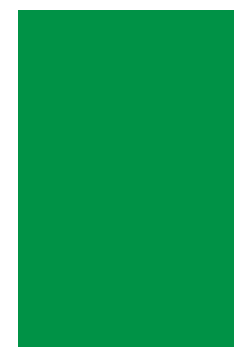


Studies from the EU CAP Network's Focus Group on Enhancing the Biodiversity on Farmland Through High-Diversity Landscape Features





www.facebook.com/tenuta.paganico

www.tenutadipaganico.it

www.instagram.com/tenuta_di_paganico/



GEOGRAPHICAL LOCATION:

Civitella Paganico (Grosseto) Tuscany - Italy

<https://goo.gl/maps/U8RWghQ7B6zEgUrc6>

INVOLVED ACTORS:

Department of Agriculture, Food and Environment (DAFE)

Centre of Agro-Environmental Research "Enrico Avanzi"

University of Pisa

SOURCES OF INFORMATION, REFERENCES, WEBSITES:

- <https://agromixproject.eu/in-the-field/trial-sites/tenuta-di-paganico/>
- <https://gonewton.it/>
- <https://uninuoro.it/wp-content/uploads/2022/05/EURAF2022-BOOK-OF-ABSTRACTS-Def-def.pdf> - pagg. 97, 145, 333.
- <https://agroforestry2022.org/sites/226/files/documents/Proceedings%20WCA5.pdf> - pag. 127.

DESCRIPTION OF THE HDLF FARM:

This farm is located in the Maremma region and combines extensive rearing of the rustic traditional Maremmana cattle breed on a large and diverse farm encompassing over 1500 ha of forest (73%), pastures (7.3%), olive groves (0.4%), vineyards (0.2%) and arable crops (19.1%). The presence of such a large area of forest has always directed farms' technical and management choices toward the integration of forestry, agriculture and animal husbandry. Most of the feed is produced on farm and the system is complemented by butcher's shop, restaurant and agritourism services, adding and preserving the value of the area by enhancing a very short supply chain.

BENEFITS FOR BIODIVERSITY:

Agroforestry management:

- water ponds in pastures and forests could ensure water supply for wildlife and increase biodiversity of the entire ecosystem (frogs, turtles, anatids, ...);
- forest provide a better livestock thermoregulation in hot seasons: that could also represent shelter and food for wild mammals, birds and insects;
- the use of local sturdy breeds can increase landscape biodiversity and valorize and/or restore marginal areas management;
- the maintenance of scattered trees in arable land and grassland, along with the cultivation of buffer strips, hedges, and field borders can drive to positive impacts on soil organic matter and crop resilience.

ECONOMIC BENEFIT/VALUE:

Agro-silvo-pastoral systems could be able to provide several benefits such as mitigation of greenhouse gas emission from the livestock sector, increment of the adaptability of livestock to the climate change effects and improvement of the nutritional quality of animal derived food and animal welfare. All these factors create ecosystem services that are beneficial for the whole population, although today they are difficult to economically quantify and represent an income source for farmers that is difficult to achieve.

SOCIAL BENEFIT/VALUE:

"We aim to be a sustainable farm. Experience and passion enable the bond between animals, people and environment"

Agrarian landscapes hold cultural, ethnological and environmental values, but they are susceptible to financial and environmental crises, also as a consequence of the scarcity in public resources. That areas are vulnerable to the decline in public services and social support: depopulation pattern, aging of rural communities and geographical isolation due to the specific settlement of the population and the difficulty in organizing effective services for the local inhabitants: abandonment is the new agrarian land management.

Innovative agricultural practices are needed to create viable and sustainable rural and periurban areas, embracing and making explicit the ecosystem services and benefits provided. In marginal areas, the presence of a creative and active population can set the baseline for a new social and economic development.

Spreading the knowledge of rural farm activities to citizens represent a key role to increase consciousness in consumers for supporting a food production systems with high cultural values: a reterritorialization of food production is needed.

SUCCESS FACTORS:

Integrated management of forest, agricultural and livestock systems, can be considered complex adaptive social-ecological systems in which the relationships between humans and nature have created the socio-cultural and ecological conditions to deliver a diverse flow of ecosystem services.

CHALLENGES & RESEARCH NEEDS:

Climate change: rainfall concentration plays a crucial role in watershed management, especially for the constant availability of trough water for livestock. That demands new holistic models of land management.

Animal welfare: an effective evaluation of animal welfare in silvopastoral systems is needed thanks to integrated skills (veterinarian, zootechnician, agronomist, soil scientist, behaviorist, ethologist, biologist, forester,...).

Farm profitability: economic margins are getting lower due to increasing fixed expenses, making it difficult to make long-term investments, such as HDLFs, which increase system resilience in a way that is difficult to quantify economically.

Educational-pedagogical aspects: a severe paradigm shift in teaching the new agriculture undergraduates for an agroecological divergent thinking development.



This poster was presented at the 1st meeting of the European CAP Network Focus Group « Enhancing the Biodiversity on Farmland Through High-Diversity Landscape Features » -1-2 February-2023

More information: <https://eu-cap-network.ec.europa.eu/>



Funded by
the European Union



DESCRIPTION OF THE HDLF CASE(FARM):

Krämars Farm consists of 90 hectares of arable land and 150 hectares of forest. The farm has got the EU Organic certificate. The « case » are many small oases on different places on the farm, like a pond with a variety of trees between two fields, or a group of trees and bushes somewhere else. Sometimes the places of HDLF can be planted and sometimes it can be a area that is just left for nature to take over.

BENEFITS FOR BIODIVERSITY:

More will be more. A few trees that provide shelter attracts all kind of insects and wildlife. The variety of insects keep the balance and there will be less need for chemicals

GEOGRAPHICAL LOCATION:

South coast of Finland

INVOLVED ACTORS:

SOURCES OF INFORMATION, REFERENCES, WEBSITES:

ECONOMIC BENEFIT/VALUE:

Maybe no direct economic value. On a longer perspective there might be benefits like higher yields that comes from healthier soil, better water management and so on.

SOCIAL BENEFIT/ VALUE:

It might raise awareness of the value of biodiversity and the value of nature and healthy food production. I have a summer cafe and an exhibition in my greenhouse so I hope that my HDLF make people happy.

SUCCESS FACTORS:

The ability to « change of mindset », to make people visiting the farm (Cafe) think about their relation to nature and food

CHALLENGES & RESEARCH NEEDS:

The landowners/farmers need to change the way they see their land- this is a challenge! The rules need to change. Economical support?





GEOGRAPHICAL LOCATION:

Germany, Herrischried

INVOLVED ACTORS:



INFORMATION

der-hof-schwarzwald.de
weidelandschaften.org
dvl.org
agrinatur.ch
fiibl.org/en/shop-en

DESCRIPTION OF THE HDLF CASE(FARM):

Two examples:

1. When mowing at the end of June we leave flowering and old grass strips at every meadow.
2. Our animals are outdoors all year round.

BENEFITS FOR BIODIVERSITY:

1. Space of retreat for insects, increases structural diversity. In my experience one of the most effective measure for insects!
2. Profit for dung fauna (in spring and autumn). Open floor spots for seedlings insects and birds.

ECONOMIC BENEFIT/VALUE:

1. Not really a benefit, but also not much effort.
2. Less effort and much less costs for buildings.

SOCIAL BENEFIT/ VALUE:

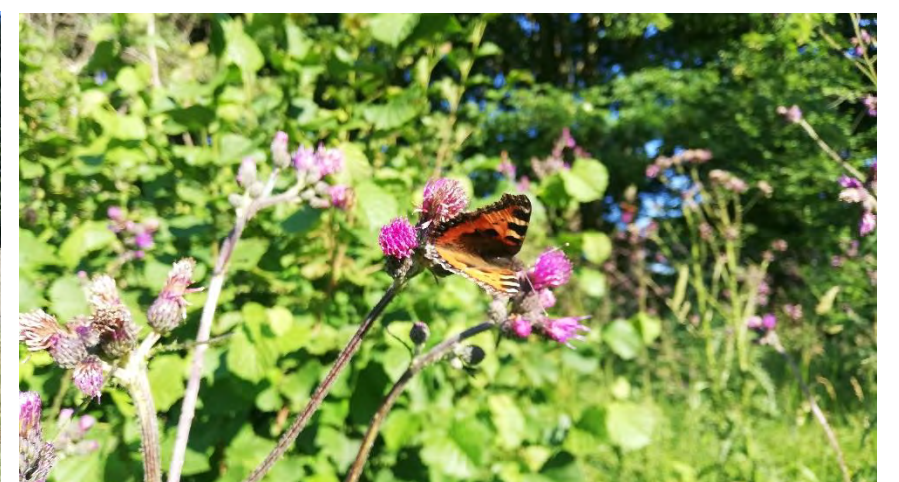
1. We enjoy it ourselves 😊! People don't always appreciate it, because it doesn't look very tidy, especially in autumn.
2. People enjoy the sight of the animals.

SUCCESS FACTORS:

1. Mowing direction and date, size and distribution. Even small ones - better than none!
2. Good management in wet weather conditions!

CHALLENGES & RESEARCH NEEDS:

1. Wider implementation; plastic remains after mowing (bale binding, motor scythe).
2. Human needs - animal needs; Research on animal welfare and weather withstand.





GEOGRAPHICAL LOCATION:

CPH 110450056

Lower Brimley
ST43123 01090

Stoke Knapp
ST44738 01676

INVOLVED ACTORS:

Family members, local
craftsmen, occasional
volunteers, specialist advisors
on botany and woodlands

SOURCES OF INFORMATION:

Dorset History Centre,
historic maps, Dorset Place
Names, Sherborne Abbey
records

DESCRIPTION OF THE HDLF FARM

Lower Brimley Coombe Farm consists of two farms in West Dorset, Southwest England: Lower Brimley and Stoke Knapp. The farm is 70.7ha across 42 land parcels, of which 57.0ha are permanent grassland. The farm has many biodiversity features: Ancient Semi-Natural Woodlands, 3 Sites of Nature Conservation Interest; 5 ponds, 9km of hedgerows with many hedgerow trees, strip lynchets, a scheduled Roman fort monument and a selection of ancient trees up to +600 years old. Hedgerow lengths exceed historic records, as does tree density in hedgerows.

The farm is managed extensively, no mineral fertilisers, spot spraying only, rotational grazing and no housed livestock.

Livestock include a fold of Highland Cattle and commercial flocks of Portland, Poll Dorset and Dorset Horn sheep – all native breeds and the Portland and Dorset Horns rare breeds

BENEFITS FOR BIODIVERSITY:

There is no unconnected habitat on the farm, partly owing to small field size, and woodlands and hedgerows are maintained in good condition after over two decades of restoration work. A range of habitats are on offer which cater to woodland birds, field birds, waders and raptors. Fieldfares, swallows, lesser spotted woodpecker, kestrels, kingfishers and many others are present. Clouds of insects are evident in the setting sun during summer and slow worms, newts and the occasional adder are seen. The only expected, but largely missing, species is the hedgehog. Rare flora are found in all three of the SNCI's, each of which are different in character: wet grassland, dry calcareous grassland, dry acidic grassland. Wax caps are a particular feature late in the autumn.

ECONOMIC BENEFIT/VALUE:

Currently there is no effective mechanism to value the economic benefits provided by such biodiversity on farms like these. Governments talk of rewarding farmers for biodiversity improvement, but there is a large gap between government comprehension of biodiversity and the natural environment and the hard monetary values associated with that biodiversity – and the fact that carbon sequestration and biodiversity can be intimately linked, e.g. a well maintained woodland will be more biodiverse and store more carbon.

SOCIAL BENEFIT/ VALUE:

The farms are crossed by footpaths and bridleways including the nationally recognised Wessex Ridgeway, so many members of the public have access to enjoy the environments of the farms.

SUCCESS FACTORS:

The primary required success factor for the farms is financial sustainability such that all the improvements made for the natural environment can be sustained.

CHALLENGES & RESEARCH NEEDS:

The primary challenge is to maintain economic viability of the farms. That is only possible today by supplementing the finances of the farms with external income and diversification with holiday cottages on the farms – which are heavily taxed and can threaten inheritance status.

In terms of research, more needs done to attach economic value to well-maintained, biodiversity rich farms. The natural environment left to itself will in fact become less biodiverse so the need for recognition of costs of management is crucial to sustainability.



GEOGRAPHICAL LOCATION:

Brittany, Northwestern France

INVOLVED ACTORS:

Farmers, technical advisers

SOURCES OF INFORMATION, REFERENCES, WEBSITES:

Farmers' association:

<http://terresetbocages.org/>

AGFORWARD EU-project:

<https://www.agforward.eu/bocage-agroforestry-in-brittany-france.html>

DESCRIPTION OF THE HDLF CASE(FARM):

Agroforestry (AF) hedgerows planted by farmers of the *Terres et Bocage* association are considered as **multifunctional components of agricultural systems and landscapes**. They are designed with multiple aims including restoring biodiversity, preventing nitrogen leaching for water protection, restoring *bocage* landscapes, creating windbreaks, providing shelter for livestock, and producing valuable products from trees.

The practices of hedgerow planting and management are designed to promote a logic of tree development. The tree species and modes of hedgerow establishment are chosen according to farmers' objectives, the use of their fields, the local conditions on farms, the observed vegetation structures, and local tree species in the surrounding area.

BENEFITS FOR BIODIVERSITY:

15 years after planting, the expected agroecological benefits of AF hedgerows can already be perceived, in terms of flora and fauna diversity. New AF hedgerows also contribute to reinforce the structure and ecological functions of the bocage landscape.

ECONOMIC BENEFIT/VALUE:

AF hedgerows contribute to enhance crop and livestock production, by sheltering crops and livestock in pastures against inclement harsh weather. The farm use and the sale of wood chips and logs contribute to cover on-going hedgerow maintenance costs. Mutual aid, recycling of material (e.g. for mulch) and the principle of parsimonious pruning contribute to controlling costs

SOCIAL BENEFIT/ VALUE:

The *Terres et Bocage* association offers to farmers the opportunity to join active groups of stakeholders sharing agronomic and environmental concerns in relationships with hedgerows and bocage. The farmers also reported that hedgerow planting improves landscape aesthetic and life quality on farm.

SUCCESS FACTORS:

Through participatory fieldwork and action-learning sessions, the association ensures relevant knowledge and experience is shared with and among farmers. They benefit from technical advices and assistance of the technical advisers employed by the association.

A scientific assessment of planted hedgerows in the AGFORWARD EU-project (2014-2017) has allowed to demonstrate the added-value of AF hedgerows for involved farmers.

CHALLENGES & RESEARCH NEEDS:

The issues expressed by farmers, which raise questions for research, concern bocage agroforestry systems as agroecological systems in the long run. How to monitor, evaluate and help adapt agroforestry systems that 1) ensure synergies between the multiple functions expected of them over the long term, and 2) are sustainable for farmers in light of socioeconomic and climatic changes.





GEOGRAPHICAL LOCATION:

Wine and fruit growing regions in Austria

INVOLVED ACTORS:

Farmers – wine and fruit production
ÖKL – Austrian curatorship for agricultural technique
Bio Ernte Steiermark – association of organic farmers

SOURCES OF INFORMATION, REFERENCES, WEBSITES:

Results of associated projects/previous work, e.g.
<https://www.bio-austria.at/biodiversitaet-2/> or
<https://www.life-vineadapt.eu/aktuelles> or
<https://obstwein-technik.eu/Leader>

DESCRIPTION OF THE HDLF CASE:

Viticulture and fruit production offer various opportunities to integrate biodiversity measures in production systems and to foster or protect biodiversity/HDLF in and besides the cultivated area.

The educational project **BeeP!** (“Biodiversität, Technik und Wirtschaftlichkeit im Obst- und Weinbau praktisch verbinden“) strives for a comprehensive approach with focus on technical and economical feasibility.

BENEFITS FOR BIODIVERSITY:

Farmers get to know a wide range of methods to foster and protect biodiversity on their farms, e.g. reduction of drift, sowing/managing of flowering stripes and cover crops, integration of structural elements or replacement of herbicides

ECONOMIC BENEFIT/VALUE:

Technical optimisations and knowledge on interactions with biodiversity lead to a more efficient, targeted use of machinery; natural pest control

SOCIAL BENEFIT/ VALUE:

Protection of species; less drift to non-target areas; some measures to enhance biodiversity enhance the attractiveness of the landscape

SUCCESS FACTORS:

Multidisciplinary; technical approach; possibility for the farmers to get support for individual and specific measures

CHALLENGES & RESEARCH NEEDS:

Broad and lasting participation of farmers; not all measures which are beneficial for biodiversity are accepted as “beautiful“ or “useful“ by population or other farmers



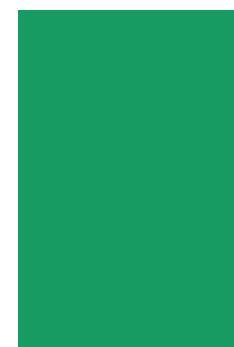
Mit Unterstützung von Bund und Europäischer Union

Bundesministerium
Land- und Forstwirtschaft,
Regionen und Wasserwirtschaft

LE 14-20
Entwicklung der Landwirtschaft

Europäischer
Landwirtschaftsfonds für
die Entwicklung des
ländlichen Raums.
Hier investiert Europa in
die ländlichen Gebiete.





GEOGRAPHICAL LOCATION:

Ireland (northwest) across six
Special Areas of Conservation

INVOLVED ACTORS:

National Parks and Wildlife Service
(via the Department of Housing,
Local Government and Heritage)

Department of Agriculture, Food and
the Marine

Farmers, advisors and local
stakeholders

SOURCES OF INFORMATION, REFERENCES, WEBSITES:

[RBPS Materials – Wild Atlantic
Nature](#)



WILD ATLANTIC
NATURE LIFE

DESCRIPTION OF THE HDLF CASE:

Wild Atlantic Nature Results-Based agri-environment Payment Scheme (RBPS) pilot is an agri-environment scheme adapted to upland areas, which delivers favourable outcomes for the environment, farmers and local communities. Wild Atlantic Nature RBPS directly links farmer payments to the environmental quality of the land, which incentivises and rewards restoration, conservation and maintenance of high-quality habitats. Where a landowner wishes to improve the ecological quality of their lands, the project team provide financial and technical support including training, advice, regulatory assistance and funding. The project puts farmers and their skills, expertise and knowledge central to the development of the initiative, and builds capacity and support in local communities for long-term nature conservation.

BENEFITS FOR BIODIVERSITY:

Protection and conservation of good quality habitat;
Restoration of poorer quality habitat; Creation of new habitat

ECONOMIC BENEFIT/VALUE:

Payments for landowners for ecosystem services (e.g. clean water, biodiversity; climate regulation); Employment opportunities

SOCIAL BENEFIT/ VALUE:

Increasing education and awareness of peatlands and other habitats; Upskilling landowners in conservation techniques and dealing with threats to peatlands; Developing new networks

SUCCESS FACTORS:

Locally adapted, practical, results focused; Developed with local representatives; Fairly funded; Facilitates flexible and adaptive management; Builds trust and capacity; Rewards good quality habitat and facilitates improvements to sub-optimal habitat

CHALLENGES & RESEARCH NEEDS:

Aligning land use policies including water, climate, biodiversity and agriculture policy to find a workable solution that can satisfy diverse needs. Other challenges include IT and administrative procedures.



<https://www.gozdis.si/projekti/EIP-16.5-Mejice/>



GEOGRAPHICAL LOCATION:

6 locations in Slovenia

INVOLVED ACTORS:

1 research, 2 education, 2 consultings, 1 management institution, in a partnership with 6 farms

SOURCES OF INFORMATION, REFERENCES, WEBSITES:

<https://www.gozdis.si/projekti/EIP-16.5-Mejice/>

DESCRIPTION OF THE HDLF CASE(FARM):

Solutions for establishing and maintaining of hedges will contribute to species diversity and to reducing or mitigating the impact of climate change. Through awareness-raising activities, stakeholder training and the development of management models, we will improve the condition and well-being of hedges and their production capacity for owner's benefits.

BENEFITS FOR BIODIVERSITY:

- improved/targeted diversity of hedges
- limiting the spread and abundance of non-native and invasive species
- promoting and ensuring the regulation, conservation and production functions of the hedges

ECONOMIC BENEFIT/VALUE:

- production of a wide range of goods (honey, fruits, mushrooms/truffles, etc.)
- providing ecosystem functions such as maintaining species diversity, pollination, seed dispersal, biological pest control and conservation of genetic diversity

SOCIAL BENEFIT/ VALUE:

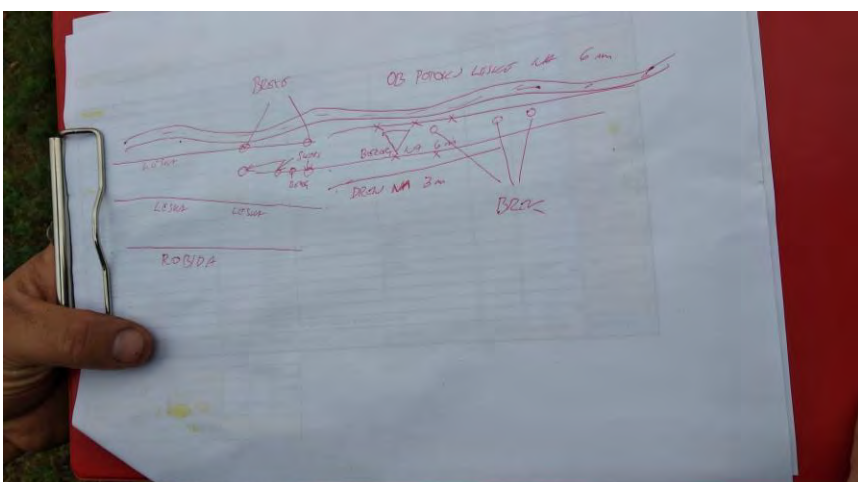
- improved and diversified production function
- targeting (agritourism) farms need and potential for a becoming visible
- education potential for farmers and other audiences

SUCCESS FACTORS:

- active involvement of participating and awareness of farms/agritourisms
- new / improved local products

CHALLENGES & RESEARCH NEEDS:

- bringing traditional agriculture landscape elements in farm's management plans and giving them new/improved value





GEOGRAPHICAL LOCATION:

Croatia, Dalmatian Coast

INVOLVED ACTORS:

Farmers, NGOs, national and nature parks, local governments, local tourist boards

SOURCES OF INFORMATION, REFERENCES, WEBSITES:

<http://www.dragodid.org/>

<https://suhozid.giscloud.com/>

DESCRIPTION OF THE HDLF CASE:

Maintaining, protecting, reconstructing and creating dry stone walls. Farmland dry stone walls are man-made linear elements used as field boundaries to restrict livestock movement or to separate property. They are typically built using stones removed from fields and traditionally they are built of stones only, without the use of mortar. In Croatia, they are typical for the Mediterranean (costal) region but they can be found also in some other parts of Croatia. Each region has its specific way of stone wall building, primarily due to the different types of stone present.

BENEFITS FOR BIODIVERSITY:

Dry stone walls provide an important habitat for many plants and animals and are particularly important for lichens, mosses, ferns, and a number of invertebrates. Several bird species use dry stone walls as nest sites. Dry stone walls are important element of landscape diversity, and they also act as a corridor between larger areas of other habitats.

ECONOMIC BENEFIT/VALUE:

Well-maintained dry stone walls have an excellent water drainage performance, and they can effectively minimize landslide risks and soil erosion. They are effective windbreaks and can also counteract forest fires that are very common in coastal areas of Croatia. Farmers can get 0,74 EUR per meter/year for the maintenance of dry stone wall as a part of agri-environment scheme. They can also get payment of 100 EUR per m3 for the reconstruction or creation of dry stone wall.

SOCIAL BENEFIT/ VALUE:

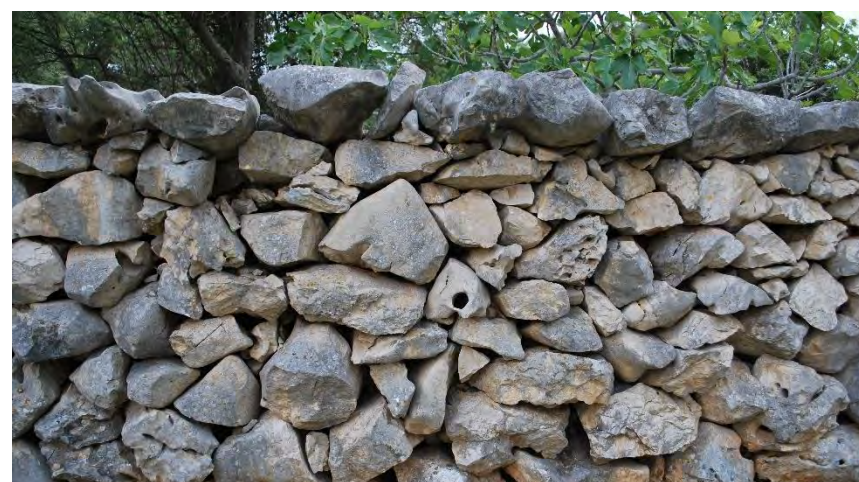
Inscribing 'Art of dry stone walling, knowledge and techniques' into the UNESCO Representative List of the Intangible Cultural Heritage of Humanity in 2018 alongside with several other countries brought lot of attention and social recognition. Acknowledgement of skills of local old master builders and transfer of their knowledge to younger generation. Organisation of local events around dry stone wall subjects, including workshops, student camps, etc. It also brought interest and encourage visits from tourists.

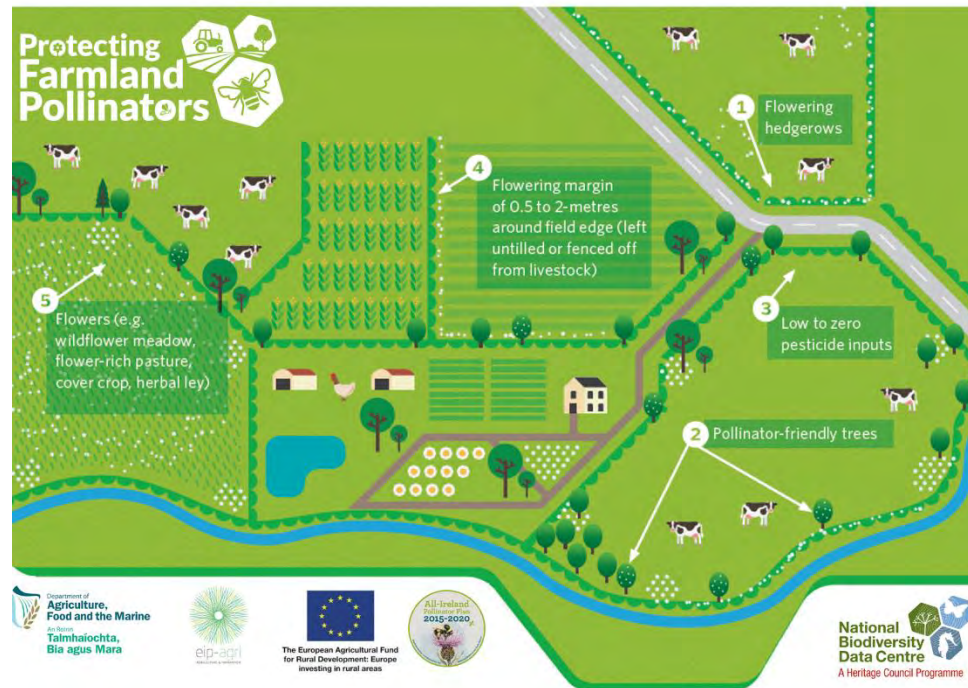
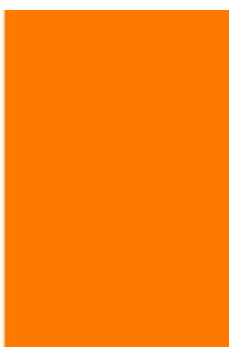
SUCCESS FACTORS:

Active NGOs and individuals working on protection and maintenance of dry stone walls for more than 15 years. Sense of national pride for the cultural heritage that is worth protecting. Introduction of agri-environment payments. Tourism valorisation.

CHALLENGES & RESEARCH NEEDS:

Challenges: abandonment of traditional livestock farming systems, ageing population, unclear land ownership preventing farmers of getting agri-environment payments. Research needs: identifying and monetising the benefit flows from ecosystem services provided by dry stone walls.





DESCRIPTION OF THE HDLF CASE:

- A whole farm pollinator scorecard was created in consultation with farmers.
- Forty participant farms receive Pollinator Points each year and, each year, farmers receive a results-based payment that relates to the points.
- There are nineteen actions on the scorecard and these actions are about maintaining habitats that provide food, shelter, and safety for pollinators on the farm.
- The aim is to ultimately create a scoring system that is fully evidence based.

BENEFITS FOR BIODIVERSITY:

Farm scores have increased annually, meaning that more farmers are taking more actions to help pollinators on the farm.

- Nine farms have reduced pesticide inputs.
- Eleven hectares of native meadow have been created and maintained.
- 66,109 metres of flowering hedgerow and hedgerow margin have been maintained.
- 300 bare soil sites and 130 bee boxes were created.

ECONOMIC BENEFIT/VALUE:

- A results-based payment structure is used to score the farms.
- Payment scales are linked to the whole farm pollinator score which depends on the farmer's management practices.
- Farmers receive an annual payment based on their overall pollinator score which is calculated based on the amount and quality of habitat maintained and/or created.

SOCIAL BENEFIT/ VALUE:

- Farmer led peer to peer mentoring on best practice farm management for broader biodiversity, not just pollinators.
- Evidenced based resources published that can be freely accessed by anyone.
- An online hoverfly identification training course was created.

SUCCESS FACTORS:

- Thirty-two farmers increased their whole farm pollinator score.
- Increased land area managed for biodiversity.
- Farmers learning about biodiversity.

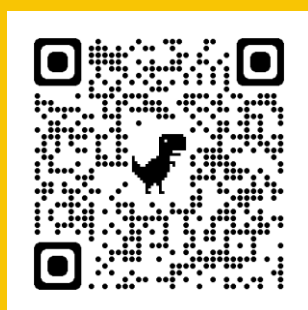
GEOGRAPHICAL LOCATION:

Counties Kildare, Laois, and Wicklow, Ireland

INVOLVED ACTORS:

Researchers
Forty farmers
Farm advisors
Local food authorities
Commercial companies

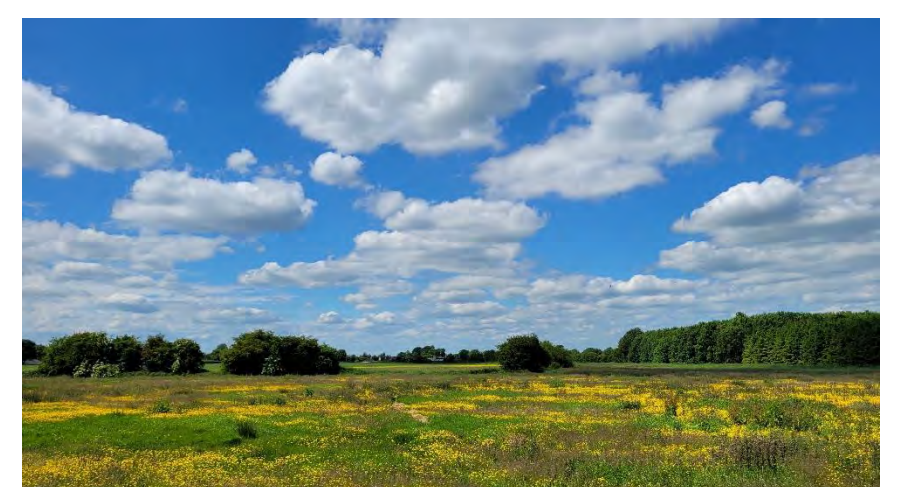
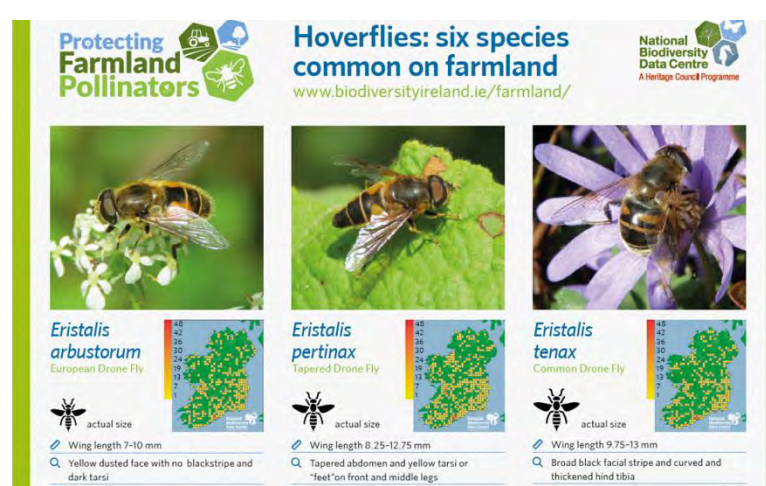
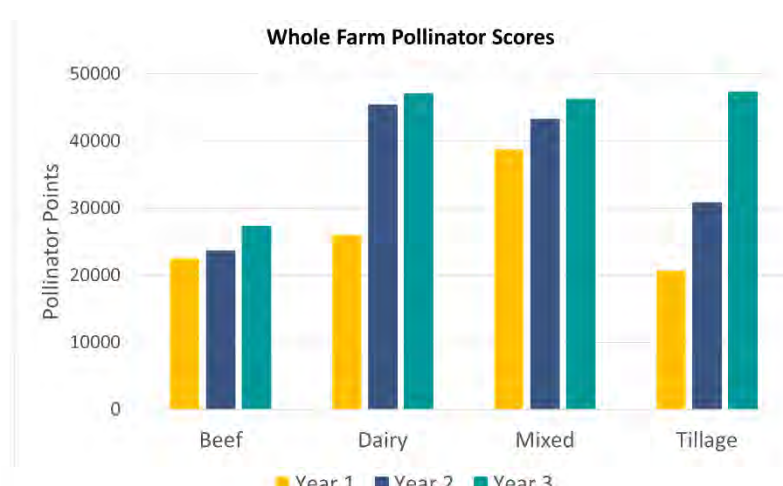
SOURCES OF INFORMATION, REFERENCES, WEBSITES:



The free online hoverfly identification training course can be accessed at:
<https://learn.biodiversityireland.ie/>.

CHALLENGES & RESEARCH NEEDS:

Characterising Irish hedgerows to fit into the scorecard was the greatest challenge. Farmers are interested in learning how to be biodiversity friendly, and farmers will use this knowledge to take action to help biodiversity. More resources are needed to help facilitate the transfer of biodiversity knowledge within the farming community.





GEOGRAPHICAL LOCATION:

Brandenburg, Germany

INVOLVED ACTORS:

Scientists, farmers, landcare
association

SOURCES OF INFORMATION, REFERENCES, WEBSITES:

[https://www.researchgate.net/
project/Disentangling-forest-
effects-on-grassland-
biodiversity-and-ecosystem-
services-ForGrass](https://www.researchgate.net/project/Disentangling-forest-effects-on-grassland-biodiversity-and-ecosystem-services-ForGrass)

DESCRIPTION OF THE HDLF CASE(FARM):

The ForGrass project explored the social-ecological relationships between grasslands and adjacent deciduous and mixed forest fragments. The aim was to identify how different species use and move between the forest and agricultural area, how farmers perceive and manage these spill-over effects, and how these areas contribute to biodiversity conservation and agricultural yields. Ultimately, the information can be used to inform farmers, hunters, forest managers, and other relevant land owners to collaboratively manage the agricultural landscape.

BENEFITS FOR BIODIVERSITY:

Shade and wind shadow increase moisture for diverse plants and associated insects and animals. Forest fragments also are a habitat for multitrophic diversity.

ECONOMIC BENEFIT/VALUE:

In drought years, farmers observed better forage adjacent to the forest due to microclimatic benefits. The forage quantity was positively related to the high plant diversity in these boundary areas. Some farmers would also consider allowing their livestock to graze in the boundary areas, particularly in summer heat.

SOCIAL BENEFIT/ VALUE:

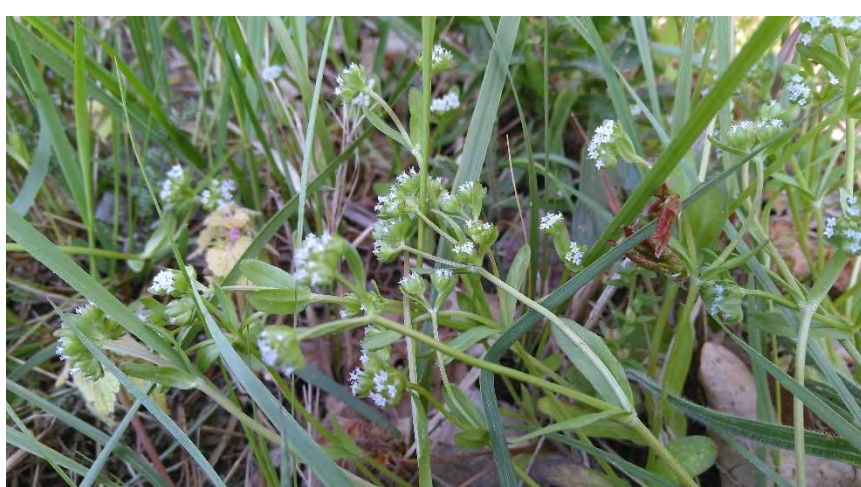
Maintaining forest fragments is important for maintaining social value attributed to agricultural landscapes by providing a desired landscape aesthetic. Moreover, the interactions between farmers and hunters, for example, might be socially important for tradition and collaboration.

SUCCESS FACTORS:

Forest edges provide habitats for very different plant communities than are found elsewhere in the agricultural landscape, thereby increasing the overall plant diversity. Allowing farmers to graze animals in forest edges could potentially benefit animal welfare and maintain the overall habitat quality of these forest edges.

CHALLENGES & RESEARCH NEEDS:

Challenges such as wildlife damage of agricultural yields, field area losses due to forest canopy growth, and intraspecific competition for water and nutrient resources between vegetation types at the forest edge could be dealt with by maintaining successional forest gradients within the boundaries of the forest. This would improve forest fragment stability against wind, decrease field area losses, and reduce yield damage from falling tree debris. Collaboration and communication between farmers, other land owners/managers, and hunters could target forest edge maintenance. Additionally, loosening regulations that keep farmers from having their livestock graze in boundary areas could benefit all actors. To this end, social and agroecological innovations could be explored.





GEOGRAPHICAL LOCATION:

Eisenwurzen, Austria

INVOLVED ACTORS:

Farmer, The "Bergwiesn Verein", Researcher

SOURCES OF INFORMATION, REFERENCES, WEBSITES:

LANA-project
(<https://www.studia-austria.com>); Stefan Kirchweger; bergwiesn.at;

DESCRIPTION OF THE HDLF CASE (FARM):

On the one hand cattle from local farmers graze on alpine pastures and on the other hand the "Bergwiesn Verein" a self established association mows, with the help of volunteers, the often extremely steep and remote mountain meadows.

BENEFITS FOR BIODIVERSITY:

Both activities contribute significantly to the preservation or restoration of the characteristic limestone-based habitats and their biodiversity in the Natura 2000 European protected areas (FFH and bird sanctuary).

ECONOMIC BENEFIT/VALUE:

The grazed cattle is used for milk and meat production. The mown hay from the mountain meadows is sold as fodder or as a herbal hay bath for the bathtub.

SOCIAL BENEFIT/ VALUE:

Increase of habitats for more species within the region, recreational area and other ecosystem services parallelly; Social benefits as farmers and volunteers work together;

SUCCESS FACTORS:

Milk and meat from grazed cattle gets more and more popular; The work of young volunteers: A strenuous activity, but one that is obviously fun and valuable;

CHALLENGES & RESEARCH NEEDS:

High work load; Requires a high degree of commitment;





No website

No social media



GEOGRAPHICAL LOCATION:

Northeastern France

INVOLVED ACTORS:

Arvalis – Institut du végétal

SOURCES OF INFORMATION, REFERENCES, WEBSITES:

The work is rather preliminary. The production is restricted to two master thesis (Jacques 2021 ; Dohokou 2022)

DESCRIPTION OF THE HDLF CASE (FARM):

- Definition of a protocol to **assess the quality of hedges** regarding biodiversity
- Based on the botanical **composition and management** of the hedge
- Focus on **aphids natural enemies** in cereal crops

BENEFITS FOR BIODIVERSITY:

- Hedges are likely to provide **contrasted biodiversity-mediated services** depending on their composition and management
- Indicators are key to help managers to better implant and manage hedges

ECONOMIC BENEFIT/VALUE:

- Biodiversity-friendly hedges should reward the farmer through species providing **services to neighbouring fields** (e.g. pollination, pest control)
- **Payment for Environmental Services** could be a way to reward the aesthetic and cultural services of the hedges

SOCIAL BENEFIT/ VALUE:

Improvement of the **public perception of farmers** & improved dialog with neighbours.

SUCCESS FACTORS:

« Light » diagnosis procedure & improvement perspectives

CHALLENGES & RESEARCH NEEDS:

Develop **science-based indicators** relevantly ranking hedges regarding their **biodiversity benefits**



Photo credits: X. Mesmin – Arvalis Institut du végétal



GEOGRAPHICAL LOCATION:

23 locations in Heves and Borsod-Abaúj-Zemplén counties of Hungary

INVOLVED ACTORS:

Local national park, farmers, landowners, nature conservationists, archeological experts

SOURCES OF INFORMATION, REFERENCES, WEBSITES:

[BNPI](#); [NatGeo](#); [NAK](#)

DESCRIPTION OF THE HDLF CASE(FARM):

Kurgans and hillforts in 23 Hungarian locations (on farmland, grassland & Natura 2000) were restored and rehabilitated as biodiverse habitats and historical sites.

Main objectives & activities: remove invasive species and re-establish native grassland vegetation; preserve habitats and cultural heritage; avoid soil erosion and stabilise surface.

BENEFITS FOR BIODIVERSITY:

- re-established native grassland vegetation
- providing important resting, overwintering and nesting habitat for multiple bird, reptile and amphibian species
- species-rich steppic ecosystems
- habitats for pollinators and pest antagonists
- 'extending' the boundaries of protected natural areas

ECONOMIC BENEFIT/VALUE:

- increased botanical and landscape value
- stabilised surface
- as ecological focus areas they are considered under 'greening'
- area remains eligible for subsidies

SOCIAL BENEFIT/ VALUE:

- kurgans are examples for remarkable national heritage and parts of Hungary's historical landscape

SUCCESS FACTORS:

- available funding (~257.000 EUR)
- cooperation between stakeholder groups

CHALLENGES & RESEARCH NEEDS:

- Presence of artificial elements (drain pipe, antenna) and infrastructure.
- Kurgans are often heavily degraded by former ploughing and soil erosion.

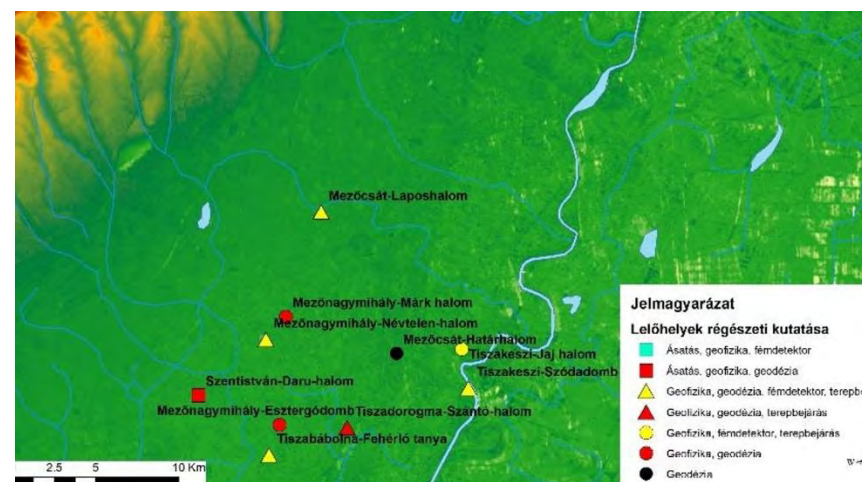




Photo: Via Pontica

GEOGRAPHICAL LOCATION:



INVOLVED ACTORS:

NGOs
University professors - Forestry University
Ministry of Agriculture
Ministry of Environment and water
Irrigation Systems JSC.
Municipality of Ostrov
Designers
Geologists
Hydrogeologists
Ecologists
Ornithologists and etc.

CHALLENGES RESEARCH NEEDS:

- Recreated the elements of the wetland in which the target species inhabits;
- Ensuring the appropriate plant species for breeding and nutrition;
- Protection of the restored area from predators and poachers;
- Ensuring a constant flow of water so as to prevent swamping;
- Community understanding of the importance of wetlands.
- Geological, soil and hydrological conditions;
- Climatic conditions;
- Possible water sources and water quality;
- Biodiversity;
- Opportunities and threats for project implementation.



Wetland where Aythya nyroca nests and has been used as model ecosystem



Area where the small wetland will be created



Possible design to build a small wetland

DESCRIPTION OF THE HDLF CASE(FARM):

In Bulgaria, at the beginning of the 20th century, wetlands covered 2% of the country's territory, and currently they have decreased 20 times.

Large territory of former swamps have been drained and plowed over in the past to create arable land.

The current project aims to **restore a small wetland as a habitat for the White-eyed Warbler (Aythya nyroca)** in protected area BG0000334 „Ostrov“ (located in an agricultural area) **by replicating the conditions and parameters of a wetland where the species is established.**

BENEFITS FOR BIODIVERSITY:

The white-eyed warbler is a "vulnerable" species, listed in the Red Data Book of the Republic of Bulgaria. Restoring wetlands as its habitat is key not only for the Aythya nyroca, but also for the ecosystem in the Danubian Plain as a whole.

In addition to the Aythya nyroca, the creation of wetlands creates suitable habitat for many other species.

It is expected to **increase the diversity of nesting birds, amphibians, fish and other species** as well as to create **a habitat for protected plant species** such as the water lilies, etc.. All this will contribute to maintaining the balance of the ecosystem in the area.

ECONOMIC BENEFIT/VALUE:

The restoration of wetlands will have a **positive impact on fisheries** in the area, providing them with **spawning grounds for various fish species**. It has been established that the drying of the marshes along the Danube in the past had a negative impact on the population of a number of fish species and, respectively, on fishing.

Restored wetland can play an important role in **flood abatement**, soaking up and storing floodwater.

SOCIAL BENEFIT/ VALUE:

Restored wetland can become a **destination for outdoor activities** such as hiking, fishing, bird watching, photography, hunting and recreation.

Restoration of wetland in the area will provide meaningful opportunities to **educate the public** regarding wetlands, wetlands protection, and the value of water resources. It will give a **good example** for the whole Danubian Plain.

Last but not least, wetlands will provide a certain **visual value** in the area.

SUCCESS FACTORS:

- Environmental factors;
- The design and construction of the wetland;
- The behaviour of the community.



GEOGRAPHICAL LOCATION:

Andalusia, Spain

INVOLVED ACTORS:

Farmers, researchers,
private and tech
companies.

SOURCES OF INFORMATION, REFERENCES, WEBSITES:

www.biolivar.es

#BIOLIVAR

DESCRIPTION OF THE HDLF CASE:

The project is based on a need to improve management at the farm scale, with valid strategies for multiple types of olive groves, and to obtain a profitable and quality production with an improvement in biodiversity and a sustainable use of soil and water.

The final objective of the project is the development, validation and dissemination of a strategy to optimize the natural capital in olive groves in integrated production valid for a wide typology of farms, including in this strategy the tool for its valuation by agents unrelated to olive production.

Through this objective, the BIOLIVAR project aims to be useful to farmers in improving biodiversity management by integrating sustainable management of plant covers, adapting it to the different social, economic and environmental factors of olive groves, and different risks and stresses associated with biodiversity.

BENEFITS FOR BIODIVERSITY:

Improvement of ecosystem services:

Increase of the biodiversity of vertebrates and invertebrates.

By having greater plant biomass and slightly increasing the organic carbon content in the soil, the function of the olive grove for CO₂ sequestration is improved.

Reduction of erosion, improvement of soil quality and efficiency in the use of water by the crop by increasing the water retention capacity of the soil.

ECONOMIC BENEFIT/VALUE:

Alignment with the new CAP and, specifically, with the eco-schemes related to the maintenance of a living plant cover in permanent crops.

Better positioning to participate in carbon markets.

Long-term sustainability for olive farms.

SOCIAL BENEFIT/ VALUE:

Improvement of the technical training of the potential users of the innovation, by offering tools for a better management of their exploitation and a better use of the information already available and included in GIS.

Reinforcement of the social image of the olive sector for consumers and society in general by offering mechanisms for assessing its effect on positive externalities through the improvement of natural capital and the circular bioeconomy.

SUCCESS FACTORS:

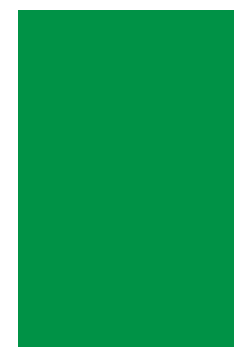
Demonstrate to farmers that landscape and biodiversity conservation measures also have a favorable impact on farm profitability.

CHALLENGES & RESEARCH NEEDS:

Challenge: Increase the interest of the actors of the value chain and consumers in rewarding farmers who develop conservation measures of natural elements of the landscape. Facilitate and better reward the maintenance of landscape elements on agricultural land.

Research need: Better quantification (and knowledge transfer) in economic terms of the value of the natural capital.





DESCRIPTION OF THE HDLF CASE(FARM):

In the UNESCO WHL site of The Hills of Prosecco of Conegliano and Valdobbiadene, scattered trees, small woods and linear tree formations (commonly called Trees Outside Forests - TOF), deeply characterize the local cultural landscape. According to the statement of Outstanding Universal Value (OUV) the UNESCO site is composed by a "mosaic landscape where [...] the patches of vineyards are often connected to one another by small woodlands, hedges, rows of trees that serve also as corridors connecting different habitats. [...] The result is a harmonious landscape with outstanding scenic values that maintains a delicate environmental and functional balance". 931 different small woods and linear tree formations have been identified in the area, corresponding to 1.95% of the total surface.

BENEFITS FOR BIODIVERSITY:

Trees Outside Forests (TOF) represent microhabitats, source of food or nesting places, for different insects, birds and small mammals, as well as constituting an extensive ecological network within a cultural landscape recognized by UNESCO.

ECONOMIC BENEFIT/VALUE:

The local cultural landscape could represent a crucial resource for the area, especially for rural tourism, but the importance of local HDLF should be emphasized.

SOCIAL BENEFIT/ VALUE:

In the past, small woods and linear tree formations were managed according to traditional practices to obtain different products. Nowadays they are rarely managed, but they have a key role for landscape, biodiversity, and in reducing hydrological risk as they can be found also in slopes above 80% of inclination.

SUCCESS FACTORS:

Small woods and linear tree formations have been preserved because they are found in places not suitable for agricultural production (steep slopes, along small streams,...). Scattered trees within vineyards are a traditional feature of the cultural landscape and are still found in vineyards on steep slopes, where mechanization is not possible.

GEOGRAPHICAL LOCATION:

45°54'52" N, 12°06'59" E

INVOLVED ACTORS:

Farmers, researchers, UNESCO site management authority, Regional Government through Rural Development Plan.

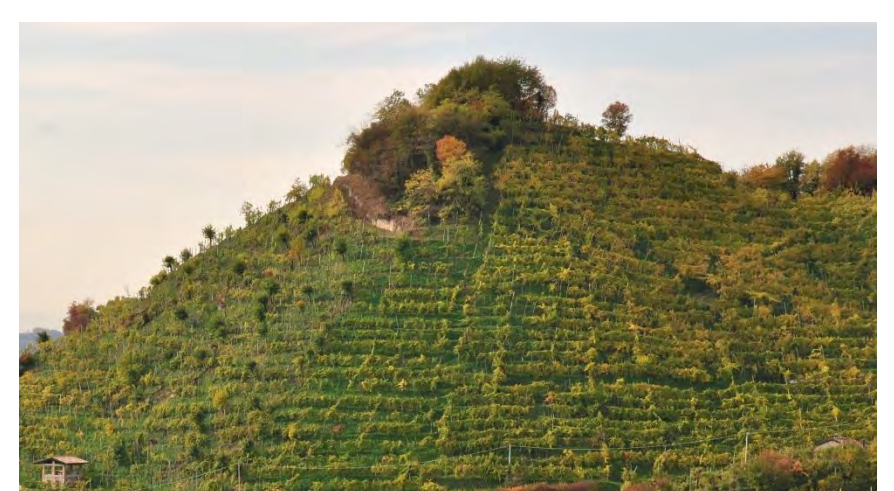
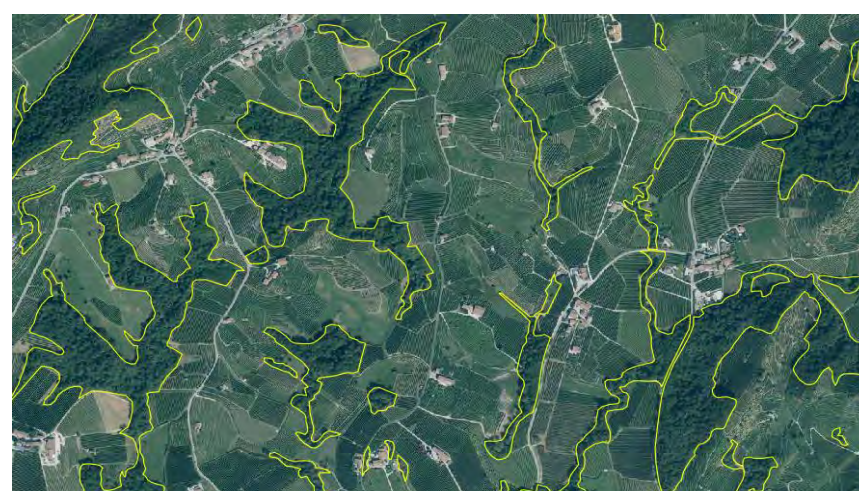
SOURCES OF INFORMATION, REFERENCES, WEBSITES:

<https://whc.unesco.org/en/list/1571/>

<https://www.mdpi.com/1999-4907/13/4/514/html>

CHALLENGES & RESEARCH NEEDS:

TOF needs to be preserved, valorized, and managed, through their inclusion in local forest planning and inventories. Local wine producers need to be trained about the importance of preserving and managing TOF, especially considering the recent trend of planting new vineyards replacing small forests and linear tree formations.





GEOGRAPHICAL LOCATION:

Hriňová dispersed settlement -
48°35'22.365 N, 19°30'9.958 E

INVOLVED ACTORS:

Ministry of agriculture and rural development, Local government, local inhabitants and farmers

SOURCES OF INFORMATION, REFERENCES, WEBSITES:

Dobrovodská, M., Kanka, R., David, S., Kollar, J., Špulerová, J., Štefunková, D., Mojses, M., Petrovič, F., Kristin, A., Stasiov, S., Halada, L., Gajdos, P., 2019. Assessment of the biocultural value of traditional agricultural landscape on a plot-by-plot level: case studies from Slovakia. *Biodivers. Conserv.* 28, 2615–2645. <https://doi.org/10.1007/s10531-019-01784-x>

Šatalová, B., Špulerová, J., Štefunková, D., Dobrovodská, M., Vlachovičová, M., Kozelová, I., 2021. Monitoring and evaluating the contribution of the rural development program to high nature value farmland dominated by traditional mosaic landscape in Slovakia. *Ecol. Indic.* 126, 107661. <https://doi.org/10.1016/j.ecolind.2021.107661>

Špulerová, J., Dobrovodská, M., Izakovičová, Z., Kenderessy, P., Petrovič, F., Štefunková, D., 2013. Developing a Strategy for the Protection of Traditional Agricultural Landscapes Based on a Complex Landscape-Ecological Evaluation (the Case of a Mountain Landscape in Slovakia). *Morav. Geogr. Rep.* 21, 15–26. <https://doi.org/10.2478/mgr-2013-0017>

Špulerová, J., Dobrovodská, M., Lieskovský, J., Bača, A., Halabuk, A., Kohút, F., Mojses, M., Kenderessy, P., Piscová, V., Barančok, P., Gerhátovej, K., Krajčí, J., Boltižiar, M., 2011. Inventory and Classification of Historical Structures of the Agricultural Landscape in Slovakia. *Ekológia (Bratislava)* 157–170. https://doi.org/10.4149/ekol_2011_02_157

DESCRIPTION OF THE HDLF CASE(FARM):

- high-diversity landscape features (HDLF) are abundant in traditional agricultural landscapes/ high nature value farmland dominated by traditional mosaic (HNV2)
- The national inventory of TAL (2009-2011) was the basis for identifying HNV2 and evaluating the contribution of the rural development program on them - monitoring for two periods: 1st monitoring of RDP 2007-2013 and 2nd monitoring of RDP 2014-2020.
- We developed a set of indicators for monitoring of HNV2, including share of semi-natural elements defined in seven types:
 - productive plots (1. Grassland, 2. Orchards)
 - unproductive plots (3. Trees and small woodland – 3.1. Solitaire; 3.2. Line of trees; 3.3. Small woodland; 3.4. Hedges; 3.5. Scrubland; 4. Ecotones; 5. Agrarian landforms including 5.1. Terraces and step bounds, 5.2. Mound, 5.3. Heap, 5.4. Stone walls; 6. Wetlands – 6.1. Riparian forests, 6.2. Willow riparian vegetation, 6.3. Herbaceous vegetation along banks, 6.4. Water habitats, 6.5. Bogs and fens, 6.6. Springs; and 7. Rocky habitats).
- Detailed monitoring of biodiversity was carried out in three case study areas (one of them Hriňová dispersed settlement), which was the basis for the development of a HNV2 protection and management strategy consisting of practical management measures and strategic development.

BENEFITS FOR BIODIVERSITY:

- maintenance of biodiversity in traditional agricultural landscape

ECONOMIC BENEFIT/VALUE:

- Support for farming in less favored areas
- Proposal to support HNV2 in new RDP (not accepted) and inclusion of elements of green infrastructure into LPIS (accepted)

SOCIAL BENEFIT/ VALUE:

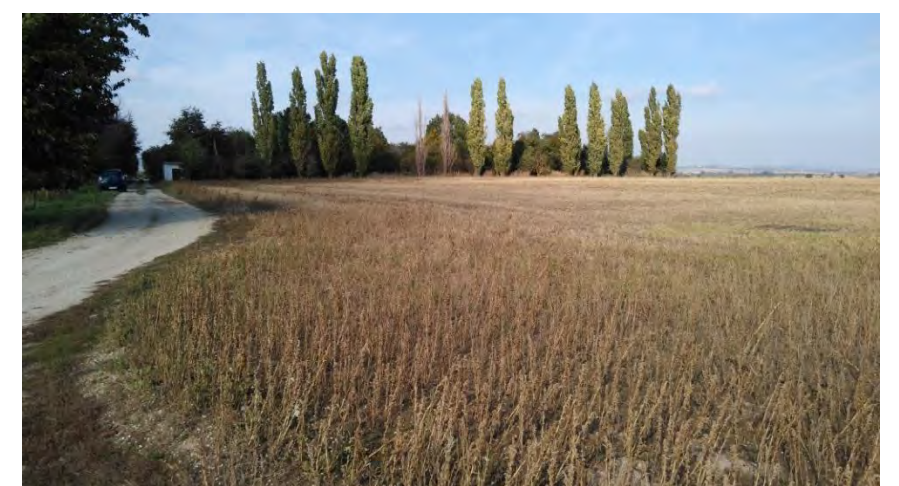
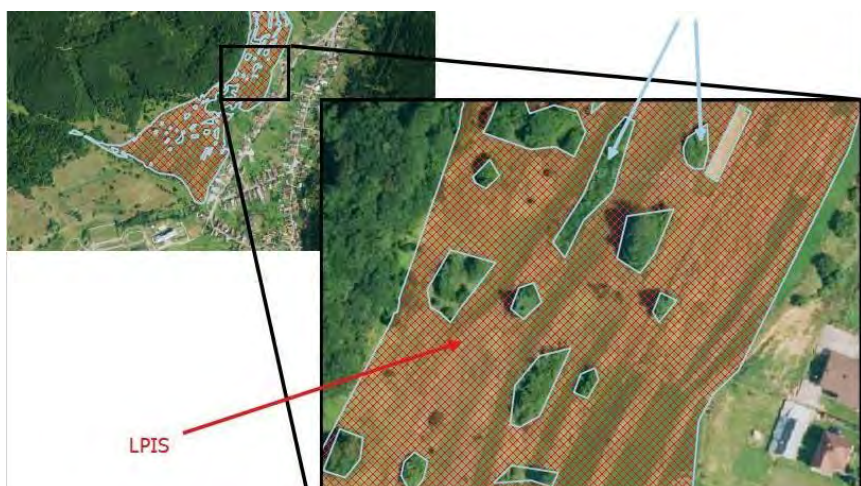
- traditional ecological knowledge, genius loci, biocultural value
- the aesthetics and attractiveness of the landscape for recreation and tourism

SUCCESS FACTORS:

- revival of traditional agriculture, Sustainable development, maintenance of cultural and historical heritage, preservation of tradition, interest of young farmers in farming and regional development
- Delineation of HDLF in LPIS

CHALLENGES & RESEARCH NEEDS:

- maintenance and support of traditional farming, HNV2 dominated by traditional mosaic, with presence of HDLF
- increase the motivation of farmers for eco-schemes through CAP, creation of new HDLF in intensively managed landscape, dissemination of knowledge about the ecological-economic benefits of HDLF and Eco schemes





GEOGRAPHICAL LOCATION:

Semi-natural meadows, and
farmland across Estonia

INVOLVED ACTORS:

Ministry of Rural Affairs,
Ministry of Environment,
University of Tartu, and others
(10 total)

SOURCES OF INFORMATION, REFERENCES, WEBSITES:

<https://loodusrikaseesti.ee/en>

DESCRIPTION OF THE HDLF CASE(FARM):

Aims to introduce certain landscape features to
farmland (skylark plots, grassland strips) and
preserve existing features. Support schemes
accommodating HDLF-s.

Aims to incentivise preserving biodiverse,
culturally important semi-natural meadows.

Study outcomes and change policy accordingly.

BENEFITS FOR BIODIVERSITY:

Habitat for farmland birds (skylark plots); Habitat
for pollinators and natural predators of pests;
Overall higher biodiversity and connectedness of
habitats.

ECONOMIC BENEFIT/VALUE:

Management techniques or landscape features as
part of support schemes; Ideally less spent on
pesticides and fertilisers in the future.

SOCIAL BENEFIT/ VALUE:

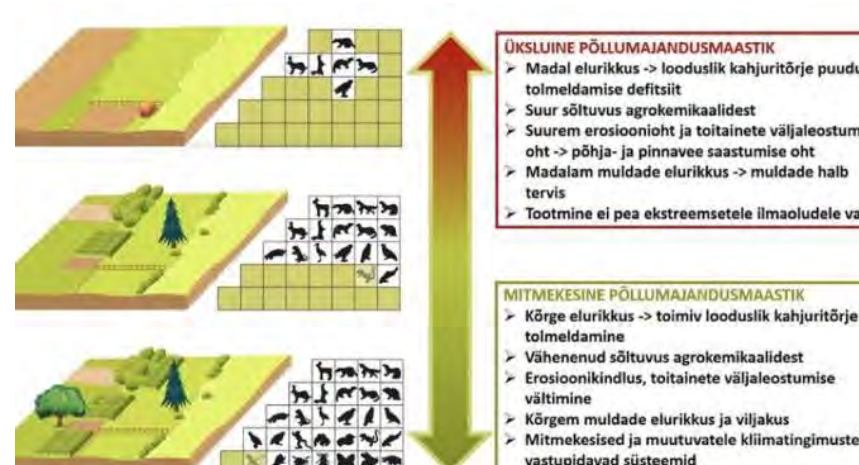
Learning that biodiversity can be valuable and
profitable. Connecting to old customs.

SUCCESS FACTORS:

Cooperation between governmental bodies and
scientists; demonstration areas and events.

CHALLENGES & RESEARCH NEEDS:

Incorporating landscape features into the agricultural policy of Estonia;
proving benefits with local case studies; motivating and informing people.





GEOGRAPHICAL LOCATION:

Whole Switzerland

INVOLVED ACTORS:

Federal Office of Agriculture,
different experts

SOURCES OF INFORMATION, REFERENCES, WEBSITES:

<https://www.agrinatur.ch/fr/>

<https://www.blw.admin.ch/blw/de/home/instrumente/direktzahlungen/biodiversitaetsbeitraege.html>

CHALLENGES & RESEARCH NEEDS:

Although this system has been implemented in Switzerland for many years and the obligatory 7% of APB are far exceeded, the biodiversity targets are not achieved. We have too few areas with ecological quality and deficit regions especially in the Central Plateau and in arable regions. Many farmers are not aware that they need biodiversity for the production of food.

DESCRIPTION OF THE HDLF CASE(FARM):

Proof of ecological performance = > 7% of agricultural area per farm have to be areas of promotion of biodiversity (APB) (average 2022 = 19%).
15 types have been specified (e.g. meadows, pastures, natural field margins, hedges, stone walls,...).

Quality level I (mandatory)

Conditions of fertilizing, plant treatment products and/or utilization pattern are fixed.

Quality level II (participation optional)

Famer is remunerated for existing ecological quality of his APB. Swiss Confederation fixes minimum requirements (botanic criteria and/or structure elements and/or exploitation prescriptions).

Ecological networking projects (participation optional)

Every project defines key and characteristic species, according to the ecological potential of the region as well as measures aiming promotion of these species.

BENEFITS FOR BIODIVERSITY:

Biodiversity is promoted in particular with the creation of high-quality APB (quality level II and networking projects) and new habitats for animals and plants are created through the different types of biodiversity promotion areas.

ECONOMIC BENEFIT/VALUE:

Farmers get money for most of the APB. Contributions for quality level II are higher than for quality level I, networking projects result in additional contributions.

SOCIAL BENEFIT/ VALUE:

Ecosystem services (e.g. pest control, pollination, erosion control)
Beauty of the landscape
Recreational space

SUCCESS FACTORS:

Farmers get money for (most) of their APB.
They can choose among different types (which ones fit most in the farm concept).
7% of APB are mandatory.
Quality level II and networking projects are optional.

