Production Systems and Environment*

Mountain farming has been shaped over centuries by harsh environmental conditions. The climatic factors, terrain, and altitude have been the limiting factors for the growth in crop and livestock production. The natural conditions in the mountains preclude agricultural intensification and raising of high-producing livestock breeds. Therefore, resistant and less demanding local breeds have been extensively used there for centuries. Traditional products and the wide choice of regional dishes are important factors in deciding on tourist destinations. The high quality and unique qualities of these products result from the use of traditional production methods. Traditional products, dishes and beverages are an important part of the culinary heritage of towns and tourist regions; they play an important role in promoting and fostering the culinary heritage. In addition to basic forms, the promotion of traditional products and regional cuisines is enhanced by supplementary forms such as local and regional folklore events, festivals, festivities, contests, harvest festivals, tourism fairs, and town and village days.

The following review presents major activities – local initiatives to promote products from mountain and foothill regions, carried out in the Małopolskie, Podkarpackie, Śląskie and Dolnośląskie Voivodeships.

The **package of strategic programmes**, developed by the Self-government of the Małopolska Region, is aimed at efficient management of different regional policies. A catalogue of 10 strategic programmes was elaborated, which form the basic instruments to coordinate different areas

of the voivodeship's development policy. The Territorial Marketing Strategic Programme concentrates on creating own and partnership events with a strong image and communication power, focused around the diverse and attractive cultural offerings, including the **Taste of Małopolska** and the **International Mountain Folklore Festival** in Zakopane.

The aim of the **ekoMałopolska** project (Marshal Office of the Małopolska Region) is to increase the activities of the Małopolskie Voivodeship in environmental conservation and management. Activities in one of the project areas (Promotion of the region through environment. Healthy foods) focus on promoting regional foods, including mountain products as part of the **Małopolska Festival of Taste**. The activities of the **Culinary Heritage Network** consist in collaboration with food producers, processors and distributors, mostly based on local raw material resources. This is designed to preserve and develop regional culinary traditions typical for the regions. They also facilitate consumers' and tourists' access to local and regional foods of high quality, including foods from mountain areas. [<https://www.malopolska.pl/ekomalopolska/projekt-ekomalopolska>].

Pict. 1. The Małopolska Festival of Taste logo



The Małopolska Festival of Taste (Małopolski Festiwal Smaku) is Poland's largest regional culinary event, which promotes food producers, local and traditional products and dishes from the Małopolska region. The **Taste of Małopolska** (Małopolski Smak) is a project piloted by the Marshal Office of the Małopolska Region to promote regional and traditional products from Małopolska. The main objective of the project is to organize regular events known as the Małopolska Festival of Taste, during which food producers from the Małopolska territory showcase and sell

their products and dishes. The festival is accompanied by many added attractions, including cooking shows, competitions, animations for children, concerts. The decision to implement the project was made by the Self-government of the Małopolska Region in late 2003, and the first festival was held in 2005. Since then, the event has become a permanent item on the calendar of major cultural events in the region, each year expanding the range of products and increasing the number of exhibitors and visitors eager to taste culinary products from the entire Małopolska region, including the Podhale area. So far (until 2020) the festival of “real Małopolska flavour” has had 15 editions.

The Taste of Małopolska contest is organized during semi-finals held in different towns of Małopolska and during the final. The entered products and dishes are judged by the selection board, which awards the First, Second and Third Prizes. Semi-final winners qualify for the final, in which best products from all over Małopolska are selected. Also the fair visitors choose best products in a special opinion poll. Both the jury and the audience evaluates products in four categories: “Ecological Delicacies”, “Traditional Specialities”, “Specialities with a Legend”, and “Home-made by Mum”. At each fair, the voters receive attractive prizes. The fairs are accompanied by artistic stage presentations. [<http://www.ock.org.pl/Malopolski-Festiwal-Smaku-1411.html>].

Pict. 2. Festival of Taste in Nowy Targ, 2015



Source: [<https://www.watra.pl/nowy-targ/rozmaitosci/2015/07/13/malopolski-festiwal-smaku-w-nowym-targu>]

It should also be noted that the Marshal Office of the Małopolska Region took the initiative to publish the “**Małopolska to Eat**” cookbook, which contains a selection of Małopolska cuisine recipes. The key to the unique taste of the presented dishes are regional products, including those from the mountain areas, such as: lamb meat from Podhale (*jagnięcina podhalańska*), oscypek cheese, as well as *sucha sechłońska* prunes, apples from Łącko (*jabłka łąckie*), Lisiecka sausage (*kielbasa lisiecka*) and Zatorski carp (*karp zatorski*). [<https://www.malopolska.pl/malopolskismak/malopolskie-inspiracje>].

It is worthwhile mentioning that mountain products such as oscypek and bryndza cheeses were included in the group of traditional products thanks to efforts from the Regional Union of Sheep and Goat Breeders (RZHOiK) in Nowy Targ and the producers themselves, just as was the case with lamb meat from Podhale. The application for registration in the European Union of mountain lamb meat, which for more than 20 years was popular with Italian and Spanish importers, resulted in inclusion of *jagnięcina podhalańska* on the list of traditional products in 2008. Further efforts of the RZHOiK Union in Nowy Targ and of the Tatra and Beskidy Producers Cooperative “Gazdowie” led to the product receiving a Protected Geographical Indication (PGI) designation in 2012.

Pict. 3. The Strategy to Promote the City of Zakopane Brand logo



The Strategy to Promote the City of Zakopane Brand for 2013-2020 has taken the form a portfolio of tourism products offered by the city. The project is carried out on the commission of the Zakopane Promotion Office. The project assumes that the city will develop as a tourist centre under three slogans: “Ethnic Zakopane”, “Creative Zakopane”, and “Avant-garde Zakopane”. In simple terms, this means that the city under

Giewont Mountain will try to win over both less affluent tourists and those with refined tastes. Formulating the strategy took a year and cost 120,000 zloty. The external company Ageron in the first place carried out in-depth market studies. Surveys were carried out among tourists who were resting in Zakopane, Poles who have never visited the Podhale region, and inhabitants of the city themselves. It was established that **Zakopane, and, more broadly, the entire Podhale region, is mainly associated with mountains, skiing, and oscypek cheese.**

The primary objective of the strategy is to strengthen the **International Mountain Folklore Festival**, indeed to combine it with the **European Fair of Regional Products** into a large event, two weeks long. This fair features the **Oscypek Festival** and artistic metalwork shows.

With increasing public awareness of nutrition, attention in the “Factors affecting the development and design of tourism products: New trends in tourism – the external factors” was drawn to the growing consumer interest in regional and local products; the continued importance of the Internet as a source of information and buying tourist products (including food); and the increasing significance of social networks in marketing communication.

The analysis performed in stage I showed that some of the tourism products offered so far highlight the city’s unique features, but generally these are simple products or composite point products. **Currently the most important tourism products include oscypek cheese** and other regional and traditional products, regional inns, and restaurants serving regional products. Facilities that form part of the regional thematic routes, located within the city, were identified. Some of the Małopolska thematic routes that cross Zakopane include: **the Oscypek Route, the Małopolska Gourmet Route**, and the Cultural Heritage Route of the Sub-Tatra area.

The following main components were identified as part of the priority types of tourism (“Culinary Tourism”): regional cuisine, regional and traditional products, events promoting the site’s culinary heritage, fusion restaurants combining traditional cuisine with new gastronomic trends, regional inns.

In turn, with regard to the “Existing or Recommended Tourism Products”, emphasis is placed on: regional inns and fusion restaurants, regional products and traditions, important tourism products, creation of a strong tourism product on the basis of existing events that promote local culinary heritage, creation of a culinary route.

The idea behind one of the leading products, “Ethnic Zakopane”, is to present the city as a strong centre of cultural tourism, a city with rich cultural and culinary heritage and at the same time a strong centre of contemporary culture.

The product should expand on two major cultural events taking place in the city: the **International Mountain Folklore Festival (IMFF)**, the European Fair of Regional Products (EFRP), which features the **Oscypek and All Cheese Festival**, as well as Artistic Metalwork Shows. Held in August, the events present the region’s heritage and are accompanied by many attractions, in which tourists can take part. These events have high potential and fit optimally into the city’s brand. The product needs to be developed and it is complemented by thematic routes. The product’s qualities include promotion of Podhale’s cultural heritage, living traditions and customs, regional cuisine, regional and traditional products, and the art of local artists. The potential to develop the product is seen in maintaining the EFRP formula: the key elements are the Oscypek and All Cheese Festival, Artistic Metalwork Shows, fairs of regional and traditional products, culinary shows, and tasting of regional dishes (not only from the Podhale region), folk artist workshops, **“Master Shepherds’ Parade”**, **“Flock Driving”**, and scientific conferences. Partners in the project are: Tatra Agency for Development, Promotion and Culture, the City of Zakopane, Tatra Chamber of Commerce, the Association of Polish Artists and Designers of the Zakopane Region, and cultural institutions.

The concept of network products is further built on Thematic Routes, which include **“Zakopane. The Culinary Route”**. The guiding theme is regional cuisine and fusion cuisine, which make use of regional and traditional products, as well as promotion of the region’s culinary heritage, distinctiveness and uniqueness.

The **“Oscypek Route”**, which crosses the city (regional route), is formed by (certified) regional inns, restaurants that serve regional and traditional products turned into modern dishes, the Tatra Museum, and shepherd’s huts (only in season). The route is complemented by culinary events as part of the “Ethnic Zakopane” product (The Oscypek and All Cheese Festival, culinary workshops, shows). It is recommended to establish the “Living Museum of Podhale Culture”, which should be located on the route.

The added value here is promotion of the region's culinary heritage, presentation of the region's diversity, cultivation of the region's culinary traditions (culinary workshops, fusion restaurants), as well as strengthening Zakopane's competitiveness as a destination of culinary and ethnographic tourism.

The project is coordinated by the Zakopane Promotion Office, and the partners are: the City of Zakopane, Zakopane inns and restaurants, the Tatra Museum, and the Podhale Folk Union.

Pict. 4. Lamb meat from Podhale



Source: [<https://www.potegasmakow.pl/>]

In line with the concept, the existing tourism products that fit well into the City of Zakopane brand and are worth further promotion, include the following regional and traditional products: **oscypek, golka, bunc, re-dykolka, bryndza podhalańska, żentyca, jagnięcina podhalańska.**

The European Fair of Regional Products. Every August, Polish and foreign producers of regional foods present their products on the Lower Równia Krupowa in Zakopane. The fair also offers an excellent opportunity to get acquainted with the culinary heritage of different European regions. The organizer, the Tatra Agency for Development, Promotion and Culture strives to make Zakopane the European capital of best traditional and regional products during the fair. August is the period when several hundred thousand tourists from Poland and all over the world

spend their holidays under the Tatras. For them, the European Fair of Regional Products is a journey to the most interesting spots on the map of authentic Podhale, Polish and European cuisine. An equally important aim of the Fair is to exchange experiences among exhibitors and to establish international collaboration involving promotion of Podhale and Tatra products abroad.

Pict. 5. The European Fair of Regional Products



The Fair features **The Oscypek and All Cheese Festival**. It is opened by a colourful procession of master shepherds, delegations of local authorities, invited guests, and crowds of tourists. The festival presents traditional making of oscypek cheese and its different culinary uses. Contests involving master shepherds and the public are also organized: “Taste Testing”, which chooses the best oscypek cheese based on its size, shape and colour; “Oscypek Making”; “Milking and Shearing Sheep” – a contest for master shepherds, young shepherds, and shepherd’s helpers. The festival features performances by regional folk bands, tasting of highlander dishes, oscypek, bundz and żętyca. Awards are granted by the selection board consisting of master shepherds, the Tatra Starost, veterinary inspector, invited guests, and the public. The contest for “The Best Product of the European Fair of Regional Products” is also organized during the fair. The fair is accompanied by performances of regional folk bands from befriended counties as well as highlander folk bands. The European Fair of Regional Products brings together manufacturers of regional and traditional products from Poland and abroad. Despite the traditional nature of the fair, the folk performances take place alongside the concerts by pop music stars, as well as culinary shows with tasting, and all kinds of competitions. The interesting programme encourages tourists and inhabitants of the Podhale

region to share the fun. [<http://www.tatry.pl/tatrzenska-agencja/europejskie-targi-produktow-regionalnych>, <http://www.produkty-regionalne.eu/o-targach>].

The Mountain Product Society, which has its seat in Ludźmierz, was created in 2015 and brings together more than 20 producers of duly certified mountain products as well as people promoting mountain products such as cheeses, honeys, cured meat products and herbs. Its scope covers the Małopolskie, Podkarpackie and Śląskie voivodeships. Selected regional products are subject to an evaluation and control system being set up as part of the operation of the Mountain Product Society. In order to promote own products nationally, a concept of the “Carpathian Shelf” was conceived. It is an attractive form to present (and facilitate distribution of) all available products gathered on one shelf. Products in this form will be widely available all over Poland in small points of sale of organic foods, in hotels, petrol stations, recreation centres, and airports. The concept behind such presentation, distribution and promotion of products will be expanded to include regular extension of the product range not only with products from the Polish Carpathians, but also those from other Carpathian countries such as Romania, Ukraine, Czechia, Slovakia, and parts of Serbia and Hungary.

“We want to avoid questions: Is this genuine oscypek? These products are slightly more expensive, but customers remember product quality rather than prices”, says Andrzej Gąsienica Makowski, President of the Society

The Mountain Product Society intends to join a Polish-Slovak project named the Wallachian Culture Route, serving as organizer of the Fair of Mountain Products. As part of promoting the Rural Tourism Development Programme by the National Rural Network, efforts will be made to take part in the fair.

The growing interest in high quality products causes also large players in the food sector to meet consumer expectations. This year, the **District Cooperative Dairy in Bochnia** started to market mountain milk from Polish Red cows. This is the only milk in a glass bottle marketed all over Poland (including in Biedronka stores). This primitive breed, raised in mountain and foothill regions and covered by genetic resources conservation, shows high resistance, good health and longevity; due to traditional feeding based on summer pasturing, the milk is characterized by a particularly high biological value (high protein, fat and solids content) and has

health-promoting properties [<https://www.forummleczarskie.pl>]. Alongside the Polish Mountain Sheep, Polish Red is the most numerous breed of cattle traditionally raised in the mountain and foothill areas.

In the **Podkarpackie Voivodeship**, regular events are held to promote and popularize traditional foods, especially those produced in mountain and foothill regions. These regional and local promotional events are also an important distribution channel for local products. The most popular events include the International Fair of High Quality Food and Products “**EKOGALA**” in Rzeszów [Marshal Office of the Podkarpace Region – Department of Rural Development Programmes, regularly held during the Subcarpathian EXPO (this year the Virtual Expo 2020 was held online on 6-8 October)], the **Plum Stew Festival** in Krzeszów, the Traditional Food Fair – the **Podkarpackie Tastes Festival** organized in Górnio, the **Festival of Cultures and Borderlands Cuisine** in Basznia Dolna, Lubaczów municipality, and the **Podkarpackie Honey Feast**. The last mentioned event was held for the 15th time in 2019.

Pict. 6. The Voivodeship Beekeepers Association in Rzeszów logo



Source: [<http://www.wzp.rzeszow.pl/>]

During the event, apiarists from the region present various types of honey from the Podkarpace region, including certified honeydew honey from Podkarpace (**Podkarpacki miód spadziowy**), beekeeping equipment, meads, honey tinctures, and bee products. The event takes stock of honey harvest and provides an opportunity to honour the most

active and distinguished breeders. The Honey Feast is also an excellent opportunity to promote honey and bee products such as pollen, propolis, cosmetics and candles. It bears references to the history of forest beekeeping while getting support from the Self-government of the Podkarpackie Region for honey producers in the form of continued information and promotion programmes. Considering the developmental factors and current weather anomalies, as well as the alarming mass extinction of bees, the Self-government of the Podkarpackie Region, jointly with the Voivodeship Beekeepers' Association in Rzeszów, runs an education campaign "The role of honey bees in preserving agricultural biodiversity". Its goal is to promote activities aimed at preserving biodiversity through protection of honeybees, and to promote agricultural activities in support of this protection and maintaining a sufficient number of honeybee families in the voivodeship for proper pollination of entomophilous crops. During the Honey Feast, honorary badges of the Podkarpackie Chamber of Agriculture are awarded; this honorary distinction is granted by the Polish Beekeepers Association for outstanding services in work and activities (diamond badge of the Voivodeship Beekeepers Association, awarded for the first time for outstanding achievements and work for Podkarpackie and Polish beekeeping g), in addition to the brown, silver and golden badges of the Polish Beekeepers Association. It should be noted that the honeydew honey from the Podkarpackie region is mainly sold through direct distribution channels. It is distributed among regular consumers who appreciate its taste and quality. According to Dżugan and Wesołowska (2016), the direct sales of this honeydew honey accounts for 79.00% of the total production.

On the initiative of the Self-government of the Podkarpackie region, the **"Lexicon of Subcarpathian Tastes"**, which is a guide on the voivodeship's traditional culinary specialties, was published. All the promotional campaigns are connected with promoting and upholding the culinary traditions of the region. The commitment to promoting these foods is reflected in the opening, in the seat of the Marshal Office of the Podkarpackie Region in Rzeszów, of a site presenting the most popular tastes from the Podkarpackie region.

Relevant and large-scale activities, indirectly related to the promotion of traditional foods, are also conducted in the Podkarpackie voivodeship, including the competitions **"Our Good Products from Subcarpathia"** and **"Tasty Because Subcarpathian"**. The former, organized by Gazeta Codzienna Nowiny daily, is aimed to popularize products that

serve as a model to be followed, due to their quality and utility or taste value. The competition is targeted at all producers from the Podkarpackie voivodeship. In this way potential customers acquire knowledge about the advantages and qualities of products made in the region.

The Business Promotion Centre in Rzeszów organizes the “Tasty Because Subcarpathian” Certification Programme for Best Food Products from the Podkarpacie. The purpose of the programme is to select products which are the hallmark of the region due to their unique sensory and health-promoting attributes. The principal objective of the project is to promote, out of a wide range of food products, those that represent the highest level and, due to their unique attributes, can serve as the hallmark of the Podkarpacie region. Products from local producers and those made by large dairies or processing plants are eligible to compete. The Certificate is the distinguishing feature of the winning product, providing information that it meets the strictest standards of commercial, sanitary and health quality. The “Tasty Because Subcarpathian” Certificate is an outstanding recommendation of the product, contributes to the company’s image, and is a tool for effective promotion in the region and nationwide. [<http://www.smaczne.rze.pl/index.html>; Bienia et al., 2014].

The region’s landscape value with extensive tourist facilities is an important driver of the local sales of products made in the mountain and foothill regions. In south-eastern Poland, attractive services are offered by **Grupa Bieszczady** – a tourism cluster offering comprehensive tourism-related services in the Bieszczady, Low Beskids, Eastern Carpathians and East Slovakia areas [<http://www.grupabieszczady.pl>]. The group has a database of cooperating hotels, restaurants and leisure facilities. These offerings are supported by very good knowledge of the local tourist market and a wide network of contacts, aided by commitment to the promotion and advertising of the region. This includes many accommodation establishments, agritourism facilities, and shepherd’s huts with a wide choice of locally made products, including a variety of cheeses (e.g. “Czar PGR-u” shepherd’s hut/guesthouse in Wańkowa; “Góralskie Domki w Bukowcu” organic farm with “Serowy Raj” educational pen; shepherd’s hut in Berehy Górne with cultural grazing run in the Bieszczady National Park). This platform has attracted interest from several thousand tourists, potential customers and buyers of mountain products made in the Bieszczady and Eastern Carpathians regions.

The Strategy for Silesian Voivodeship Development “Śląskie 2020” (as updated by “Śląskie 2020+”) in the Strategic Objective A.3: Innovative and Competitive Economy, Activity A.3.3: Modernization of agriculture and support of economic changes in rural areas, is designed to implement activities aimed at overcoming the unfavourable ecological image of the voivodeship, serving to improve the perception of food products made in the region. A good example of this is the interest of agricultural producers in converting conventional agricultural production to organic production. The main types of these measures include creation and promotion of quality and organic agricultural products; promoting partnership and cooperation among food producers; forming cooperative groups and enhancing commercial communication between food producers and customers from international markets by creating cooperation networks with foreign partners and introducing and disseminating sales techniques that use internet tools. [<https://www.slaskie.pl/content/strategia-rozwoju-wojewodztwa-slaskiego-slaskie-2020>]

Pict. 7. The Silesian Tastes Culinary Trail logo



Source: <https://www.slaskiesmaki.pl>

The Silesian Tastes Culinary Trail, which runs through the Śląskie voivodeship, is a tourist product developed on the initiative of the Silesian Tourist Organization in 2012 to promote Silesian cuisine as well as cuisine from the Beskidy, Jura Krakowsko-Częstochowska and Zagłębie Dąbrowskie regions. The programme involves restaurants and breweries which also serve regional dishes based on traditional recipes and natural

ingredients. A significant part of these are included in the List of Traditional Products published by the Ministry of Agriculture and Rural Development. In 2016, the trail route featured 31 facilities serving 170 dishes based on local ingredients (compared to 32 facilities in 2015). Each restaurant is easily recognized by the “Silesian Tastes” designation on the door, the certificate is displayed on the wall, and the menu has a special insert with regional dishes. The Silesian Tastes Culinary Trail has received the Certificate of the Polish Tourism Organization for Best Tourist Product in 2013. It was also awarded by the European Commission in the International European Destinations of Excellence Competition for Best European Tourist Destination 2015. The promotion of the Silesian Tastes Culinary Trail through a visual identification system (a single system of logotypes and rules for their use, acceptable or unacceptable ways of the logo’s exposition), is carried out through a restaurant marking system (information boards, and plate certificates of membership in the Silesian Tastes Culinary Trail). A large number of the restaurants are located in the central part of the voivodeship, but there are also facilities in the mountain and foothill areas in the towns of Bielsko-Biała, Wisła and Cieszyń.

In the context of activities promoting mountain and foothill products, an important role is played by initiatives of local breeders and producers, as exemplified in the Silesian voivodeship by the **Regional Product Centre** and the Pastoral Centre in **Koniaków**. The wide choice of offerings includes the sales of mountain milk products and, equally importantly, educational activities and accommodation facilities. Traditional cultural grazing of around 1200 sheep is carried out in the mountain pastures of the Silesian and Żywiec Beskids. Their milk is used to make cheeses sold in a wooden shepherd’s hut (Kolyba). The Pastoral Centre holds a permanent exhibition of wooden pastoral equipment as well as an exposition of handcrafted sheep’s wool products – pillows, decorations and souvenirs. In the Educational Pen, lectures are combined with tasting of cheeses, bundz making shows, and educational workshops related to folk handicraft and wool processing. An interactive education path of wool processing is also available here. [<http://seroscypek.pl/>]

Pict. 8. The “Lower Silesia. The Green Valley of Food and Health”
Development Project logo



Source: www.umwd.dolnyslask.pl

The “Lower Silesia. The Green Valley of Food and Health” Development Project was elaborated based on regulations of the Law of 6 December 2006 on the principles of development policy. The role of the leader of the Programme was entrusted by the Lower Silesia Voivodeship Board to the Wrocław University of Environmental and Life Sciences. As part of this large-scale project aimed at increasing consumer nutritional awareness and promoting regional products, the Lower Silesia Agricultural Advisory Centre undertakes measures to support health education among children and young people through classes organized directly in the Educational Pens (currently 28 such pens are operated in Lower Silesia), where theory is combined with practical classes on a farm. As a result, the youth can become acquainted with the processes of high quality food production while developing positive eating habits

Local government officials and scientists are favorably disposed towards local initiatives in support of this undertaking. One of them is a project that has been promoted for several years by the **Sudeten Beef Cluster** – Progress Foundation for Regional Development. The principal goal of the project is to prepare implementation of the Sudeten beef (*wołowina sudecka*) regional product in Sudeten LFAs encompassing six districts of the Lower Silesia Voivodeship (Kłodzki, Wałbrzyski, Kamiennogórski, Jeleniogórski, Lwówecki and Lubański districts).

Pict. 9. Sudeten Beef



Source: [<https://naszbiznes24.pl/festyn-z-wolowina-sudecka/>]

The undertaken research and implementation project has the following basic priorities:

- to develop lines of agricultural production to which the region is especially suited due to its natural conditions;
- to provide tourists and health resort visitors with original regional products of high quality;
- to start non-agricultural activities in the rural areas covered by the project,
- to integrate local communities related to agriculture, food production, catering and tourism services,
- to support activities for preserving the natural value of the region.

Research-wise, the project is conducted by the Wrocław University of Environmental and Life Sciences. Because its aim is strictly practical, after project completion it will be possible to undertake the above described activities that are essential for local communities. Work has already begun to determine the supply potential of catering facilities and

hotels, and as a result, 281 entities of this type were surveyed in the Jeleniogórski and Lubański districts. In the future, they will be able to offer the new regional product (Sudeten beef) to potential consumers (tourists and sanatorium guests in the Sudeten Mountains region). The next stages of the research will include evaluating the level of demand for Sudeten beef, evaluating the production potential of culinary beef in the study region, assessing the local market for Sudeten beef, identifying potential buyers, and developing the distribution and production systems.

The project *“generally provides that cattle will return to mountain slopes. In the Kłodzko land there were around 90,000 cattle during the interwar period, around 45,000 in the 1970s, and when we launched the concept four years ago, over 9,000. Today, the Agency for Restructuring and Modernization of Agriculture reports that we have almost 11,000 head of cattle in the area. It means that good things are happening,”* sums up Zbigniew Szczygieł, President of the “Sudeten Beef” Cluster. [<http://www.dkl24.pl/pl/a/4620/o-wolowinie-z-sudeckich-lak-i-past-wisk.html>]

The Wrocław University of Environmental and Life Sciences is an initiator, leader and partner of economic undertakings in the region concerning broadly defined bio-business, including specialized production of health-promoting foods. Scientists believe that the available potential may help to make the region one of the most competitive producers of functional foods, dietary supplements and quality food in the world. In this perspective, “Sudeten Beef” is viewed as the flagship mountain product of the “Lower Silesia. The Green Valley of Food and Health” Development Project.

The above evidence of activity from local governments, as well as the initiatives of local breeders and producers in promoting locally made products, especially in the mountain and foothill regions, are a welcome response to temporally variable expectations of consumers with regard to food products. The gradual reduction in the nutritional and health quality of products, especially those of animal origin, paralleled by the rising standard of living, suggests that the public interest in quality, certified products and regional dishes will spontaneously increase. Acknowledging them as a complementary added value to the tourist attractiveness of the Tatras, Podhale and Sudeten Mountains, as is the case with oscypek cheese, lamb meat from Podhale and recently promoted Sudeten beef, will be of definite benefit to the mountain and foothill regions.

Summary

Traditional products, dishes and beverages are an important element of the culinary heritage of towns and tourist regions, and their promotion plays an essential role in popularizing and caring for culinary heritage. Local initiatives in this area, carried out in the Małopolskie, Podkarpackie, Śląskie and Dolnośląskie voivodeships, such as the Małopolska Festival of Taste, the Oscypek Festival as part of the International Mountain Folklore Festival, the Podkarpackie Honey Feast, and the Sudeten Beef project are the mainstay of the promotion of traditional products such as oscypek cheese, lamb meat from Podhale, Podkarpacki Honey or Sudeten Beef in the mountain and foothill regions. An equally important role is played by the initiatives of breeders and producers in promoting locally made products. Apart from the main measures, the supplementary forms of promotion, such as local and regional folk events, festivals, festivities, contests, harvest festivals, tourism fairs and town and village days all make these products more popular. These activities are a welcome response to temporally variable expectations of consumers with regard to food products. Acknowledging them as a complementary added value to the tourist attractiveness of the Tatras, Podhale and Sudeten Mountains will be of definite benefit to the mountain and foothill regions.

Key words: mountain product, promotion, local initiatives.

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Structural solutions for mountain farming in Italy

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Mountain areas size in the EU and Italy

Mountain areas, as defined in art. 18 of Regulation 1257/1999, occupy 18.5% of the Union's surface area and, counting almost 2 and a half million farms, represent 17.8% of the total European farms. In Italy, 47.5% of the surface area is mountainous and the number of farms involved is 31% of the total national farms. A considerable extension of territory, therefore, on which farmers are faced with a series of specific disadvantages:

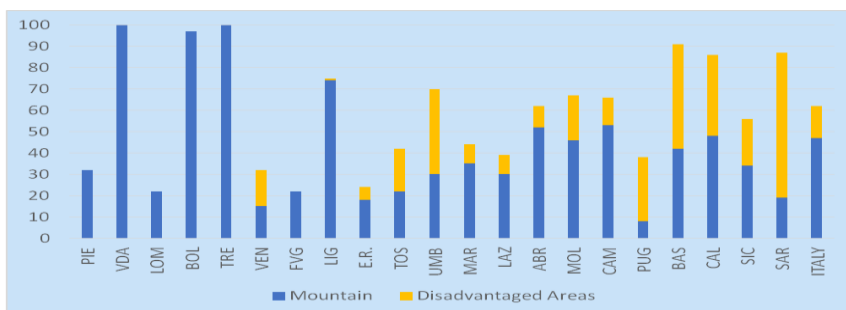
Lower temperatures, a shorter growing season, greater slopes, together with lower soil fertility and the need for often more expensive machinery, as well as longer working times. All this leads to lower soil productivity and consequently lower labour productivity. In addition, difficult access, fewer processing facilities and their small size ultimately lead to higher transportation costs and lower economies of scale. Alongside the disadvantages, however, there are some positive economic data, which represent specific advantages:

The price paid to the producer is in fact on average higher in the mountains than that paid to other farms: for example, 10% more for cow's milk and up to 25% more for fruit. Index of a quality appreciated by the market.

The diagnosis: mountain territories and their specificity

Mountain areas occupy about 19 million hectares and represent 40% of the European territory, but in some States, such as Greece, Spain, Italy, Austria and Portugal, these areas constitute more than 50% of the national territory; it is estimated that in the mountains there currently live almost a fifth of the European population, about 13 million inhabitants (Galluzzo, 2006). In Italy, agriculture is a significant part of the mountain tissue, both in productive and social and environmental terms, as well as in terms of surface area, as shown in Figure 1. Mountain farms are over one and a half million, accounting for almost 60% of total Italian farms. Italian mountain areas have a very low population density (less than 60 inhabitants per km²), and have been affected by depopulation and abandonment of agricultural activities. Among the last two censuses there is a significant decrease both in residents and in agricultural areas (-17%), and in the number of farms (-20%) (Mipaaf, 2007).

Figure 1. Percentage incidence of UAA in disadvantaged areas (mountains and other disadvantages) compared to the overall UAA in Italian regions



Source: INEA elaborations on ISTAT and EU data - Cagliero et al. (2007).

A mosaic development model and the spiral of marginality

These phenomena contribute to the marked weakening of the local economic and social tissue, as well as to the worsening of territorial prob-

lems, such as hydrogeological instability or the loss of the traditional landscape, through a growing disorder and a loss of variability. Mountain areas differ from other areas for very specific factors, especially in physical terms, but also present a significant variability within them, including very different situations and creating a considerable territorial and development complexity. However, in general terms we can refer to a mosaic development model, where activities are integrated with each other, without a single particularly marked specialization. These territories have a sort of fragility not only in productive terms, due to permanent natural disadvantages, especially in agriculture, and environmental, but also, and above all, in terms of demographic balance. A sufficient population, fighting depopulation and attracting new inhabitants, is often the key factor, especially to stop the so-called spiral of marginality (Buran et al., 1998), which considerably amplifies the phenomena of decline, as exemplified in Figure 2. A sufficient presence of inhabitants is, in fact, fundamental to activate the mechanisms aimed at guaranteeing a minimum level of services, improving the accessibility and interconnection of mountain areas and providing the necessary infrastructure, including broadband access.

In this context, the role of rural activities, and agricultural activities in particular, is of high importance, for the production, care and use of the landscape, the maintenance of traditional social structures, as well as a multifunctional base for other economic sectors; even if sometimes, as for example in the case of too intense tourist exploitation, forms of pressure or competition with other activities, such as agriculture itself, can be activated.

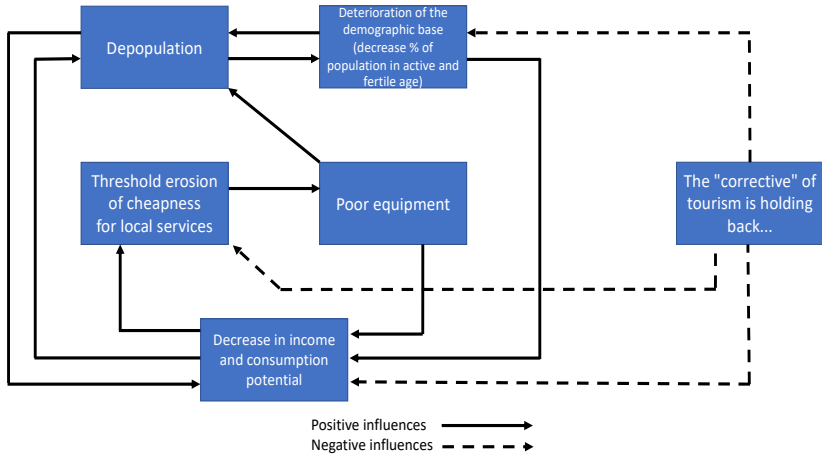
The tissue of the farms in mountain areas is made up of family businesses, often at financial risk, with economic activities, precisely because of natural conditions, more labour-intensive and with higher costs; in other words, mountain agriculture is less able to face the conditions of competition, suffering additional costs and, consequently, an offer with prices that are difficult to compete.

SWOT analysis of mountain farms

As a point of strength and opportunity, mountain agricultural production is characterized by a marked typicality and high quality, albeit

with the threat of multiple imitations, and relevant activities of a multi-functional nature; the primary activity is in many cases the only possibility of managing territories often difficult to maintain.

Figure 2. The spiral of marginality

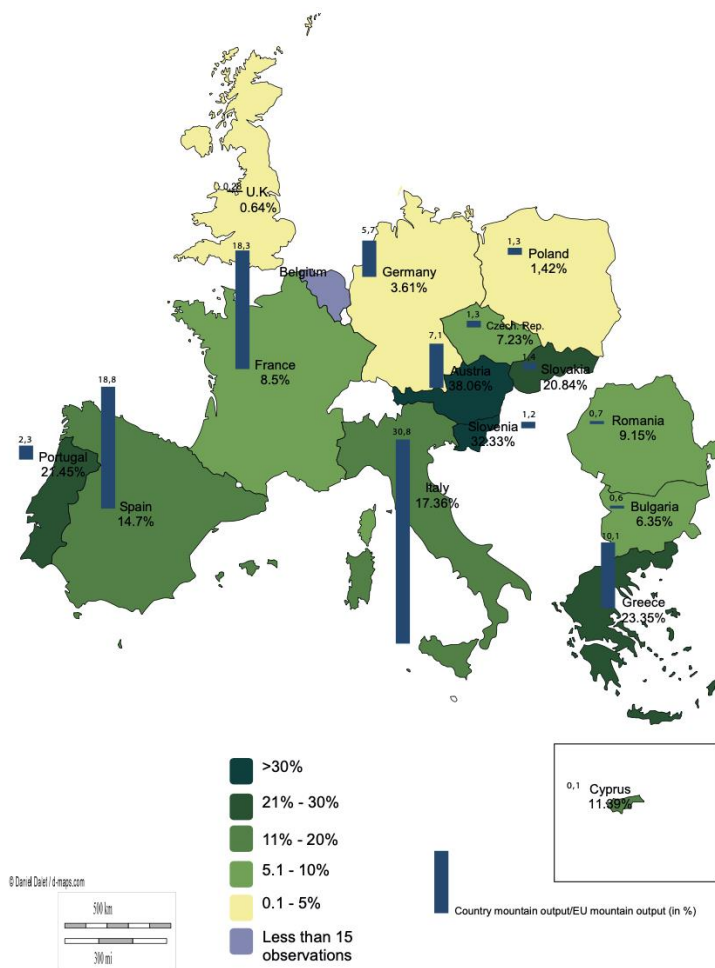


Source: Buran et al., 1998.

How much are the European mountains worth in terms of agri-food turnover?

The total turnover (GDP – gross domestic product) of mountain areas in Europe is worth 11% (31.3 billion euros) of the total agri-food turnover of the Union. Italy confirms its leadership in the sector. Italy alone produces as much as 30% of the agri-foodstuffs of mountain areas throughout the Union, followed by France and Spain with 18% each. Other important producers are Greece, Germany and Austria, which together account for about one fifth of total turnover. With reference to the main national sectors, the Italian production of cow's milk in the mountains is equal to 17.5% of the European total, second only to France (25%). Italy, moreover, is first in terms of fruit production, representing alone 72% of the total European mountains.

Figure 3. Share of mountain agriculture output in each member state



Source: Labelling of agricultural and food products of mountain farming/DG AGRI.

Role of agriculture in mountain areas

Agriculture represents a considerable resource and in a phase of strategic planning of mountain areas, we must not miss opportunities to

provide development policies in enhancing the role of agriculture, integrating it with other elements that can ensure the vitality of mountain areas. For example, the existence in mountain areas of specific traditions and knowledge linked to the agri-food chains, enhanced by the label “mountain product”, represents an opportunity to be exploited in synergy with policies for the development of food and wine and rural tourism. According to European parliamentarian Michl Ebner, the focal point of mountain areas in Europe is the development of agriculture in these areas. It is essential to plan and implement a unique development strategy, with agriculture in a central position.

Table1. Mountain productions by single member state

	Moun- tain crop output (M€)	Moun- tain livestock output (M€)	Moun- tain output (M€)	Mountain share in total output (%)	Crop share in mountain output (%)	Livestock share in mountain output (%)
Europe	10,700	12,650	23,350	8.0	45.8	54.2
Belgium	0.08	10	10	0.2	0.8	99.2
Bulgaria	78	70	147	6.4	52.6	47.4
Czech Rep.	121	180	300	7.2	40.2	59.8
Cyprus	25	7	32	11.4	77.9	22.1
Germany	235	1,085	1,320	3.6	17.8	82.2
Greece	1,435	926	2,361	23.4	60.8	39.2
Spain	1,965	2,415	4,380	14.3	44.9	55.1
France	1,035	3,230	4,265	8.5	24.3	75.7
Italy	4,745	2,450	7,195	17.4	65.9	34.1
Austria	249	1,420	1,669	38.1	14.9	85.1
Poland	104	191	296	1.4	35.3	64.7
Portugal	349	193	542	21.4	64.4	35.6
Romania	85	84	169	1.8	50.2	49.8
Slovakia	160	164	324	20.8	49.4	50.6
Slovenia	131	142	273	32.3	48.0	52.0
UK	6	59	65	0.3	9.7	90.3

An integrated strategy for mountain farming

The challenge to strengthen the vitality of these areas is played out on a package of incentives and services. Mountain areas in Europe are a territory in which agriculture plays a fundamental role for the proper management of the landscape, the conservation of biodiversity, the fight against abandonment and above all the local economy. Agriculture in these areas is very often the trigger of more complex development processes, capable of integrating other economic sectors, ensuring the vitality of the mountains.

With a view to making the mountain products on the market more clearly identifiable and less misleading for consumers, the EU institutions legislated on a common definition of an optional quality term, “mountain product”, in the labelling of agricultural products. The term “mountain product” should only be used for products for which the feed and the raw materials come essentially from mountain areas and for which the processing also takes place in mountain areas. The European Commission approved a new Regulation (EU) No 1151/2012 of the European Parliament and of the Council of 21 November 2012 on quality schemes for agricultural products and foodstuffs in order to take into account the specificities of the different sectors involved.

Regulation (EU) No 1151/2012

The Regulation (EU) No 1151/2012 report aims to (i) gather and analyse information on the supply chains for agricultural and food products in mountain areas; (ii) review the possible reasons why citizens, stakeholders and consumers need clarity regarding the provenance of mountain products; and (iii) assess past and present labelling practices for mountain products.

Some derogations to the rules governing the term 'mountain product' are possible with regards to:

- the exact place where feed is sourced;
- the places where agricultural raw material produced in mountain areas are transformed in further processed goods;
- the share of non-mountain ingredients within a mountain processed product that may be considered as acceptable.

An important challenge is to enforce the rules and to ensure coexistence between the new optional quality term “mountain product” and other existing tools, such as trademarks and geographical indications. Somebody might think that in the absence of derogations, the applicability of the optional quality term “mountain products” would be impaired.

Regulation No 1151/2012, however, provides that, in the absence of derogations, for the purposes of the indication “mountain product”, raw materials and animal feed must come essentially from mountain areas and that, in the case of processed products, the processing also takes place in the same areas.

But in many cases the supply chains cross the borders of mountain areas. Animal feed may need to be supplemented from other areas. For the processing of products, mountains are often not self-sufficient, while in some cases non-local ingredients are traditionally used.

The main interventions of the plan for mountain agriculture in Italy until 2020

On the occasion of the “International Mountain Day”, every year on 11th December, in 2014, the MIPAAF presented the Plan for Mountain Farming. Two main guidelines: enhancement and support of agricultural activities in mountain areas also through the optimal use of European funds and an operational plan with the Regions for the management of the forest heritage, which is part of the actions to combat hydrogeological instability.

“Mountain agriculture is a fundamental presidium for the life of many rural territories and is strategic for the fight against hydrogeological instability” (Ministry of Agriculture Maurizio Martina).

We are talking about a sector that in Europe is worth 30 billion euros and involves more than 2.5 million farms, 280 thousand of which are Italian.

Until 2020 Italy has decided to intervene in favour of mountain farms, with specific choices within the application of the Common Agricultural Policy. In particular, interventions in favour of mountain animal husbandry, with over 50 million euros per year to give future to a central

activity for the life of mountain territories. At the same time, an operational plan for the management of Italian forests has been approved with the Regions. Italy has invested 1.8 billion euros for the protection, enhancement and preservation of our forest heritage, which was not previously adequately cared for. There are 11 million hectares on which action has been taken to prevent hydrogeological instability, with the aim of reducing landslides, fires and triggering a vicious cycle of the use of “waste” as biomass. In Italy, the wood supply chain employs 700 thousand people.

Summarizing the 4 actions for mountain farming until 2020:

1. Active farmer

Within the direct payments of the CAP 2014-2020 the definition of farmer in activity provides that:

- natural or legal persons receiving direct aid for a maximum amount of 5,000 euro in mountain areas are considered active farmers (in other areas the limit is 1,250 euro).
- for companies with areas mainly located in mountain and/or disadvantaged areas, it is sufficient to have an active VAT number in the agricultural field.

2. Coupled support and convergence

- With regard to coupled support (1st pillar), a set of measures has been prepared at national level for mountain areas.
- Mountain areas as well as disadvantaged areas will benefit from the effects of internal convergence. The convergence (process of approaching the value of rights) will lead to a redistribution of payments, from farmers with a value of rights higher than the national average (intensive farming areas) to farmers with a value below 90% of the national average (extensive farming areas).

3. Rural development plan (PSR)

MIPAAF asked the Regions to use the individual measures of the rural development programmes, taking into account the selection criteria of rural areas in greater difficulty, such as mountain areas.

The reform regulation of the CAP 2014-2020, in fact, provides support to mountain areas:

- Compensation for areas subject to natural or other specific constraints

- Agri-environmental and climate interventions
- Cooperation
- Investments in tangible fixed assets
- Development of farms and enterprises in rural areas
- Quality schemes for agricultural and food products
- Setting up of agroforestry systems
- Basic services and renovation of villages in rural areas
- Knowledge transfer and information actions
- Consultancy, replacement and farm management assistance services
- Establishment of producers' associations
- LEADER (i.e. the promotion of Local Action Groups that see the preparation of a development plan by local institutions and representatives of professional associations at local level).
- A differentiated intervention in favour of dairy cows in mountain areas is also established for animal husbandry.

In particular, within the framework of the Zootechnical Plan with a total financial allocation of 210 million euros, diversified premiums are provided for the support of quality production, genetic improvement and mountain areas.

In this context, the ceiling for dairy cattle is 74.6 million euros, while for "Dairy cattle farms in mountain areas" an additional premium to the basic unit premium is established, for an estimated amount of 40 euro/head and a ceiling of 10 million euros.

Support is also strengthened for suckler cows with a ceiling of 40.5 million euro, extensively reared mainly in mountain areas, with an estimated unit amount of 202 euro/head.

A ceiling of 70 million euro is allocated for the support of olive growing. In areas with an average slope of more than 7.5%, there is an additional aid estimated at 70 euro/ha, with a ceiling of 13 million euro. This is valid only for the regions of Puglia and Calabria, whose agricultural economy is highly dependent on olive trees (regions characterized by a ratio between olive groves and regional agricultural area greater than 25%).

4. Partnership agreement

For the development of mountain areas, the Partnership Agreement that Italy has presented as a coordinated strategy of all Community Structural Funds is also of great importance.

The objective is to slow down the phenomenon of depopulation of the internal areas, through an integrated approach of intervention aimed at the recovery and enhancement of the potential present also in marginal areas, critical for the overall stability of the national territory and balanced development paths, but tend to be less and less manned and cared for by active local communities.

The Internal Areas strategy implies that local development projects focus on:

- protection of the territory and local communities;
- enhancement of natural and cultural resources and sustainable tourism;
- agri-food systems and local development;
- energy saving and local renewable energy supply chains;
- know-how and craftsmanship.

The local development projects, however, must be complemented by a national intervention to ensure the communities involved conditions for the use of adequate essential services (telecommunications, transport, health and education services) in order to maintain or attract, in these territories, a population of adequate size and with a balanced demographic structure.

Some Italian products and interventions in mountain areas

Project Prosecco hills, Unesco's World Heritage Site

The Prosecco hills – a land of nature, history and culture between Conegliano and Valdobbiadene, in the province of Treviso, in the north-east of Italy – are an extraordinary land, where an internationally renowned wine is produced, a small world of the past covered with vineyards worked by hand on steep slopes that in July 2019 received an important recognition: the title of Unesco's World Heritage Site.

The Prosecco hills are the 55th Italian site recognized by Unesco, a site that comprises most of the production area of Prosecco di Conegliano-Valdobbiadene DOCG, a white wine exported all over the world with more than 90 million bottles produced each year. This land boasts a foremost sparkling wine technique (in 1876 in Conegliano Italy's first Enological School, still active today, was founded) and a heroic viticulture,

that masterfully shaped the rugged terrains to make them suitable for vine crops.

This area is dominated by a particular geomorphological conformation: hogbacks, a series of rises with narrow ridges and steep slopes (even with a slope of 50%). Worked by men since the Middle Ages, over the centuries the Prosecco Hills have taken on spectacular geometries and an odd checkerboard appearance.

Project Environmental Passport for Montagna Vicentina Agri-Food Products

On the website www.passaportoambientale.it are available the outputs of the European project called ENVIRONMENTAL PASSPORT FOR MONTAGNA VICENTINA AGRI-FOOD PRODUCTS. In particular, guidelines are released to support the agri-food sector to follow recognized paths of reduction of environmental impacts.

The 7 companies in the territory of the Montagna Vicentina have been the object of the Environmental Passport experimentation, a path of sustainability of the agri-food chains conceived by the Industrial Engineering Department of the University of Padua that allows designing new products with reduced environmental impact.

The project, started in October 2018, was successfully completed in summer 2020 and the results are finally available to all companies interested in reducing their impact on the environment.

Project Parmigiano Reggiano Mountain Product

Parmigiano Reggiano is the most important PDO product obtained in the mountains, with over 110 dairies located in the mountains and over 1,200 farmers who, every day, help to strengthen the economy and preserve the uniqueness of the mountain territory of Parma, Reggio Emilia, Modena and Bologna. In order to give greater sustainability to the development of the mountains and offer consumers additional guarantees linked not only to the origin but also to the quality of the cheese, the Parmigiano Reggiano Consortium has defined the “Mountain Product – Quality Consortium Project”.



Certification requirements:

- 100% milk milked in stables in mountain areas
- more than 60% of the cows' feed is grown in mountain areas
- dairy and seasoning up to 12 months minimum, in mountain area
- qualitative selection at 24 months with “hammer” evaluation of the experts of the Consortium
- sensory evaluation (tasting group) and chemical composition analysis

The “Parmigiano Reggiano di montagna” represents 22% of the total product in terms of wheels of cheese, and is obtained from 93 dairies in the mountain area (Apennines) in the provinces of Parma, Emilia, Modena and Bologna, with over 1000 farmers involved. Concrete results are the retail price sold equal to 2 – 2.5 euro/kg more than the standard, while wholesale production is sold from 0.20 to 0.40 euro/kg more than the standard.

Project FITOCHE: From Fields To Cheese

The FITOCHE project is a PSR project of the Veneto region. The problems to be solved with the FITOCHE project concern: 1) the reduction of fodder essences, traditionally present in mountain pasture meadows, as well as the abandonment of mowing and grazing with the progress of the forest; 2) the land degradation risk; 3) the risk of compromising over time the “common consumer feeling” that recognizes the mountain product a

superior quality and genuineness, as well as a role of soil protection; 4) the lack of specific production discipline in order to protect and promote the production of raw mountain milk (which may also have other value, such as organic products) for the production of excellent dairy products and still little known and documented. The innovative solution adopted is to foster a synergistic process among the major cooperatives of the Veneto mountain dairy, through a holistic approach that includes the deepening of the historical-cultural aspects of dairies, the adaptability of mountain livestock systems to the territory and their relationship with the biodiversity that populates the Veneto mountains. In addition, aspects of the geographical and aromatic traceability of dairy products will be applied, all with the implementation of investments along the dairy supply chain, encouraging the transfer of scientific knowledge, with the control and development of good practices.

The specific objectives of the FITOCHE project are the following:

- Historical aspects and origins of partner case studies
 - History and origin of the cases
 - Role and benefits of dairy products
- Technical-scientific aspects
 - Technical-nutritional sheets of the various products
 - Mapping and analysis of soil degradation (also using drones)
 - Analysis of the floristic composition
 - Traceability of milk and cheeses
- Aspects of adaptability to the territory
 - Census of agronomic and livestock activities
 - Good management practices and environmental mitigation
- Economic aspects
 - Analysis of production costs
 - Market analysis
- Social, formative aspects

Project TOP VALUE

In summary the Top Value project foresees:

- The cooperation between 6 partners of the border area between Italy and Austria.

- Co-financing by the Interreg Programme V-A Italy - Austria 2014-2020.
- A duration of 36 months, from January 2017 to December 2019.

The four main objectives are:

1. to evaluate the economic impact of the use of quality schemes, especially with reference to the optional indication “Mountain Product”.
2. to quantify and enhance the ecosystem services provided by mountain producers in terms of maintaining the landscape and traditional cultural heritage
3. to promote the adoption by mountain producers of the optional indication “Mountain Product”.
4. to promote knowledge and raise the level of consumer awareness of quality production.

The expected results are the following:

- to maintain the productive activities in the mountain guaranteeing the profitability of the agro-alimentary enterprises.
- Attract more consumers to the mountain area.

Summary

The European community in recent years has invested heavily in terms of structural solutions, legislation and funding for the enhancement of mountain products and various structural solutions adopted in the Italian mountains have been presented and discussed. It is now recognized and shared that agriculture represents a considerable resource for mountain territories and in a phase of strategic planning of mountain areas, the enhancement of the label “mountain product”, represents an opportunity to be exploited in synergy with the development policies of food and wine and rural tourism. In this context, further modified by COVID-19, knowing the peculiarities among the countries of the mountain community, it is therefore topical to support a specific policy for the European mountains, providing a specification for the mountain in each national reality. In particular, this overall strategy should focus on the importance of guaranteeing a high level of services of economic and population interest, accessibility and interconnection, the presence of the necessary infrastructures

(transport, education, communication networks), the contrast of depopulation phenomena, the attraction of new inhabitants and the protection of the landscape.

Key words: mountain farming, structural solutions, Italia.

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Management and breeding strategies for Italian Holstein cows reared in the mountains

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The Parmigiano Reggiano cheese

Parmigiano Reggiano embodies a unique and extraordinary journey lasting a thousand years, which still takes place today in the same places, with the same passion and the same ingredients (www.parmigianoreggiano.com). In the Middle Ages, the Cistercian and Benedictine monks, driven by the search for a cheese capable of lasting over time, were the first producers: thanks to the salt coming from the Salsomaggiore salt pans and the milk of the cows raised in the grangie, the farms of the monasteries obtained a cheese with a dry texture and large shapes, suitable for long storage. Over the centuries, Parmigiano Reggiano has not changed the basic production methods: today, as in the Middle Ages, production takes place naturally, without additives. At the beginning of the 1900s, however, some important innovations were introduced, still current, such as the use of whey and steam heating. On July 27, 1934, the representatives of the dairies of Parma, Reggio, Modena, Mantua (right Po), agreed on the need to approve a mark of origin for their cheese.

Parmigiano Reggiano is produced exclusively in the provinces of Parma, Reggio Emilia, Modena, Bologna to the left of the Reno river and Mantua to the right of the Po river: here are concentrated the farms where

the cows are fed with fodder produced in this area. Animal nutrition is taken care of in compliance with a regulation that prevents the use of ensiled fodder, fermented foods and flours of animal origin.

Production: The milk from the morning and the previous evening is poured into the typical copper boilers in the shape of an inverted campaign. For each form of Parmigiano Reggiano approximately 550 litres of milk are needed. The coagulation of the milk occurs slowly and naturally thanks to the addition of rennet and whey obtained from the previous day's processing and rich in natural lactic ferments. The curd is fragmented by the master cheese maker into tiny granules thanks to an ancient tool called a "*spino*". It is at this point that the fire enters the scene, for a cooking that reaches 55 degrees centigrade, at the end of which the cheesy granules fall to the bottom of the boiler forming a single mass. After about fifty minutes the cheese maker extracts the cheese mass which will give life to two twin forms. Cut into two parts and wrapped in the typical linen cloth, the cheese is placed in a mould that will give it its final shape.

Trademarks of origin: Each wheel is assigned a casein plate with a unique and progressive alphanumeric code: it is the identity card that makes it possible to identify its origin at any time and in any place. After a few hours, a special marking band engraves on the cheese the month and year of production, the serial number that distinguishes the dairy and the unmistakable dotted writing on the entire circumference of the wheels.

The salting: After a few days, the cheeses are immersed in a saturated solution of water and salt: it is a salting by osmosis. With this last step, the production cycle of Parmigiano Reggiano is concluded and the seasoning period begins.

The Parmigiano Reggiano Consortium: a bit of history

The Reggio Emilia Chamber of Commerce proposes in 1901 the establishment of a union between cheese producers and traders in order to authenticate the origin of the product intended for export. The representatives of the Chambers of Commerce of Parma, Reggio, Modena and Man-

tua meet to discuss the application of a marking of the grana cheese produced in these four provinces and to discuss whether the name should be Parmigiano or Reggiano. The Chamber of Commerce of Parma prepares a Regulation for the marking of Parmigiano cheese with a trademark consisting of a shield, surmounted by the ducal crown, with the letters F.P. (Parmesan cheese). The representatives of the dairies of Parma, Reggio, Modena, Mantua (right Po), agree on the need to approve a mark of origin for their cheese. Thus, on July 27, 1934, the Interprovincial “**Grana Tipico**” Voluntary Consortium was born, adopting the oval mark for suitable shapes; this trademark bore the vintage and the written C- G.T. Parmesan Reggiano. In 1937 the production area was defined with the current borders, also including the territories of the province of Bologna (left Reno): finally, the term “Parmigiano Reggiano” was made official for the first time in 1938. In 1964 the Consortium implements one of its most important measures: the marking of origin with the writing in dots Parmigiano Reggiano on the side of the wheel that gave the cheese its current appearance.

Tasks of the Consortium were and are:

- defense and protection of the Designation of Origin
- facilitation of trade and consumption
- promotion of initiatives aimed at safeguarding the typicality and peculiar characteristics of the product

In 1992 the EEC Regulation 2081/1992 on Protected Designations of Origin, the PDOs was approved (later integrated by Regulation (EEC) 510/2006); in 1996, Parmigiano Reggiano was recognized as a European PDO, and finally in 2008 the ruling of the European Court of Justice of 26 February 2008, established that evocative terms of the Parmigiano Reggiano PDO such as the term parmesan must be reserved for authentic cheese produced according to the Production Regulations.

The mountain Parmigiano Reggiano

Mountain Parmigiano Reggiano originates in the Apennine areas of the provinces of Parma, Reggio Emilia, Modena and Bologna. It is

made only with the milk with high coagulation properties: short coagulation time and high curd firmness. These cows breathe fresh air, graze in high altitude meadows and, thanks to the cool and rainy climate, feed on local herbs and hays, which are more varied and luxuriant than those of the plains – also for the mountain one, as for every other variety of Parmesan, the use of silage and additives is prohibited.

The differences between mountain Parmigiano and traditional Parmigiano are few, yet decisive for the quality of the finished product.

In general, with the same seasoning, mountain Parmigiano Reggiano has a slightly more intense straw yellow color; the flavor is stronger, but, like the other organoleptic characteristics, it can vary, even markedly, depending on the milk used. In any case, on closer inspection, the collection of the raw material, its processing and transformation into cheese and the maturing of the wheels are always those provided for by the production regulations of the Parmigiano Reggiano Consortium; without respecting these prescriptions, the product cannot boast the designation of Parmigiano Reggiano DOP.

In addition, for the mountain Parmigiano Reggiano, the cows raised only in high altitude areas guarantee a higher yield to cheese-making that it is excellent for the production of cheese and ensures a good balance between quantity and quality of the milk, rich in proteins and other nutrients.

The production of over 700,000 wheels of Parmigiano Reggiano is concentrated in the Apennine belt between Parma and Bologna, out of a total of 3 million and 300,000; these numbers confirm that Parmigiano Reggiano PDO boasts, among Italian cheeses, the highest mountain production, for a consumer value of over 380 million euros and 3.5 million quintals of milk destined for processing.

To enhance the daily work of the Apennine dairies, in March 2016, the Parmigiano Reggiano Consortium inaugurated the “mountain product” Quality Project. The initiative aimed to ensure an even higher quality of cheese made at high altitudes, thanks to an additional quality assessment, carried out in the twenty-fourth month of maturing of the wheels.

The Quality Project aims to verify compliance with these conditions:

- the farms of producers of milk destined to be transformed into cheese capable of becoming “Parmigiano Reggiano mountain product” are located within the mountain areas;
- in the feeding of dairy cows destined to be transformed into cheese capable of becoming “Parmigiano Reggiano mountain product”, 60% of the dry matter, on an annual basis, of the feed must come from mountain areas;
- the establishments of the cheese-producing dairies capable of becoming a “mountain product Parmigiano Reggiano” are located within the mountain areas;
- each phase relating to suitable milk pursuant to the points preceding the transformation into cheese capable of becoming “Parmigiano Reggiano mountain product” (milk collection, introduction into the dairy, night rest in the tanks, processing in the boiler and any other phase permitted by the specification) takes place separately and independently from milk not suitable for transformation into cheese capable of becoming a “mountain product Parmigiano Reggiano”, with an entry in the “Production register”;
- the minimum maturation (12 months) of the cheese wheel to become a “mountain product Parmigiano Reggiano” takes place in factories located within mountain areas.



The Parmigiano Reggiano DOP guaranteed by this initiative is recognized by the **green mark**, marked by two stylized mountain peaks and by the words **Progetto Qualità “mountain product” - Parmigiano Reggiano Consorzio** (Figure 1).

Figure 1. Progetto Qualità – Prodotto di montagna (logo)

A new breeding value for cheese making ICS-PR – Italian Holstein breed

Between 2017 and 2018 the Parmigiano Reggiano consortium together with the Italian Holstein Association and the Universities of Padua and Parma worked together in order to set up a new breeding value for Italian Holstein (Figure 2) with the aim to select for animals which are more directed towards cheese making in the Parmigiano Reggiano area. In 2018 there was published a selection index for the Italian Friesian, the Cheese-making and Sustainability Index - Parmigiano Reggiano (ICS-PR), for all FA sires authorized in Italy (Visentin et al., 2018; Marusi et al., 2019).

This index stems from the need of the Parmigiano Reggiano cheese production consortium to provide their breeders with new opportunities for choosing breeders, which take into account the evolution of the zootechnical system with a view to substantially improving the welfare of their animals without giving up profitability. In other words, ICS-PR brings all those aspects related to the sustainability and ethics of dairy cattle breeding to the centre of genetic selection, in particular for the farmer who assigns his own to dairy processing. In fact, the zootechnical activity must be able to guarantee the breeder a fair remuneration for his work also through the choice of animals with a genetic makeup that, in addition to production, at the same time leads to a significant improvement in the management capacity of the herd in terms of health, fertility and longevity. The selection index is the result of the collaboration between the National Association of Friesian and Jersey Italian Breeders (ANAFIJ), which represents more than 11,000 breeders throughout the national territory, the Parmigiano Reggiano Consortium and various Italian academic realities (University of Bologna, Parma and Padua). The need for this collaboration stems from the objective of being a genetic index that fully represents the reality and above all the production specificity of those who work within the Consortium area, integrating it with the most up-to-date technical-scientific knowledge and the result of research of the main Italian universities that are directly involved in the cheese production area. The ICS-PR does not want to replace the other two official selection indices of the Italian Frisone, the PFT (production, functionality and type) and the IES € (economic health index) but aims to provide a specific selective tool for the

breeder who allocates its milk to dairy processing destined for long maturation (Biffani et al., 2002; Marusi et al., 2017; Marusi et al., 2019; Visentin et al.; 2019). ICS-PR estimates the potential extra income resulting from the use of a particular reproducer through the development of a system for calculating estimated revenues and costs starting from the genetic indices that ANAFIJ normally calculates and publishes in routine genetic assessments.



Figure 2. Italian Holstein breed

What does the ICS-PR index tell us?

ICS-PR is an index that estimates the economic balance of the entire productive life of the animal taking into account the expected revenues and costs incurred. The ICS-PR index is expressed in € and highlights the extra income, estimated over the entire productive life of livestock, resulting from the use of a particular bull compared to the average of the population. In other words, a bull with an ICS-PR index of € 1,500 will generate daughters that, compared to the cows of the base, will produce € 1,500 more profit in their entire productive life.

To better understand what we can expect in terms of phenotypic response from the use of the best sires for ICS-PR € we took the best 25% and the worst 25% of the sires for ICS-PR that had at least one thousand daughters throughout Italy, this to avoid any possible effect of environmental and management differences; then we went to “measure” the phenotypic performances of the two groups of bulls. The results are summarized in Table 1 and the data comfort us as they confirm what we expect in terms of results using the best sires for ICS-PR: daughters of the best 25% show more economic efficiency, producing more milk per day of life, better fertility and a level of somatic cells, and consequently of mastitis, much lower than the daughters of the worst 25%. In short, the expectations for those who select at ICS-PR are promising to be interesting, and will benefit primarily their own profitability but even more generally the economic, ethical and environmental sustainability of their herd.

Table 1. Performance of daughters of sires with different levels of ICS-PR

	Milk 305 days 1 st lactation	Milk d/lifetime	Birth Conception	Somatic Cells
Top 25% sires ICS-PR	11450	15.2	138	226
Worst 25% Bulls ICS-PR	10846	14.4	161	353

Summary

The valorization using the product differentiation is the strategy used for the collaboration between the Parmigiano Reggiano Consortium together with the Italian Holstein Association and the Universities of Padua and Parma. Thanks to this fruitful cooperation Italian Holstein (major breed reared in Italy and in the world) has published a new breeding value. The aim of this collaboration was to select animals which are more

directed towards cheese making in the Parmigiano Reggiano area also specific for mountain area, where the differentiation of the product could improve the profit in a niche market as the PDO and mountain products. The specific index named ICS-PR (index of cheese making and sustainability – Parmigiano Reggiano cheese) is directed towards the selection of animals that are more resistant and therefore more suitable to the conditions of mountain breeding, in which environment resilience, pasturability and a high attitude to milk cheese making are needed.

Key words: mountain cheese making, breeding value, Italian Holstein, selection.

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Structural initiatives for the livelihoods of mountain livestock farming in Greece

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Introduction

Greece is a predominantly mountainous country – the second in the Balkans. Over two thirds of the 131.957km² of its land is mountain (42.2%) or semi-mountain (28.5%). Only 31 Municipalities were characterized as mountainous after the 2010 reform of the National Architecture of Local and Decentralized Government ('Kallikratis' project), while additions were made in 2018, accounting also for Municipalities in which more than 50% of communities is characterized as 'mountainous'. Under the criteria of the National Statistical Authority, mountain communities are those whose acreage is mostly in altitudes over 800 m or whose terrain is uneven and involves altitudinal differences of 400 m or higher. According to the Population Census of 2011, about 960,000 persons (8.9% of Greek population) live in mountain areas, although this percentage demonstrates a constant decrease over time. Indeed, according to Basiouka (2010) the population of mountain areas stood for more than 20% of total population in 1940, decreased to 11.18% in 1971 and was further reduced to 8.53% in 2001, mainly due to movements to lowlands or immigration.

One of the major problems of Greek mountain areas is the lack of economic diversification. Due to their inherent disadvantages, most of these areas demonstrate a significant dependence on the primary sector, while processing activities and service provision are limited. This pattern differs from the country average, as in 2017 agriculture contributed around

4.1% to the national GDP and about 10.7% of total employment. Historically, the livelihoods in the vast majority of Greek mountain areas have been linked to livestock production, especially in the form of agro-pastoralism and sheep and goat transhumance, as they pertain to their harsh natural conditions and make sustainable use of their natural resources. In general, the Greek sheep and goat sector has considerable potential for quantitative and qualitative increase in production and plays important economic and social roles, manifested through high quality dairy products, significant exports (feta, yogurt) and the provision of income and employment to thousands of rural families. Mountain livestock farms achieve lower yields and revenues – due to their extensive character and lack of market outlets – but also operate with important cost savings due to the sustainable and efficient use of natural resources.

Policy framework and initiatives for Greek mountain areas

Two types of income support and funding tools are available to farmers in the European Union through the Common Agricultural Policy (CAP), which are generally referred to as first-pillar and second-pillar measures. The former include direct payments – such as the Single Farm Payment – and coupled payments. The latter policies support rural development and provide financial incentives to farmers who wish to ameliorate their performance and competitiveness, or to those who undertake commitments regarding their production practices or to those who provide society with environmental and social services. These payments include agri-environmental and mountainous areas payments, support for investments of various types and structural measures to improve quality of life in rural areas or to upscale the skills and competences of farmers and rural populations.

Mountain farmers are generally entitled to the same support schemes as farmers in the lowlands, with the exception of the ‘mountain area’ payment, which is a premium paid to mountain (or transhumant) farmers up to a specific ceiling of cropland or rangeland acreage grazed. They are also eligible for financial support for modernizing their farms or for counterbalancing losses from natural handicaps and/or for the introduction of environmental-friendly measures, but their structural and system-specific problems are not addressed or are disregarded. Therefore, mountain farmers are mostly treated like lowland farmers. The previous

reform of the CAP provided little improvements – if any - to extensive livestock systems and especially mountain pastoral farmers seem excluded from the decision-making process.

First-pillar income support has been found to account for the main part of the total income of Greek farms (Karanikolas and Martinos, 2012), however the case is slightly different for pastoral livestock farms, of importance for mountain areas. Hadjigeorgiou et al. (2002) calculated the contribution of subsidies within a range of 20.9% - 41.6% for the period 1989–1995. Ragkos et al. (2014) reported that income support schemes accounted for 10.4% of gross output of transhumant farms in Northern Greece, but did not take into account the Single Farm Payment. The study by Galanopoulos et al. (2011) examined the implications of EU income support on transhumant farms in Central Greece based on their size and concluded that they had a positive impact on the technical efficiency of smaller farms. Hadjigeorgiou (2011) ascertained the positive effects of other policy schemes, such as subsidies in crop production, Products of Designated Origin (PDO) certifications, mountainous areas compensatory payments, agri-environmental measures etc on the structure of mountain sheep and goat production.

One reason why scientific research has focused on first pillar policies on the farm level is that integrated strategies for Greek mountain areas and economies are missing or scarce. EU actually emphasizes on the design of regional programmes and on targeted actions, while there is significant room for structural and rural development measures. Initiatives such as ‘Leader’ (Leader 1, Leader 2, Leader+) have been proven less effective for Greek mountain areas compared to the islands (Arabatzis et al., 2010). Apart from that, little knowledge is available concerning their implications on mountain areas or even on specific systems relevant to these settings, such as pastoral systems.

Research initiatives informing development projects for Greek mountain areas

This Section outlines specific research projects implemented during the last decade in Greek mountain areas – basically aiming to support production and income-generating activities. These projects yield important considerations informing policy-making, which are outlined in the next Section, while the identification of each project is provided in Table 1.

Table 1. Key (expected) benefits and potential policy uptake of research projects

Project	Financing	Duration	Objective	Key message(s)
<i>The dynamics of transhumance in Greece</i>	National funds – Action Thales	2012-2015	An integrated analysis of the environmental and socioeconomic role of sheep and goat transhumance	The multifunctional roles of transhumance can be transformed to lucrative activities – Requires an enabling and targeted policy framework such as Pillar II measures
<i>iSAGE – Innovations for sustainable sheep and goat production in Europe</i>	H2020 Grant Nr. 679302	2016-2020	Technical, managerial and socioeconomic innovations for the sheep and goat sector in multiple European settings and systems	Alternative value chains for mountain transhumance products play diverse roles and can benefit the economic performance of farms and the maintenance of ‘pastoral identities’ – Value chain measures and integrated approaches are required
<i>TrueCheese</i>	TIEDK-04475 (National Action ‘Research-Create-Innovate’)	2018-2021	Production and certification of a mountain transhumance-specific cheese	Market measures to ensure premium pricing of quality products can have significant structural and socioeconomic benefits for mountain areas, including employment
<i>PACTORES</i>	ERANET-MED2	2018-2021	Pastoral actors and policies as key elements of Mediterranean pastoralism	Policy support for basic rural infrastructure and economic diversification towards pluriactive mountain households is required to maintain mountain areas alive

Thales project “The dynamics of transhumance in Greece”.

This project provided an overview of sheep and goat transhumance in Greece and of its dynamics. Structural data of the system were collected and analysed, revealing that there are 3,051 transhumant sheep

and goat flocks across the country. The system plays an important socio-economic role for mountain areas, which remain inhabited for at least 4-5 months due to the movements of transhumant families from the lowlands to the highlands. Sheep and goat transhumance can be a profitable system due to the important cost savings it achieves (Ragkos et al., 2014), while it is in the process of modernization and innovation adoption. In addition, sheep and goat transhumance is a multifunctional system with important sociocultural, developmental and environmental roles. Actually, this system can provide tools for development if these multifunctional roles can be ‘transformed’ to lucrative market activities. There are already available policy measures to support this type of development, as is briefly discussed in the Conclusions.

Pict. 1. Sheep grazing in summer in Northern Greece



iSAGE – Innovation for sustainable sheep and goat production in Europe

Sheep and goat transhumance forms value chains with significant dynamics and competitive advantages, which support sustainable businesses and innovative entrepreneurship in the secondary (dairies, slaughterhouses, meat processing plants) and tertiary sectors (retail, restaurants)

with their local quality products. Within iSAGE – a 4-year H2020 Research and Innovation project – a case study was developed examining the value chain alternatives that transhumant farmers have to commercialize their high-quality summer milk and profit from its added value. In particular, as described in the work of Ragkos et al. (2019), transhumant farmers have three basic options. The first concerns on-farm processing of milk and direct sales of dairy products to consumers (face-to-face). The second involves selling their milk to the same industry in summer and in winter, which is usually based in the lowlands and produces dairy products which are channelled to larger cities or are exported. The third alternative is less widespread and includes selling the summer milk to small local dairies in the highlands. In this case, smaller quantities of dairy products are produced and sold locally.

Each one of the three alternatives was found to entail different impact on the economic performance of transhumant farms. Financial results varied as each option had different organizational requirements in terms of combining hired and family labour, cultivating land for feedstuff, allocating time for sales to consumers, negotiating prices for milk – especially for the small quantities produced in summer, which are further burdened with transportation costs. On the other hand, a qualitative analysis demonstrated that large dairy companies have a crucial role to play in promoting ‘pastoral identities’ and increasing the recognizability of these products, while locally produced dairy products may maintain traditional aspects and increase the share of added value for local producers.

TrueCheese

On-site research in most mountain areas has shown that farmers usually choose a combination of the three approaches described in the previous Section and that premium pricing can be achieved through a variety of marketing strategies even within a specific alternative. Within the ongoing ‘TrueCheese’ project, the economic and structural consequences of premium pricing of summer milk in a typical Greek mountain area were examined by means of a parametric programming model. A detailed description of the methodological approach is available in Ragkos et al. (2020) and Figure 1 summarizes the key findings. Each one of the plans 3.1 – 3.4 corresponds to the structure of sheep and goat transhumance under a different price of milk. Plan 3.2 demonstrates the current situation

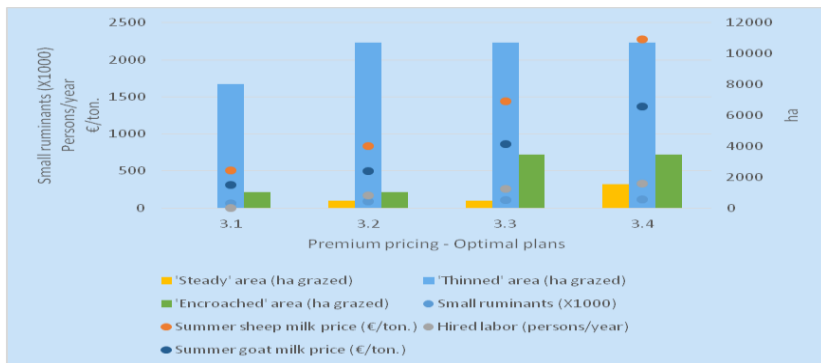
(actual milk prices) and Plan 3.1 shows the potential effects of price decreases – a situation experienced in Greece in previous years due to high production and turbulences in demand. Plans 3.3 and 3.4 highlight the effects of premium pricing, which include:

1. An increase in the number of sheep and goats.
2. Larger area grazed by small ruminants in a sustainable way – conforming to grazing capacities as defined within the Common Ministerial Decision 117394/2932/30-12-2014.

3. Increase in employment. In Plan 3.1 only family members work, as the marginal output of labour does not cover for the wages of hired workers. As milk prices increase, the marginal output also increases which brings about the use of hired labour – up to 471 persons in this particular study area. It should be stressed that these jobs concern exclusively the primary sector, without taking into account the multiplier effects in the secondary and tertiary sectors.

4. The total financial results increase, however the financial result (gross margin) per small ruminant decreases.

Figure 1. Alternative plans of sheep and goat transhumance structure under the effects of premium pricing of summer milk



Source: Ragkos et al. (2020).

Within this on-going research project, the Greek pastoralism sector is examined along with similar settings across the Mediterranean under a common framework. The basic notion is that Mediterranean pastoral systems are multifunctional, offering a variety of ecosystem services and playing diverse roles in mountain and remote areas. The Greek study area (Mountain Ziria in Peloponnese) is vulnerable in terms of climate change and market economy challenges and thus requires particular policy adjustments to support its integration. Local farmers – much like other Greek mountain areas – undertake a variety of activities to achieve their livelihoods, ranging from pastoral sheep and goat production to extensive bovine transhumance, crop production (especially legumes) and tourism. Measures for basic infrastructure (roads and health services) are required to reverse the depopulation trends in the area.

Transversal activities to support mountain economies

Tourism

Tourism is one of the most important economic activities in Greece – often referred to as the ‘heavy industry’ of the country, accounting for about 20% of national GDP. Although mass tourism is of high importance for coastal areas and islands, alternative tourism is emerging in Greek mountain areas, favoured by CAP measures or by other EU initiatives and investment tools (e.e. Leader programme). The development of alternative tourism is connected either to the availability of recreational opportunities – for instance ski centres, mountain sports, walking/running trails, religion – or to natural landscapes. In both types, a rich and diverse local agrotourism product is offered, involving small-scale hostels or larger hotels with infrastructure to host events, football teams summer preparation and other activities; restaurants offering local dishes as well as modern cuisine; ski resorts and folklore museums.

Pict. 2. Petros Mokas is a transhumant farmer and a well-known musician, playing the famous Greek klarino



Agro-tourism witnessed a rapid expansion in the 1990s and 2000s but saw an abrupt reduction during the past decade due to the economic crisis and non-enabling economic environment. In the past 2-3 years, with the high influx of migrants and refugees in the country, some hotels actually host refugees throughout the year. Recently, another opportunity relating to agro-tourism was the establishment by law of ‘multifunctional farms’ (Common Ministerial Decision 543/34450/2017, Government Gazette 1145/B/3-4-2017), which are visitable farms where tourists can be involved in farm tasks and buy raw or processed products directly from the producer.

The role of local breeds

Local livestock breeds constitute an important asset for development for Greek mountain areas. There are several examples of such

breeds, whose values have not been properly acknowledged in the Greek setting nor in respective territories. Imported improved breeds and extensive crossbreeding threaten local breeds (especially of sheep and goats) due to their higher productivity. However, these breeds can achieve satisfactory economic performance, sociocultural roles and low environmental footprint. Thus, they are able to ensure benefits not only for mountain systems and value chains, but also for other local/regional actors by generating employment opportunities and income. In this development pattern, business models emerge where farms, dairies, manufacturers, entrepreneurs and other stakeholders run their businesses efficiently and communicate directly. In Greece there are policy measures providing financial support to farmers rearing endangered local breeds (Sub-measures 10.2.1 and 10.2.2 of Rural Development Programme of Greece 2014-2020), but no specific policy tools to boost the overall sustainability of farms and systems based on local breeds.

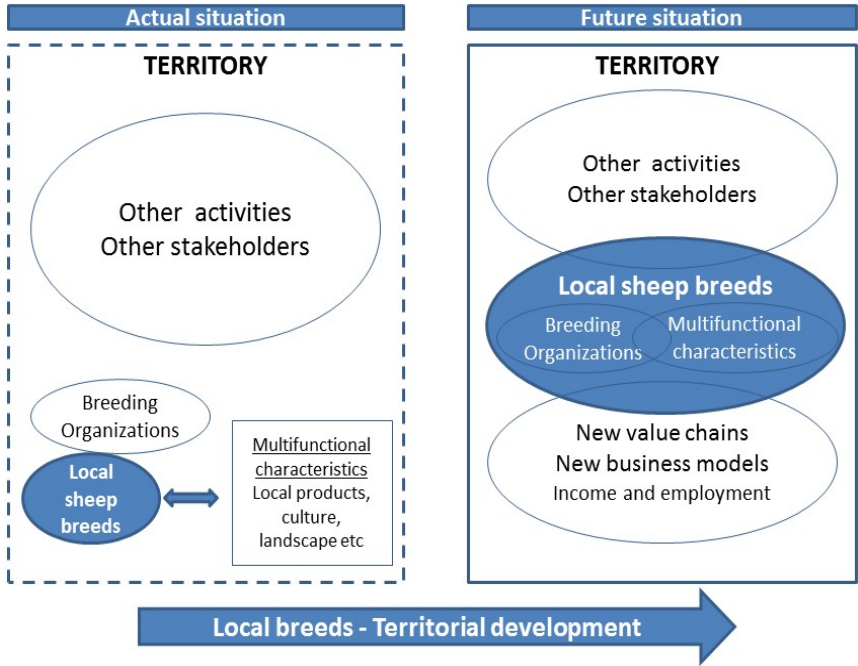
Pict. 3. The traditional small dairy of Giorgos Zaharis in Aspropotamos, Thessaly



Figure 2 illustrates a territorial development pattern for mountain areas based on the key role of local breeds. The left-hand side of the Figure represents the actual situation. Territorial products (such as local dairy and meat products, local dishes, landscapes, traditional practices, cultural features) have not yet been clearly defined. The local economy is mainly

based on non-livestock activities or on farms rearing imported sheep breeds. Local breeds are of low importance for the mountain territory and, most of all, their interconnections to their multifunctional characteristics are unclear. The right-hand side of Figure 1 represents the effects of territorial development. Local breeds are in the centre, as 'territorial products' have been recognized and clearly connected to local breeds in the example of the “**one breed – one place – one product**” concept. Multifunctional characteristics are being transformed to innovative products (dairy and meat products, certified/traditional) and services (arts and crafts, customs and festivals, production practices, particular landscapes). Other stakeholders are still present in the territory but now maintain closer relationships with the value chains of local breed products.

Figure 2. The road to territorial development and the role of local livestock breeds



Source: Ragkos et al (2019b).

Conclusions

With the current situation in Greek mountain areas there is a necessity for a holistic development approach. Strategic plans are required which will propose pathways based on their inherent advantages and sustainable use of their resources. Table 1 provides an outline of key policy messages extracted from the experience of research projects presented in this paper. Apart from policy measures targeting individual farms or even the primary sector, there is also a need to support innovative business models with strong environmental (natural resource protection) and social sustainability (employment, culture, tradition, social cohesion) elements. These business models will leverage cultural heritage, existing infrastructure and consumer preferences for local products. To this end, innovative tools and approaches are needed: modern production and processing infrastructure, increased and stable product quality, integration into niche markets, quality schemes/labelling/certification, better information flows, transparency and market cooperation between actors.

Some of the main challenges for mountain areas are related to human resources. In Greece there is a critical mass of university graduates related to the value chain of livestock production and/or mountain products: animal scientists and veterinarians, agricultural economists, agronomists, food technology scientists, tourism experts. These people are expected to support innovation in the Greek economy, however, there is a significant gap between the skills acquired by graduates and the skills required to support the sustainable development of mountain areas. There is a need to create favourable conditions for their employment into sustainable economic activities through training and specialized formal education. In addition, special skills are required for sheep farmers to adopt sustainable practices in order to certify their products and increase their quality, but also for workers in processing plants and other related companies.

Summary

Greece is a mountain country, although until now there has been no integrated framework to support the development of mountain economies and livelihoods. Severe depopulation is the key characteristic of most

of these areas. Livestock production – especially in the form of pastoralism – is the most important economic activity, followed by alternative tourism. Research initiatives undertaken recently have yielded important considerations to inform the design of targeted policy measures, which will accommodate the specificities of mountain economies and production systems.

Key words: transhumance, quality products, innovative value chains.

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Mountain livestock in Spain and Galicia

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The mountain areas in Spain

According to data from the European Commission in its Commission Staff Working Document report. European Commission. Directorate-General for Agriculture and Rural Development. “Peak Performance. New Insights into Mountain Farming in the European Union”, Brussels, 2009). Spain is the EU country with the largest mountain utilized agricultural area (UAA), with 7.4 million ha, representing 28% of the mountain UAA in Europe. It is followed by Italy (with 4.3 million ha), France (with 3.99 million ha) and Romania (with 2.71 million ha). Poland has 270,000 ha, which represents 1% of the UAA of Europe (EU27).

All of these ha produce only 8% of European agricultural production. Of that European 8%, Italy ranks as the first country with a 30.8% despite having almost half of the Spanish UAA, which ranks second with 18.80%, as does France, which has similar amount of ha to Italy and produces 18.4%, almost the same as Spain.

Mountain livestock represents more than mountain agriculture in Europe, 54.20% versus 45.80%, predominating in northern European countries with more surface area (UAA) of permanent pastures, with cases of more than 70% in some of them.

On the other hand, in the Mediterranean countries, southern Europe, the high presence of olive groves and fruit trees (woody crops) determines that agriculture predominates over mountain livestock and France, Italy, Greece, Portugal, Romania and Spain concentrate 98% of the European total woody crops.

In mountain agricultural production in the EU, Spain has a prominent role, being the first in the production of pork meat and stone fruits, second in olive oil, nuts and beef, sheep and goat meat.

Criteria for determining mountain areas in Spain

The Spanish state is organized through autonomous communities (17) and two autonomous cities, Ceuta and Melilla. Each autonomous community is made up of provinces that are older than the communities and date back to the 19th century (1833). These provinces, of a total of 50, plus Ceuta and Melilla, are divided into municipalities with some exceptions that are not the subject of this article.

The criteria based on European regulations, currently Regulation (EU) No. 1305/2013, which determine which municipalities in each autonomous community are mountain areas, are in the Rural Development Programmes of each Spanish autonomous community.

Regulation No. 1305/2013 determines that:

Article 32. Designation of areas with natural limitations or other specific limitations

1. Member States shall designate, on the basis of paragraphs 2, 3 and 4, the areas eligible for the payments provided for in Article 31 according to the following categories:

- a) mountain areas;
- b) areas other than mountain areas with significant natural limitations; and
- c) other areas with specific limitations.

2. Mountain areas may be eligible for the provided payments in article 31 when they are characterized by a considerable limitation of the possibilities of using the land and by an appreciable increase in the costs necessary to work it due to:

- a) the existence, due to the altitude, of harsh climatic conditions that significantly reduce the vegetative period;
- b) the presence, at a lower altitude and in most of the area considered, of slopes that are too steep for the use of machinery or that require the use of a very expensive special equipment, or a combination of these two factors

when, the difficulty resulting from each of them alone is lower, such combination results to an equivalent degree of difficulty.

The areas located to the north of the 62nd parallel and some contiguous areas will also be considered mountain areas.

The Document of the National Rural Development Framework 2014-2020 also mentions that:

The mountain areas (category a) eligible for sub-measure 13.1 payments will be made up of municipalities (LAU 2) or parts of municipalities characterized by a considerable limitation of the possibilities of using the land and an appreciable increase in the necessary costs to work it, according to the following criteria defined for the Spanish Kingdom in accordance with article 3, paragraph 3, of Directive 75/268 / EEC:

- an altitude equal to or greater than 1,000 meters or,
- a slope equal to or greater than 20% or
- a combination of altitude and slope, the altitude being equal to or greater than 600 meters and the slope of, at least, 15%, except for a limited number of municipalities completely surrounded by mountainous regions, for which the minimum slope may be 12 %.

Areas with significant natural limitations (category b) (...).

Areas with specific limitations (category c) (...).

In relation to the Rural Development Programs, it is mentioned:

The rural development programs will attach a description of the method and results for the delimitation of the areas that may be eligible for the payments provided for in article 31 of regulation 1305/2013, according to the following typology:

- (a) mountain areas,
- (b) areas other than mountain areas with significant natural limitations and
- (c) other areas with specific limitations.

In accordance with the provisions of article 31.5 of Regulation 1305/2013, the conditions of the 2007-2013 period will continue to be applied in order to aid the areas with natural or other specific limitations until the new delimitation of areas is applied.

Therefore, the criterion for preparing the updated list of mountain municipalities used in the study is the one considered by the Rural Development Programmes of each Autonomous Community (PDR).

Currently, 3009 municipalities throughout Spain are defined in all the PDRs as mountain areas, 38% of all 8125 municipalities.

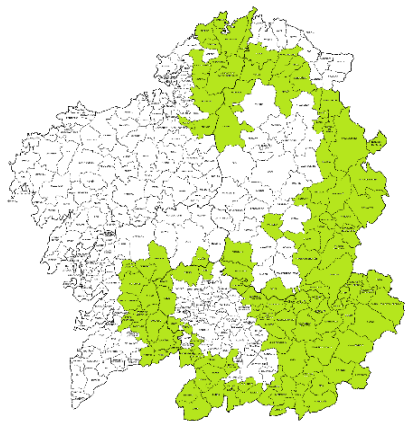
Galicia

Galicia is a region located in the northwest of Spain with 313 municipalities registered as mountain areas corresponding with approximately 36% of its total and 4% of all of those in Spain. The latest data from mountain areas in Galicia (2009) indicate that the total area of farms in Galicia is 914,853 ha, of which 338,944 ha are mountain areas, which is equivalent to 37%. Of this total, 71% is considered mountain UAA. The total area of the community's farms is distributed as follows: 63% is not mountain and the rest, which is considered as mountain areas, 26% is UAA and 11% is other mountain land not usable for the agricultural activity. According to data from the PDR of Galicia (2014/2020), Galicia has 647,600 ha of UAA, and only 5% is under irrigation system. There are 81,170 livestock farms, of which more than 63% have less than 5 ha of UAA and only 10% are above these 20 ha. The smallholding still persists today in the Galician agrarian structure.



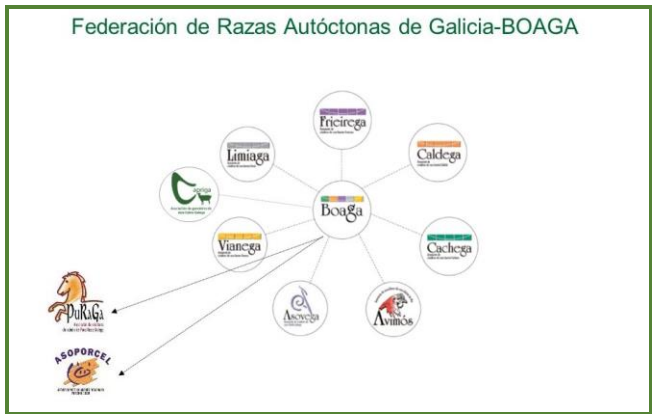
Source: Wikipedia.

The Galician mountain areas distribution, according to the order of February 12, 2020 by municipalities is shown below:



Local breeds in Galicia

Galicia has one of the greatest zootechnical wealth of local livestock breeds in Europe. It has 6 breeds of cattle and a breed of sheep, goat, pig and hen. The Federation of autochthonous breeds of Galicia (BOAGA) brings together 8 of the breed associations of Galicia, and has established collaboration agreements with the associations responsible for the Galician Pure Breed Horse and the Celtic Pig breed.



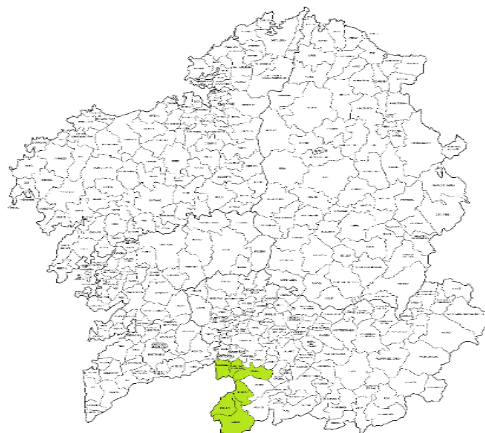
At the same time, the Federation of autochthonous Spanish breeds (FEDERAPES) groups together the Spanish autochthonous breeds that officially manage the genealogic books and their breeding programmes.

In this article we will briefly describe the breeds that are managed by BOAGA.

Cachena breed



The name “cachena” is used to designate a bovine population extended through the southwest of Ourense, in the mountains of the Sierra del Xurés, Sierra del Leboeiro and Montes do Quinxo, which, at the end of its census regression, was practically quartered in the parish of La Illa, Entrimo town hall; more specifically, in the town of Olelas. Its origin is not yet well known, although its general appearance places it in the Cantabrian trunk, due to some common characteristics with the other races of the same trunk (dome in bulls, hair color). But their totally different antlers suggest another ancestry and phylogenetic dependence that could be that of *Bos primigenius mauritanicus*, from which the bovines from North Africa would derive when they arrived to the Iberian Peninsula during the Arabian occupation. The main area of origin and dispersal of the breed are the mountainous areas of the municipalities included in the Baixa Limia-Xurés natural park, in the province of Ourense (Spain), and at the base of the Portuguese Peneda-Gerês national park (Portugal).



Area of origin of the Cachena breed

It occupied poor lands with acidic soil and limited forage possibilities, with a humid and cold climate. At present, the breed is bred throughout Galicia with manifestations in the rest of the Spanish territory, mainly mountainous areas, being a breed adaptable to any type of environmental conditions.

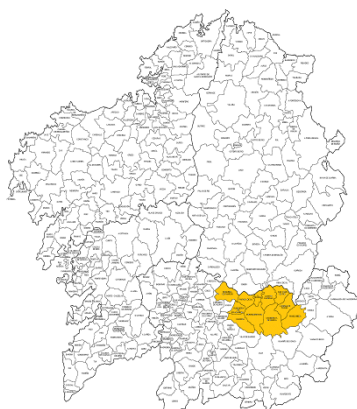
More information <https://www.mapa.gob.es/en/ganaderia/temas/zootecnia/razas-ganaderas/razas/catalogo-razas/bovino/cachena/default.aspx>

Technical information: https://mediorural.xunta.gal/sites/default/files/razas-autoctonas/ficheiros/ficha_cachena.pdf

Caldelá breed



The Caldela breed specimens, considered at the time as the more suitable for work in all of Galicia due to their calm temperament, are originally from the region that gives them their name, Terra de Caldelas, which is located in the north of the province of Ourense, bordering on the east with Terra de Trives, on the south with Verín and A Limia, on the west with Allariz-Maceda and Ourense, and on the north with the Lugo regions of Terra de Lemos and Quiroga, where most elders of the place remembered the trips to the fairs of Castro Caldelas (Capital of the Terra de Caldelas) in search of Caldela oxen due to their reputation of being extraordinary draft animals.



Area of origin of the Caldela breed

All these bordering areas share the importance in the origin of the breed as a genuine dispersal area, due to the great demand for specimens that were produced from them. Its dynamogenic ability generated its export to further regions such as Valdeorras (Ourense), O Caurel (Lugo) or El Bierzo (León). Current authors prefer to place it on the Cantabrian trunk, along with the other “Galician brunettes”, since the birth of the brown-coloured pups makes them lean towards this statement. As a historical fact, it is the first of the “Galician brunettes” that is related to the recently created Galician Cattle Selection Center (1945) in the Pazo de Fontefiz. In the first legislation that seeks to order Spanish genetic heritage, which was the Order of the Ministry of Agriculture of July 30, 1979, establishing the Official Spanish Cattle Breed Catalog, the Caldela breed appears as a breed of special protection. None of the other 4 breeds of the “Galician brunettes” appear.

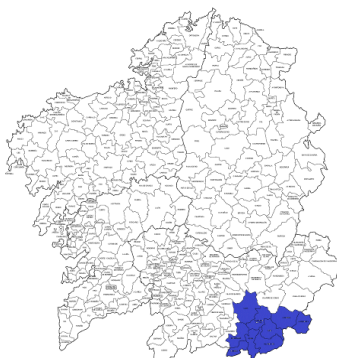
More information <https://www.mapa.gob.es/en/ganaderia/temas/zootecnia/razas-ganaderas/razas/catalogo-razas/bovino/caldela/default.aspx>

Technical information: https://mediorural.xunta.gal/sites/default/files/razas-autoctonas/ficheiros/ficha_caldela.pdf

Frieiresa breed



The Frieiresa Breed takes its name and origin from the region called “Terra das Frieiras”, which includes the municipalities of A Mezquita and A Gudiña in the province of Ourense.



Area of origin of the Frieiresa breed

Frieiras would act as the center where the breed was formed, from where it passed to Portugal, constituting the Frieiresa breed as the ancestor of the Mirandesa and not its relative. This breed is found in a geographical area with a high density of bovine breeds. Southerly, it is surrounded by the Mirandesa breed, to the north by the Vianesa breed, to the east by the Alistano-Sanabresa, and to the west by the Limiá breed. The Royal Decree 1682/1997 of November 7, publishes, for the first time, the name of the Frieiresa breed, as well as all the names of all the breeds formerly included as “Galician brunettes”, except for the Caldelá breed, which already appeared in the ministerial order of the year 1979.

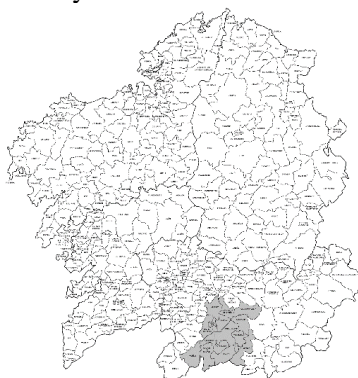
More information <https://www.mapa.gob.es/en/ganaderia/temas/zootecnia/razas-ganaderas/razas/catalogo-razas/bovino/frieiresa/default.aspx>

Technical information: https://mediorural.xunta.gal/sites/default/files/razas-autoctonas/ficheiros/ficha_frieiresa.pdf

Limíá Breed



Originally from the region of A Limia from which it takes its name, it has great agricultural wealth and grazing resources, which allowed it to raise large animals. Its specimens reach the largest size of all Galician autochthonous bovine breeds, being considered as “the regional giants of the bovine species”. Its influence extended to bordering areas, such as the Monterrei valley.



Area of origin of the Limíá breed

Phylogenetically, this breed would be framed in the Cantabrian trunk, the origin of the other “brunettes”, and the existence of this race can

be explained, according to Sánchez Belda (1984), by its superiority compared to other neighbouring races due to its great size and draft aptitude. It can be said that the Limiana breed has been a great exporter of cattle far from its natural region, in such a way that its oxen, known and appreciated, were marketed in Madrid and, mainly, in the Basque Country. The Royal Decree 1682/1997 of November 7, publishes, for the first time, the name of the Limiá breed, as well as all the names of all the breeds formerly included as Morenas Gallegas.

More information <https://www.mapa.gob.es/en/ganaderia/temas/zootecnia/razas-ganaderas/razas/catalogo-razas/bovino/limia/default.aspx>

Technical information: https://mediorural.xunta.gal/sites/default/files/razas-autoctonas/ficheiros/ficha_limia.pdf

Vianesa Breed



The Vianesa breed originates from the Region of Viana which is located in the east of the province of Ourense, bordering to the north with the Sierra do Eixe, to the east with the Sierra Calva, and to the west with Sierra de Queixa and Parque Natural do Invernadeiro. Specimens of this breed are found in the neighbouring municipalities of A Veiga, Chandrexa de Queixa, Manzaneda, Pobra de Trives, Vilar de Barrio, Montederramo and Maceda. As headwaters of this region, we find Viana do Bolo, from

which the breed takes its name, and also Celeiros, O Bolo and A Veiga, main points of trade, and to their fairs in the months of July, August and September, when the most important cattle dealers attended to buy boards of oxen, which would be shipped by railroad in A Rúa de Petín or Monforte de Lemos to be exported to other regions. The orographic conditions of this region, the most mountainous in the province, made agricultural mechanization difficult and allowed maintaining traditional farming systems, in need of animals with a strong adaptation to the environment; this fact allowed the Vianesa breed to keep the largest census of all the “Galician Brunettes”.



Area of origin of the Vianesa breed

Sánchez Belda (1984) included its specimens, of great rusticity, in the Cantabrian Trunk. It seems that their origin could be located in an own ethnic trunk from the northwest of the peninsula and its twin expression in the Alistana-Sanabresa breed, with which it keeps, according to this author, neighbourhood positions and exchange relations. He mentions that there is a census (1984) of 15,000 to 20,000 animals of the breed, many of them crossbred with other breeds. The Royal Decree 1682/1997 of November 7, publishes for the first time the name of the Vianesa breed, as well as all the names of all the breeds formerly included as Galician Morenas.

More information <https://www.mapa.gob.es/en/ganaderia/temas/zootecnia/razas-ganaderas/razas/catalogo-razas/bovino/limia/default.aspx>

Technical information: https://mediorural.xunta.gal/sites/default/files/razas-autoctonas/ficheiros/ficha_limia.pdf

Galiña de Mos breed



The genetic origin of the Galiña de Mos was initiated with the arrival of the Celts to Galicia, a civilization that would introduce this type of birds. The first written references to the breed date from 1936, after the creation of the Regional Livestock Station in Lugo, where a Breed Selection Programme is carried out based on the hens that were in the Terra Chá region and in other areas of the inner Galicia, and that were used for the production of capons. The first specimens were bought in the parish of San Xiao de Mos, in the municipality of Castro de Rei, in the province of Lugo, giving the breed the name of the Mos breed. In that year the first pattern of the breed was informally published. In those years the breed enjoyed a great splendour, being widely used in Galicia to obtain high quality products, being exported to markets in the Peninsular territory. The importations liberalization in the sixties, caused the massive entry of highly genetically selected foreign hybrid birds to achieve high production, removing the breed from the forefront and placing it on the verge of extinction. The eggs are light brown. It is raised in the open air, taking advantage of traditional chicken coops to apply an alternative and artisan poultry farming system. In this way, when combined with a natural diet, they give products of highest quality.

More information. <https://www.mapa.gob.es/es/ganaderia/temas/zootecnia/razas-ganaderas/razas/catalogo/peligro-extincion/aviar/galina-mos/default.aspx>

Ovella Galega breed



The Ovella Galega breed was originally dispersed throughout the Galician Community, with the largest concentration being located in the central area and the province of Ourense. In the 18th and 19th centuries, the intensification of production looking for higher yields brought with it the replacement of the males of the Ovella Galega by other breeds of greater meat specialization, which is why there was a drastic decrease in the population of the breed throughout Galicia, which brought the situation to the edge of extinction. Nowadays, and thanks to the recovery works from the nineties, its censuses increased until they spread throughout Galicia, its presence being more and more common. This breed groups small-format animals for the production of lambs. The females are generally devoid of horns, and, if they have them, they are rudimentary. The males usually have horns, in the form of a double loop. The presence of a coverage of wool called “moña” in the forehead is characteristic. Its trunk is narrow, with very thin extremities and a long tail. The fleece is of the medium or coarse type. The breed is raised in an extensive/semi-extensive system for the production of lambs and has unique characteristics that give it a perfect adaptation to the orography and climatology of Galicia, making it a true specialist in taking advantage of the natural resources of the Galician field, and making it a natural brushcutter for the mountains. Its advantages are rusticity, great resistance to diseases, longevity, prolificacy and fertility. In addition, she is a good milk producer and has an excellent

maternal character. Currently, wool is not easily marketed and traditionally it was highly valued, so characterization studies are being carried out for possible textile uses. The breed together with a traditional production system (pastures with supplementation of dry grass) make the products differentiated and of high quality. Lambs are usually slaughtered when they are 4-5 months old, weighing around 6-7 kg/carcass, presenting high meat yields and a high percentage of pieces in the best commercial categories such as leg, shoulder, and ribs. Its meat is low in fat, with a very pleasant taste and smell, juicy and tender. The absence of a brave smell and taste is the distinguishing characteristic of the breed.

More information <https://www.mapa.gob.es/es/ganaderia/temas/zootecnia/razas-ganaderas/razas/catalogo/peligro-extincion/ovino/gallega/default.aspx>

Cabra Galega breed



The breed is defined by its medium size and great sexual dimorphism. Its head is small in size, with a straight or sub-concave fronto-nasal profile, large and expressive eyes and medium to small ears, as well as the usual presence of backward arched horns in females often looped in the

males. Males also have a developed goatee and toupee. The coat is uniform and mahogany or reddish with different shades, short and shiny hair. The presence of long and abundant hairs located and distributed throughout the body is characteristic. In females, the udders are baggy, collected and well implanted, covered with pilosity, with well differentiated teats of good size and implanted in the lower part of the udder. The breed is bred in an extensive/semi-extensive system, taking advantage of the pastures in mountainous areas that are difficult to access for other species, so they become true specialists in cleaning the forest and maintaining ecosystems. This breed is aimed at meat production, and, in this aspect, the sale of goats stands out, which are always fed with the mothers' milk and, only when necessary, they are supplemented with cereals such as corn, wheat or barley. Due to the production system based on the use of resources, there is a certain seasonality that causes the births to be grouped mainly in spring, which leads to a greater supply of kids in the summer months.

More information <https://www.mapa.gob.es/es/ganaderia/temas/zootecnia/razas-ganaderas/razas/catalogo-razas/caprino/gallega/default.aspx>

About mountain products

Eight years have passed since December 14, 2012 when Regulation (EU) No. 1151/2012 of the European Parliament and of the Council of November 21, 2012 on the quality regimes of agricultural and food products was published, where Article 31 established “Mountain Product” as an optional quality term in which both the transformation of the products, as well as the raw materials necessary to obtain them, including feed, come from mountain areas. It was, in short, a “decaffeinated” Protected Denomination of Origin (PDO).

Two years later, on March 11, 2014, Delegated Regulation (EU) No. 665/2014 of the European Parliament and of the Council is published regarding the conditions of use of the optional quality term “mountain product”. Here, products of animal origin, beekeeping products, products of plant origin including feed, ingredients and processing operations outside mountain areas are defined (in particular milk and dairy products, slaughter of animals and butchering of the carcasses, and pressing of olive oil).

In Spain, only in Galicia is there a mention of mountain products in Law 2/2005 of February 18, on the promotion and defence of Galician food quality and the Decree 174/2019, of December 19, by which food crafts are regulated, lays out the following:

Also specified in this decree are the requirements to be met by artisans and also those that companies must meet to be considered artisan food companies. The conditions for the use in the labelling, presentation and advertising of the products are also set out, of the terms “home crafted”, “artisan” (and related) and “mountain home crafted”. For the latter, in a consistent manner with the regulation made by the European Union through Delegated Regulation (EU) No. 665/2014 of the Commission, of March 11, 2014, which completes Regulation (EU) No. 1151/2012 of the European Parliament and of the Council as regards the conditions of use of the optional quality term “mountain product”.

The Decree defines it as follows in article 3:

Mountain artisan products: these are artisan products made by artisan food companies located in areas classified as “mountainous” in accordance with the provisions of article 32 of Regulation (EU) No. 1305/2013, of December 17, relating to the aid to rural development through the European Agricultural Fund for Rural Development (EAFRD) and by repealing Council Regulation (EC) No. 1698/2005, and using raw materials from those areas in its preparation. These products will also comply with the specifications established in articles 1 to 6 of Delegated Regulation (EU) No. 665/2014 of the Commission, of March 11, which completes Regulation (EU) No. 1151/2012 of the European Parliament and of the Council regarding the conditions of use of the optional quality term “mountain product”.

But in this Decree, to our great disappointment, fresh meat products are not allowed, perhaps due to the strict hygienic-sanitary measures required for the slaughter of animals in the mountain farms themselves.

Therefore, we can conclude that the optional labelling term “Mountain Product”, in relation to the transformation and/or commercialization of products of our farmers in mountain areas, has been a failure since it does not exist. After almost 8 years with EU legislation that allows it, there is

no product labelled accordingly, either of animal origin or of plant origin. In order to defend the products of the autochthonous Spanish breeds, and given that they are developed almost exclusively in an extensive system and in mountain areas, FEDERAPES proposed to the Ministry of Agriculture of the Government of Spain, the existence of a brand that would identify the products of autochthonous breeds that are managed through genealogical books. An analogy was made to the “race à viande” brand from France.

Our breeds use the 100% AUTOCHTHONOUS BREED LOGO, which is a unique, differentiating and recognizable official seal. It is a voluntarily used logo that identifies products from animals of autochthonous Spanish breeds, which offers to the consumers the guarantees of origin of the products they consume.



There is a national regulation that governs it, Royal Decree 505/2013 of June 28, which regulates its voluntary use in products of animal origin. The development of these regulations is included in the specifications for the use of the “Autochthonous Breed” logo for products of the corresponding breed.

The entity that owns this 100% Autochthonous Breed Logo, is the Ministry of Agriculture, Fisheries and Food, which is the one who has implemented it, but allows its use to the associations of breeders of the Spanish autochthonous breeds, upon request and that additionally requires the drafting of a list of conditions of use, which must be approved by the competent authority.

The associations of breeders of autochthonous breeds are in charge of ensuring compliance with the specifications of the 100% Autochthonous Breed logo, but the control and management authority, in our case, is the Federation of Autochthonous Breeds of Galicia (BOAGA), to whom the eight Associations integrated into it, have transferred these powers.

This brand guarantees the purity of the breed, offering a market opportunity and an opening of the native breed breeders to all the links of the food chain until reaching the final consumer.

The birth of this brand causes the consumer to recognize the products of a certain autochthonous breed as 100% ours, with a guarantee of origin. It covers all products derived from the breed animals: meat, milk, skins or processed products, as well as prepared food (the specifications for the use of the 100% logo, define which products of the breed are admitted, as well as provide its description and presentation). For the products of the Ovella Galega breed, wool is included, and, in the case of the Galiña de Mos breed, in addition to meat, eggs are included.

Three types of authorized operators can benefit from the use of the logo:

Primary producers: livestock farms where the breed's animals are born, raised and/or fattened.

The processors: slaughterhouses, cutting rooms, leather processing and work places, milk, cheese or dairy product manufacturers and, in general, any establishment admitted by current legislation in which the slaughter, cutting, packaging, processing, transformation and boxing are carried out of the products of the breed.

The marketers: points of sale to the public and restaurants where the products of the breed are exhibited and commercialized (butchers, specialized stores, restaurants, prepared food outlets for public sale, fur shops...).

There are 8 logos, one for each breed and association integrated into BOAGA.



The authorized operators for each breed, as well as the specifications, and informative material, can be downloaded through our website www.boaga.es and by clicking on each logo.

More information about the 100% logo in the following link of the Ministry of Agriculture, Fisheries and Food:

<https://www.mapa.gob.es/es/ganaderia/temas/zootecnia/razas-ganaderas/arca/raza-autoctona.aspx>

Summary

Spain is the EU country with the most useful mountain agricultural area and with the most diversity in local breeds in Europe that are located almost exclusively in mountain areas. The Spanish and community regulations for mountain products and their little application are explained, as well as the local breeds of Galicia, the region of Spain with the most diversity of local breeds, which do use the 100% Autochthonous Breed logo to defend the products of those autochthonous races and of all those of the Spanish state.

Key words: native breeds, mountain, Autochthonous Breed Logo, autochthonous rare breed, Galicia.

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www.boaga.es

www.federapes.es



Boaga

Federación de razas autóctonas de Galicia

Mountain agriculture and pastoralism in northwest Portugal – transition to sustainable multifunctionality?

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Introduction

Portugal, situated in south-western Europe, has a total area of 88 789.52 km², and is generally mountainous, especially in the north of the country. Eighty one per cent of portuguese territory corresponds to less-favoured areas, from an agricultural point of view; 41.8% of Mountain, 37.8% in Other Zones not Mountain and 1.7% in other zones with Intense Rock Formations (GPP, 2016). Under this delineation, the entire Alto Minho region faces limitations regarding agriculture production, mainly due to the hilly and mountainous relief. From the Atlantic to the eastern border with Galicia (Spain), the Alto Minho's region seems like an amphitheatre, reaching its highest point (1416 m) in the Peneda-Gerês National Park. It is important to notice that 30% of the region's surface is classified under Nature 2000 Network (Caldas and Graça, 2020).

In the middle of the twentieth century, a long process of abandonment in rural world began, which significantly changed rurality in Portugal (Oliveira Baptista, 1996). Today's ruralities reflect this regression,

marked by the decrease in the social and economic importance of agriculture, the depopulation and abandonment of many rural territories and the polarization of development in cities and coastal areas. These structural trends coexist with the diversity of the rural world and with the different ways in which each territory has adapted to change, diversifying economic activities, responding to new conditions, needs and social demands, and reorganizing local communities and institutions. Some areas we have seen agricultural intensification, industrialization and / or the development of the residential function, while in others the promotion of tourism and the conservation of the landscape and nature have been the preferred paths. Mountain spaces, which have significant orographic, climatic and accessibility restrictions, are almost always in this second category (Nordregio, 2004).

Mountains are globally recognized for the value and relevance of the ecosystem goods and services they generate for societies, which go far beyond the ones traded in markets (Nordregio, 2004; Körner and Ohsawa, 2005, Madureira et al., 2013, O'Rourke et al., 2016; Honrado et al., 2017). The provision of these goods and services, essential for human well-being (drinking water and regulation of the water cycle, conservation of soil and biodiversity, carbon sequestration, preservation of environmentally attractive recreational and leisure spaces) depends on the integrity and good condition mountain ecosystems, which are particularly fragile (Körner and Ohsawa, 2005, Madureira et al., 2013). In Europe, the paradigm of interdependence among maintaining ecosystems in good condition and the permanency of viable agricultural communities and production systems has become dominant on a political, academic and social scale. Considering the socio cultural characteristics of each community, the production systems and the natural resources utilized altogether, the concept of biocultural diversity applies, which is intended to be preserved on a European scale (Agnoletti, 2014; Madureira, et al., 2013; Honrado et al., 2017, Moreira and Lomba, 2017). In other contexts, namely in the American continent, this paradigm is challenged by a more favorable view of the abandonment of marginal areas in productive terms, by prioritizing their rewilding and the waiving of productive activities (Barnaud and Couix, 2020).

The challenge for the european model is to successfully maintain populations in areas of high natural value, creating adequate conditions

for people and local communities. It also implies the ability to promote activities and management options that best contribute to preserving the landscape and the biodiversity as well as, in a broader sense, the integrity of ecosystems and their resilience to risks, such as fires or climate change. Mountain agriculture in particular extensive livestock farming, is one of the activities that best fits this model, as there is a widespread consensus around the recognition of its multifunctionality, which includes the generation of public goods, of environmental and cultural interest (Barnaud and Couix, 2020; Moreira and Lomba, 2017; Honrado et al., 2017; O'Rourke et al., 2016; Madureira et al., 2013). This multifunctionality has been compensated and encouraged through public policies, mainly at the level of the Common Agricultural Policy (CAP) and environmental policy.

Since there is a consensus on the interest and need to compensate farmers (and other local landscape managers) due to the ecosystem services they contribute to generate, there is less certainty about the best design of these policies. From a conceptual point of view, the search for models of rural development on mountain landscapes is increasingly focused on recovering sustainable balances between people and nature. Given the multiple stakeholders often implied in decision and action, it is important to consider their diverse perspectives and interests, and this implies a better understanding of the local arena social dynamics (Barnaud and Couix, 2020). Regarding this issue, the concept of socio-ecosystem seems appropriate, allowing an integrated analysis of social, economic and ecological aspects of the territories (Chapin et al., 2010; Honrado et al., 2017).

We intend contribute to this discussion with a case study in the mountains of northwest Portugal. The case study privileged a participatory diagnosis in a village, involving technicians and local leaders with semi-structured interviews, the resident population with focus groups and questionnaires, as well as the tourists perspectives captured by a questionnaire. We begin by presenting the trajectory of recent local development and its articulation with the transformations of Portuguese society at a socio-economic and political level. Afterwards we present results that confirm the appropriateness of an analysis of the territories at a local scale guided by the concept of socio-ecosystem.

Transition trajectories for multifunctionality - the case of Sistelo

The mountainous systems of the Alto Minho (NUTIII) in the northwest of Portugal are characterized by an ancient human occupation with small peasant communities, dedicated to pastoral activity in the mountains and subsistence polyculture in small fields on the slopes (terraces) or “lameiros”. The cattle and the small ruminants were fed during much of the year in free grazing, in the areas of bush and in semi-natural pastures of higher altitude communal lands (*baldios*). At an intermediate altitude level, we find the typical *brandas*, complementary to each village, with privately owned shelter structures, small meadows and cultivated fields. In the winter, the animals approached the villages to feed with locally produced grass, hay and corn. The main goal of livestock production was the sale of the veal, kid and lamb, while cattle raising was meant to provide animal traction (Santos, 2000; Brito et al, 2005). This traditional agro-silvo-pastoral system was characterized by a high biodiversity, encompassing wild biodiversity (fauna and flora) and agrobiodiversity (local animal breeds and ecotypes of several vegetable varieties). Local mountain economy peaked with Barrosã beef exports to England in the late 19th century, steeply declining after 1930 (Lima Santos, 1996). Small herds of suckler cows of local breeds, like Barrosã and Cachena breeds, are still the main farming activity in the northwestern mountainous areas (Araújo et al., 2014).

These areas currently preserve a natural heritage of high value, confirmed by the various classifications regarding nature conservation at national and international level (National Protected Areas Network - RNAP, Natura Network, Biosphere Reserve). The mountains of northwest Portugal are part of one of the four main types of Agricultural Areas of High Natural Value, with several habitats and species of conservation interest in the European Union depending on the existence of extensive mountain grazing, the Iberian wolf included (Moreira and Lomba, 2017). Barrosã and Cachena breeds, the latter considered one of the smallest bovine breeds in the world (Brito et al., 2005), constitute a vulnerable genetic heritage, although still present and valued, like some vegetable cultivars, namely the gastronomically appreciated Tarreste beans (Amorim, 2020). In addition to the natural value, Alto Minho mountain landscapes feature scenic and cultural qualities that grant them significant touristic attractiveness. The terraced agricultural landscape of the parish of Sistelo (Figure

1) was recently classified as Cultural Landscape - National Monument (Decree-Law 4/2018). Local authorities have developed a strategy to promote the village as a tourism destination and results have been unexpectedly high in terms of the number of visitors. Due to its dynamics, Sistelo was selected to carry out a participatory diagnosis under the project “Acontece in Loco – Montanha do Alto Minho”, financed under a Rural Development Program 2020 measure called Observatory of Rural Territories. In this diagnosis, the territory was analyzed as a socio-ecological system, and we tried to understand the dynamics and interactions between the social, economic and ecological dimensions, namely in terms of land use and agricultural and pastoral practices. The ecological aspect was observed taking into account the concept of ecosystem services (SE), as we sought to understand which services were valued by local actors, for their own quality of life and for that of society in general, and what are the roles performed by the population and its activities in this valorization.

Fig. 1. Sistelo terraces - Cultural Landscape
(Arcos de Valdevez - Alto Minho)

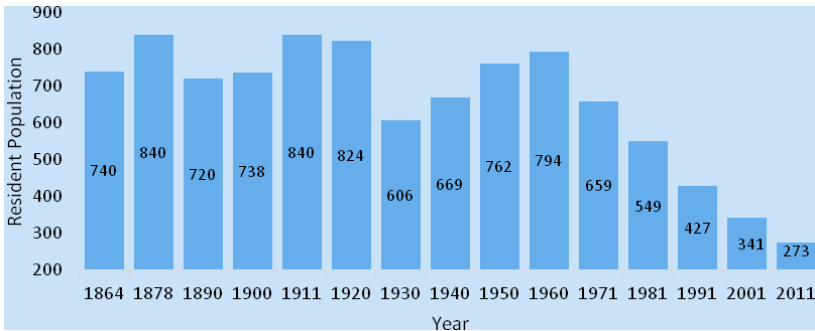


Picture taken by Serena Barbieri

Social and economic dynamics - a brief historical perspective

In order to understand the current dynamics at local level, it is important to have a perspective of the last decades. Emigration was the main driver of socio-economic change in mountain villages. In Sistelo, population decreased rapidly from 794 inhabitants in 1960 to 273 in 2011 (Figure 2). On the other hand, remittances from emigrants allowed families to improve their living conditions, as the eldest, female and children often tended to remain on the village, waiting for the male’s return. Nevertheless, the population is mainly constituted by individuals over 65 years old (52% in 2011). Many are returned emigrants whose main income source are retirement pensions (66% of residents in the same year). The development cycle linked to emigration has been running out, and the focus has turned to the promotion of endogenous development. In the 1980s a strategy began to be designed to diversify rural economies with touristic activity (Figueiredo, 2011, Pereiro 2018), and subsequently, other opportunities arose, namely in terms of wind farms. Both activities have increased local communities’ incomes, but had a reduced significance in local employment. And the creation of attractive jobs is the essential driver for the generational renewal.

Fig. 2. Evolution of the population living in Sistelo



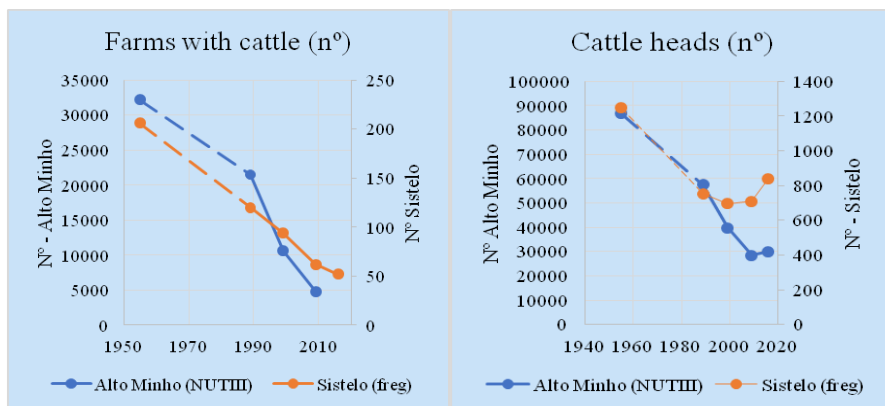
Source: INE, Population Census. Own elaboration.

The decrease in the population and the receiving of foreign income contributed to the preservation of many of the traditional features of

the agroecosystem, especially while the productive activities were left to women and children and, later, to the elderly. Although the number of breeders continues to decrease both in the region and in Sistelo, it must be noticed that some generational renewal has occurred, deeply related to CAP's, namely young farmers installation incentives and policy measures targeting the maintenance of extensive livestock production systems. It should be noted that the number of cattle has recovered in this parish (Figures 3 and 4). Currently, according to our estimates based on information collected from producers, around 75-80% of the gross income of livestock farmers comes from policy support and incentives.

In the early 1990s, PDO Cachena and PDO Barrosã were created to promote the commercial value of these breeds, through differentiation and quality certification. PDOs have been able to secure a position in the market - in the case of Cachena only from the middle of this decade (Silva, 2020). However, the impact of this certification on the income of mountain breeders appears to be very limited, a topic to be discussed further.

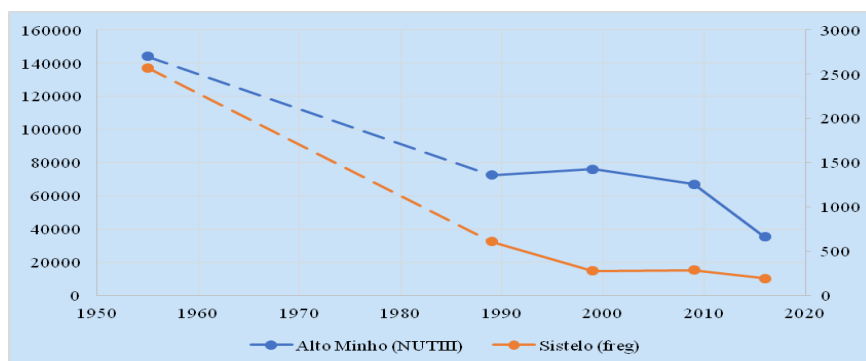
Fig. 3 and 4. Evolution of the number of breeders (left) and the number of heads of cattle (right) in Alto Minho region and in Sistelo's mountain parish



Source: INE, Agricultural Censuses 1955-89-99 and 2009; DGAV, 2016).
Own elaboration.

Concerning small ruminants - sheep and goats - the decrease in the number of animals was more intense, even if Sistelo shows a relative stabilization of that number in the last two decades (Figure 5).

Fig. 5. Evolution of the number of small ruminants in Alto Minho region and in Sistelo's mountain parish



Source: INE, *Agricultural Censuses 1955-89-99 and 2009*; DGAV, (2016).
Own elaboration.

Despite the historical predominance of cattle in the pastoral systems of the northwestern mountains, it is evident the great abundance of goats and sheep up to the middle of the 20th century, from then in straight regression. This decline was in part due to the communal land afforestation policy during the authoritarian political regime of the “Estado Novo” (Medeiros, 1984). After decades of state management, community-owned areas were given back to local communities after 1974, restricting state intervention to a model of co-management, mainly affecting wooded areas. From the point of view of the economic viability of extensive livestock production on the mountain, this common land pastureland is crucial, as it is included, along with privately owned land, in the calculation of subsidies and supports to farmers.

From a socioeconomic point of view, agro-pastoral activity has

several functions, as it involves different types of families and beneficiaries. In terms of direct benefits for producers, elderly farmers stand out in number, complementing pension benefits with the income deriving from a small number of animals. Younger individuals or couples, in short number, dedicate themselves exclusively to the activity and depend on it economically. In relation to the former, agriculture has some economic importance, but it has mainly value as a form of active aging (Figures 6 and 7), improving the well-being and quality of life of the elderly, an aspect that has been gaining importance in contemporary societies (São José and Teixeira, 2014). The second are professional farmers, for whom the economic viability of the activity is crucial, as well as the improvement of work conditions and efficiency. This group are the main drivers of change in the production system, having increased the scale of the activity, with greater numbers of cattle, and invested in machinery, installations and equipment. From the point of view of job creation at the local scale, this professional type of agriculture has been of significant importance. Only recently, from 2015, employment began to emerge in new businesses related to tourism (catering, accommodation, transport and sale of local products).

Fig. 6 and 7. Elderly farmers cutting hay (left) and participating in a traditional cattle fair (right)



Multifunctional agroforestry - between theory and practice

The president of the Sistelo Parish Council, a young mayor since 2013, believes that tourism is the activity that can “leverage all activities that allow for future sustainability. Not only the new activities created by tourism, but also the reinvention of agricultural activity which characterizes so much Sistelo, producing value added products, as well as the compensation for the conservation of a common good - the landscape - and ecosystems”. This sentence summarizes the development strategy that has been sought in the Alto Minho region for rural areas, especially in mountain areas. The participatory diagnosis carried out in Sistelo allowed us to confirm the existence of a broad social consensus around this strategy. However we also found latent conflicts and some opportunities for improvement. In this work, we highlight the changing interdependencies between agro-silvo-pastoral activity and the social life of the community, as well as with tourism and with the conservation of nature and the landscape.

The traditional production system that created the cultural landscape and preserved ecosystems of high biodiversity and environmental sustainability in the territory, has been changing in recent years. After dramatic reduction in the number of producers and animals in the agro-ecosystem, a small number of cattle breeders emerged who stand out for the larger size of the herd, a high degree of specialization and for becoming the main users of the parish's agricultural and agroforestry areas. There is a certain consensus among breeders that 50 or more cows are needed so that a family with 2 children can live with this activity, and yet with some difficulty. Official data show that the proportion of producers with less than 20 animals has dropped from around 90% in 1998 (Santos, 2000) to 71% in 2019 (Table 1). It should be noted that the questionnaire carried out to the families of Sistelo showed that this proportion, for management purposes, would be lower (around 60%).

The two types of producers identified are clearly distinct in terms of the herd size and production system. The little ones preserve traditional peasant practices, though replacing animal traction for mechanical, own or rented, wherever possible. As for the second ones, traditional management is no longer viable - they depend on the acquisition of food abroad (hay and concentrate), so they mechanized as many operations as possible

facing mountain's limitations, and substantially reduced the time dedicated to livestock monitoring. An important part of simplifying the work depends on the possibility of tractors to access the fields, and the terraces. It also relies on the construction of modern and large stables in the mountains, replacing the small cuts “cortes” located under the houses in the village (Figures 8 and 9).

Table 1. Distribution of Sistelo farms by herd size, 2019

Cattle per farm (n°)	Farms (n°)	% of total
1 a 5	23	44,2
6 a 10	2	3,8
11 a 20	12	23,1
21 a 50	12	23,1
>50	3	5,8
Total	52	100,0

Source: OPP. Own elaboration.

Fig. 8 and 9. Traditional section on the ground floor of a house (left) and recently built stable in a bland “Branda”



The 24/24 hour free grazing regime in the mountains, which is increasingly extended into the winter months with weekly surveillance,

has replaced the traditional system, which comprised higher animal–human relationship. Sucker’s cows move autonomously to the stables where the calves remain, with the daily presence of the producer. The limitations to the construction and licensing of new stables (for orographic, ecological and landscape preservation reasons) and the need to rationalize the use of available labor, lead producers to sell calves at weaning with 4-5 months, with very low commercial value and no added benefit through PDO certification.

“Modern” producers are the ones who contribute more to maintaining the cultural landscape of the terraces and reducing the risk of fire, by creating an agro-forest mosaic that limits the approximation of shrub and forest to the villages and by controlling the levels of forest biomass accumulation through grazing. Together with traditional producers, they contribute to the maintenance of the landscape’s authenticity and of the rural life. The resident population in general, including tourism professionals, recognize the importance of these functions, not only for their own well-being and safety, but also for their contribution to the notoriety of the Sistelo’s landscape. But there are doubts among the producers and community itself regarding the future viability of this activity, considering the difficulties in attracting young people to the profession. New generations’ job expectations are less and less compatible with harsh traditional, non-mechanized tasks, still required due to existing limitations towards mechanization. The high economic dependence on support and subsidies is also often pointed out as a vulnerability and a factor of social devaluation of farmers before the local community and society in a broad sense. Producers would like to sell meat on more favorable terms and the creation of PDOs has contributed to a limited extent for this objective.

Regarding the specific aspects of habitat, biodiversity and soils conservation there is less certainty towards the degree to which the current system continues to guarantee the desired results. Two factors explain this uncertainty: (1) the inexistence, as far as we know, of ecological monitoring at the local scale and (2) the relative ignorance and / or indifference of producers regarding the specific protection objectives (either of habitats or species). It is our perception that these factors are rooted in the weak involvement of producers and the community in the processes of diagnosis, planning, monitoring and evaluation of development policies and strategies. It is suggestive that, when asked about the value of nature, 79% of residents in Sistelo agree that it is a “great attraction for those who come

from the city” (tourists), while 73% of the same respondents consider that “people from Sistelo, in general, give little value to wild animals and plants”.

This weak involvement devalues an essential function of local communities from an ecological point of view: their ability to detect environmental changes at the local scale, allowing them to identify the need for adjustments in practices (Dodson, 1998). In Sistelo, the local community, in a broad sense, reveals a latent concern with the overexploitation of collective lands in the mountains related to the greater load of cattle grazing and greater annual duration of free grazing. The producers, on the other hand, allege the existence of ignorance on the part of public entities in relation to various aspects of the production system and in the way they use natural resources. The conflicts focus on the topics of protection for the Iberian wolf, the prohibition of the use of fire (in winter) and the criteria that lead to the exclusion of various areas of the mountain range as forage areas (not eligible for support), even if they are effectively grazed by highly rustic animals of indigenous breeds. The existence of these conflicts leads to the detachment of producers towards the objectives of the policies, as well as a low predisposition for cooperating with the entities responsible for their implementation.

Future prospects for research and action

The future of mountain communities will depend on the local and regional capacity to enhance the synergies between agriculture and tourism and on the more systemic and voluntary incorporation of the generation of ecosystem services in agro-silvo-pastoral activity. In both cases, it is crucial to work more collaboratively and closely with the producers and the local community, while meeting simultaneously their economic, social and environmental needs. This involvement is a necessary condition for the implementation of an adaptative management of local social and ecological systems. The latter benefiting those who live on the mountain and all those who value and need the ecosystem services they provide.

The approach to the territory applying the concept of socio-ecosystem has the advantage of allowing the identification of positive and negative interactions between the various human and natural elements that compose it, and between the various actors involved. It allows investigators to get closer to the actual experience of people who live and work in a mountainous landscape. A legal and institutional framework that allows

for flexibility and adjustments is another essential condition for this adaptive management. The socioeconomic and ecological fragility of mountain systems makes these practices even more relevant. In order to animate and support participatory processes multidisciplinary teams would be required, sufficiently close to the territories, with decision-making capacity. The experience of commercial valorization of PDO cattle meat reveals recognition and market for these differentiated products. However, one of its main objectives - to contribute to the improvement of the income of mountain producers – performed worse than expected. It would have been important to ensure with the relevant actor (producers and the entities responsible for the licensing new facilities) the ability to adjust the mountain's production system in order to allow producers to sell the product with greater added value. This path can still be followed, producers and their organizations are carrying out efforts to make this happen.

Similar considerations can be made about the synergies between tourism and agriculture, and between mountain farming and ecological conservation. The sale of local products to tourists, or the involvement of local producers in the provision of touristic services, including the interpretation of the territory and socio-cultural animation, requires organization and training at local level. The farmers and young people's tendency to move away from agroecological values and practices should raise our attention. There is European evidence that agroecological production systems, certified or not, have found ways to innovate, to become more profitable, more attractive to young people, and ultimately capable of fostering more territorialized, resilient and fair alliances between consumers and producers (Van der Ploeg et al., 2019).

The adhesion of mountain farmers to improved agroecological models will depend, in part, on adequate public financing for goods and services that the market can't provide. But this is not enough. It is important to ensure the training of producers and rural development agents for a more autonomous, responsible and adaptive management of local endogenous resources and landscape, in cooperation with scientists and public entities. A management model that values both their work, their knowledge and the natural and cultural heritage that they inherited from their grandparents and want to have the opportunity to bequeath to their children.

Summary

European mountains hold a long history of human-nature interactions, which have been conservative of rich natural and cultural heritage. There is a growing recognition that critical mountain ecosystem services depend on the maintenance of local communities, and on the continuity of traditional (adapted) productive systems, which tend to be multifunctional. Portuguese mountainous territories are currently facing the threat of abandonment, due to decades of economic and social marginalization. On-going depopulation in Alto Minho mountainous areas poses a demanding challenge for public and private entities, and triggered a collaborative project at regional level, aiming to get a better insight into local mountain community's dynamics. Current mountain development strategies are based on increasing mountain products value (local cattle breeds and traditional meats with PDO), providing financial support to farmers and cattle producers, and developing mountain tourism. The project team adopted the socio-ecological system theoretical framework, and a participatory approach at the village level, in order to get a closer view to the effects of these strategies at local level. This allowed us to understand that the mountainous context, combined with nature and landscape conservation regulations, poses specific constraints to farmers and local communities, which are not fully reflected on policy design and implementation. Several obstacles and inefficiencies arise which could have been prevented or solved with a sounder involvement of farmers and other local community actors. Empowering local actors by promoting a more autonomous, responsible and adaptive management of local endogenous resources and landscape, by farmers and tourism entrepreneurs, would, in our view, allow for better and more sustainable results at both social, economic and environmental goals.

Key words: mountain socio-ecosystems, local governance, multifunctional farming.

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Sharing the experience of the development path of Slovenian mountain farming

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Mountains in Slovenia

Slovenia is a mountainous country with 72.3% of its territory defined as LFA mountains (Figure 1). Most of the northern part is dominated by the Alps, that reach their southeastern limit of distribution in Slovenia by the forested plateau of Pohorje. Slovenian Alps are known as the South-eastern Limestone Alps. All alpine mountains in Slovenia (Julian Alps, Kamnik-Savinja Alps and Karavanke) are included in the Alpine Convention (Further AC), which occupy 33.4% of the total Slovenian territory (Figure 2). Most of the Julian Alps are protected as part of the Triglav National Park covering an area of 880 km². In the south and south west of Slovenia the Alps meet the Dinaric Mountains that run south-eastwards right through the Balkans (Figure 3). Part of the Dinaric Mountains in Slovenia is included in the Regional Dinaric Arc Association. The protected area of the Dinaric Mountains in Slovenia is the Regional Park Kozjansko with an area of 206 km². Next to the Alpine and Dinaric Mountains also hilly regions in the middle of Slovenia and Mediterranean hills are considered as LFA mountains.

Although all the above mentioned “upland” varieties are considered under the umbrella of LFA mountains, many geographical, natural and socioeconomic differences as well differences in development level, potentials, and opportunities exist. The most pronounced differences in development level are detected between AC and other areas. The AC initiative has a long track record, much better experience in raising external

(EU funds) and internal (national funds) support as else in mountains; the AC also encourages much more scientific community, NGOs and local actors for dealing with mountain development issues. In the AC area we observed less decreasing number of agricultural holdings, with the most stable number of agricultural holdings in municipalities fully on the AC area. It showed that being part of the AC initiative is an advantage (Borec, 2019).



Figure 1: LFA mountains occupy 72,3% of Slovenian territory



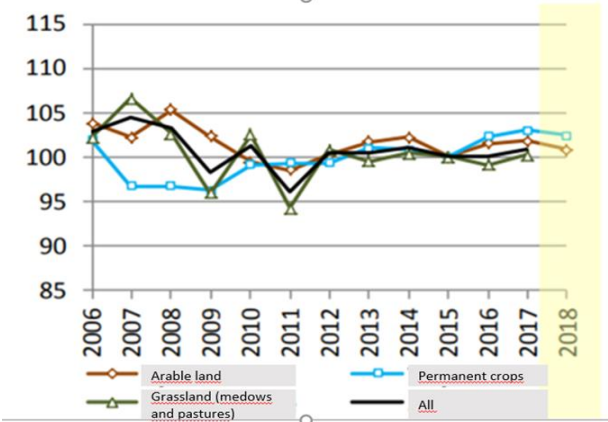
Figure 2: Area of Alpine convention



Figure 3: Area of Dinaric mountains

In terms of land use, agricultural land occupies 480,000 ha and represents 34% of the total Slovenian territory. The share of grassland (UAA) is 58%, arable land 36% and permanent crops 6%. The share of grassland slightly increased after 2016 in total.

Fig. 4. Change of agricultural land between 2006 and 2018 in Slovenia



Source: KIS, 2018.

In the mountains meadows, pastures, and forests prevail (MAFF, 2020). In addition, due to more difficult natural conditions for farming, agricultural production in the mountainous areas is more oriented towards livestock production on grassland (Knific, 2010). Other than in economic terms, mountain agriculture is important in terms of environmental function (provision of public goods), natural hazard prevention and high nature value farming (further HNV farming). Mountains developed strong cultural identity and tradition (know-how and tradition in agricultural production and food processing, special handcrafts, building heritage).

Almost 82% of all utilized agricultural areas (further UAA) is located on LFA mountains, which is cultivated by almost 84% of all farms of Slovenia. The number of agricultural holdings and UAA in ha decreased in the mountains from 2005 to 2016 (Table 1). Compared with the number of agricultural holdings in Slovenia in general (Table 2) the number of mountain agricultural holdings decreased less. The decreasing rate of UAA mountains and UAA in general is alike, although slightly higher for mountains. From the statistical data (Table 1 and 2) it could be observed that in the mountains the number of holdings is more stable but the ha of UAA decreases more compared to the Slovenian average (SURs, 2020).

Table 1. Agricultural holdings and UAA in LFA mountains in Slovenia

	Number of agricultural holdings							Utilised agricultural area [ha]						
	2000	2003	2005	2007	2010	2013	2016	2000	2003	2005	2007	2010	2013	2016
Agricultural holdings in less-favoured area, mountain area	42,762	42,138	43,371	42,854	40,787	259,335	258,786	252,750	251,048	252,348

Source: SURs, 2020.

Table 2. Agricultural holdings and UAA in Slovenia, general overview

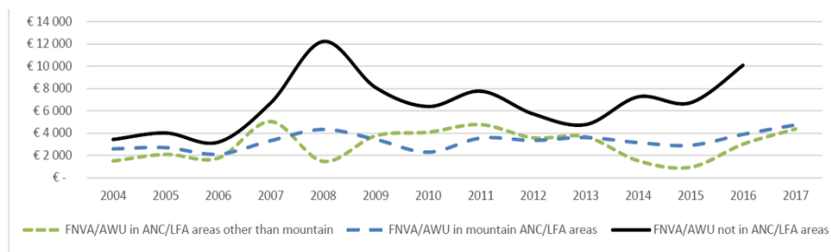
	Number of agricultural holdings							Utilised agricultural area [ha]						
	2000	2003	2005	2007	2010	2013	2016	2000	2003	2005	2007	2010	2013	2016
Agricultural holdings	86,467	77,149	77,175	75,340	74,646	72,377	69,902	485,879	486,473	485,432	488,774	474,432	477,023	479,589

Source: SURs, 2020.

The UAA decline in the mountains is likely related to agricultural land abandoned and the stable number of holdings to more diversified incomes on mountain farms, although the structural changes in agriculture and in agricultural households vary due to different micro natural conditions for agricultural production, natural resources and different level of local development. The mountain farms are diversifying their incomes by self-employment (supplementary activities, mostly linked to forest management and services) and by off-farm employment outside the agricultural household mostly because of limited incomes from the farming. The self-employment contributes to higher incomes in comparison with agriculture as well as to a higher quality of employment (Bonjec, 2010).

Figure 5 show the evolution of agricultural income in ANC/LFA areas. The agricultural factor income per worker (FNVA/AWU in FADN) is on average lower in mountain areas (Areas with Natural Constraints – ANC/LFA areas) and presents only 45% of income not in ANC (Figure 5).

Figure 5. Agricultural factor income per worker in areas with natural constraints



Source: DG AGRI - FADN

Source: EU Commission, 2019.

Research studies from different mountain areas in Slovenia shows that in the mountains mixed (plural activity) and supplementary farms predominate (Voler, 2016; Barath, 2015; Cunder, 2001; Knific, 2010; Borec, 2003) and from comparative analysis between farm types and their incomes between 2004 and 2016 (Pohorje mountain) it could be observed that the income of full and mixed conventional farms has decreased from 2004 to 2016 and for supplementary farms the income is stable (Voler, 2016). Bonjec (2010) concluded in the research paper that in the long-run we might expect that the most important factor for the household's decision in the mountainous areas to stop farming due to the small size of

farms is the limited household income from agriculture for the household's survival and better opportunities for the employment and incomes outside the farms.

It is a general agreement that market oriented agriculture increases income. Mountain agriculture, however, with many limitations regarding natural handicaps, with a need for more complex machinery and more working time is handicapped in respect of farm incomes and competitiveness.

In Slovenia more than 33% of agricultural output is produced in the mountains (Santini, 2013).

In terms of mountain products dairy products predominate, the milk sector in the mountains accounts for 38.9%. Mountain products have in general higher production cost and lower labour productivity although differences between mountain areas, products, farm size and farm orientation exist (Santini, 2013). Higher prices of mountain products in Slovenia are linked to higher cost not to high quality, thus mountain products do not express desirable added value. To overcome this gap, to make the mountain products on the market more clearly identifiable and thus less misleading for the consumer as well to avoid fraud by free riders, the EU legislated in 2014 optional quality term (further OQT) "mountain product" (Santini, 2013) and Slovenia has adapted its national legislation to integrate the OQT in April 2015. Slovenia did not make use of the possibility of reducing the derogation on the distance of dairy processing outside mountain areas, as the LFA mountain area covers more than 70% of total land surface and in general all processing facilities are located in the area. Further, every producer who wants to use the OQT has to inform the ministry about it at the beginning of using the term. The controls against fraud are made by the National Administration for Food Safety, Veterinary Sector and Plant Protection, which is the competent authority responsible for official controls 'based on a risk analysis'. For the time being, the ministry did not introduce any prescribed logo or any requirement on the size of the font used on packaging. Currently, there is only one known farmer, producing fresh beef meat, registered as using the OQT (EUROMONTANA, 2017). According to the opinion of a Ministry of Agriculture, Forestry and Food representative, the main reason is that farmers are not enough informed about this scheme, but so far no campaign on state or municipalities level about schemes, applicants, logos and procedures has been planned. This is an important weakness as more than one third of products are coming from the mountains, and the products are marketed

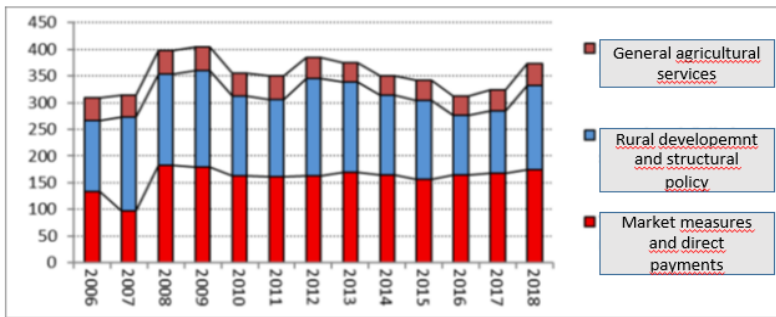
in regional cities and tourism centres with no information about the origin. In addition, no studies or analysis were conducted regarding labelling of mountain products, also in general rare studies to analyse structural changes particularly in the mountainous areas are available and good analytics for LFA, especially in the mountains are missing.

In state administration, government and government offices lack of mountain engagement could be found, even in state statistics few data related to mountain areas are available.

CAP and mountain policy in Slovenia

The aim of the Common Agricultural Policy (CAP) is focused on the support of agricultural production and rural sustainability in a wider context. The CAP was introduced in Slovenia in 2004. Direct payments from Pillar 1, above all mountain milk payments and rural development subsidies from Pillar 2, in particular LFA subsidies are of crucial importance for sustaining predominantly fragmented family farm structures in hilly and mountain areas of Slovenia (Knific, 2015). The Rural Development Programme (RDP) support in 2014-2020 shrunk in general from the period 2007-2013 by approx. EUR 78,000,000, still the subsidies in Slovenian agriculture are in general high and have become an important factor of farm incomes, which has mitigated the exit of farms (Barath, 2015).

Figure 6. Budget payouts in Slovenia (in million EUR) between 2006-2018



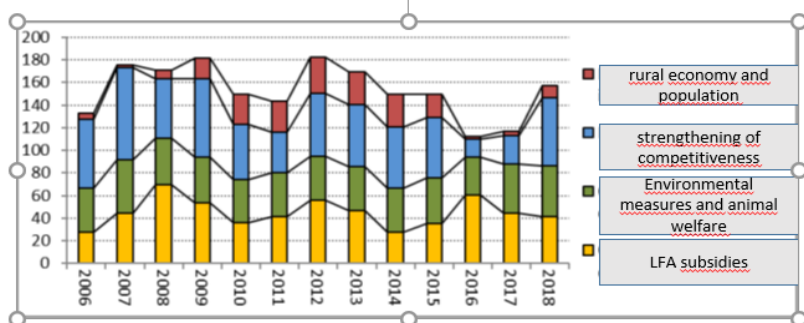
Source: Travnikar T., 2019.

The structure of budget payments (in percentage) is as follows (Figure 6): 49% market measures and direct payments (more than 80% of that only for direct payments), 40% for RDP and structural policy (55%

of that for environmental schemes and LFA), 11% for financing of general agricultural services (approx. half of that for research, development, advisory and professional services).

From the dynamics of budget payouts for LFA (Figure 7) reduction of subsidies from 2016 could be observed. Still, LFA payments for agricultural production are among the most standard measures of rural development policy and in terms of absorption, they are among the most successful measures under the Slovenian RDP.

Figure 7. Budget payouts for rural development and structural policy in Slovenia (in million EUR) between 2006-2018

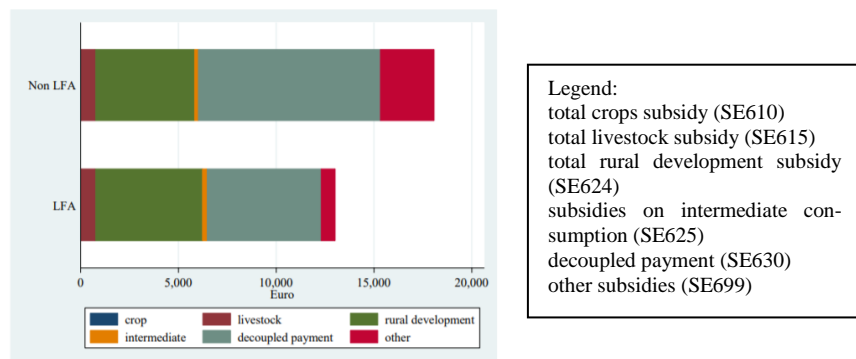


Source: Travnikar T., 2019.

Figure 8 shows that average subsidies per farm were considerably higher for non-LFA than LFA farms in the period 2007-2010, which could be explained with the (on average) low farm size on LFA and thus less subsidies compared to non-LFA farms. There are two prominent subsidy types: decoupled payment and rural development supports. The decoupled payment plays a dominant role followed by rural development supports for non-LFA farm. These subsidy forms are roughly equally distributed for LFA farms as opposed to non-LFA (Barath, 2015). Other subsidies (grants and subsidies for disasters or extraordinary subsidies) are higher for non-LFA.

From 2007 to 2010, the amount of LFA payments was determined with the help of a model matrix calculation, i.e. the areas were classified into individual difficulty classes according to altitude and slope.

Figure 8. Mean size and distribution of subsidies for different purposes between LFA and non-LFA farms (Barath, 2015)

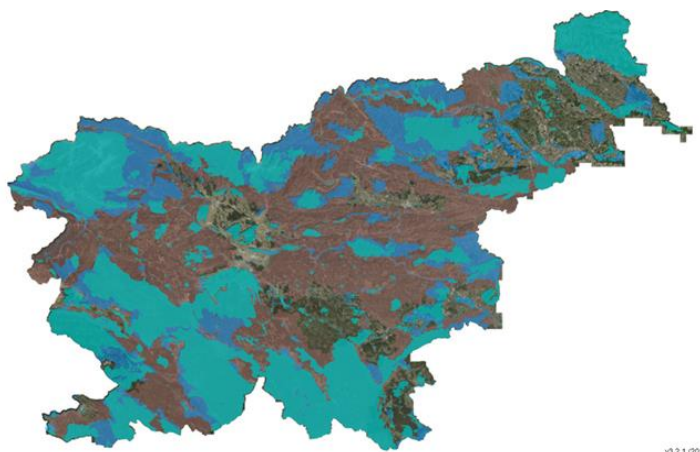


In 2010, however, there was a differentiation of LFA payments. The register of farms in LFA was created for a more precise definition of each farm separately. Standard (soil potential, climatic conditions, altitude, slope and parcel fragmentation) and regionally specific indicators (karst surface, flood area, erosion area, presence of strong winds) were taken into account when allocating points to individual farms. With scoring, the limiting factors on the land itself were well assessed, while the constraints faced by farms due to their location were poorly captured. Therefore, the payment is divided into a fixed part (55%) and a variable part (45%). The fixed part is determined according to the difficulty class of each farm, and the variable part based on the calculation of points. Despite the desire for a more balanced and coherent LFA payment, mountain farmers still face some concerns. For example, in Slovenia only two categories available for slopes exist: I. category with 35% slope and II. category with 50% slope and more. However, the costs for a slope above 70% are much higher than for a slope of 50%, and the payment for such an area is the same. In addition, there has recently been a combination of flat and steep of each GERK (graphic unit of agricultural use), which for the farm usually means taking away the slope allowance, because the average slope of the entire area is not large enough. Today's upper amount of payments for mountain area is 450 EUR/ha, the minimum payment per hectare is 25 EUR/ha (MAFF, 2020).

The next most important factor in the mountains are Natura 2000 sites and Agri-environment-climate payments (AECM). Natura 2000 occupies 37.5% (ca. 720,000 ha) of the Slovenian territory. The majority of

Natura 2000 sites are in the mountains (Figure 9). LFA mountains above 500 meters' sea level are strongly dominated by permanent grassland, which represents as much as 95% of all agricultural land, only 5% is arable land. As a result, livestock farming predominates, often extensive, as only herbivorous animals can take advantage of the voluminous forage from the meadows. Due to the natural conditions in the mountains, biodiversity rich grasslands predominate and are mostly included in the Natura 2000 network. Habitats in Natura 2000 are protected by AECM measures.

Figure 9. LFA mountains and Natura 2000 sites (mountain area = brown, Bird Directive = blue, Habitat Directive = green)



Source: GERK, 2020.

From the total Natura 2000 area, for AECMs is eligible 15% (ca. 108,000 ha, primarily grassland) of which only 22% (ca. 24,000 ha) is covered with AECMs. For the grassland (and other agricultural areas), the operational management programme for Natura 2000 (PUN) gave in the period 2007-13 AEM measures a formal role of a systemic instrument for the management of Natura 2000 sites and the AEM measures were defined as a crucial instrument for managing agricultural land within Natura 2000 sites. As nature-appropriate AEM for the conservation of permanent grassland more than ten different measures were voluntarily in use in the period 2007-2013. Analysis of objectives of PUN shows that the period 2007–2013 was not successful, because the objectives were achieved only in

11% of Natura 2000 sites. The reasons for this can be found in some system errors, such as inadequate scheme of agri-environmental measures, which also in Natura 2000 sites allows entry of horizontal measures; inadequate financial evaluation of the so-called biodiversity agri-environmental measures; lack of promotion and education (Zavod za varstvo narave, 2013). Another problem that we are still facing at Natura 2000 sites is overgrowing, which is a result of total or partial abandonment of agricultural use for various economic and social reasons, especially in LFA mountains.

In the Annual Report (KIS, 2018) of RDP for the period 2014-2020 it is indicated that the central problem in evaluating the contribution of the RDP to improving the environment (e.g. biodiversity) is the lack of reliable data at the micro level. Nevertheless, we must take into account the short implementation period to draw conclusions on certain environmental impacts, in particular where positive (or negative) trends are reflected only over a longer period of time. Regardless, in the Annual RDP Report (KIS, 2018) authors conclude that the key measures relating to biodiversity conservation in the period 2014-2020 are well designed. Good results of measures are based on in-depth analyses of narrowly defined areas and newly introduced target based measures.

Discussion

Regardless of the long presence of CAP in Slovenia the overall objectives of support for agricultural holdings in mountain areas have remained unchanged from the beginning:

- maintaining the landscape by promoting land management despite difficult farming conditions and thus protecting in particular the soil from erosion and landslides or the loss of biodiversity,
- maintaining the settlements in mountain areas and stopping the migrations,
- ensuring public benefits in the mountain area and their contribution, in particular to the conservation and restoration of infrastructure, protection against natural disasters, tourism and cultural heritage.

If we consider the relevant indicators used for evaluation of CAP (according to six priorities), particularly for Pillar 2 measures and related to the above objectives (e.g. Number of agricultural holdings for RDP support for investments in restructuring, Number of agricultural holdings, supported under quality schemes, local markets, short delivery chains and producer groups, Agricultural land covered by management contracts that contribute to biotic diversity) only some partial progress (protection of soil

and water) could be detected in general, unfortunately no data for LFA mountains are available (MAFF, 2020).

The lack of data for LFA mountains is perceived in general. This is partly understandable, as most of the area is included in the LFA, but the structural data for the LFA mountains would significantly improve the view on situation in different mountain territories of Slovenia. We can draw some parallels from the collection of general data (e.g. labour productivity, farm age structure) but we must not be misled by such information.

Not only is the lack of data identified as a shortcoming. Another is that very few funded national scientific projects related in particular to the mountains are found. From public available sources (from 2004 to 2020) only 12 scientific mountain related projects were found (with key words used: mountain*, agriculture*, LFA*, Alps*, Dinarides*), among them 6 were linked to Alps, 2 to Dinarides, and only one to each other descriptor.

Further, looking at the published work in Slovenia between 2004 and 2020 the situation is similar. For the analysis of published work, we used the descriptors both in English and Slovene language: mountain and agriculture*, mountain* and area*, mountain* and region*. In Slovene language the words hill, hilly area, hilly region (between 200 to 500 m relative altitude) are often used, therefore we included them as descriptors. Interestingly, in general the descriptor hill agriculture* was used 105 times and mountain agriculture* only 31 times. The publications are, according to the selected descriptors, as follows: for the descriptor mountain and agriculture* 26 scientific papers, 28 diploma, master and doctoral theses, 14 books, reports, studies, proceedings. The number of publications with the same descriptors in Slovene language is the same, only some more diploma and master theses were found. According to the content the majority of publications are focused on forest and/or specific tree species, in the second place we found publications related to socio-economic characteristics of mountain farms, but only few related to mountain policy and mountain products (only 2 publications).

We were also interested how the descriptors like mountain and agriculture*, mountain region*, hill region* (in Slovene language) are present in the three largest mainstream media portals: “24ur.com”, “rtvslo.si” and “nova24tv.si”. A short look revealed that by all portals the number of articles related to mountain agriculture is below 5. By the key word mountain region* and hill region* the number is higher (e.g. by “24ur.com” the

number is 25) but we have to take into account that among them the majority news are connected to accidents in the mountains, news from mountains out of Slovenia etc.

The Kmečki glas (Peasant Voice) is the leading publishing house for agriculture publishing newspapers, magazines and books, in particular original Slovene titles. In the group of books, no hit was found with defined descriptors.

In addition, higher education institutions do not offer any study programmes nor particular study subjects related to mountains.

This quick look reveals to us that topics related to mountain areas in Slovenia are somehow neglected both on scientific and general public levels. Indeed, criticism from different sources stated that the situation could be much better, if the LFA mountains on national level would get more general attention and public validity and/or to be perceived as independent discipline or branch with good analytics behind.

With the high share of LFA mountains in mind it should not be forgotten that the preservation of populated rural areas is the main goal for years, certain measures in this direction would also be desirable. Medium-sized farms, most of which are located in mountainous areas, contribute the most to Slovenia's self-sufficiency. And it is precisely these farms that are being abandoned and thus further contributing to emigration from the countryside to the cities and suburbs (Gabrovšek, 2019).

Summary

Slovenia is a mountainous country with 72.3% of its territory defined as LFA mountains. Mountain areas differ from each other by geographical, natural and socioeconomic differences as well differences in development level, potentials, and opportunities, but are all handicapped towards flatland areas. The overall objectives of supports for agricultural holdings in mountain areas remain unchanged from the beginning of CAP. Given the long period of different CAP measures, the development progress in mountains is only slowly improving (e.g. conservation of high biodiversity grasslands) or almost no progress could be detected (e.g. land abandoned, no added value to mountain products). However, the causes of such situation should not always be attributed only to ineffective agricultural policy, but in case of Slovenia also to general lack of public and scientific interest for mountain issues. A quick look at publications, mainstream media portals and national funded scientific projects reveals to us

that topics related to mountains areas in Slovenia are somehow neglected both on scientific and general public levels. The situation could improve if the LFA mountains on national level would get more attention and public validity or/and would be perceived as independent discipline or branch with good analytics behind.

Key words: mountains, agriculture, policy, Slovenia.

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Incentives for development of mountain farming in Croatia

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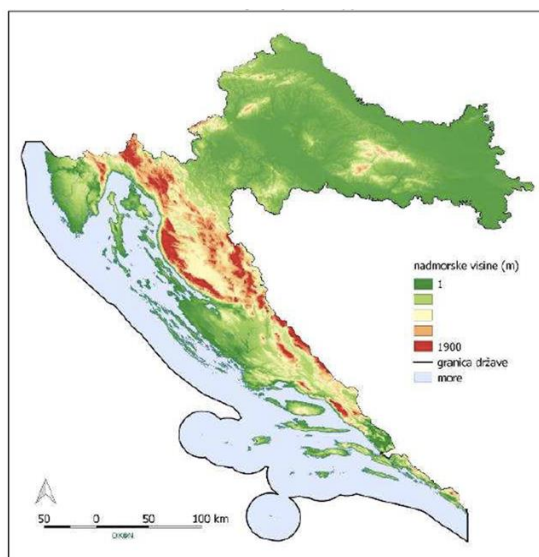
Introduction

Rural and mountainous areas in the Republic of Croatia make up a large part of its territory. According to Eurostat data from 2012, 79.1% of Croatia's land area is classified as predominantly rural, 19.8% as mixed, while only 1.1% of the area is classified as predominantly urban, categorized according to the NUTS-3 level of the region. Rural and mixed areas of Croatia include the area of villages, mixed settlements, small and medium-sized towns and the area of complex social and economic structure and mosaic landscape, in which, in addition to agricultural production and forestry, there are a number of other activities and purposes. They have a population of 3,217,117 (75.08% of the total population)⁹. In the Republic of Croatia until 2019, hilly and mountainous areas were defined by the Act on Hilly and Mountainous Areas (OG 12/02, 32/02, 117/03, 42/05, 90/05, 80/08, 148/13, 147/14) at the level of local self-government units (Croatian: *JLS*). According to the mentioned law, 45 local self-government units had the status of hilly and mountainous areas in the Republic of Croatia.

According to the new Act (OG 118/18), which has been in force since 1 January 2019, a total of 85 local self-government units have the status of a hilly and mountainous area.

⁹ Rural development programme of the Republic of Croatia 2014-2020.

Fig. 1. Map of Croatia with highlighted mountain area



Source: State Geodetic Administration.

Rural and mountainous areas play an important role in the economy of every country, including the Republic of Croatia. Although such areas face many problems, they are also areas where there are many natural and cultural resources. Rural and hilly-mountainous areas are characterized by the diversity of territories as well as the diversity of functions that such areas perform. This diversity includes physical and geomorphological characteristics, biological diversity, landscape but also society, culture, tradition, etc. Economic activities in these areas are important in creating cohesion (within these areas but also towards urban areas), improving efficiency, competitiveness, job creation, social, environmental, cultural and economic sustainability of these areas. The biggest problems in rural and mountain areas of the Republic of Croatia are depopulation and low level of economic activity, emigration of highly educated population, low level of innovation processes, lack of cooperation between various actors in society – fragmentation, lack of links between the research sector and local companies.

The Law on Regional Development of the Republic of Croatia states¹⁰: “The general goal of regional development policy is to contribute to the socio-economic development of the Republic of Croatia, in accordance with the principles of sustainable development, by creating conditions that will enable all parts of the country to strengthen competitiveness and realize their own development potentials”. The stated goal of the regional development policy is to ensure the connection of local and regional development needs with the development priorities of the central level and the goals of the cohesion policy of the European Union. In addition, support is given to less developed areas to increase and optimally serve their own development potential and eliminate the causes of development difficulties.

In recent years, a thorough review of the rural environment has been carried out in the European Union, which will also be reflected in political decisions regarding these territories. Thus, like governments in many European countries, Croatian government also recognized the importance of preserving rural and mountain areas through creation of measures for these areas that will make it easier for the local population to stay and settle.

Problem of croatian mountain areas

Mountains areas in the Republic of Croatia, similarly to other parts of Southeast Europe, are characterized by depopulation and population aging. A comparison of the results of the 2001 and 2011 censuses shows a decrease in the number of inhabitants in most local self-government units covered by the current Law on Hilly and Mountainous Areas in the Republic of Croatia.

With the acquisition of independence in 1991, most of the Republic of Croatia territory was affected by the war. Most of the rural areas as well as part of the hilly and mountainous areas were covered by war events. In that period, there were no special legal frameworks that would regulate the issues of encouragement and development of such areas. Along with the destruction of a good part of the existing industry in these areas, there is a neglect of agricultural production, which until then was one of the most important activities in rural areas. In the 1990s, market

¹⁰ Official gazette, no. 147/14, 123/17, 118/18.

liberalization took place, which led to the entry of products from foreign producers into the Croatian market. These products are more affordable to the average consumer in Croatia, so after the end of the war, fewer and fewer people in rural areas decide to engage in agricultural production. Low production, fragmentation of land ownership, low productivity, deficit of entrepreneurial mentality and knowledge, technological backwardness, demographic weakening manifested in the constant departure of young and educated people to urban areas, strengthening the sense of hopelessness, etc. are the main features of the current situation in Croatian agriculture (Čavrak V., 2003, p. 2) in the mentioned period. During 2001 the Republic of Croatia introduced first Law on Agriculture, which defines the goals of agricultural policy. In the mentioned Act, rural development is only mentioned as one of the goals of agricultural policy, but without proposals for development measures. All these years, rural as well as hilly and mountainous areas have not been recognized as areas that can contribute to the development of the state, so they are neglected in their views.

As the policy of the Republic of Croatia is increasingly directed and harmonized with the legal framework in the European Union, laws related to the development of other regional areas are also being passed. Thus, in 2002, the first law on hilly and mountainous areas was drafted. As the European Union was planning a new multiannual financial framework at EU level at the time, a shift in agricultural policy planning and financing began. A new programme is being designed that will be more comprehensive than the previous common agricultural policy – the rural development program. Therefore, in the period until 2008, the first Plan for Agriculture and Rural Development 2007-2013 – IPARD programme was developed. The programme was aimed at eliminating specific weaknesses and shortcomings that characterize the development of rural areas in Croatia. The European Commission approved the IPARD programme on 19 December 2007. As the Republic of Croatia continues the pre-accession process for full membership in the European Union, it is increasingly adopting programmes and regulating legal acts. Thus, in May 2008, the Government adopted the Rural Development Strategy of the Republic of Croatia 2008-2013. The Strategy determines the strategic goals of rural development until 2013, namely (Pavić-Rogošić L., (ed.), 2010):

- Improving the competitiveness of the agricultural and forestry sector.
- Preservation, protection and sustainable use of the environment, landscape, natural and cultural heritage.

- Improving the quality of life in rural areas and expanding the economic programme of the rural economy.
- Improving the efficiency of the institutional environment.

As previously mentioned, accession to the European Union and the use of funds required the development of the Rural Development Programme 2014-2020, which is actually the first programme that focuses exclusively on rural areas, and is a continuation of IPARD and SAPARD pre-accession programmes. This programme was adopted by the European Commission in 2015. The programme defines 18 measures aimed at increasing the competitiveness of the economy in rural and mountain areas, primarily agriculture, forestry and processing industry, and improving living and working conditions in rural areas (improving existing and introducing new services, building various infrastructure, etc.).

Legislation in the Republic of Croatia

The Agriculture Law (OG 118/2018)¹¹ is a basic document that determines the objectives and measures of agricultural policy, rules related to the common organization of the market of agricultural products, information and promotion measures, organic production, quality systems of agricultural and food products and all other activities related to agriculture. The goals of agricultural policy in the Republic of Croatia are:

- raising the level of competitiveness of the agri-food sector
- Improving market mechanisms for the sale of agri-food products
- sustainable management of natural resources
- environmentally friendly agriculture
- balanced spatial development of rural areas with the improvement of life in the local community, including the creation and retention of jobs, and
- ensuring a stable income of farmers.

Agriculture is a strategic branch of the economy in the Republic of Croatia and is therefore an integral part of other development strategies. This law determines the measures of agricultural policy in the Republic of Croatia, which are:

- rural development measures,
- direct support measures,

¹¹ Available at: https://narodne-novine.nn.hr/clanci/sluzbeni/2018_12_118_2343.html (17.08.2020.)

- measures for arranging or organizing the market for agricultural products, and
- other measures that achieve the objectives of agricultural policy.

The law stipulates that such measures are financed from the budget of the European Union intended for agriculture and rural development, from the national budget and from the budgets of local and regional self-government units.

According to Article 85, quality systems for agricultural and food products are established by Regulation (EU) no. 1151/2012 and the Act and include: protected designation of origin (Croatian abbreviation: ZOI), protected designation of geographical origin (Croatian abbreviation: ZOZP) and guaranteed traditional specialty (Croatian abbreviation: JTS) and optional expressions of quality. The same Act, Article 96, provides for the use of the optional expression of quality “mountain product” in the provisions of Article 31 of Regulation (EU) no. 1151/2012 and Commission Delegated Regulation (EU) no. 665/2014 of 11 March 2014 amending Regulation (EU) no. Regulation (EU) No 1151/2012 of the European Parliament and of the Council as regards the conditions of use of the optional quality label “mountain product” (OJ L 179, 19.6.2014).

Fig. 2. Protected designation of origin



Source: Ordinance on protected designations of origin, protected geographical indications and guaranteed traditional specialties of agricultural and food products and the optional quality term “Mountain product”, available on: https://narodne-novine.nn.hr/clanci/sluzbeni/2019_04_38_786.html.

One example of a mountain product which currently holds the label of Protected designation of origin in Croatia is honey from Gorski kotar mountain area “Goranski medun”. “Goranski medun” is honey that differs significantly in its composition and quality from most other honeys on the market. It is characterized by an increased proportion of minerals in its composition, which is reflected in increased electrical conductivity and specific sensory properties (taste, smell, tactile and visual properties). In order to ensure this and prove the origin of “Goranski medun”, a monitoring procedure is established based on the principles of traceability of production and keeping a unique system of documents that monitor production activities from the positioning of apiaries during grazing to the packaged product (Association of Medun Honey Producers).

Fig. 3. Logo of “Goranski medun”



Source: Association of Medun Honey Producers.

Protected designation of origin is currently the most recognized and appreciated label in Croatia, so that is the reason why mountain products are labelled like protected designation of origin.

Some of mountain products in Croatia hold also the label of Protected designation of geographical origin.

Fig. 4. Protected designation of geographical origin



Source: Ordinance on protected designations of origin, protected geographical indications and guaranteed traditional specialties of agricultural and food products and the optional quality term “Mountain product”, available on: https://narodne-novine.nn.hr/clanci/sluzbeni/2019_04_38_786.html

Mountain product from Lika mountain area named “Lika potato” (Croatian: *Lički krumpir*) holds this label from 2015. Association of Lika Potato Producers monitors traceability from the records of varieties used for planting to the final product. Thanks to the special conditions of the area and climate caused by altitude, “Lika potatoes” have a higher quality (accumulates a higher percentage of dry matter) compared to other areas where potatoes are grown (Association of Lika Potato Producers, page 9). Guaranteed traditional specialty label still has no products from Croatian mountains which hold this label.

The protection procedure is carried out, first at the national level, by the Ministry of Agriculture, and upon completion of the procedure, the name of the product is protected in the territory of the Republic of Croatia. After that, the request for registration of the protected name is forwarded to the European Commission, and the procedure ends with the entry of the name in the corresponding register.

Fig. 5. Guaranteed traditional specialty



Source: Ordinance on protected designations of origin, protected geographical indications and guaranteed traditional specialties of agricultural and food products and the optional quality term “Mountain product”, available on: https://narodne-novine.nn.hr/clanci/sluzbeni/2019_04_38_786.html

Optional quality term (OQT) “Mountain product” and the implementation of the OQT mountain products are expected in 2021 as the Ministry for regional development and EU funds should prepare a programme on Croatian mountain products. The procedure for authorization of use of “Mountain product” is currently that potential applicants have to fill in the form of the annex XIII of the “Ordinance on protected designations of origin, protected geographical indications and guaranteed traditional specialties of agricultural and food products and the optional expression of quality “Mountain product” where they detail raw material used such as the transformation process to justify that they can benefit from the OQT mountain products. Then a dedicated commission for mountain products within the Ministry of Agriculture must validate the possible use of this term before the producer is allowed to use it. There is still no logo of OQT in Croatia.

National Programme for Mountain Farming as part of Rural Development Programme

As the Republic of Croatia became EU member state from 2013 for the first time Croatia developed and implemented the Rural Development Programme of the Republic of Croatia for the Period 2014-2020.

Given the low productivity that characterizes the agricultural sector in Croatia and the high degree of fragmentation in the Croatian farm structure, the Rural development programme is targeted to addressing the restructuring and modernization needs of Croatian agriculture and food-processing sectors through measures to improve economic efficiency and competitiveness, including generational renewal and the development of small and competitively viable farms. The restoration, preservation and enhancement of biodiversity by promoting environmentally sound farming systems, including organic farming and the non-productive investments related to environmental preservation targeted Natura 2000, is a strategic goal for Croatia. Furthermore, granting compensation for the economic disadvantages in areas facing natural and other specific constraints (e.g. mountain areas) shall allow the maintenance of agricultural land and the preservation of the countryside as well as promoting farming systems in these areas (Rural development programme, page 145).

A majority of agricultural producers in the mountain area of Croatia cultivate small areas, in which it is difficult to establish sustainable production. For this reason some of the measures in Rural development programme 2014-2020 are designed to help small mountain farms to start production and develop existing activities. Also, diversification of small farms to other agriculture-linked activities will contribute to economic sustainability. Processing and marketing of agricultural products, rural tourism and the opening of the service sector in rural areas will greatly contribute to entrepreneurial development.

Measures that are linked with mountain farming in Croatia are explained in more detail below.

Measure 4 – Investments in physical assets

To minimize the number of threats and risks to biodiversity which are results of intensification of agricultural activities in the context of economic development and abandonment of less productive farming, measure 4 will help in the restoration of habitats and landscape features, including the construction and restoration of green infrastructure, protection of livestock from large carnivores, and restoration of ponds, which will contribute to enhancing high nature value areas (e.g. Natura 2000 areas) and ensuring preservation of various species and endangered habitats.

Measure 4 consists of four sub-measures and we will present just measure 4.1 which contributes the most farms from mountain areas – restructuring, modernization and increasing the competitiveness of agricultural holdings. Users are natural and legal persons registered in the Register of Farmers and producers groups/organizations. Three types of operations are financed and they are:

1. Restructuring, modernization and increasing the competitiveness of agricultural holdings.
2. Disposal, handling and use of manure in order to reduce the harmful impact on the environment.
3. Use of renewable energy sources in agriculture.

Eligible activities are investment in new buildings, machinery, equipment, investment in building storage capacities for manure and digestate, investments in the construction and/or equipping of energy production facilities, etc. Some of mountain farmers use this measure and these operations to raise competitiveness of their agricultural holdings. Maximum support depend on type of operations but incentives can reach up to 95% for farmers from mountains.

Measure 6 – Development of agricultural holdings and business

In order to encourage young people to stay in rural and mountain areas or return from cities, it is necessary to ensure adequate living and working conditions. One of the most important goals of this measure is to enable young people to develop new and existing agricultural businesses and to find employment outside of agricultural activities.

This measure consists of four sub-measures:

- 6.1 Support for young farmers.
- 6.2 Support for investment in starting non-agricultural activities in rural areas.
- 6.3 Support for the development of small farms.
- 6.4 Investments in the development of non-agricultural activities in rural areas.

In this paper we will further elaborate measures 6.1 and 6.3 as they are more convenient for small farmers from mountain areas.

Users in measure 6.1 are persons between the ages of 18 and 40, who possess the appropriate professional skills and knowledge of agriculture and who have been appointed as the holder of an agricultural holding for the first time (not longer than 24 months before the submission of the Application). The agricultural holding at the time of submitting the application for support belongs to an economic size in the range from 8,000 to 49,999 EUR.

Eligible costs are: purchase of domestic animals, annual and perennial plants, seeds and planting material; purchase, construction and/or equipping of enclosed/protected spaces and facilities and other economic facilities including external and internal infrastructure within the agricultural holding for the purpose of performing agricultural production and/or processing of products; raising new and/or restructuring existing plantations; arrangement and permanent improvement of the quality of agricultural land for the purpose of agricultural production; construction and/or equipping facilities for the sale and presentation of own agricultural products, including advertising costs; purchase or lease of agricultural land; purchase of agricultural machinery, machinery and equipment. In total users can be supported up to 100% of the value of the total eligible costs, max. 50,000 EUR. During evaluation of submitted projects, projects which came from mountain areas have slight advantage as they can receive 19% of points just because they come from mountain areas.

Main users in measure 6.3. are small farms, whose economic size is between 2,000 and 7,999 EUR. Eligible costs for them are: purchase of domestic animals, annual and perennial plants, seeds and planting material; purchase, construction and/or equipping of closed/protected spaces and facilities and other economic facilities including external and internal infrastructure within the agricultural holding for the purpose of performing agricultural production and/or processing of products; raising new and/or restructuring existing plantations; arrangement and permanent improvement of the quality of agricultural land for the purpose of agricultural production; construction and/or equipping facilities for the sale and presentation of own agricultural products, including advertising costs; purchase or lease of agricultural land; purchase of agricultural machinery, machinery and equipment. In total users can be supported up to 100% of the value of the total eligible costs, max. 15,000 EUR. This measure is most popular within small agricultural producers from mountains as economic size of the farm who can apply are in line with size of the most

agricultural producers in mountains. During evaluation process only 14 from 100 points can be awarded to applicants from mountain areas.

IACS measures

In the Rural Development Programme of the Republic of Croatia for the period 2014-2020, four IACS measures were included¹²:

1. Measure 10 – agriculture, environment and climate changes.
2. Measure 11 – organic growing.
3. Measure 13 – payments to areas with natural and other special restrictions.
4. Measure 14 – animal welfare.

Measure 13 is very important for mountain farmers in Croatia. Some parts of Croatia (usually rural parts) are areas affected by unfavourable climate or unfavourable soil characteristics, where the problem of population outflow is particularly present and where residents have to invest more effort to sustain agricultural production. Agriculture is very often the only source of income, however due to unfavourable conditions yields are below average and, more recently, very often affected by climate change. This measure is extremely important for the maintenance of agricultural production in areas where conditions are unfavourable for agricultural activities, since in 73% of the territory of the Republic of Croatia there are some restrictions and it covers 41% of the total agricultural area (Ministry of Agriculture, page 51). Through this measure support can be achieved through three sub-measures:

- 13.1. Payments in mountainous areas.
- 13.2. Payments in areas with significant natural constraints.
- 13.3. Payments in areas with special restrictions.

Payments in mountain areas can be done for farmers whose municipality is classified in the mountainous area if more than 50% of its surface area is bound by altitude and terrain slope restrictions, according to the following criteria:

- a. Altitude above 700 m.
- b. Altitude 500 - 700 m with a slope greater than 15%.

¹² More available at: <https://ruralnirazvoj.hr/files/documents/MPS-Brosura-200x200-Kako-ostvariti-potpuru-za-IAKS-mjere.pdf>

c. Altitude 400 - 500 m with a slope greater than 15 % if the vertical relief of the relief is greater than 500 m. This criterion is only applicable when municipality borders with other municipality defined according to the first or the second criteria.

Payments in areas with significant natural constraints are available for farmers who have at least 60% of agricultural land in municipality with constraints like low temperature, the length of the growing season, adverse chemical properties, gradient which are all typical for mountain areas.

In the Republic of Croatia, karst is defined as special restriction. Municipalities are classified as an area with special restrictions if more than 50% of its surface from which forest areas are excluded contains karst.

The support is paid as compensation for loss of income and additional costs incurred due to natural restrictions on agricultural production. The amount of support is (Ministry of Agriculture):

- a. for mountainous area 226 EUR/ha,
- b. for areas with significant natural constraints 119.85 EUR/ha,
- c. for areas with special restrictions 82 EUR/ha.

Regional measures which support small farmers in mountains

Except EU and national support for farmers some of Croatian counties (which have mountain territories) also provide small financial support for mountain farmers. In total Croatia have 20 counties. In 12 counties there is at least one municipality which have the status of mountain area. In this paper we will present measures for small mountain farmers in County of Primorje and Gorski kotar. This county, situated in western part of Croatia, has a mountain area called Gorski kotar. Gorski kotar is characterized by an above-average share of primary and secondary sector activities and below-average representation of the tourism sector. Agriculture and forestry account for 11.2% of employment in this microregion (Đokić I., Bakarić Rašić I., Starc N., 2018). County development strategy recognized the potential of this mountain area for development of sustainable tourism and agriculture.

Fig. 6. Mountain products from Gorski kotar



Source: Local development agency Pins.

One of the measures is support for small farmers in mountain areas with the goal to support local people to stay living in mountains and to start small farms. This also encourages entrepreneurial spirit among local people. Every year (except 2020 due to Covid 19 situation) the county invites small farmers which have small farms up to 2,000 EUR of economic value to apply for these small grants. Maximum available grant is also 2,000 EUR per project and can cover the costs of purchase of domestic animals, annual and perennial plants, seeds and planting material and some basic equipment like protective fences etc. Small farmers from the mountain part of the county have better selection conditions than farmers from other parts of the county so they can quite easily get these small grants.

Table 1. Project selection criteria for small farmers in the County of Primorje and Gorski kotar

No.	SELECTION CRITERIA		SCORE	MAX SCORE
1.	LOCATION OF ACTIVITY	The activity will be carried out in the area of Gorski kotar	10	10
		The activity will be carried out in the area of islands	5	
		The activity will be carried out in the other rural area of the county	0	
2.	AGE OF THE GRANT USERS	The beneficiary is a young farmer (under 40 years of age on the day of applying for support).	10	10
		The beneficiary is older than 40 years on the day of submitting the Application for Support.	0	
3.	ECONOMIC SIZE OF THE FARM AT THE TIME OF THE APPLICATION FOR SUPPORT	Farm starts agricultural production or has an smaller economic size than 500 €	15	15
		Economic size from 500 to 1.000 €	10	
		Economic size from 1.000 to 1.500 €	5	
		Economic size more than 1.500 €	0	
4.	INVESTMENT	The subject of investment refers to plantations under autochthonous varieties and/or breeding of autochthonous breeds	10	10
		Other type of investment	0	
SCORE				45

Source: County of Primorje and Gorski kotar, Public call for grants for agricultural holdings through co-financing of rural development measures in agriculture of Primorsko-goranska county in 2019.

In this way these small grants improve existing farms and raise their economic value which farmers have to prove in the final report. After they use this grant they can in next year or two apply for national measures or rural development programme measures, like 6.3. Support for the development of small farms, which is explained earlier, or even for some other measures which also support starting non-agricultural activities in mountain areas (e.g. rural tourism).

Summary

The Republic of Croatia did not develop special legal frameworks that would regulate the issues of encouragement and development of agricultural sector in mountain areas. In the process of joining the EU, Croatia started to recognize rural and mountain areas and their opportunities. Currently the Agriculture law and other legislation start to recognize mountain areas as specific areas with natural constraints. For the first time in the Rural development programme 2014-2020 some of the actions especially in IACS measures are specially intended for farmers from mountain areas. In implementation of other measures from the rural development programme mountain farmers are not favoured despite all the problems they are facing. For these reasons some counties through their strategies develop special measures which support small farmers from mountain territories. During 2019 the Republic of Croatia accepted new law for mountain areas which should further promote and help to develop mountain farming in the country.

Key words: mountain farming, National Programme for Mountain Farming, Croatia

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