



AgroBioCom: Food products and regional value chains with traditional crop varieties and livestock breeds

Workshop report: Upper Lusatian Heath and Pond Landscape, Malschwitz, Germany 11. - 13. June 2026

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1. Introduction

Traditional crop varieties and livestock breeds are important elements of biological and genetic diversity in European rural regions. Genetic resources are a key form of natural capital needed for stability and adaptability in agriculture, rural development and tourism. Unfortunately, cultivation of landraces has been dramatically reduced in the last decades all over Europe. To counteract the loss of diversity is facilitating its sustainable use [1]. Often, the development of that short food value chains is connected with several structural challenges, such as multi-actor cooperation, regional coordination as well as processing and logistics of smaller quantities.

Traditional crop varieties and livestock breeds often possess unique flavours, appearances, or healthy compositions of ingredients, along with other distinctive characteristics or rich histories that tell an authentic local story. These qualities provide excellent opportunities for their revival or for developing innovative new products. Such products might become iconic regional symbols of rural areas or simply interesting offerings that can enhance regional branding.

Many regions and biosphere reserves are already using typical breeds and varieties in tourism marketing. These efforts support regional marketing channels for diversity products, strengthening regional food processing and value chains, including those tied to tourism and gastronomy [2]. The role of traditional crops and breeds in rural agri-food tourism can be seen as a kind of market access at the end of that regional food value chains.

2. Products and consumer groups

Rural tourists are often drawn to authentic, traditional, and local foods that provide them with a unique “Taste of Place.” However, it’s not just visitors who seek out authentic and trustworthy local food. Local consumers also prioritize purchasing locally produced items for their daily needs. Their motivations typically include



accessing fresh and nutritious products, reducing environmental impact, and supporting their community, cultural heritage, and rural development [3, 4]. Consumers tend to view products made from local landraces as being of higher quality compared to those produced with high-yielding varieties, and they are often willing to pay a premium for such items [5]. Furthermore, products derived from heritage landraces and marketed as regional specialties frequently command higher prices thanks to their unique taste and strong cultural identity [3].

It is important to inform consumers about the added values of purchasing products made from traditional regional varieties and breeds. This is particularly relevant for small-scale local farms, where effective labelling can play a crucial role [6]. The significance of such labelling is especially evident in some Mediterranean countries, where food is connected with cultural identity. In these regions, products from local landraces are highly valued, widely recognized in markets, and often featured in restaurants as regional specialties [6].

2.1 Experiences and approaches from practice

2.1.1 Champagne rye products from Upper Lusatian Biosphere reserve

Champagne rye was a forgotten grain variety since the 1960s and brought back from the gene bank to the field by VERN in 1994. The old variety has proven to be particularly suitable for the dry, barren sandy soils of Upper Lusatia and delivers stable yields even in drought. Today the Champagne rye is still in the “Red List of endangered native crops in Germany”. Today, five farms in the region grow more than 250 hectares of the local rye variety.

Flours and backing mixes from the Rätze Mill

www.raetze-muehle.shop

The local Rätze Mill in Spittwitz, operated by brothers Johannes and Sebastian Unger, produces around 300 tons of Champagne Rye flour annually, about 5% of their total production. The flours and backing mixes are not only processed by regional bakeries but are also available in the mill shop and regional sections of local Rewe and Edeka supermarkets. Since about one year there is a “Rätze-Mühle-Online-Shop”, that sells the mills products very successfully and directly to consumer.





Bread made with Champagne rye

Local craft bakeries, such as the “BäckeReck” (BakeReck) owned and run by master baker Martin Reck, rely 100% on Champagne rye for their rye-based products. The breads made with Champagne Rye by “BäckeReck” has gained recognition beyond the region and accounts for around 15% of the bakery's bread sales. It is known for its exceptional digestibility, great taste, and long-lasting freshness. In addition to smaller family-run bakeries, the large bakery Fehrmann has also specialized in breads made from Champagne rye within its two branches located in the Biosphere region. Fehrmann also sells these breads in its 15 additional branches, stretching from Bautzen to Dresden.



Champagne rye whiskey from Christian Lissina

Christian Lissina grows Champagne rye on his farmland in Großdubrau (Saxony), located within the biosphere region. To increase the value of his produce, he decided a few years ago to use this high-quality grain to create various spirits. His product range includes spirits such as “Schlesischer Heidekorn” (Silesian heath grain spirit), as well as various fruit brandies and herbal liqueurs.



His premium offering is a rye whiskey that is aged in barrels for several years; he produces around 300 litres annually and successfully sells it through the small specialty shop "Neue Presse" in the nearby city of Bautzen.

2.1.2 Local „Broa“ diversity from traditional maize varieties in Portugal

Portuguese maize bread, known as "Broa", holds significant economic and social importance in the rural communities of Central and Northern Portugal. Traditionally made from local maize landraces, Broa reflects the unique agricultural practices





and cultural heritage of each community. These practices are evident in the distinct composition, shape, size, and flavor of the bread, which varies from one village to another. Historically, the economy of these regions was based on small-scale farming, where maize was a staple crop used to produce Broa. A research project conducted across 11 counties collected 51 different maize landraces and 175 associated crop varieties, highlighting the extraordinary genetic diversity of maize in a relatively small geographical area [7]. In many villages, the old granaries (espigueiros), still demonstrate the longstanding tradition.



Today, the diverse forms of traditional Broa offer visitors a taste of history and a view into the finely structured communities of Central and Northern Portugal. It is worth for visitors paying a price premium to experience that typical and authentic high-quality bread and for local residents to uphold that valuable element of regional identity.

2.1.3 São Pedro do Sul - a centre of bean varieties in Portugal

The centre region of Portugal and especially the mountainous area around S. Pedro do Sul, is famous for the huge tradition and variety of beans. With more than 100 bean varieties, this territory held this important genetic heritage and has been working to keep it.

The collection and care are special traditions of women's work. Sample boxes of beans are already showcased in the local tourist office. Since 2014 the municipality of S. Pedro do Sul organizes a yearly beans festival and fair in cooperation with local producers, gastronomy and tourism. In this festival there are beans from 20 producers, who can't come to the fair. Further, selling the beans directly from farmers to consumers at the local farmer market in the municipality offers very good opportunities to communicate the special history and quality of the local varieties.





2.1.4 Red Mountain cattle meat in Upper Lusatian farm shops and restaurants

Since 2013 the Upper Lusatian Biosphere reserve work on the conservation and reproduction of the traditional landrace of “Red Mountain cattle” in cooperation with the farm “Agricultural production and landscape management MönaU-Uhyst”. In former times the breed served of three purposes: providing milk, beef and draught power. With focus on landscape conservation and valuation of the meat the partners they increased the number of animals from four in 2013 to 60 in 2025.

The MönaU-Uhyst farm markets its meat directly on site. Since the slaughter and processing of meat products from these extensively raised animals only take place on specific dates, farm sales are mostly seasonal. In addition, local producers offer their regional meat and sausage products at the two large spring and autumn farmers' markets organized by the Biosphere Reserve administration on its grounds in Wartha (Malschwitz).



Furthermore, the Biosphere reserve supports the marketing of the meat to restaurants within the Biosphere region. A leaflet to inform guests was developed by the Biosphere reserve administration and provided to the restaurants, making it easier for them to communicate and make available to guests the unique features of meat dishes featuring Red Mountain cattle. For example, the Sorbian restaurant Wjelbik (small vault) is able to combine its specific cultural character with the high-quality and history of the meat from the traditional breed Red Mountain cattle (www.wjelbik.de/sorbisches-restaurant-lausitz).



2.1.5 Arouquesa beef in restaurants and festivals of central Portugal

The Arouquesa cattle breed is an autochthonous (native) breed from northern Portugal that is well adapted to this mountainous terrain. Traditionally, these cattle were used for draught work but are now primarily raised for beef. In 1902 Arouquesa beef was the winner of the “Award for the Best Beef” in Paris.

Today beef from that traditional breed reared by traditional methods within the specified area of central Portugal has “Protected designation of origin” status and





may be marketed as Carne Arouquesa DOP. The Portuguese association of Arouquesa breeders, that is known as ANCRA (Associação Nacional dos Criadores da Raça Arouquesa), represents a significant network of breeders dedicated to the preservation and promotion of the Arouquesa cattle breed.

This good quality meat is sold to residents and visitors in restaurants such as “Casa Arouquesa”, in the regional central city of Viseu. The guests are looking for authentic regional specialities and high quality. Casa Arouquesa offers only two dishes with that cattle meat. In their presentation they are focusing on that high meat quality and flavours of this traditional cattle breed and typical Portuguese food (www.casaarouquesa.pt).



Further, in the region around S. Pedro do Sul there is a large number of local festivals with relation to the traditional food, recipes and culture. Livestock and crops play an important role in the rural life and local identity. The municipality, farmers and other producers, as well as restaurants, tourism are working close together. The festivals offer local people and tourists very good occasions to come together for celebration with tasting and buying products. Every year in May there is the important Festa da Vitela (veal festival) with driving Arouquesa cattle in a parade through the villages. Here you can watch an impressive video on Festa da Vitela with the traditional Arouquesa cattle breed. <https://youtu.be/aZNltFNJ3j0>.



2.1.6 Trdinka corn for Bohinj žganci in local restaurants

The traditional local Trdinka corn is an indigenous variety native to the Bohinj region in Slovenia, adapted to the harsh climate of the Julian Alps. It is distinguished by its multicolored grains that range from yellow and orange to deep red. Historically, flour made from Trdinka corn was a vital ingredient in the daily diet, particularly in the preparation of traditional Bohinj žganci, similar to polenta.





Today, this unique local specialty is experiencing a revival, as chefs in the region incorporate it into modern culinary creations. For example, the local chef at the restaurant “Sunrose 7” in Bohinjska Bistrica is working in collaboration with the Bohinj Tourism Organization to bring renewed attention to Trdinka corn and Mohant cheese, a local product with an EU



Protected Designation of Origin. Together, they are playing a key role in revitalizing these traditional ingredients (www.sunrose7.com). A variety of restaurants in the Bohinj region in the Julian Alps is have also integrate Trdinka corn into their menus with interesting creativity. Some notable dishes include trout coated in Trdinka cornmeal, cottage cheese soup with Trdinka corn, and pudding made from Trdinka cornmeal.

2.1.7 Prga from Tepka pears in Julian Alp village of Zasip

Another impressive example is the successful preserving of the traditional pear variety Tepka with its cultural history in the village of Zasip in the Julian Alps region of Slovenia, and its integration into regional culinary practices. Prga is the name given to dried pears of the Tepka variety or to the flour that is ground from them. This pear variety is a historical specialty from the village of Zasip. The tradition dates back to the time of the Austro-Hungarian Empress Maria Theresa, who ordered pear trees to be planted to avert famine.

The dried these pears and its sweet flour (Prga) is traditionally used for bread or as a filling for dumplings. Today “Prga” is used in a huge variety of tasty dishes and sweets and have found its



way into high gastronomy of the Julian Alp region. And, the dried pears are grinding into a powder that can be used instead of wheat flour. Bread is baked from it, as are a variety of pastries. A good gastronomic example is the restaurant Kurej in Zasip, that is offering a tasting menu featuring dishes made with Tepka pears, illustrating best practices in linking local producers with the gastronomic offer (www.bled.si/sl/kaj-videti-poceti/kulinarika/gostinski-obrazi/2022030315363884/gostilna-kurej/).





Tepka pear brandy from the Trglav family farm

In addition, the Tepka pears are used to distil the highly prized pear brandy at the Trglav farm, where it is sold directly to tourists and residents. It is an other good example of successful preserving and using the traditional Tepka pear variety. The Trglav family farm is just some hundred meters from the centre of Zasip, where Andreja Pogačar produces this high-quality schnapps, beside more than other thirty different flavours of schnapps, from traditional versions like the traditional Smrekovec



(bled.si/en/what-to-see-do/bled-local-selection/offer/2020012012141792/tr-glav-tepkovec-brandy).

2.1.8 Smoked carp from pond farming in Upper Lusatian Biosphere Reserve

Carp farming in Upper Lusatia has an over 750 years tradition, making the region around the UNESCO Biosphere Reserve one of the largest pond areas in Europe. The first ponds were established during the Middle Ages to meet the demand for fasting foods, particularly for monasteries and the nobility. Carp farming reached its peak in the 15th and 16th centuries.

Today, the focus lies on combining economic efficiency, regional marketing, and nature conservation. The classic Lusatian carp is now the mirror carp. Numerous pond farming enterprises operate in the Upper Lusatian heath and pond landscape,



with many marketing smoked fish directly through their farm shops. One notable example is the Ermisch Trout and Salmon Farm, which manages ponds in Klitten (www.fischzucht-ermisch.de). Their offerings vary seasonally, as carp in particular, traditionally has its peak season during the cooler months. The highlight of the year is the Lusatian Fish Weeks, held in autumn. During this time, numerous fish farmers and local restaurateurs invite visitors to experience the traditional fish harvest and participate in regional carp events.





2.1.9 PGI labelled Lika lamb meat in Zadar region of Croatia

The Lika Pramenka is an indigenous breed of sheep from the mountainous Lika and Gorski Kotar regions of Croatia. Renowned for its resilience and adaptability to the rugged, rocky pastures, this curly-coated breed forms the foundation for the Lika lamb, which has been awarded Protected Geographical Indication (PGI) status in the European Union. The lambs are known for the unique taste of their meat, which is attributed to their diet of mountain herbs and vegetation during summer pasture grazing.



The branding and reintroduction of Lika lamb products in restaurants, gastronomic events and food festivals gave the communities a sense of reputation that shapes regional identity. Agro-tourism services bring visitors in contact with rural communities. Gastronomic events with such local dishes in restaurants boost both tourism and community pride.

3. Management of short regional value chains

When considering the role of underestimated landraces, along with the products derived from them and their associated traditions, a local approach to developing short regional value chains can have a significant impact. This approach not only aids in preserving agrobiodiversity but also contributes to local territorial development, fostering economic, social, and environmental benefits [8].

Effective multi-actor cooperation and partnerships, involving farmers, processing entrepreneurs, gastronomy professionals, logistics providers, and local residents, often play a critical role in achieving success [6, 9]. At the same time, shared communication and marketing efforts, as well as coordinated knowledge exchange, are essential. The direct access to information and knowledge, gained through personal relationships and familiarity with the local environment, nature, and animals, builds trust and reliability [10].

Short regional value chains vary in their structure, and their management and coordination come with a range of challenges. In some cases, one of the participating entrepreneurs may take on the responsibility of coordination. In other instances, this role might be fulfilled by a biosphere reserve administration or a tourism organization. By implementing common territorial strategies that focus on collective valorization, these efforts can achieve significant outcomes. Entrepreneurial action, in particular, plays a pivotal role in achieving success [8].





3.1 Experiences and approaches from practice

3.1.1 Management of the Champagne rye value chain in Upper Lusatian Biosphere reserve

In 2007, the administration of the Upper Lusatian Biosphere reserve launched a project to establish a regional value chain for Champagne rye. Today, there is a network of nine farmers cultivating about 400 hectares of Champagne rye, one mill, and around 20 bakeries in the region, coordinated by the Biosphere reserve administration.

Rätze mill: a value chain key partner

In collaboration with the VERN association and the Biosphere reserve, farmers are able to cultivate Champagne rye. The Rätze mill processes around 300 tons of Champagne rye flour annually, accounting for about 5% of their total production. To compensate for the lower yields of this crop, the farmers can receive higher payments, and the price of Champagne rye flour is approximately 40% higher than that of regular rye flour. This traditional variety has proven to be particularly well-suited to the dry, sandy soils of Upper Lusatia. It consistently delivers stable yields, even during droughts, and thrives without the use of mineral fertilizers or chemical plant protection.



Regional attention due to media and training courses

The topic gained widespread attention in 2016 through presentations at meetings of the Bautzen Bakers' Guild, as well as through press articles and radio broadcasts. The biosphere reserve administration is also now addressing the issue. Plans are in place to organize training sessions for bakers and sales staff in the future.

Distribution of Champagne rye products

Champagne rye is a success story in the Upper Lusatian heath and pond landscape. Its flour is not only used in bakeries but is also available in local branches of the German supermarket chains Rewe and Edeka. Beyond its economic impact, the initiative has strengthened the community's connection to the region, promoted biodiversity, and contributed to enhancing the local area's image in a positive way.





3.1.2 Coordination of local territorial labelling by Turizem Bohinj

The Bohinj tourism organisation, located in the Julian Alps Biosphere Reserve of Slovenia, is coordinating various local territorial marketing and labelling activities, since many years. These activities are basing on multi-actor approaches involving not only food producing entrepreneurs and gastronomy with their individual value chains, but also craft products, accommodation and other local providers, that contribute to an authentic regional image. Bohinj tourism organisation is managing and designing the internal and external communication, qualification and cooperation in order to improve an regional sustainable development.

The topic of traditional landraces is focussed with the integration of the Slovenian association of Bohinj flint producers, that fosters the autochthonous local "Trdinka" maize, a partner of the territorial branding. Further, the voluntary association of breeders of the indigenous Cika cattle is closely associate with the regional branding activities and the regional tourism organisation, too.

"BOHINJSKO/FROM BOHINJ"

www.bohinj.si/en/from-bohinj/

The regional brand "Bohinjsko / From Bohinj" is of the 14 territorial collective brands in Slovenia, that are created following the "Izorno slovensko" model (www.izvornoslovensko.si). It has been working successfully since 2012. The owner of the brand is the Municipality of Bohinj. Products and services get the right to use the brand, once they receive a certificate of quality and geographical origin. Providers can receive that Certificate for culinary products, dishes and drinks served in gastronomy, handcrafted products and products in contemporary design, guided experiences, accommodations, and events.



The certification system includes evaluation by external experts, based on clearly defined forms with specific criteria for each product or service category. This model allows the creation of a verified register of providers and a list of high-quality products, which are promoted through Bohinj Tourism channels. The criteria also require that products have appropriate visual labelling, technical and gift packaging, and a story that explains their uniqueness.

Currently there are 200 culinary products, 70 dishes and drinks at 12 inns, 130 artisan products and industrial design products, 35 guided experiences and 6 accommodation providers. Target groups are coming from the tourists because there are only 5.000 people in the region





The „Bohinjsko/From Bohinj“ regional brand is basing on the Bohinj Agricultural Development Strategy 2021 - 2030 that is focussing on producing quality food, maintaining rural identity, preserving nature cooperation in food chain, preserving the identity of the mountains, integrating farms into the tourist offer, co-existence of agriculture and tourism, knowledge and digitalization, preserving forestry.



„Julian Alps - JA 100% Local“

Beside the „Bohinjsko/From Bohinj“ regional brand, the "JA 100% Local Initiative" (Julijske Alpe - 100% lokalno) is a local supply chain project that connects local farmers, food producers, and restaurateurs to boost local self-sufficiency and reduce the carbon footprint of tourism.



The project aims on shortening the supply chains through direct delivery with fresh vegetables, grains and dairy products from local producers to local restaurants and catering services. It focusses on market integration through support of local direct sales points, making fresh local produce accessible to both locals and tourists. The "From Bohinj" certificate guarantees the local geographical origin and highest quality to improve the visibility and added value the products.

The projects offers the participating farmers and tourism entrepreneurs a unified ordering system, a consolidated offer in one place, shared logistics with three delivery routes, cold-chain management (two refrigerated facilities), B2B networking events and stakeholder cooperation, as well as joint promotion and marketing activities. Until now 57 producers and 16 buyers are part of these local value chain. Next steps are to involve additional local producers and buyers and to enable deliveries throughout the entire year.





3.1.3 Coordination by municipality São Pedro do Sul

As a key region for bean diversity in Portugal, the area around São Pedro do Sul takes pride in its rich tradition of preserving and valuing its significant genetic and cultural heritage. The municipality plays a vital role in coordinating various activities aimed at safeguarding this legacy.

The yearly bean festival

One of the highlights of this preservation effort is the annual Bean Festival and Fair, organized by the municipality in collaboration with local producers, tourism initiatives, and gastronomy enthusiasts.

At the festival, beans from over 20 producers who are unable to attend the fair in person are showcased and sold by the municipality. To support these producers, the municipality actively collects



their beans and provides monetary support to encourage the cultivation of local varieties. This initiative helps sustain the production of these traditional beans. During the festival, local farmers and residents come together to celebrate their shared heritage by tasting traditional bean dishes and recipes presented by various village associations. Over time, the festival has grown into a cherished yearly event, fostering a sense of community, strengthening local identity, and bringing people closer together.

Local labelling and the farmer market

In the Viseu-Dão-Lafões sub-region, a specialized local labelling system has been developed to promote the unique identity of vegetables and fruits grown by local farmers.

The municipality of São Pedro do Sul has adapted this labelling for use at its local farmer's market, which it also organizes. This label aims to encourage the consumption of locally produced goods, stimulate the local economy, and promote a territorial food identity. By emphasizing local products, the initiative highlights the cultural and historical significance of these goods.

The direct sale of beans and other fresh local products from farmers to consumers offers numerous benefits. Not only does it eliminate intermediaries, ensuring





better prices for both farmers and buyers, but it also provides opportunities to share the history and unique qualities of these local varieties. Additionally, this direct interaction creates meaningful and memorable experiences for consumers and visitors, further strengthening the connection between the community and its agricultural heritage.

3.1.4 Management of Arouquesa beef value chain

The management of livestock-meat value chains with the complex production, processing and selling under high quality cooling and hygiene conditions is a challenge.

ANCRA: preserving the Arouquesa breed

In the case of the Arouquesa cattle breed, the Portuguese National Association of Arouquesa Breeders (ANCRA) has taken on the responsibility of managing and preserving this unique livestock value chain. As of 2026, ANCRA represents over 2,000 breeders across 28 municipalities in northern Portugal. The association's primary mission is to preserve, promote, and regulate the Arouquesa breed, with a focus on the following key areas:



- Ensuring Quality and Authenticity: ANCRA oversees the production of "Carne Arouquesa" beef, which holds Protected Designation of Origin (DOP) status, guaranteeing its authenticity and quality.
- Supporting Sustainable Practices: The association helps breeders maintain traditional and sustainable farming methods suited to the breed's native mountainous environment.
- Protecting Genetic Heritage: ANCRA safeguards the genetic integrity of the Arouquesa breed while promoting its socio-economic importance in the region.
- Regulatory Oversight: Recognized by the Portuguese government and the European Commission, ANCRA ensures compliance with breeding standards and certification processes.



Carnarouquesa: mainstreaming the value chain

To facilitate the practical organization of the Arouquesa meat value chain, ANCRA established the Carnarouquesa cooperative in 1998. This producers' group specializes in the Arouquesa breed and manages the entire process of certification and



marketing. Carnarouquesa provides logistical support, ensuring that once a calf leaves the farm, the producer incurs no additional costs or concerns. This streamlined approach allows breeders to focus on sustainable farming while ensuring the meat reaches consumers under optimal conditions.

Distribution and points of sale

The Arouquesa beef value chain involves several key partners, ensuring the meat is accessible to consumers through various channels:

- Local butchers: Four butchers in the Arouquesa region sell the meat, with online purchasing options available through platforms like fumeirosdazezinha.com and talhoarouques.com.
- Urban butchers: Two butchers in Porto and southern Portugal also participate in the value chain.
- Retail and restaurants: The meat is available in 15 stores of the major food retailer Continente and served in 20 restaurants across northern Portugal.



This diverse distribution network ensures that Arouquesa beef reaches a wide audience while maintaining its premium quality and authenticity.

3.1.5 Regional value chains in the LEADER region "Bura" Zadar, Croatia

The LEADER region "Bura" Zadar, located in northern Dalmatia, Croatia between the Adriatic coast and the Velebit mountain range.

This region covers several rural municipalities, including Jasenice, Obrovac, Novigrad, Posedarje, Poličnik, Ražanac, Starigrad, Vrsi, and Zemunik Donji, which together form an area of traditional agricultural practices, natural beauty, and cultural heritage.



Traditional agriculture and local specialties

Traditional agriculture in this region thrives with practices such as olive growing, fig production, sheep farming, and small-scale family farming. These activities are closely connected with traditional knowledge and farming practices that have been passed on through generations. The primary production in the area includes family farms and cultivation and processing of traditional varieties in the fields of olives, grapes as well as meat and milk of extensive grazing sheep.



Tourism and gastronomy

The region's gastronomy reflects its rich heritage, offering traditional recipes, regional food experiences, and an authentic taste of Dalmatian cuisine through local restaurants and taverns.

The natural and cultural heritage of the "Bura" region has created a strong foundation for gastronomy and rural tourism. With a growing demand for authentic local products, tourists, both domestic and international, are drawn to the area. The target audience for these authentic, locally produced products are more to find in these groups of visitors, rather than local inhabitants.



Decentral value chain cooperation

The management of value chain cooperation in the "Bura" region is working more spontaneously and decentralized. Instead of a unified collective structure, cooperation is managed directly by the involved partners for example between producers and restaurants. This approach stands for flexibility and adaptability in addressing the needs of the different stakeholders.

Role of LEADER LAG Management

The LEADER Local Action Group (LAG) plays an important role in the coordination of the rural development activities between the involved municipalities and their interest groups. But the region's value chains of local products are in the hands of the groups of producers, restaurateurs and other distributors. The LAG management responsibilities include:

- information and advice for the nine partner municipalities,
- co-ordination between the projects and the municipalities activities,
- facilitating access to EU and national funding opportunities.

The basis of cooperation within the region lies in the LEADER strategy plan, which brings together all partners in agreement on a common idea and measures that support the development of the region.



4. Ecosystem services provided by traditional landraces

The products and regional value chains highlighted in the European AgroBioCom project regions emphasize that traditional landraces offer a broad range of ecosystem services. These services contribute significantly to food security, biodiversity, rural livelihoods, and resilient agroecosystems. The benefits of traditional landraces can be broadly categorized into four main types (11):

- Provisioning services: Genetic resources, food, and fibers.
- Regulating services: Landscape management, disease control, and climate regulation.
- Cultural and heritage services: Cultural identity, traditional knowledge, and tourism.
- Supporting services: Nutrient cycling, soil health, and agroecosystem resilience.

In this chapter, we focus on the ecological benefits of traditional landraces and their role in supporting agroecosystems, particularly under the challenges of global environmental change.

4.1 More resilience and stable yield under harsh conditions

Traditional landraces, which have been adapted over centuries, often demonstrate high resilience to harsh environmental conditions. As a result, they are a reliable source for achieving stable crop yields in challenging circumstances (12).

Drought resistance and water management

The examples of Champagne rye in the Upper Lusatian region that is particularly well-suited to the dry, sandy soils and the Trdinka maize in the Bohinj part of Julian Alps demonstrate this characteristic and their flourishing without the use of mineral fertilizers or chemical plant protection. This provides various advantages for the water management and can contribute to buffering cultivation during climate extremes.

Additionally, traditional olive varieties in rural areas around Zadar are adapted to changing climates, requiring less water and exhibiting strong resilience.

Breeding resources and agroecosystem capacity

The genetic diversity found in traditional landraces is invaluable for future breeding efforts and agroecosystem adaptability. For example:

- In Northern Portugal's mountains, 51 maize landraces have been identified within a small geographical area characterized by diverse climatic conditions.





These landraces have been selected over centuries by both natural and human influences.

- In the mountainous region of S. Pedro do Sul in central Portugal, more than 100 bean varieties have been identified. These varieties have historically supported stable nutrition for local populations over generations.

This genetic heritage serves as a reservoir of traits such as disease resistance and climate adaptability, which are essential for future breeding programs. Moreover, these landraces enhance the adaptive capacity and stability of intercropping and polycropping systems in agroecological farming practices.

4.2 Landcare and landscape management

Traditional extensive use and local community practices are often characterized by their reliance on natural ecological processes, minimal external inputs, and an integration with the surrounding landscape. Such practices can offer contemporary models for sustainable landscape management, biodiversity conservation, and the preservation of cultural identity.

Keeping mountainous landscape and wild-fire prevention

The traditional management of Arouquesa cattle in the Manhouse mountains of central Portugal exemplifies how heritage breeds can support landcare. The Arouquesa breed is well-adapted to rugged terrain and harsh weather conditions. This extensive, free-range grazing system involves releasing animals to the mountains during the day, allowing them to return home independently or be gathered by the owner. The grazing practices provide multiple benefits:

- Preservation of mountain landscapes and their diverse habitats.
- Fostering of biodiversity and natural ecological balance.
- Active wild-fire prevention by counteracting scrub encroachment and reducing the accumulation of combustible material.

Similarly, the Lika Pramenka sheep, adapted to the rocky pastures of the mountainous Lika and Gorski Kotar regions in Croatia, performs comparable landscape management duties for local communities.

Maintaining grassland and moist habitats biodiversity

In the Upper Lusatian Biosphere Reserve groups of Red mountain cattle, a breed threatened with extinction, are used for natural landscape conservation. These robust cattle are specifically employed for grazing and keeping the moist biotope and maintenance zones open. The animals prevent the bushing of valuable meadows and promote native biodiversity. This low-intensity grazing maintains grasslands, enhances soil organic matter and contributes to carbon sequestration and soil health.





Orchard meadows: extensive use and care

Extensive orchard meadows with traditional apple, pear or cherry varieties represent cultural habitats with high biodiversity and valuable ecosystems. The grassland, sometimes grazed by traditional sheep varieties, contribute to good soil water balance and CO₂-storage. In many parts of Europe orchard meadows are a part of the region's traditional cultural landscape.

A notable example examined in this project are the Tepka pear orchards in the Slovenian Alpine village of Zazip. These historic orchards, with trees dating back to the 18th century, are still actively maintained by 20 farmers who collectively harvest and dry Tepka pears. This demonstrates how traditional practices, when preserved through active use, maintain both ecological and cultural heritage for contemporary and future generations.

Nature-based solutions to environmental challenges

Traditional landraces, crop varieties and heritage breed, adapted over centuries to regional conditions, along with their associated farming practices provide multiple critical ecosystem services, that are essential for climate adaptation and resilience. These represent sustainable, nature-based solutions that address contemporary environmental challenges.

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