



European Network for
Rural Development

EN

PROJECTS BROCHURE

The European Agricultural
Fund for Rural Development

RESOURCE EFFICIENT RURAL ECONOMIES



European Network for Rural Development

The European Network for Rural Development (ENRD) is the hub that connects rural development stakeholders throughout the European Union (EU). The ENRD contributes to the effective implementation of Member States' Rural Development Programmes (RDs) by generating and sharing knowledge, as well as through facilitating information exchange and cooperation across rural Europe.

Each Member State has established a National Rural Network (NRN) that brings together the organisations and administrations involved in rural development. At EU level, the ENRD supports the networking of these NRNs, national administrations and European organisations.

Find out more on the *ENRD website* (<https://enrd.ec.europa.eu>)

The European Agricultural Fund for Rural Development (EAFRD)

The EAFRD Project Examples brochure forms part of a series of ENRD publications that help encourage information exchange. Each edition of the brochure features different types of projects that have received RDP co-finance from the EAFRD.

Past editions of the EAFRD Projects Brochure can be downloaded from the publications section of the ENRD website.⁽¹⁾ The ENRD collection of good projects and practices⁽²⁾ contains many additional examples of EAFRD assistance to rural development initiatives.

(1) <https://enrd.ec.europa.eu/publications/search>

(2) https://enrd.ec.europa.eu/projects-practice_en

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Introduction

This edition of the EAFRD Projects Brochure looks at how resource efficiency is being supported in rural Europe. Resource efficiency means using natural resources in a sustainable way. It also means minimising the impact of human activities on the environment.

The concept of resource efficiency is encapsulated in the idea of ‘doing more with less’. The examples highlighted in this edition focus on water and soil, two especially relevant resources for agriculture and rural development.

Managing soils and water more efficiently is a strategic priority for Europe. Through the EU's contribution to international accords such as the UN Sustainable Development Goals and through high-profile initiatives, such as Europe 2020 – the growth strategy that aims to make the EU a smart, sustainable and inclusive economy – a shift towards sustainable growth via a resource-efficient, low-carbon economy is taking place.

Europe is transitioning from a traditional economy where resources are simply extracted, used and thrown away to one where resources are used more carefully and recycled so they stay in use for longer. The need for a more efficient use of resources and waste minimisation is at the heart of this approach.

In the specific context of rural development, the need for resource efficiency was reinforced by the Cork 2.0 Declaration and again by the recent European Commission Communication on the Future

of Food and Farming, which says that the Common Agricultural Policy (CAP) should lead a transition towards a more sustainable agriculture.

An ENRD Thematic Group recently examined how resource efficiency is practised in rural areas. In limiting the scope of its work to soil and water management, the group identified how the Rural Development Programmes (RDPs) can be shaped to make change happen faster. Building on that work, this edition of the EAFRD Project Brochure profiles inspiring rural development projects that are already improving resource efficiency all around rural Europe.

Securing adequate food supply for future generations while reducing resource use is a significant challenge for the rural economy. The examples in this brochure demonstrate how the European Agricultural Fund for Rural Development (EAFRD) is promoting sustainable practices which are the best guarantor of a continued supply of clean water, healthy soils



and crop pollination, and that help in the fight against climate change.

RDP Measures are changing the way land managers are using water and soil in their agricultural and forestry activities. At least 30 % of the RDP budget is required to be allocated to Measures contributing to the environment and climate, in line with Priority 4 (restoring, preserving and enhancing ecosystems) and Priority 5 (promoting resource efficiency). In reality, the share is far higher (52 % according to recent figures).

For water, the featured projects are helping to reduce nutrient pollution, decrease water consumption and better manage water supply. The problem of excessive use of fertilisers and other chemical compounds has a long history in different parts of Europe. EAFRD projects are combatting this problem by improving site monitoring, by easing the shift to more sustainable cultivation patterns and by providing better advisory services to farmers. Investment in water system infrastructure and in farmers' ability to tailor water use more accurately to crop needs is also helping to reduce water consumption.

For soil, initiatives that limit soil erosion, improve quality and retain soil carbon are profiled. These include projects that are boosting knowledge

exchange between farmers, experts and researchers, projects that target biodiversity conservation and ones that support more efficient carbon sequestration in soil.

The business case for resource-efficient behaviour is mounting as pressure on natural resources increases. For the rural economy, there are numerous ways to create greater value from fewer inputs. The EAFRD is providing valuable support to encourage a faster rate of change towards a more sustainable economic production model in agriculture.

A healthy environment implies a healthy rural economy.

The ENRD Contact Point Team

1. Avoiding nutrient pollution

Nutrient contamination occurs when too many nutrients flow into surface waters. It is a primary cause of eutrophication, whereby severe growth of algae leads to lower oxygen levels and, eventually, catastrophic effects on water quality and all forms of aquatic life.

Agricultural run-off – such as nitrogen and phosphorus – from fields and pastures is a primary source of nutrient pollution. The push toward a resource-efficient economy, the greening of the Common Agricultural Policy (CAP) and the EU's Water Framework Directive (WFD) all emphasise the need for arable and livestock farmers to consider the impact of their use of fertilisers and other substances on local water bodies.

The European Agricultural Fund for Rural Development (EAFRD) supports a range of efforts that are closing the knowledge gap regarding the effects of some current land-use practices and which encourage voluntary land-management agreements. The fund is also essential in trialling innovative solutions to guide action and reduce run-off. Demonstrating how the latest technology or farming practices can limit nutrient pollution that threatens the long-term quality of rural Europe's water bodies is a good way to change behaviour. The EAFRD may also, under certain conditions, support related investments on farms to help avoid run-off, for example in manure storage capacity.

Spreading insight

With pressure building from policy-makers, market forces and citizens to adjust and innovate, more

than ever farmers need timely access to knowledge and information, to training and education, and to support services. Farm advisory services thus play a key role in problem-solving, information-sharing and innovation-generating processes.

Water quality problems tend to increase when soils are thin and poor, and especially where setting up efficient wastewater solutions for farming operations is impractical. In such conditions, good advisory services are the key to improving the awareness of farmers. They both showcase the most relevant tools to reduce nutrient run-off and make it easier for farmers to cooperate in initiatives controlling water pollution.

The project highlighted on page 6 profiles an initiative from the island of Gotland in Sweden that is helping farmers reduce nutrient pollution.

Showcasing real-life solutions

For those living in isolated rural settlements, solving wastewater problems can be difficult because many technologies are designed to operate on a larger scale to remain efficient and they are not adapted for areas with a small population. Local Action Groups (LAGs) are especially effective in addressing such local issues



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through investment under Measure 07 (Basic services and village renewal) where such infrastructure does not yet exist or needs upgrading.

Tackling nutrient contamination typically requires testing of different solutions to identify the ones best suited to a local environment. The use of real-life demonstrations is a sure way to build inhabitants' awareness and to promote cooperation with local authorities in order to solve the problem of excess nutrients entering the water system.

An interesting case from Slovenia centred on these issues can be found on page 8.

Protecting groundwater sources

Beer may be a convivial drink, but when its production involves intensive water and fertiliser use – as is typically the case for hop production – it loses some of its charm for rural communities. Against a backdrop of environmental regulation, notably the WFD, land users of all types are looking to reduce their water consumption and to limit pollution of neighbouring surfaces or groundwaters.

Hop growers in Germany, the world's leading producer of the crop, have used EAFRD support to develop

a geographic information system software in order to enable soil and water sampling and monitoring. The cooperation engendered has helped establish voluntary land management agreements and introduced buffer zones for particularly sensitive karst sites.

It is but one example of how the Rural Development Programmes (RDPS) can improve knowledge about the status of groundwater supply and bring about more efficient cultivation methods. The secondary effect of building a good working relationship amongst local stakeholders also bodes well for the protection of water resources. Moreover, this process helps to enhance hop quality, leading to a better final product.

A more detailed account of a Bavarian project protecting groundwater sources based on data-driven decision-making among hop producers is available on page 9.

Advising farmers on reducing nutrient run-off in Sweden

The nation-wide Greppa Näringen project provided a free advisory service to farmers on the island of Gotland, successfully targeting reduced nutrient run-off from their land. Through effective relationship-building with farmers, the project delivered tangible results for water quality in the area.

Gotland is Sweden's largest island at just over 3 000 km² and located in the middle of the Baltic Sea. Nutrient run-off and its negative consequences for water pollution is a particularly significant environmental concern on the island.

An official statistical guide by the regional authority in Gotland from 2011⁽¹⁾ stated: "the basic problem is that it is difficult to achieve good wastewater solutions in areas with extensive solid ground and only thin layers of soil. If the sewerage system is also poorly maintained, pollutants can easily reach the groundwater."

An EAFRD contribution to a national challenge

Shortly after the millennium, the Swedish government decided on new environmental goals which targeted nutrient run-off. The Greppa Näringen campaign was initiated in this context, specifically to reduce the run-off associated with agricultural activity across the country.

Gotland was one of the areas selected due to the known eutrophication challenge in the Baltic Sea. Greppa Näringen aimed to increase awareness and knowledge among farmers on how to reduce the negative environmental impact of agriculture as much as possible, while maintaining a profitable agricultural sector. It specifically targeted nutrient management efficiency and reduced eutrophication.

The project provided a free advisory service to farmers in Gotland. In total, ten training courses were held, along with one-to-one and group advisory sessions. These were complemented by field excursions, newsletters, exhibitions, information meetings and cooperation with projects in other counties. A dedicated project coordinator was able to organise these efforts.

"You have to take the right action in the right place. In the conversation with the farmers, it is important to... take in their knowledge and then add the environmental knowledge we possess."

Maria Källming
Project coordinator, Greppa Näringen

The nutrient balance on all the farms that took part in the project was calculated and added into a database. Meanwhile, the participating farmers received advice on different management practices that could reduce nutrient run-off. For example, different types of animal feed could be used, fertiliser usage could be reduced and changes to the handling of manure could help limit run-off.

Successfully engaging farmers

The voluntary participation of farmers was a prerequisite for the success of the initiative, since they were not paid to take part. From the outset, the coordinators worked closely with farmers' organisations, both to explain the intentions of the project and to understand fully farmers' expectations and needs.

Overall, the level of interest amongst farmers was even higher than had been anticipated and more group advisory sessions were added to the project activities. The project confirmed that farmers in general are interested in environmental issues, because they recognise that they depend on a good environment for their production and livelihoods.

Another important success factor was good cooperation with the consulting companies providing advice to farmers. It was important that they spent time working on a good relationship with farmers in order to provide support that could help them handle regulatory and other demands for improved environmental performance.

"Environmental measures often go hand-in-hand with economic benefits for the farmer. Of course, this is not always the case, and this is when the adviser's role becomes extra important."

Linda Larsson
Project coordinator in Gotland

Proven results and follow-up

Database monitoring showed that nutrient efficiency increased distinctly, particularly on some farms. A national evaluation confirmed these local results and showed a strong connection between this project and decreased levels of nitrogen and phosphorus flowing into the Baltic Sea from Swedish farms.

(1) www.gotland.se/1354

In Gotland, a qualitative evaluation was also conducted through interviews with 12 farmers, which confirmed that the farmers were pleased with the advice and found it to be useful and rewarding. In general, the level of knowledge increased and awareness of the issues was raised.

“During the course of the project, it also became clear that advising farmers serves as an indirect support for rural vitality more generally. That is very satisfying.”

Maria Källming
Project coordinator

The Gotland experience was considered a success and has been continued in the current Rural Development Programme. Since the initial project was based on volunteering, one of the challenges has been to reach out to those who did not already show an interest in taking part. Gotland has since exchanged experiences with four neighbouring counties in mainland Sweden.

The coordinators have directly contacted all farmers in specific areas of the county to engage them in the themes of the project. These activities are currently still dependant on continued funding, but the

awareness and knowledge among the farmers, the project organisation and the advisory companies will be maintained in any case.

“The most fun is when you meet a satisfied farmer... when you get feedback and they tell you that they have followed one’s advice and that it has worked.”

Linda Larsson
Project coordinator in Gotland

Project Name	Greppa Näringen – ‘Focus on nutrients’
Type of beneficiary	Regional Authority (County Boards)
Period	2011-2014
Funding	Total cost: € 165 775 EAFRD contribution: € 82 887.5 National contribution: € 82 887.5
RDP Measure	M111: Vocational training and information actions (Axis 1)
Further info	http://greppa.nu/om-greppa/om-projektet/in-english.html
Contact	Linda.larsson@lansstyrelsen.se



© Greppa näringen

The free advisory services for farmers on limiting nutrient run-off proved very popular.

Wastewater treatment in isolated rural settlements in Slovenia

A LEADER project developed knowledge and awareness of effective wastewater treatment solutions for isolated rural buildings and communities.

The municipalities of Škofja Loka and Gorenja Vas in north-western Slovenia are characterised by hilly terrain with small dispersed settlements and isolated farms where public sewerage networks do not exist.

Addressing knowledge gaps

To raise local awareness about the requirements and possibilities of small Wastewater Treatment Plants (WWTPs) – serving a population equivalent of up to 50 – the Sora Development Agency, together with four local municipalities, launched the ‘Let’s Clean the Water’ initiative.

With LEADER support, they trained a team of local advisors, set up an office and organised a series of events to reach local populations and potential investors. It sought to encourage the installation of small WWTPs in the LAG area prior to new environmental legislation on treatment of wastewater came into force.

“I attended lectures organised by the [project] and joined study visits to learn from those who had already installed different types of WWTPs. I found that very valuable.”

Franc Žagar
Project participant

During visits to small WWTPs across Slovenia, an additional challenge was identified: many existing solutions were not sufficient to meet incoming regulatory requirements. More knowledge was needed about the most appropriate solutions.

The coordinators installed and tested four small WWTPs in a follow-up initiative. Each municipality implemented a different technology and the development agency supported them in defining their needs, preparing procurement documents and selecting the most appropriate solution.

The tests increased knowledge of the installation, maintenance, performance and costs of three mechanical solutions and a constructed wetland. All four plants also served as demonstration examples for people to visit.

Successful impact

The initiatives reached 2 600 building owners with information and over 400 people took part in specific



Demonstration sites helped bring the concept of small wastewater treatment plants to life.

© Iztok Amersek, Razvojnina agencija Sora d.o.o.

education activities. Significantly, municipalities are now able to target financial support to private investors delivering the most appropriate small WWTPs.

By 2014, the number of such plants had risen to 179 – of which 7 were constructed wetlands. Furthermore, LAGs across Slovenia have started to use the information materials produced by this project to spread awareness further.

“We were able to offer citizens reliable information... Today, a list of producers/suppliers that comply with requirements is publicly accessible.”

Kristina Knific
Municipality of Gorenja Vas – Poljane

Project Name	‘Let’s clean the water’
Type of beneficiary	Local Development Agency and municipalities
Period	2011-2013
Funding	Total cost: € 149 336 EAFRD contribution: € 100 745 National / regional contribution: € 25 236 Private source: € 23 355
RDP Measure	M413: Quality of life/diversification (Axis 4)
Further info	www.ra-sora.si
Contact	info@las-pogorje.si

Protecting water quality in Bavaria, Germany

A LEADER project brought together hop growers, a water association and experts to identify successful approaches for maintaining productivity whilst protecting groundwater resources.

The Bavarian Jura region is characterised by karst systems in which soluble rocks are dissolved to create large underground aquifers with sinkholes and caves. However, it is also characterised by shallow soil which limits filtering and leaves groundwater supplies at risk from bacteria and nutrient pollution, especially from agricultural run-off.

Reducing water consumption by hop growers

A LEADER project tackled specific challenges facing Germany's most important hop-growing area, located in that karst region. Hop production typically has intensive fertiliser use and farmers did not know how best to adapt their production to comply with important environmental regulations, notably the Water Framework Directive.

The project brought together hop growers, a water association and experts to gather information about hop-growing strategies and to improve the available data about the specific impacts of these on groundwater supplies. The findings helped better inform farmers about more efficient agricultural and environmental management options.

The implementation of growing strategies that not only protect the environment, but also enhance plant quality are crucial in addressing the potential conflict of interest between maximising yields and protecting groundwater supplies. The LEADER approach proved helpful for building more trusting relationships between stakeholders, particularly farmers.

Long-term LEADER approach

The project built on the lessons and successes of previous LEADER projects which started in 2003 with cooperation between three Bavarian Local Action Groups. These developed a geographic information system software to support soil and water monitoring, established a large number of voluntary land-management agreements and introduced buffer zones for particularly sensitive karst sites.

Having improved data helped the process of building relationships and trust between stakeholders. The water association has subsequently bought productive land that can be offered to farmers in exchange for land in geologically more sensitive areas. The

association then either leaves the sensitive areas fallow or converts them into grassland to improve their water-filtering capacity.

"It is very important that the services [farmers] provide and the compensation they receive are well-balanced and reasonable."

Anton Humml
Farmer

Further projects have been initiated by the same LAG – e.g. the project Sipplquelle, Spring water protection in Jurakarst (2015) or the project HofpeNO3 – optimising the nitrogen cycle in hop production (2016). Both projects address the issue of drinking water protection and build on the results of previous LEADER projects.

Project Name	Groundwater protection project, Jura
Type of beneficiary	Land management organisation, Water users' association and Farmers' association
Period	2009-2014
Funding	Total cost: € 223 000 EAFRD contribution: € 94 000 Private contribution: € 129 000
RDP Measure	M412: Environment/land management (Axis 4)
Further info	www.zwv-hallertau.de
Contact	asiebler@zwv-hallertau.de



© Zweckverband Wasserversorgung Hallertau

The project improved the available data about hop-growing strategies.

2. Soil erosion

Soil erosion is the wearing away of topsoil by water and wind or by human activity, such as tillage farming. Other forms of soil degradation – such as soil compaction, low organic matter and poor drainage – exacerbate the soil erosion process.

Using local knowledge

The action of strong winds and rainfalls contributes to soil erosion, especially in areas where soil structure is more vulnerable. As a result, farming productivity decreases (sometimes leading to land abandonment), and run-off of soil sediments can severely affect the sustainability of surrounding ecosystems.

The EAFRD is tackling this continual challenge by supporting both the monitoring of erosion forces and by funding awareness-raising and training of all local stakeholders affected by this threat. The approach taken can build on existing community-led knowledge (e.g. low-tech farming methods) to make the difference and produce significant results. Likewise, encouraging a participatory assessment and implementation of preventative activities is proving a useful way to combat soil erosion.

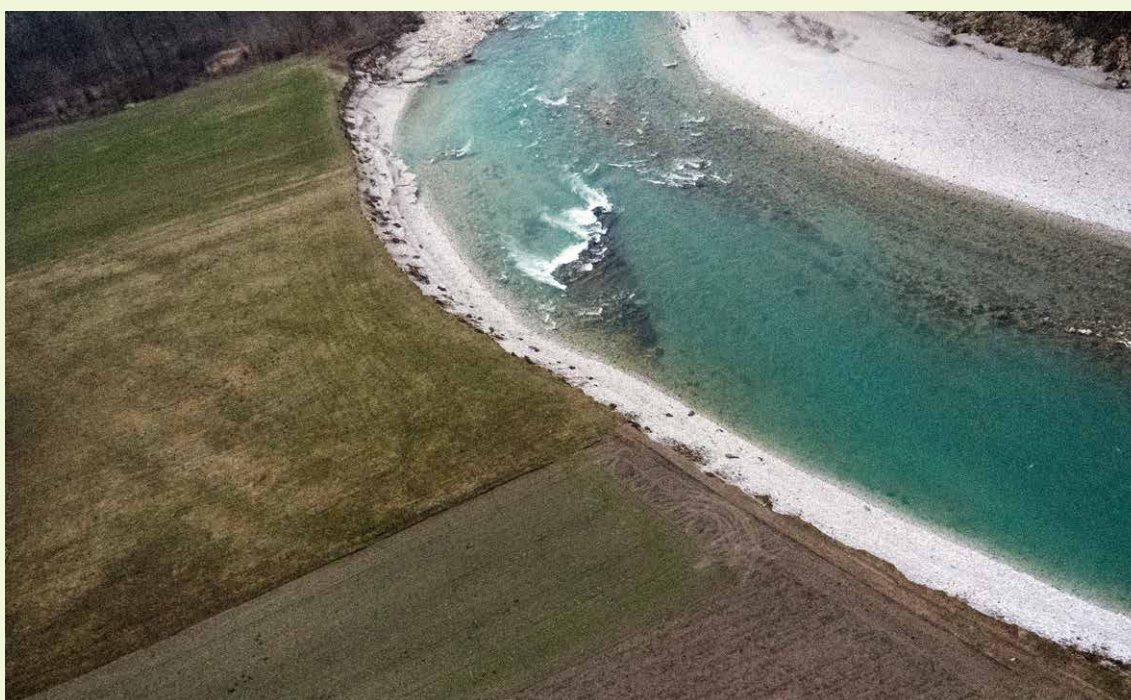
The project from Mayotte (a French overseas territory) on page 11 developed an erosion roadmap and linked monitoring tools.

Changing land-management patterns

While the rate of soil erosion varies according to specific context, its outcomes are familiar. The loss of topsoil from farmland reduces crop productivity, lowers surface water quality and damages drainage networks.

Human factors accelerate the problem of soil erosion. Soil mismanagement can derive from poor planning of cultivation and can be strongly influenced by market forces that result in volatility in the price paid for crops. A more cautionary approach favourable to soil conservation and to a more efficient use of natural resources will increase the sustainability of farming businesses. RDP funds are facilitating this process by supporting a range of goals in the management of land that taken together are slowing down the rate of soil erosion.

The project from the Czech Republic on page 13 demonstrates how soil conservation can be promoted to benefit land users and boost resource efficiency.



Fighting soil erosion in Mayotte, France

A project in Mayotte is improving local stakeholders' understanding of soil erosion and the steps necessary to combat the problem.

A major soil erosion issue

Mayotte is a French overseas island located in the Comoros archipelago, between Madagascar and Mozambique. The terrestrial ecosystem is characterised by vulnerable ferrallitic soils which are particularly at risk of erosion due to the prevalence of significantly sloping ground and aggressive rainfall patterns.

Additional factors, notably deforestation, slash and burn practices, mangrove cutting and unsuitable plantations on steep slopes, have left soils increasingly unprotected. Unplanned urban sprawl and climate change are key threats.

The resulting soil erosion threatens the sustainability of agriculture on the island, as well as the important local lagoon ecosystem which is affected by siltation and pollution of sediments. In response, Mayotte has developed an 'Erosion Roadmap' and associated action plan for 2014-2020, which seeks to promote awareness and knowledge development around erosion processes, impacts and remedial actions. The ultimate aim is to preserve the economic, environmental, and touristic potential of the island.

The LESELAM project, supported by the EAFRD, fits into the framework of the 'Erosion Roadmap'. It has worked to involve local stakeholders in a collective effort to define and implement a set of technical and organisational remediation practices to limit soil erosion on agricultural, natural and rural land. Complementary projects supported by the European Regional Development Fund (ERDF) have focused on the aquatic environments in the lagoons.

A soil erosion observatory

The project created an 'erosion observatory' to better monitor and characterise water run-off and soil erosion by installing monitoring infrastructure at four locations within three pilot catchment areas: M'tsamboro; Dzoumogné; and Salim Bé.

Specifically, it installed hydro-sedimentary instruments to measure water flows and sediment content in strategic locations, including under forest cover, on agricultural land and on banks. It also installed rainfall-monitoring and climate stations to help understand the causes of flux in measurements over time.

The locations were chosen in consultation with local stakeholders, taking account of various technical,



Public meetings and local workshops were essential to the success of the project

© CAPAM, BRGM, Les Naturalistes de Mayotte

environmental and logistical criteria and providing comparisons across different land-use types. The first monitoring period results showed a much stronger erosion process in the urbanised zone of M'Tsamboro (5.4 t of sediment per ha) compared to the more agricultural area of Dzoumogné (0.3 t/ha).

The observatory is and will be able to generate long-term monitoring data that can provide a better understanding of the sources of soil erosion, their contribution to the siltation of the lagoons and the effectiveness of any tested remedial actions. Local stakeholders are being trained to use the infrastructure and the database of recorded information for continued use after the project ends.

Training local stakeholders

An essential and central element of the project has been the organisation of public meetings and local workshops. The multi-stakeholder approach has particularly targeted farmers and the managers of public services in addition to all local inhabitants more generally.

These efforts have aimed to build upon existing local knowledge, encourage collective action and create a feeling of local ownership of the solutions identified. The hope is to develop a sense of shared responsibility for the long-term continuation of the erosion action plan for Mayotte.

More specific workshops have been organised with farmers to address soil erosion on agricultural land. These sessions aimed to show farmers practical methods that they could implement to protect their soils and, at the same time, increase their productivity. Other sessions specifically addressed politicians,

businesses, technicians or students, including those at a local agricultural college.

“People understood the techniques to fight against soil erosion, they saw the interest and most of them wanted to start implementing these techniques on their plots.”

Atoumani Anassi
Agricultural college technician

The interest of farmers and local communities has been higher than expected. One of the most positive experiences of the project so far was when over 40 participants turned up to a local workshop, held in M'tsamboro in May, 2016. Participants included local authority representatives, environmental NGOs, farmers, landowners and their families, but also non-declared or informal economy workers.

By its completion, the project held more than 15 local workshops. An initial set of seven aimed to make sure that local communities understood and accepted the project, and to get relevant feedback and engagement for planned demonstration actions. Subsequent workshops have focused more on transferring successful soil conservation practices.

Demonstration actions have been implemented on agricultural and rural land based on landscape and soil conservation techniques identified during local workshops. Through implementation, monitoring and participatory assessment of the pilot actions, the project has been able to test, demonstrate and spread awareness of techniques that work.

A key message of the project is that additional manpower, resources and high-tech innovative

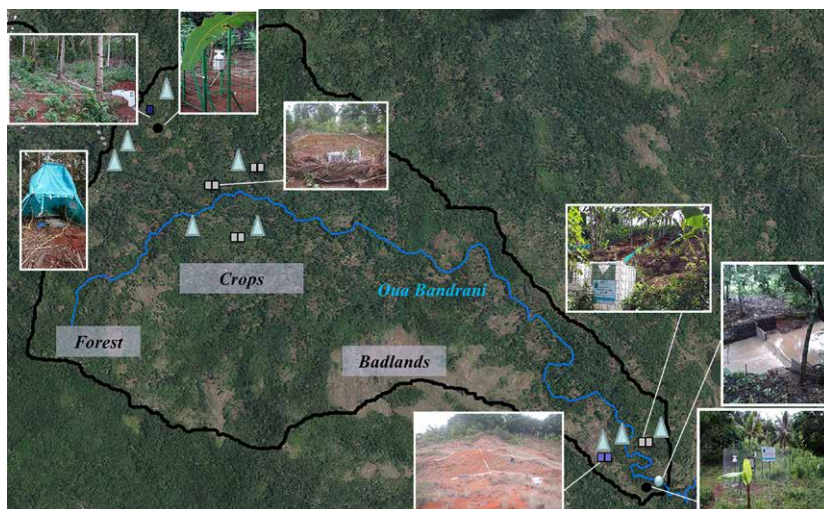
solutions are not always necessary to combat soil erosion. Existing, low-tech and sometimes ancient farming techniques can deliver significant results.

“I raise manioc in order to stop mudflows. With this technique and during rain, the soil remains where it is. We must take care of this soil because if we let it go into the sea, agriculture will not be cost-effective.”

Zabibou Ahamada
Woman farmer and chair of the local agricultural advisory service

Project Name	LESELAM (Fight against soil erosion and lagoon siltation in Mayotte)
Type of beneficiary	Public research institution; Chamber of agriculture, environmental NGO and private consultancy
Period	2015-2017
Funding	Total cost: € 1 124 156 EAFRD contribution: € 489 814 National contribution: € 182 052 Regional contribution: € 63 725 Private source: € 388 565
RDP Measure	M16.5: Support for joint action undertaken with a view to mitigating or adapting to climate change and for joint approaches to environmental projects and ongoing environmental practices
Further info	www.leselam.com
Contact	jf.desprats@brgm.fr

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The Dzoumogné catchment monitoring sites.

Using grasslands to prevent soil erosion in the Czech Republic

A former orchard's conversion to grassland completely eliminated soil erosion and improved local groundwater supplies.

The PATRIA Kobyli company employs 160 people in and around the village of Kobyli in the south-east of the Czech Republic. It is involved in various forms of agricultural production and retail, including crops, fruit, dairy, wine and meat, as well as the production of plastic and other construction materials.

Overcoming the loss of arable land

In the 1990s, a 13 ha peach orchard managed by the company – on behalf of private owners – was suffering from consistently low yields. Fruit production was abandoned, but after several attempts to grow field crops, the land started to suffer from significant soil erosion – calculated by the beneficiary to amount to 260m³ per year.

“Soil is our most valuable asset and water the most scarce resource – we have to care about them as much as possible.”

Michal Schovanek

Fruit production manager, PATRIA Kobyli

The company recognised that converting to permanent grassland could prevent erosion, but would mean an end to arable production and loss of income.

The decision was made easier thanks to RDP support for land conversion. The funding was used to cover costs of the initial grassland conversion, as well as annual and cyclical maintenance costs. The support compensated income foregone due to the loss of production on the converted plot.

Important benefits

The permanent grassland cover entirely eliminated soil erosion from the hillside. Rainwater is also better absorbed by the soil into groundwater supplies. Furthermore, the mown grass is collected and used profitably – mainly as fodder for cattle.

“A combination of poor economic results, regulatory pressure and moderate financial support encouraged the management to make the painful decision of taking valuable land out of production.”

Tomas Ratering

Czech Rural Development Expert

The experience encouraged the company to convert more land to grassland in order to avoid soil erosion, including other steeply sloping plots in orchards and



© Tomas Ratering

Converting to permanent grassland helped prevent soil erosion.

vineyards. They also started using grassland as an effective temporary cover to protect soils on plots before later replanting with cash crops.

From 2012, the company also incorporated biodiversity objectives into its management of grasslands by leaving some strips of the plot unmown to provide an improved habitat for animals and insects.

Project Name	Maintenance of grasslands recently converted from arable land to reduce erosion
Type of beneficiary	Agricultural joint stock company
Period	2012-2017
Funding	Total cost 2012-2017: € 4 868 EAFRD contribution: € 3 894 National contribution: € 974
RDP Measure	M214: Agri-environment payments (Axis 2)
Further info	www.patriakobyli.cz
Contact	roman.borovicka@patriakobyli.cz

3. Improving soil quality

As pressure on natural resources increases, resource efficiency is a strategic priority for Europe. Reinforced by the Cork 2.0 Declaration, Rural Development policy is playing a key role in protecting and improving soil quality, which is vital to ecosystems and productive sectors in rural areas.

A shared approach

Specific RDP areas of intervention under Priority 4 'Restoring, Preserving and Enhancing Ecosystems' target improvements in soil and water management. These are Focus Area 4C 'Preventing soil erosion and improving soil management' and FA 4B 'Improving water management'. Improved soil quality can result from Measures targeting long-term farm productivity and landscape resilience. Biodiversity is positively correlated with soil quality.

Looking beyond the RDPs, nature preservation is also targeted by the Birds and Habitats Directives. This has resulted in the creation of a network of the most important high-value nature sites across Europe. These sites need constant and proper management to preserve their rich biodiversity.

Riparian habitats are amongst the most likely to suffer from the effects of nutrient run-off from nearby farming areas. However, even small changes, like a coordinated method for grazing such areas, can reduce the scale of the problem. Such an approach needs to be founded upon a good working relationship with local stakeholders. Encouraging such cooperation in Europe's Rural Development policy contributes to protecting soil quality and benefiting nature conservation and social well-being.

On page 15 a Danish project is profiled. The EAFRD supported simple, yet effective tools for the greatly improved management of a riparian area.

Targeted innovation

Measure 16 (Cooperation) of the RDPs aims to promote stronger and more effective cooperation among farmers and other expert stakeholders. In so doing, it fosters the blossoming of ideas and the linking of research and innovation testing in rural areas. As a result, exciting new partnerships are being created in the countryside.

This bottom-up approach, that relies on a better understanding of farmers' needs and on their full involvement from the outset of a research project, can apply to the protection or improvement of soil quality. For instance, by facilitating dialogue between producers, food processors and technical experts, new knowledge can be derived about the best available methods to manage organic matter content – a key indicator of soil quality. Applying this knowledge on a wider scale by farmers can achieve both environmental and branding benefits along the value chain.

See page 17 for the presentation of an ambitious Italian project that is helping farmers involved in the production of a well-known and high-quality cheese to improve their ability to maintain good soil quality.



Coordinated land stewardship in rural Denmark

An EAFRD project in northern Denmark supported the coordinated management of stream-side meadows through grazing. The initiative has improved cooperation between local stakeholders and promotes a long-term coordinated approach to land management.

A land-management issue

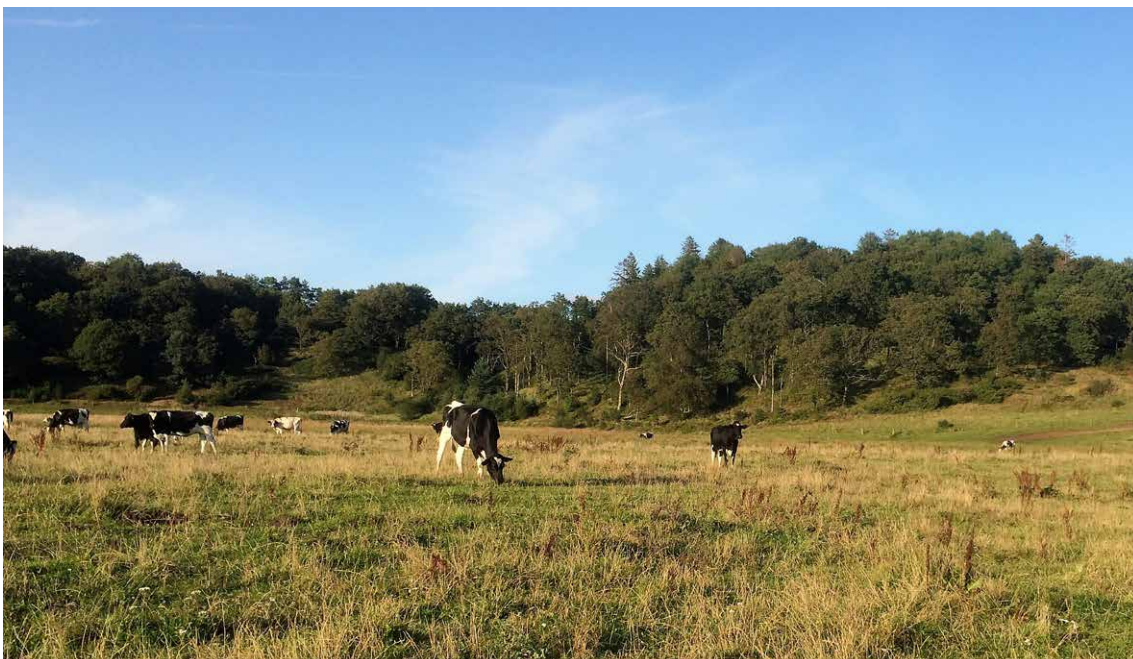
The Sønderup stream valley in the Himmerland peninsula in northern Denmark is located within the Natura 2000 network of sites, which offers protection to rare and threatened habitats and species within the European Union. Over time, meadows alongside the stream were starting to become overgrown, threatening the open nature of the valley and the water quality. To address this issue, the local farmers' association 'AgriNord' wanted to promote different landscape management options to the landowners in the valley.

Maintaining the quality of soils and water in the valley and its associated biodiversity requires an integrated approach throughout the stream basin. Careful and controlled grazing by farm animals was considered the best land-management tool in this context, thanks in part to the regular removal of overgrowth and the positive effect of animals' hooves on the embedding and germination of seeds.

Furthermore, animal waste contributes to soil fertility by adding organic matter and nutrients, such as nitrogen, and benefits a variety of organisms living in the soil. The combined effect improves the soil structure and supports its water-filtration and carbon-storage properties.

Developing coordination

In cooperation with the farming organisation 'AgriNord', a municipality received EAFRD support to re-establish green pastures surrounding the stream and instigate a long-term coordinated approach to land management in the valley. They engaged a consultant to initiate and lead multi-party dialogue between landowners, animal farmers, municipalities and other local stakeholder groups, such as anglers and walkers. Participants were particularly appreciative that these discussions focused on the opportunities and potential of working together, rather than on restrictions.



© Kirsten Birke Lund

EAFRD support was used to re-establish green pastures by the stream and initiate a long-term coordinated approach to land management in the valley.

“It has been nice to present the farmers with something positive – some options – to have a positive dialogue – and to experience the cooperation.”

Michael Palsgaard
Consultant

The approach taken facilitated broad engagement and support amongst key stakeholders. In particular, the consultant was able to establish an effective dialogue about introducing shared fencing of bigger areas – across land-ownership boundaries – to facilitate their improved management through grazing by livestock.

An important lesson learned was that many farmers had been under the impression that such land-management projects are difficult and perhaps even risky in terms of cross-compliance. The consultant helped guide them through their concerns.

Physical interventions

Alongside the stakeholder dialogue, the project conducted a thorough review of the areas in need of grazing and the available livestock in the locality in order to come up with practical solutions.

The EAFRD funding supported the installation of a series of fences and gates to create large meadows across areas of the Sønderup stream valley belonging to 14 different landowners. These sites were selected and prioritised in cooperation with the municipalities, landowners and farmers.

In some cases, the fencing was combined with clearing of the area to benefit the land. Some formal agreements were also put in place between landowners and livestock farmers. The needs of walkers and anglers were also considered: gates were installed at appropriate locations to provide access.

Over time, the grazing of the livestock in the fenced-off areas should deliver clear results in terms of land management and associated soil and water quality and local biodiversity in the valley. Thus, the impact of the EAFRD investment will continue to grow.

“The best is to see that it works! When I come to the area, I see what a difference it has made!”

Michael Palsgaard
Consultant

Direct follow-up

While EAFRD support was crucial to ensuring that change happened in the short-term, the project has established and improved relationships that will ensure long-term cooperation. One outcome is that stakeholders have continued to work together to identify further required actions along the stream.

Several more fencing projects have already been developed in the valley. In addition, an exciting aspect has been the possibility to follow up the EAFRD funding with support from the Natura 2000 grazing projects. Whilst the former was received by the municipality in cooperation with the farmers’ association, this follow-on support is accessed by landowners along the stream.

An ongoing challenge is that grazing close to the stream is often still not possible due to the saturated nature of the ground. Improved management of the stream is therefore seen as crucial to enabling the continued successful management of the land and soil alongside it. The improved cooperation between farmers, landowners and local authorities makes future coordinated efforts more likely.

“For the nature in the valley to be [fully] improved, the solution needs to incorporate the stream itself.”

Kim Buus
Local landowner

Project Name	Grazing in Sønderup stream valley
Type of beneficiary	Farmers, land owners and a municipality
Period	2012-2014
Funding	Total cost: € 38 200 EAFRD contribution: € 28 650 National and private source: € 9 550
RDP Measure	M216: Support for non-productive investments (Axis 2)
Further info	www.agrinord.dk
Contact	• Farmers Association: cwk@agrinord.dk • Municipality: SJA@vesthimmerland.dk

Enhancing soil quality in parmesan-producing regions of Italy

EAFRD support was used to set up and fund an EIP Operational Group intended to identify and share practical improvements to support the role of farmers as both guardians of the soil and producers of the regionally important Parmigiano Reggiano cheese.

Motivated stakeholders

The idea for this EAFRD-supported project came from I TER, a social cooperative that specialises in the study of soils and their application in agri-environmental contexts. The cooperative understood that soil quality influences the quality and production of the regional speciality parmesan cheese, but that farmers need more detailed knowledge to conserve soil quality.

I TER contacted the Animal Production Research Center (CRPA) and the 'Bibbiano la Culla' consortium of dairies to see if they could work together. CRPA research had already shown the benefits of grazing in permanent multi-species meadows on obtaining the distinctive flavours in Parmigiano Reggiano.

"Knowing the soil of your farm allows the agricultural entrepreneur to make technical decisions... [to] plan his own business and management choices aimed at agri-environmental sustainability."

I TER Social Cooperative

The project is developing a shared sampling and monitoring protocol to brief land users on the content and type of organic matter of the soil over time, alongside validated models for calculating the carbon sequestration of pastures in the Parmigiano-Reggiano area.

Project Name	'PRATI_CO' Operational Group
Type of beneficiary	Social cooperative (I TER)
Period	2016-2018
Funding	Total cost: € 168 284 EAFRD contribution: € 167 887 Private source: € 397
RDP Measure	M16: Cooperation
Further info	<ul style="list-style-type: none"> • www.pedologia.net • https://ec.europa.eu/eip/agriculture/en/find-connect/projects/pratico-parmigiano-reggiano-agrotecnica-impronta
Contact	scotti@pedologia.net

A new Operational Group

The partners formed an Operational Group (OG) under Measure 16 of the Emilia Romagna Rural Development Programme (RDP). OGs, which were introduced under the 2014-2020 programming period as building blocks of the EIP-AGRI⁽¹⁾, allow partners from diverse practical and scientific backgrounds to receive support for working together on specific challenges or opportunities.

Together with four farms and a parmesan producer from Bibbiano la Culla, the 'PRATI_CO' OG was created. Its mission is to identify and share guidelines for optimising the organic matter and carbon sequestration properties of soils associated with the production of Parmigiano Reggiano.

The OG has undertaken detailed studies and field activities building on the knowledge of its various members. Intermediate results include further research and communications plans, analysis of 96 soil samples with two laboratory methods, classification of farm operations in the project area and a calculation of their greenhouse gas emissions.



© I TER social cooperative

The Operational Group's detailed studies have provided insight into local soil management.

(1) European Innovation Partnership for Agricultural Productivity and Sustainability.

4. Retaining soil carbon

As the European Commission's Communication outlining ideas on the future of food and farming (November 2017) confirmed, tackling climate change and preserving the environment are key challenges. The CAP must not only protect farmers from the impact of climate change, but also ensure that farmers step up their contribution to the EU's climate change commitments. When managed correctly, soils can support carbon storage and climate mitigation.

Combining RDP Measures

The EAFRD finances the conservation of specific areas such as peatlands and forests that often face severe threats to their environmental status. One of the key incentives is to sustain the ecosystem services soil provides for society. Notably, its ability to capture carbon dioxide from the atmosphere, therefore enabling mitigation of adverse climate effects.

One of the challenges when implementing RDPs is to achieve critical mass. Coordinated management by several stakeholder groups can be essential for effective long-term management of soil across a territory. This can be achieved through the adept combination of distinct Measures.

A coordinated approach usually involves the activation of awareness-raising and assistance Measures, jointly with more investment-related and/or management-oriented ones. When farmers' needs are addressed in a flexible way, the results can be very positive, meaning that large areas of land benefit from improved soil management.

On page 19, read about how EAFRD support helped to set up a successful scheme for retaining soil carbon in a region of France.

Making forests fitter

It is easy to think that as forests generally act as a reserve sequestering carbon dioxide from the atmosphere, the need for intervention is limited to preserving them as they are. In truth, forests require not only active management to protect them from fires and negative human interventions, but also careful consideration to ensure that their capacity to store carbon is realised.

To avoid deterioration, many forests would benefit from an active plan to define the forest structure and the interventions needed to keep them healthy. Such an approach is aligned with long-term, sustainable forest management. The EAFRD is supporting such efforts.

On page 21, you will find the story of a Slovak project centred on renewal of a forest, which improved its long-term sustainability and its capacity to provide ecosystem services.



Protecting peatlands in Auvergne, France

The regional RDP of Auvergne has established a scheme to preserve carbon sequestration in Natura 2000 network areas where farmers raise cattle.

The 'Volcans d'Auvergne' regional nature park – a spectacular landscape of extinct volcanoes in central France – comprises the highland areas of northern Cantal, which have a wet mountain climate, including snow, heavy rain and severe wind. Unlike other mountain pasture areas, these benefit from relatively fertile and well-watered volcanic soils.

The local conditions also favoured the historic formation of peatland in Quaternary glacial lakes. The peatland and wet meadows that characterise the area today provide a valuable service in terms of carbon sequestration. The use of these areas as mountain pastures by local livestock farmers – typically for 130-150 days per year – helps preserve this natural landscape and the environmental services it provides. However, the incentives for modern farmers to continue bovine and sheep grazing in these Natura 2000 network areas are not high.

Supporting extensive agriculture

For the 2014-2020 programming period, the regional RDP of Auvergne created the special land category of 'common mountain pasture' (*estive collective* in

French) for these important territories. The objective is to maintain the carbon sequestration capacity of peatland and natural meadows in two Natura 2000 areas in Northern Cantal where over a hundred farmers raise cattle. The scheme is designed to specifically target support at sustaining and improving extensive livestock farming in these areas.

The scheme is called 'Agri-Environment and Climate Projects' (in French: PAEC) and combines EAFRD support under several RDP Measures. The scheme was elaborated as part of a wider pastoral strategy targeting some 500 farms and more than 17 000 hectares in the regional park.

"EU support to Natura 2000 network joint projects is a very precious tool allowing our pastoral strategy to be unrolled."

Cécile Birard
Biodiversity Officer,
Auvergne Volcanoes Regional Nature Park

In addition to the main element of direct Agri-environment-climate Measures (AECM) support to farmers (under Measure 10), the scheme also includes support to help benefit from the use of



© Airnie Bley

The project is part of a wider pastoral strategy targeting more than 17 000 hectares in a regional park.

© Aimie Bley



advisory services (under Measure 2) and joint facilitation in relation to the implementation of AECM under Measure 7 (Basic services and village renewal). Separately, support was also received for training under Measure 1 (Knowledge transfer).

The PAEC scheme starts with a training session on Natura 2000 for farmers located in the relevant territory. The training covers important topics such as: recognising grassland flora; issues of animal health; livestock manure and fertiliser management; water resource management; management of invasive species; and animal husbandry and biodiversity.

Farmers receive personalised support for preparing their AECM grant request, followed by a two-year monitoring process with regular checks on the spot and a final assessment. The project beneficiary, a regional nature park, also organises regular consultation meetings throughout the project duration, gathering farmers, local stakeholders and the Chamber of Agriculture to discuss design and implementation of the scheme.

Whilst farmers are explicitly supported to apply for AECM contracts, staff from the regional nature park also provide technical assistance upon request for other financial applications for RDP investments relevant to the environmental challenges of Natura 2000 sites.

In this context, individual farmers can also use their participation in the scheme to support applications for direct funding under Measure 4.1 (Support for investments in agricultural holdings) and a Measure of the Auvergne RDP on support for common mountain pasture investments and the national scheme to fight against predation.

Impressive results

In an initial two-year campaign in 2015-2016, the PAEC scheme aimed to cover at least 45% of the relevant territory in northern Cantal, implying AECM contracts covering at least 738 ha. By the end of 2015, some 28 commitments had been signed covering 823 ha. The number of AECM contracts is constantly growing. Overall, the scheme is expected to reach around 170 contracts during the 2014-2020 programming period.

The use of a scheme combining several Measures better prepares farmers for the implementation of actions under Measure 10. At the same time, the capacity of the regional nature park to provide multi-disciplinary support combining knowledge and skills from different fields is crucial to the scheme's success.

The AECM contracts themselves will help to preserve peatland and wet meadows of two Natura 2000 areas in northern Cantal. Along with landscape, biodiversity and water quality benefits, such management is essential for maintaining the high carbon-sequestration capacity of these wetland habitats.

“The practice of pastoralism in upland areas has long been neglected by public policies. The best sign is that more farmers want to get involved in the next campaign. EU support to AECM provides a new rationale.”

Katalin Kolosy
French Rural Development Expert

Project Name	Preserving peatland and wet meadows in Northern Cantal, Auvergne, France
Type of beneficiary	Regional Nature Park (and farmers)
Period	2015-2016
Funding	Total cost: € 558 688 EAFRD contribution: € 420 066 Regional contribution: € 138 622 Note: the project combines different types of EAFRD support on top of direct AECM commitments to farmers under Measure 10.
RDP Measure	M10.1: Payment for Agri-environment-climate commitments
Further info	www.parcdesvolcans.fr
Contact	abley@parcdesvolcans.fr

Restoring economic and environmental services in rural Slovakia

An EAFRD-supported project in Slovakia enabled restoration of a damaged and vulnerable forest. It also built a new access road to facilitate long-term sustainable management.

In eastern Slovakia's Volovec mountains, traditional deciduous forests were largely replaced by spruce in the 19th century to serve local industries. However, these trees were highly vulnerable to extreme winds, frosts and pests, significantly damaging the forest.

LESY SR, a state-run enterprise, used EAFRD support to carry out targeted interventions in order to improve the long-term viability, production potential and ecosystem services of the Volovec forest in the area of Volovske vrchy – including its important role in carbon sequestration.

Afforestation and access

Following expert assessment, the project was carried out in two distinct parts. One focused on forest renewal activities, while the other concerned the creation of a new more accessible forest road.

LESY SR used EAFRD support to prepare areas for afforestation through manual clearing of 90ha before planting 591 150 high-quality mixed seedlings across 148ha. The mixed forest – with greater presence of deciduous trees, mainly beech and maple – will be more resistant to damage caused by weather or pests.

“A crucial factor for this project was involving experienced experts. Most operations are manual so hired workers must be highly skilled. [Their] quality... is another key success factor.”

Peter Gercak
Project coordinator, LESY SR

Ongoing management supported growth of the seedlings through the brush-cutting of weeds and protection against animals across 320ha. To increase the seedlings' chances of success, the forest renewal activities were completed manually by skilled workers managed by experienced foresters.

The second part of the project saw funding used to turn 1.4km of unpaved surface into a main forest road, meeting the specifications for heavy fire-fighting and forestry management vehicles. Construction included earthworks, transverse and longitudinal drainage and paving with asphalt. It provided the first main forest road in the area, also improving accessibility for tourists.



© Ing. Peter Gercak

The project prepared areas for afforestation through manual clearing of 90ha.

Long-term impact

The project has provided for the medium-term restoration of the badly damaged forest and improved accessibility for its long-term management. This should ensure its economic and environmental services into the future, which is further supported by the ongoing commitment to its management by the project beneficiary.

“The most interesting aspect of our activity is the way in which the problem with the spruce calamity was solved – from accessing the forests to their renewal and sustainable management.”

Peter Gercak
Project coordinator, LESY SR

Project Name	Improving the viability and risk safety of a forest in eastern Slovakia
Type of beneficiary	State enterprise
Period	2014-2015
Funding	Total cost: € 460 383 EAFRD contribution: € 368 307 National contribution: € 92 076
RDP Measure	M226: Restoring forestry potential and introducing prevention actions
Further info	www.lesy.sk
Contact	lesy.ke@lesy.sk

5. Water consumption and supply

The proper maintenance of water infrastructure systems can help to safeguard security of supply for all rural activities, including farming. Likewise, the widespread uptake of water-efficient practices by the agricultural sector can significantly reduce rural water consumption. For such a vital resource, effective consultation with stakeholders is imperative to achieving the best results.

Higher precision, higher quality

Producing superior quality wines is a complex endeavour. Accurate monitoring and use of soil and water resources are inherent to the process. Water should be applied to vineyards in an optimal manner and varied according to the development stage of the plant. In southern European countries, where water scarcity is a growing problem, resource-efficient practice is essential for sustainable rural development.

The EAFRD can help viticulturalists looking to adopt a strategy based on regular analysis of soil fertility and using the latest precision irrigation techniques to reduce water consumption. The first step usually concerns a better monitoring of how water is actually being consumed. Investing in the installation of equipment that results in more efficient use of water, enables real savings in the use of this precious natural resource. To limit water use, it is often of vital importance to coordinate the action of stakeholders at a wider scale (e.g. catchment area).

On page, 23 see how a Portuguese vineyard has been made much more water-efficient.

Modernising irrigation infrastructure

Large water bodies used for irrigation require constant maintenance. Only in this way can they sustain the provision of adequate levels of water to farmers. Resource-efficient water use not only applies to farmers. It implies that water infrastructures are kept up-to-date. The older the irrigation scheme, the more important comprehensive modernisation becomes.

RDP support can fund specific interventions that are part of a wider programme and aligned with river basin management plans. These initiatives have a long-term dimension.

The result is more resource-efficient use by rural Europe's biggest water consumer – the agriculture sector. Less water consumption also reduces run-off from fertiliser and pesticide use, which can pollute local water bodies.

Find more details of this approach on page 25, involving a project from central Spain.

Improving water bodies

Water protection remains a significant challenge. A priority of European water policy is to get citizens involved in improving the quality and supply of this precious resource. EAFRD projects targeting more efficient water supply support this outreach to local stakeholders.

Regular maintenance and upgrading of water bodies can improve the local availability of water. This could happen, for example, when maintaining streams in order to prevent floods. By consulting widely, the benefits of better water management are shared amongst water users. The benefactors are not only human: biodiversity of watercourses and their surrounding areas are often sought.

In dealing with the challenges around water quality and supply, Rural Development policy is aligned with and contributes to the Water Framework Directive objectives. Projects are designed to involve a variety of local stakeholders in the process so as to access deeper knowledge of the local environmental context.

An EAFRD project that both supported water-storage capacity and reinforced local biodiversity in the Netherlands can be found on page 26.

Precision irrigation in a Portuguese winery

On the Herdade do Esporão wine estate, EAFRD support has made the vineyard's irrigation system much more efficient in a water-scarce setting.

The Herdade do Esporão estate is located in Portugal's Alentejo wine region, east of Lisbon. The region is characterised by what is known as a 'montado' – a multi-functional, Mediterranean-type landscape, with cork and other oak trees, used primarily for grazing.

Wine growing on the estate dates back to 1973. Over the past 40 years, the estate has become one of the most dynamic and forward-thinking wineries and olive oil producers in Portugal, with over 615 ha of vineyards and 80 ha of olive groves within the Reguengos de Monsaraz DOC (Controlled Designation of Origin).

A particular regional challenge is that water for irrigation is increasingly scarce. Using water resources more effectively is crucial for the long-term sustainability of the wine industry in the region. Smart irrigation can also produce grapes of superior quality.

RDP water-management support

In 2013, the Herdade do Esporão estate developed a strategy to improve the efficiency of its resource use in partnership with public research entities. It defined a code of good agricultural practice and environmental

management based on improved monitoring. Elements of the strategy included: irrigation plans based on regular analyses of soil fertility and water-retention capacity; plant health and nutrition; and water flows in the irrigation system.

Since 2015, the estate receives support for the efficient use of water in agriculture from the Portuguese Rural Development Programme. The EAFRD funds were fundamental for the acquisition and installation of improved irrigation equipment to enable the full implementation of the adopted strategy.

A challenge that the project faced was that in order to be eligible for RDP support, the estate had to comply with certain monitoring standards that it could not initially meet. As a result, it first installed meters in the pumping station, in all filtering stations and water outlet points to better track resource consumption.

The project used EAFRD support to help purchase and install: equipment to monitor soil-water movements; pressure chambers to monitor changes to the water status of plants; and meteorological stations to help inform irrigation decision-making.



© Herdade do Esporão

EAFRD support meant the vineyard could improve its irrigation system in a water-scarce setting.

© Herdade do Esporão



The new irrigation system led to a reduction of 22.6% in terms of water consumption.

With the ambition to go beyond the minimum system requirements and to join up the different installations more effectively, the beneficiary worked with an external partner to develop a tailored irrigation control platform. This platform controls the entire irrigation system, providing much greater control over the water use across all production areas based on precise needs and real-time tracking of water consumption.

“Universities and research centres possess the knowledge, we possess the raw material and the practice. We have carried out joint work with great success and we are involved in projects that can be good examples of irrigation coordination in the future.”

Rui Flores
Esporão

Important water savings

The increase in the network of sensors and improved monitoring of soil and plants greatly increased the beneficiary’s understanding of the water needs of the territory. The estate managers were surprised to notice the extent to which the combination of different grape varieties, age of plants, and soil types influenced irrigation needs on specific plots.

The combination of improved knowledge, real-time information and the control platform began to allow for differentiated irrigation across different parcels of the Herdade do Esporão estate. This improved efficiency, avoided excessive watering and facilitated a quick response to any leaks, reducing run-off and drainage losses.

In 2016, the reference values for vineyard irrigation were around 1 550m³/ha, while on the estate average values fell to 1 200m³/ha, representing a reduction

of 22.6% of water consumption. There was a similar reduction in energy consumption. Although water consumption can be heavily influenced by weather and climate conditions, the difference suggests more efficient water use.

A further result of the more effective watering is that the estate has been able to have greater control over the quantity and quality of wine produced. The monitoring data on the soils also enables the estate managers to make more informed decisions when selecting the most appropriate grape varieties for planting new vines.

The project findings and benefits were so impressive that they have already been transferred to other vineyards managed by the same company in Quinta dos Murças (Douro), os Lavradores (Castelo de Vide) and Enxofral (Alegrete). The company’s largest supplier of grapes has also introduced differentiated irrigation after seeing the project’s results. Building on the success of the project, the beneficiary is planning to move to totally automated irrigation.

“Our vision is one of superior quality and saving of a scarce resource such as water.”

Rui Flores
Esporão

Project Name	Herdade do Esporão – efficient use of water in the production of quality grapes
Type of beneficiary	Agricultural producer
Period	2015-2019
Funding	Total cost: € 34 363 EAFRD contribution: € 29 209 National / regional contribution: € 5 154
RDP Measure	M10.1: Payments for Agri-environment-climate commitments
Further info	www.esporao.com
Contact	rui.flores@esporao.com

Modernisation of agricultural irrigation systems in Spain

EAFRD funding modernised the irrigation infrastructure in the Páramo Medio zone of the province of Leon. This made an important contribution to a wider initiative which has invested hundreds of millions of euros in modernising infrastructure for the whole irrigable area of the Páramo Canal.

Páramo Medio is a 4 763 ha zone covering four municipalities to the east of the Páramo Canal in the province of Leon (Castilla y Leon). Irrigation of agricultural land in Páramo Medio was transformed by the construction of a reservoir in the 1950s that enabled a comprehensive irrigation system. However, over time, this infrastructure became increasingly outdated and inefficient.

The Agrarian Technological Institute of Castille and Leon used RDP support to replace outdated irrigation equipment in Páramo Medio. The money helped to finance the construction of an automated pumping station, a piping system and electrical installations, as part of a modernised pressure irrigation network.

Latest technologies were used to create an automated system that is able to control pumping according to requirements. The new installations optimised water use in the Páramo Medio zone and reduced water consumption by 28 %.

“Páramo Medio saves 1.5 million litres of water through the modernisation of all its holdings.”

‘Diario de León’ online newspaper
(13 June 2013)



© Wikimedia Commons, LAVF

EAFRD funding modernised the irrigation infrastructure as part of a wider initiative to improve the irrigable area of the Páramo Canal.

The optimised watering saved energy and reduced the amount of fertiliser and pesticide run-off from the agricultural land, protecting groundwater. Furthermore, the productivity of maize increased from 10 000 kg/ha to 14 000 kg/ha.

RDP support within a broad initiative

The RDP-supported project fits within a broader investment in modernising irrigation in the Páramo area of over € 184 million for the period 2007-2013. This supported interventions over 32 789 ha of a total irrigated area of 45 598 ha. The regional authority provided around 40 % of the funding, with the rest coming from farmers and European funds.

“[Modernised irrigation should] increase productivity by 20%, if sowing takes place at the right time [and] the weather is good.”

Julio César Carnero
Páramo Medio Irrigation Community

Project Name	Improvement and modernisation of the irrigation system in the community of Páramo Medio
Type of beneficiary	Public Technological Institute
Period	2008-2010
Funding	Total cost: € 5 700 000 EAFRD contribution: € 2 800 000 National / regional contribution: € 2 900 000
RDP Measure	M125: Improving and developing infrastructure related to the development and adaptation of agriculture and forestry (Axis 1)
Further info	www.itacyl.es
Contact	info@iriego.es

Reconstructing the Averlosche Leide canal in the Netherlands

A watercourse reconstruction project created retention areas to provide additional water-storage capacity and reinforced local biodiversity. Local stakeholder engagement was key to the planning and delivery of the project.

The Averlosche Leide is a canalised stream in the municipality of Deventer in the Province of Overijssel in the north-western Netherlands. The man-made stream is 5.2 kilometres long and flows through mainly agricultural land between the Overijssel Channel in the east and the Soestwetering in the west.

The main function of the stream is to eliminate surface water from its catchment area – which totals 520 ha – and drain it into the Soestwetering. It is also possible to let in water from the Overijssel Channel. These processes mean that the stream can regulate water levels in the area in favour of economic and social uses, in particular agriculture.

The regional water board 'Drenthse Overijsselse Delta' (WDOD) is responsible for the management of watercourses in the area, including the Averlosche Leide. The WDOD had four major policy targets for the period 2010-2015, in terms of water retention, biodiversity, water quality, and nature and the environment.

It identified a number of watercourses as priorities. The reconstruction of the Averlosche Leide was identified as one such priority for intervention, particularly to improve local water retention and reinforce biodiversity.

Early stakeholder involvement

The water board was able to access EAFRD support under the Dutch Rural Development Programme in order to support the reconstruction of the Averlosche Leide. In this context, it gave a high priority to local stakeholder engagement in the plans and activities of the project.

Such a strong focus on stakeholder involvement from the planning phase of the project was a relatively new approach for the WDOD and the project coordinator is proud of the process that they were able to follow.

"The new way of working was much more effective. We used to just start a project, but for this one, we involved stakeholders at an early stage. This made the project stronger."

Hilde Buitelaar
Project coordinator, WDOD

Already at the planning and preparatory stage of the project, the WDOD organised an information meeting for local stakeholders in March 2010. It also initiated

targeted dialogue with local landowners, the municipal authorities of Deventer and Olst-Wijhe, a farmers' association and the Averlo Local Action Group. In December 2010, a newsletter about the plans and expectations of the project was circulated to local households and businesses.

Strong stakeholder involvement proved successful in raising public interest, engagement and support. Furthermore, local stakeholder knowledge of the canal and its surrounding environment and their ideas and input were also useful for refining the plans and developing new targeted interventions. For example, thanks to an idea from local inhabitants, the project included plans to support local fish stocks.

"When stakeholders are involved, the project gets more public support and less resistance. Moreover, when people feel engaged they even come up with ideas to improve the project."

Marieke Kok
Rural development expert

Physical interventions

The project used the EAFRD support to carry out a series of alterations to the canal and surrounding land, using professional and experienced watercourse management teams.

The Averlosche Leide was broadened out where possible and made less deep. At the same time, one of the banks of the canal was softened to create a slope rather than a hard edge. This serves to allow and stimulate a more natural and varied growth of vegetation where the water meets the shore.

To support additional water retention, the project removed the topsoil from areas alongside the canal in six different locations. This served to create eight hectares of water storage areas which naturally fill with water from the canal.

Other interventions focused specifically on support for biodiversity. Five existing locks or barrages along the canal were replaced by fish-friendly constructions that enabled fish to navigate the canal.

A specific amphibian pool was also created, which is protected from flooding at high water in order to prevent it from becoming populated by fish. This has the particular aim of providing valuable habitat for the

rare Dutch Fire Salamander (*Salamandra salamandra terrestris*) in the area.

“An integral approach of water management and improvement of biodiversity and ecological systems is very effective. However, patience is needed when you look for concrete results after changing something in ecological systems.”

Marieke Kok
Rural development expert

IVN, an educational organisation on environment and sustainability. Another crucial long-term impact of the project is that early stakeholder involvement is now an integral part of other projects and activities of the regional water board.

“The Averlosche Leide is fantastic! Thanks to the fish-friendly construction, the biodiversity increased considerably.”

Rob Boon
Local nature photographer

Long-term impact

The reconstruction of the Averlosche Leide has improved management of water resources in the area, both to support agricultural use of the surrounding land and to improve water retention. In addition, it will provide important ecological benefits.

The long-term impact of the project will be monitored by the water board which continues to maintain the site. Biodiversity and water quality are frequently analysed. Five years after completion of the project, many knowledgeable local stakeholders – including nature guides, walkers and photographers – have noticed a considerable increase in local biodiversity around the canal. Furthermore, the Averlosche Leide is now used as a demonstration site for study visits by

Project Name	Reconstruction Averlosche Leide
Type of beneficiary	Regional Water Board
Period	2011-2012
Funding	Total cost: € 1 315 915 EAFRD contribution: € 575 008 Provincial contribution: € 380 077 Private source: € 360 830
RDP Measure	M216: Non productive investments (Axis 2)
Further info	www.wdodelta.nl
Contact	petraschep@wdodelta.nl



The project provided additional water storage capacity and reinforced local biodiversity.

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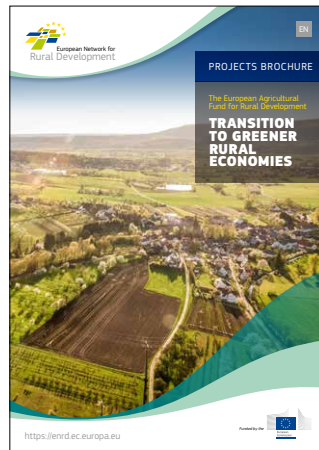
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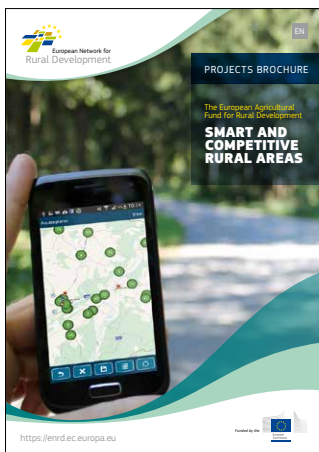
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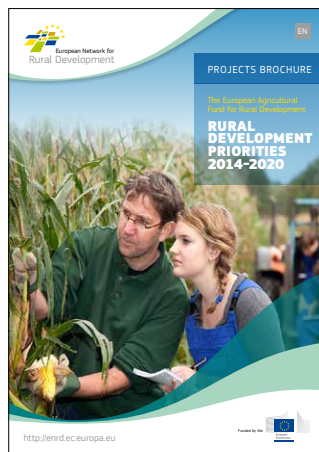
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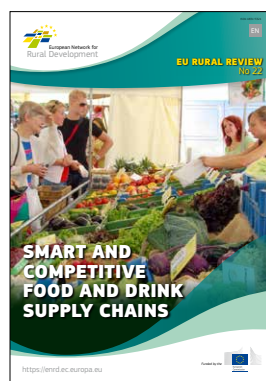
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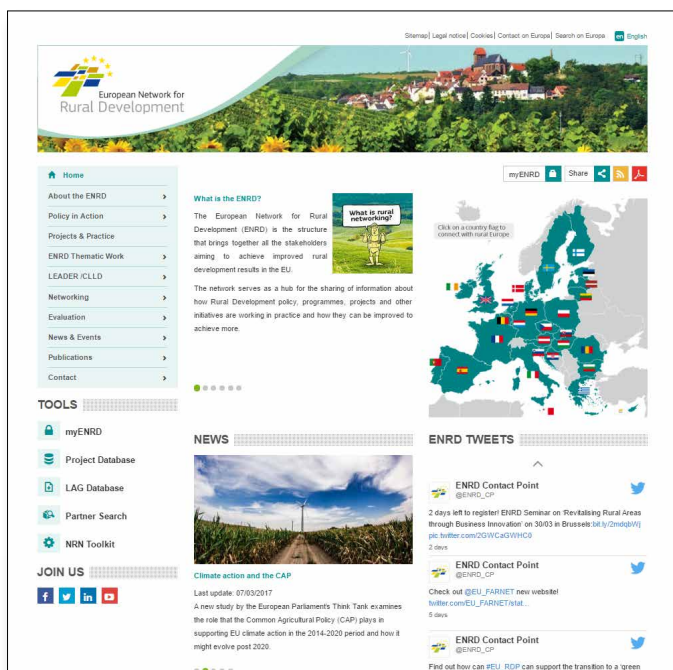
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