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ENRD Thematic Group (TG) on sustainable management of water and soils

Inventory of examples & case studies collected

September 2018

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1. Multi-actor approaches

Summary of main findings from case studies

enable stakeholders to become agents of change – minimise barriers for stakeholder engagement

when planning your capacity building component – consider `blended learning` including e-tools and field demonstrations and group learning, too

changing attitudes may be more important than finding the best technical solution

farmers consider profitability when thinking about (soil) improvement – take this into account

involving local farmers takes time and may be difficult – be patient

trust farmers – it strengthens their involvement

implement a good IT system to collect, analyse data

cooperative decision-making improves acceptance of measures/interventions

Summary table of examples

(Source: [case studies](#) / [survey responses](#) / [other sources](#))

No	Country (organisation)	Title	Funded by	RDP measure	Sub-theme	Ongoing (Y /planned/ completed)	Short summary	Lessons learned / recommendations
1	Finland (University of Helsinki, Ruralia)	OSMO project - capacity building for farmers on preserving soil	EAFRD	M16.5	Multi-actor approaches	Ongoing (2015 -)	The project aims to transfer the most up-to-date knowledge on soil health management to farmers in the form of blended learning sessions (e-learning, field practice, workshops) in five study	Lessons learned/Recommendations <ul style="list-style-type: none"> - Farmers are willing to improve soil health – if they know what to do and it is probably profitable. - Blended learning – mixture of e-

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	Institute)	health www.maan-kasvukunto.fi					groups in four Finnish regions. The project also tested tools and methods and adapted them to the Finnish context. Various methods were tested on eight farms (crop, potato, vegetable growing farms). Farmers learned to make their own soil health management plans.	learning, field days, workshops – is a good tool for training farmers. - Bringing scientific knowledge and helping farmers work together in a collaborative capacity building framework has worked.
2	France (Poitou-Charentes)	Local contract for quantitative water management	EAFRD	M125 (RDP 2007-2013); M4.3.1 & M10 (RDP 2014-2020)	Multi-actor approaches , Sustainable water management	Ongoing (2012 -)	'Coop de l'eau 79' is a water management scheme between the Water Agency and the Chamber of Agriculture with the purpose of reducing water withdrawal from the river basin and reduce pressure on the water resources in the area (surface and ground waters). The project included socio-economic facilitation and control tests on plots of land, as well as the feasibility of water reservoirs (winter storage of waters for summer use to reduce water extraction in the summer period). On the economic strand of the feasibility phase, the focus was put on diversification, developing young farmers setup, livestock feed autonomy, market gardening, etc. The issue was examined in a context of lowering corn prices and increasing water prices. The trial focused on various financial scenarios for agricultural margins related to the price of corn and its yield, over a four-year period (2013-2016). The weighted	Barriers/Bottlenecks - All parties agreed that the EAFRD allocation for this type of investments is insufficient to bolster investments from the water management agency of Loire-Bretagne. - With regard to budgetary aspects, the core decision maker is the managing authority in charge of European Structural and Investment Funds (ESIF). Since the 2016 territorial reform, the number of regional authorities was reduced from 26 to 13 and Poitou-Charentes is now part of Nouvelle Aquitaine. This regional assembly is currently reviewing its regional policy on water, based upon the 2017 appraisal and a series of public consultations meetings (from April to June 2017). The new water strategy will be endorsed in 2018; these overlapping institutional calendars and the rising societal challenges with regard to climate change create insecurity for

No	Country (organisation)	Title	Funded by	RDP measure	Sub-theme	Ongoing (Y /planned/ completed)	Short summary	Lessons learned / recommendations
3	France (upper Savoie)	Terragr'eau – Soil and water quality on the Evian water basin	ERDF / Private / EAFRD	M10, M4.1. Collective investment in agricultural productivity	Multi-actor approaches , Sustainable water management, Soil quality and nutrients	Completed (2015- 2017)	<p>average price difference over four years amounts to 6.7 q/ha.</p> <p>Terragr'eau is a farmers' grouping with around 50 agricultural holdings specialising in dairy farming, located on the Evian water basin. Together with the local authorities and the industrial partner, they participated in the creation of the first French carbon neutral biogas plant. The project relies on a double governance model: on the one hand, the biogas plant owned by the grouping of local authorities (Pays d'Evian) and managed by SAS Terragr'eau, for the treatment of livestock effluents; and on the other hand, the farmers' grouping, the water company and Pays d'Evian (SICA Terragr'eau). The farmers' grouping is responsible for spreading the digestate on agricultural land. It adopts a precision farming approach based upon high-performance equipment. Joint area-based projects can combine several AEC measures under a single scheme called 'PAEC' (<i>Projet Agro-Environnemental et Climatique</i>). Such schemes define their own menu of premiums and unitary commitments in compliance with the local conditions.</p>	<p>local farmers who remain subject to decisions that directly impact their day-to-day farming practice.</p> <p>Barriers/Bottlenecks</p> <p>- The Terragr'Eau EEIG statutes include private partners in the grouping, whereas EAFRD funding for productive investment (M4.1) is targeting farmers exclusively. In order to be able to get EAFRD funding, the EEIG farmers had to create a new grouping under the conventional statute of 'CUMA' (<i>Cooperative d'Utilisation de Matériel Agricole</i>), without their industrial partner. This allowed them to buy a new truck for spreading manure.</p>

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4	Hungary	Landscape farming via the cooperation measure	EAFRD	M16.5	Multi-actor approaches	Ongoing	<p>The landscape farming cooperation measure in Hungary has recently been launched to pilot a landscape-wide, results-based approach to environmental management.</p> <p>The aim of the measure is to facilitate, by encouraging cooperation between farmers and supporting implementation, the application of harmonised regional approaches to improve climate resilience in the countryside by, <i>inter alia</i>, improving water balance, reducing soil degradation, and facilitating efforts to increase carbon sequestration and the reduction of greenhouse gas emissions. In the target areas for 'landscape farming' payments will be based on the environmental performance of farms, which are calculated by a green point assessment (points awarded for performance on different 'green' indicators).</p>	<p>Barriers/Bottlenecks</p> <ul style="list-style-type: none"> - It appears that a call for cooperation is ongoing and no decision has been made as to the projects selected. Insufficient administrative capacity to process the applications received may led to a limitation being set (tbc).
5	Ireland	Collective AECM in relation to common management of grassland and peat land	EAFRD	M10	Multi-actor approaches , sustainable soil management	Ongoing	<p>The 2015 GLAS Agri-environment scheme supports and gives priority access to farmers who own common (peat and grass) land. Farmers are required to submit a five-year Commonage Management Plan, signed by at least 50% of active shareholders (farmers) or a group of shareholders together owning more than</p>	<p>Barriers/Bottlenecks</p> <ul style="list-style-type: none"> - Initially the uptake of the measure by farmers was very low. It was due to how the whole process was approached. Essentially the farmers preferred to self-organise the coordinated action.

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							50% of the shares in the commonage. The agreement has to be drawn with support from a qualified adviser, with the aim of achieving a balanced grazing regime over an area, including maximum and minimum stocking levels.	
6	Italy (Marche region)	Agri-Environmental Agreement for Water protection in Aso Valley	EAFRD	M1 (1.1and 1.2); M10 (10.1); M11 (11.1 and 11.2); M16 (16.2 and 16.5)	Multi-actor approaches , Sustainable water management	Ongoing (2016 – 2022)	Agro-Environmental Agreements (AEAs) can be considered as one of the most relevant collective approaches to agri-environmental action which has been experienced in Italy. An AEA may be defined as ‘a set of commitments for farmers in a limited area, supported through a mix of RDP measures, that can be activated to reach specific environmental goals. Based on a territorial approach and by involving public and private actors in the context of a shared project, AEAs aim to implement collective and coordinated actions for the management and improvement of the environment. The first designing phase of Aso Valley AEA date back to 2007, when a small group of farmers (allied in a local farmers association Nuova Agricoltura – ‘New Agriculture’) started a grassroots initiative to adopt integrated management techniques at a territorial scale. During the 2014-2020 programming period the AEA was promoted by the	<p>Barriers/Bottlenecks</p> <ul style="list-style-type: none"> - High transaction costs, mostly for gathering AEA coordinator and local farmers to deal with complex RDP administrative requirements. - Setting up the process: involvement of local farmers is a long and difficult process - Administrative tasks: due to the nature of the coordinator (public authority), the AEA requires the signature of a contract by all farmers, in front of a notary. - One of the main barriers to collective approaches is related to the setting up of the process and in identifying the right institution/actor which may stimulate and coordinate collective action. <p>Lessons learned/Recommendations</p> <ul style="list-style-type: none"> - M16 calls could be useful but they need to be ‘open’ at the beginning of the programming period. - The main factor for success is the policy innovation related to the package of

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							<p>municipality of Altidona, since this local authority was already the promoter and coordinator of the 'River Contract', an innovative planning instrument aimed at developing the river territories through integrated strategies co-developed by a broad range of local stakeholders.</p>	<p>Rural Development Programme measures involved in the AEA. Common characteristics of the local farming system and the proactive engagement of farmers in the definition and implementation of the agreement, also played a crucial role.</p> <ul style="list-style-type: none"> - The participatory process aimed at co-designing the AEA was crucial to translate farmers' knowledge into a project with specific environmental targets to be reached on a territorial scale. - Launching a call to finance the activities of 'agri-environmental facilitators' who are in charge of the animation activities and of coordinating the collective implementation of RDP measures as well as of organising and/or delivering training and technical advice.
7	Netherlands	Collective AECM	EAFRD	M10	Multi-actor approaches, Results-based payment schemes, Targeted AE measures	Ongoing (2016 -)	<p>The Netherlands has developed a new voluntary regional approach for agri-environmental and climate measures based on a new role for the authorities: the collective approach. Farmers cooperate voluntarily to obtain goals for ecosystem services (biodiversity and water), by making use of collectives. the scheme deals with collective applications only; individual applications are no longer possible. Next to a drastic scheme</p>	<p>Barriers / Bottlenecks</p> <ul style="list-style-type: none"> - The CAP is still merely focused on individual farmers. This led to difficult discussions on the feasibility of collective approaches, e.g. because of the relation between Pillar 1 and 2 conditions and sanctions (e.g. agri-environment and cross-compliance). The CAP, in general, should rethink whether it is fit for purpose when it comes to collective approaches.

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							<p>redesign, the existing farmers' agri-environment cooperatives had to drastically change their organisation and to professionalise their working methods. The Netherlands has opted for a collective result-based scheme at landscape scale. This implies that beneficiaries are no longer the individual farmers but a group of farmers and other land managers that jointly commit under a contract with the managing authority to undertake certain commitments and obligations. The measure includes two layers of commitments:</p> <ol style="list-style-type: none"> 1. In line with the contract from the management authority, the collective has to establish a certain kind of habitat at landscape level. This habitat is defined as minimum/maximum hectares that are managed in a specific way by the group of farmers; and 2. The second layer of commitments ensures that the sum of all management activities per hectare is equal or less than the maximum sums for these activities, according to the calculation of management costs for these activities. <p>The new scheme creates a shift in implementation from the government to</p>	<p>- The relation between agri-environment and 1st Pillar greening remains a major concern. Due to privacy reasons, the cooperatives are not even aware of the location of greening measures when designing their regional agri-environment management plans. Improved coordination of 1st and 2nd pillar greening measures can create important synergies.</p> <p>Lessons learned / Recommendations</p> <ul style="list-style-type: none"> - Collective approaches are served best by maximum flexibility in measures, payments and justification procedures. A shift from fixed measures to 'achievement indicators' would greatly help enhance collective approaches. - More generally speaking, collective approaches (shifting implementation to the region) require a new trust and commitment between government and cooperatives/the farming community. - There is a need for new instruments (the Netherlands has now chosen for certification, but this is only one way) to 'translate' this commitment to formal regulations.

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8	Spain (Andalucia)	Support in the 2014-2020 RDP for the sustainable management of water and soil	EAFRD	M1, M4, M10, M11, M16.	Sustainable management of water and soils, Multi-actor approaches	Ongoing (2014 - 2022)	<p>the cooperatives. The cooperatives' implementation costs are set at (on average) 15% of the total budget granted.</p> <p>Operations of measures M10 and M11 are included in the Integrated management and control system. This is based on remote sensing techniques, and inspections are carried out in the field only to a sample of the applicants. In most of the operations of 10.1, and particularly in those that have a direct contribution to the sustainable management of soil and water, it has been established as a mandatory requirement for beneficiaries to participate in integrated production groups, and in training sessions for internal verification or self-control system.</p> <p>Operations of measures M1, M4 and M16, with direct or indirect contribution to the sustainable management of soil and water, are not area-based payment, nor are they included in the IACS. The control of 100% of requests is based on the verification of all the requirements and commitments to control through the documentation submitted by the applicants. In the case of investment operations, such as those of M4 and</p>	<p>Barriers/Bottlenecks</p> <ul style="list-style-type: none"> - For some of the measures of the 2014-2020 RDP, the Spanish evaluation of ex ante conditions in the water sector in the ERDF and EAFRD had to be overcome. - In agri-environmental measures, farmers are compensated for loss of profits and the cost of carrying out beneficial practices for the environment. This does not offer incentives and farmers are subject to a great burden of controls and risk of having to return the full amount of aid. - In non-productive investments of Sub-measure 4.4, which are very beneficial for the environment but of little economic value, the same degree of control and bureaucratic burdens are required as in other sub-measures such as 4.3. or 4.2, aimed at large investments. The adequacy of proportionality between guarantees on the achievement of objectives and controls and amounts of aid granted must be reviewed. - Neither agriculture nor the

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							M16, field inspection is carried out to verify the conditions of admissibility and the non-start of operations within the administrative control.	environment are exact sciences, so the quantification of results of RDP actions for soil and water are difficult to evaluate. In spite of this, the selection of the measures in the RDP is completely conditioned to the verifiability and controllability and evaluation and quantification of results. Thus, it is very possible that the most appropriate measures are not always adopted, because those that are not directly measurable and quantifiable must be rejected.
9	Sweden	Case study: The Tullstorp Stream Project	ERDF / European Neighbourhood & Partnership Instrument	n/a	Multi-actor approaches, Sustainable water management, nutrients management	Completed (2013-2014)	<p>The specific focus of this case study was on the success factors and challenges, and how can national and regional agencies work to improve the effectiveness of similar projects such as the 'Tullstorp Stream project'.</p> <p>The Tullstorp Stream is located in the most southern part of Sweden in one of the country's most intensive agricultural areas where 85% of the land is arable and in a nitrate vulnerable zone. In 2009, the Tullstorp Stream Association (TSA) by landowners was founded and the same year the demonstration zone, 2 km in length, was constructed. Since then, 35 wetlands were created, several inventories made, reports on possible actions produced and other activities</p>	<p>Lessons learned / Recommendations</p> <ul style="list-style-type: none"> - Access to coordinators on different levels is important. Stakeholders mention such access as perhaps the most important factor. Together they have managed to find start up funding for the project and also funding to keep it running. - Need well-defined roles and clarity about mandates and responsibilities among the association, the chairman and the project coordinator and external stakeholders. i.e. formalised agreements between landowners. - AECM simplification has to do with, for example, the information and support a beneficiary receives while applying for a grant or having controls.

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							<p>with connection to the project took place. All of the landowners along the stream, around 45, have signed an agreement saying that the TSA has the right to dispose a stretch of adjacent land along the stream. The landowner still owns the land and can use it as long as it is not contrary to the signed agreement or the intention and statutes of the TSA. The agreement is individual and was created and signed by the landowner and the TSA in accordance with the grand plan for the area. The TSA will then apply for AE payments from the RDP for maintenance of the land along the watercourse. If the TSA is the only beneficiary along the stream it would simplify the management instead of each landowner maintaining their own stretch.</p>	<ul style="list-style-type: none"> - For a farmer, it is rarely a single application form or legislation that makes the burden too heavy. It is the sum of several pieces of legislation that has to be considered. Therefore, different sectors need to cooperate more in order to find solutions. - Need a more transparent system to follow how each application is prioritised. This will most likely create more administration in the initial phase – e.g. for the 2014-2020 RDP, Sweden developed a system for selection criteria to value and prioritise projects. - Need for better administrative routines between agencies when it comes to agri-environmental projects. - Similar project applications but in different regions may be treated differently due to certain flexibility within the RDP. Need for a clear national basic level, as well as an upper limit of what an application should contain. - Give more time. Often it is difficult to draw conclusions of the environmental effects of funded projects given that it often takes several years before an effect is visible. - It is important that experiences, such as interpreting legislation, are collected

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10	United Kingdom	Fferm Ifan Conwy Area case study on developing initiatives in agriculturally marginal landscapes	EAFRD	M16.5	Multi-actor approach to agriculturally marginal landscapes	Ongoing (2017 – 2020)	The decision to apply for the SMS builds on a ten-year legacy of collaborative working and, as such, does not represent a step-change in the group's behaviour. Rather, the rationale outlined echoes many of the previous points made about why and how group members collaborate. The difference is the increasing pressure that the sector is under, which has broadened and deepened their motivation to work together has both	and made available, and used in the planning of actions on a national, regional and local level. Enabling factors: - Ten-year legacy of collaborative working together; and - Openness towards each other's agenda, respect and capacity to listen.
11	Austria (EurEau – OVGW)	Water protection contract Zirking	Private	n/a	Multi-actor approaches , Nutrient management plans	Ongoing	A collaboration started with the chamber of agriculture to help reduce nutrient inputs, combining voluntary and compulsory measures. The actions by/aimed at farmers for reducing the application of fertilisers allow the nitrate concentration to be reduced from 42mg/L to 26 mg/L in the catchment area and from 50 to 21 mg/L in wells. Voluntary measures included reducing the amount of fertilisers, distribution of fertilisers in certain periods only, extension of winter cover, reduction of root crop growing, and giving up the production of corn on soils with high discharge rates. It was necessary to	n/a

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							reduce the quantity of fertilisers, given that there was a prohibition on using fertilisers in certain periods, and there were requirements for crop rotation and grain legumes. Use of maps with grouping of farmland in three soil categories depicting the risks of discharge rates, field-related documentation, tables with thresholds for fertilisers depending on the crop/soil category/earnings/nitrogen input from previous crops also supported the actions taken.	
12	Spain (NEEMO EEIG)	ES_WAMAR www.life-eswamar.eu	LIFE progra mme	n/a	Multi-actor approaches , Nutrient managemen t plans	Complete d (2006- 2011)	ES-WAMAR tackled the multiple environmental issues derived from pig slurry use in agriculture in Aragon, Spain (pig farming generates 13.5 million m ³ of slurry/year). The surplus of slurry, in areas where there is not enough cultivation land to capture all the volume produced, must be exported to other areas after applying a treatment for better management or being subjected to purification systems. Specific objectives were to reduce soil, water and air contamination – especially nitrates from non-point sources – in areas around pig farms; and to maximise nutrient recycling through the valorisation of the pig slurry on arable land. The ES-WAMAR system was implemented by the newly	Lessons learned / Recommendations - The collective management is an effective model for addressing the problem of slurry management. - Slurry has a high potential value as an organic fertiliser. - Treatment plants are an alternative to the problem that is generated in areas with high livestock load and little availability of farmland, although with a high cost - The treatment has a high electrical cost that can be mitigated with the generation of biogas and its use as renewable energy, but the economic conditions of operation of the same are very important and can render them useless (economic effects of elimination

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							<p>created Swine Waste Management Enterprises (SWME). These companies (one per project area) centralised the management of the resource which included: planning, organising and implementing manure collection; treatment (where needed); and distribution and field application. The collective management approach was found to enable cost sharing, improved energy efficiency and higher control of field application, as well as ensure support and engagement with the overall environmental aims of improved waste management.</p>	<p>of subsidies to cogeneration).</p> <ul style="list-style-type: none"> - The new technologies are a very useful tool to implement management models, optimise costs and processes and facilitate the traceability of the actions that are carried out. - The involvement of local and regional administrations is crucial to stimulate projects that can serve as a model for the implementation of large-scale environmental management policies.
13	Italy, Emilia Romagna (NEEMO EEIG)	AQUA - "Achieving good water quality status in intensive animal production areas" http://aqua.crp.a.it	LIFE programme	n/a	Nutrient management plans, Multi-actor approaches	Completed (2010 – 2014)	<p>The project was designed to show how to reduce pollution of both groundwater and surface water resulting from the losses of nutrients of agricultural origin (nitrogen and phosphorus), by optimising their use in livestock farms and on a territorial scale. Strategies were implemented both at the single farm level and at a collective level (consortium). A feed plan was drawn up for each livestock farm to limit nitrogen excretion based on the diet protein lowering and/or the best balance between energy and protein in the rations. A consortium was set up during the project bringing</p>	<p>Barriers/Bottlenecks</p> <ul style="list-style-type: none"> - The Italian derogation over the 170 kg N/ha/year set by the Nitrates Directive for NVZs, which the project intended to accompany, has obtained poor accession due to the excessive bureaucratic burden, in the opinion of the farmers and their associations. <p>Lessons learned/Recommendations</p> <ul style="list-style-type: none"> - The application of good agro-environment practices and the association with optimum nitrogen management in the barn make it possible to improve the nitrogen balance for the whole farm. - An analysis of the nitrogen balance,

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							<p>together dairy farms and farms without livestock. In the dairy farms, the solid-liquid separation of the slurry was effected by the use of a mobile separator. Another group of arable farms used the separated solids for fertilising land under cereals that normally did not receive organic matrices. During the consortium activities it was decided to optimise the use of the separated solid fraction, also exploiting it to produce renewable energy through anaerobic digestion.</p>	<p>with specific concentration on the internal nitrogen flows, can help assess the headings and processes that have the greatest effect on the nitrogen cycle. It also makes it possible to highlight which farming processes are less efficient in making best use of the element. This then makes it possible to identify alternative practices or systems to improve management, as implemented in the project's demonstration farms.</p>

2. Soil and Water Management/Nutrient Management Plans

Summary of main findings from case studies

use the information farmers already have – do not dismiss their existing knowledge

include field demonstrations in capacity building for farmers – this may work better than conventional training sessions

consider the gap between farmers' existing knowledge and the knowledge needed for applying new technologies

communicate consistently and aim for strong farmer-consultant relationships based on trust

plan your data collection and soil indicators thoroughly – consider the type of soil, the type of crops

think about the regulatory context (also the national, regional rules, ownership v lease, etc.) when thinking of farmer behaviour regarding adopting the new measures

organise shared learning events with farmers, consultants, researchers, public administration, etc.

good incentives improve performance – include incentives in your scheme, plan these carefully

Summary table of examples

(Source: [case studies](#) / [survey responses](#) / [other sources](#))

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14	Finland (Ministry of Agriculture)	Ilmase	EAFRD	n/a	Sustainable management of soils and	Ongoing (2016-2018)	'Climate-wise solutions for the countryside' is a communication project in Finland, concentrating on farming and	n/a

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		and Forestry)			nutrients		rural areas. The aim of the project is to bring scientific knowledge on climate change and climate-wise solutions closer to the everyday life of farmers and rural stakeholders as well as to hear their experiences, experiments and thoughts about the possibilities and challenges for climate actions. The project is run by the Natural Resources Institute Finland and is taking place between 2016-2018.	
15	Hungary	Sustainable management of soils/ nutrient management	EAFRD	M10	Sustainable soil management , Nutrient management plans	Ongoing (2016-)	Management zone soil samples and lab analysis are used as a basis for precision nutrient management plans at an individual farm (280 hectares – corn, wheat, barley, sunflower production) in a highly eroded landscape (Vértesalja area). The farmer collects the information, regarding field size and locations, which is then sent to the consultant. The consultant creates a GIS database from the provided information, which contains filed boundaries with all necessary attribute information. A soil sampling design is then created using several years of satellite imagery and if available soil scanning results and or yield maps and other available spatial information. The soil sampling design is a management zone based sampling, where the average size of a zone is 3 ha. This detailed	Barriers / Bottlenecks <ul style="list-style-type: none"> - Farmers' basic knowledge may limit the implementation of new technologies. - Farmers have vast amounts of information which is often unused. - Education and training provided to farmers under the RDP may at times be ineffective – more field demonstrations could be more useful as suggested by farmers - Farmers' scepticism – in spite of their awareness of the problem of soil degradation – is rooted in the lack of proper tools and inconsistent communication from consultants/advisors. - Nutrient management software, technologies and site-specific applications should be improved.

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							design is then provided to the sampling technicians equipped with automated soil samplers on 4x4 vehicles. Soil laboratory analysis is performed for 14 soil chemical and physical parameters according to local country-specific standards. These sample results are the basis of the nutrient management plan, which is calculated for the farmer-selected fertilisers. In some cases a better fertiliser combination is recommended by the consultant, but the farmer makes the final decision in the selection.	
16	Italy Council for Agricultural Research and Economics – CREA; Research Centre for Policies and Bioeconomy	Cooperation agreement between CREA and the Ministry of Agriculture Food and Forestry Policies (MiPAAF) for activities related to sub-measure 4.3.	EAFRD	M4.3	Sustainable water management	Ongoing	Scientific and technical support is provided by CREA to the ministry of agriculture on the implementation of sub-measure 4.3 'investments in irrigation infrastructure'. The activities relate to physical and procedural monitoring, environmental monitoring, and the operation of the national information system for the management of Water resources in agriculture – SIGRIAN). SIGRIAN is a reference database for all administrative bodies responsible for water in agriculture. CREA participated in the drafting of the guidelines for the regulation by the Italian regions of the methods for quantifying water volumes for irrigation	<p>Barriers/Bottlenecks</p> <ul style="list-style-type: none"> - The definition of selection criteria (hardly measurable, quantifiable and objective). - Problems in presenting support applications for potential beneficiaries (restrictive conditions). - The adaptation of the SIGRIAN database to the data regarding the monitoring of irrigation volumes and the subsequent updating and correct insertion of database data by Italian regions. <p>Lessons learned/Recommendations</p> <ul style="list-style-type: none"> - Ensure that the expenditure declared in the application is fair and in line with the costs incurred on the market.

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							(July 2015).	<ul style="list-style-type: none"> - Selection of beneficiaries needs to be done on the basis of objective and transparent selection criteria. - Create an adequate system of control and management of procedures related to aid and payment, with particular reference to the eligibility conditions.
17	Portugal (DGADR)	RDP support to farmers in the adoption of Integrated Production practices, including nutrient management plans	EAFRD	M7.2 – Integrated production	Soil management , Nutrient management plans	Ongoing (from 2014)	<p>Producers are obliged to register the use of fertilisers in a notebook that always must be performed on the basis of land analysis.</p> <p>The data used:</p> <ul style="list-style-type: none"> - Nutritional needs of plants – from National Institute of Agricultural and Veterinary Research; - Data from the agricultural accounting network; and - Data on the quality of the waters of the Portuguese environment agency. <p>The data were collected when the measure was designed. The measure at an early stage provided for increased support when farmers had the support of technical experts. These technicians, in addition to higher education in agriculture, have attended special courses in order to be recognised as specialists by the ministry of agriculture. Beneficiaries must comply with the</p>	<p>Barriers/Bottlenecks</p> <ul style="list-style-type: none"> - Controls are very much directed to administrative issues and do not focus on beneficial results in the environment. - There is also no global use of all collected information that could serve as a basis for better understanding the impacts of new cultural practices as well as allowing data processing and information on soil and water status (a large number of analyses collected from soil and water)

Country No	Country (organisation)	Title	Funded by	RDP measure	Sub-theme	Ongoing (Y/ planned / completed)	Short summary	Lessons learned / recommendations
18	Portugal (DGADR)	RDP support farmers in the adoption of soil conservation practices.	EAFRD	M7.4.1 - Direct seedling or the line mobilisation M7.4.2 Inter-row cropping with some cover sown of permanent crops	Soil management	Ongoing (from 2014)	<p>regulations on integrated production, being subject to the control by the control and certification body. Beneficiaries have to demonstrate special qualifications either from curricular training or from the attendance of specific vocational training courses in integrated production.</p> <p>7.4.1 – The scale of annual support is allocated per hectare of agricultural area sown during the commitment period and is modulated by area size and by type of support and it may be increased with the adoption of optional commitments.</p> <p>7.4.2 - The scale of annual support is attributed per hectare of agricultural area with permanent crop, during the commitment period, being modulated by area echelons.</p>	<p>Barriers /Bottlenecks</p> <ul style="list-style-type: none"> - The conditions imposed on farmers, being general, do not respond to specific local requirements. For example, in terraced areas, it is necessary to adapt the management technique of the plant cover. The same in areas with high pedrogosity. <p>Lessons learned/Recommendations</p> <ul style="list-style-type: none"> - It will still be necessary to study species more adapted to each situation as well as to differentiate requirements according to regions and crops. - Such measures have a strong impact on soil quality as well as on the improvement of some ecosystem services like water quality and biodiversity. - In the future more effort is needed on analysing the results, quantifying them. Understand how soil organic matter content is evolving, how much is the

Country No	Country (organisation)	Title	Funded by	RDP measure	Sub-theme	Ongoing (Y/ planned / completed)	Short summary	Lessons learned / recommendations
19	Portugal (DGADR)	RDP support to farmers in the adoption of irrigation practices for a more efficient and sustainable use of water resources.	EAFRD	M7.5 – Efficient use of water	Water management , Water management plans, Nutrient management plans	Ongoing (from 2014)	Annual support is allocated per hectare of agricultural area irrigated by temporary crops, fresh fruits, nuts and olive groves under contract, using located (micro sprinkler, drip irrigation), or underground sprinkler irrigation systems during the period of commitment, and the level of support decreasing with the area, differentiated according to the class of irrigator (decreasing from A to B), and by group of crops. The reduction of water consumption is established by a reference scenario. Commitments include: an irrigation plan and a fertilisation plan, periodic inspections of irrigation equipment and implementation recommendations and the correct estimation of irrigation needs. The equipment inspection is carried out by specialised technicians with specific obligatory training created for this purpose. Most farmers who adhere to this measure also receive advice on irrigation and fertilisation.	contribution to carbon sequestration, what are the best cover crops for each site and crop; best practices for each situation and quantify the impact on each of them. Barriers/Bottlenecks - The equipment to measure the water consumption at farm level is expensive and the control is very much focused on administrative issues. Lessons learned/Recommendations - The lack of training was overcome by implementing specialised training courses for technicians during the first phase of implementation. - An assessment of the impact of the measure is still to be carried out. Still, the large number of data generated can be organised in order to draw technical conclusions on water productivity.
20	Spain	AGROGESTO	LIFE	n/a	Multi-actor	ongoing	The main objective of AGROGESTOR is to	The project is currently in the early

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	(Navarra, Castilla LA mancha, Andalucia, Cataluna, Pais Vasco)	R. – collective management of crops www.agrogestor.es/	program me		approaches, Sustainable water management	(2017-2021)	reduce the environmental impact in irrigated agriculture through a decision support system that facilitates effective and sustainable collective planning and management, with two specific environmental objectives: efficiency in the use of water; and high quality of water bodies. The key activities to achieve this include developing: a tool for managers of Collective Management Areas (AGCs), which calculates different indicators that are analysed by managers (experts) to produce an initial assessment and identify problems and areas for improvement; strategies and collective management tools along with an action plan; strategies of governance and loyalty of the farmer to implement the action plan optimally; utilities, tools and monitoring and support services;	stages of platform design and the analysis of the needs of the different collective managers. Problems may arise in the management of particular data to analyse collective management and its representativeness. Lessons learned/Recommendations Encouraging the connectivity of data between different sources is key as well as to demonstrate the feasibility of interoperability, necessary in the current management of knowledge.
21	Spain (Andalusia)	AGRICARBO N www.agricarbon.eu	LIFE program me	n/a	Sustainable soil management , GHG emmissions, carbon sequestration, Multi-actor	Completed (2010-2015)	Carbon dioxide emission in farming is mainly the result of ploughing which causes soil carbon loss. The project focused on soil quality and energy consumption and GHG emissions and aimed to increase farmers' awareness about Conservation Agriculture (CA) and Precision Agriculture (PA). The project created a network of demonstration farms in the Guadalquivir Valley, where	Lessons learned/Recommendations One of the conclusions obtained during the project is the certainty that in order to achieve effective soil protection against soil erosion and runoff, or in order to avoid soil degradation, the soil surface needs to be protected by at least 30% of vegetative remains. Frequently in RDPs, soil protection measures are promoted that allow a

Country No	Country (organisation)	Title	Funded by	RDP measure	Sub-theme	Ongoing (Y / planned / completed)	Short summary	Lessons learned / recommendations
					approaches		<p>cereals, oil products and legumes were grown with the use of CA and PA techniques.</p> <p>After five years, the project resulted in a 19% decrease in CO₂ emissions and an average increase of carbon sequestration of 30%. Online software was developed for the calculation of sustainability indicators. No reduction in productivity was observed, while cost savings for farmers ranged between 9.5% and 21.5%.</p>	<p>superficial tillage, which does not favour the presence of a vegetative cover, does not provide the soil profile with organic matter and leaves the soil exposed to soil erosion processes. Therefore, in the light of the results obtained during the project, soil protection measures have to be designed to obtain a sufficient vegetative cover at all times (a minimum of 30%) and have to be based in the elimination of tillage, proposing viable and realistic alternatives for the control of adventitious flora.</p>
22	Spain (CREAF)	BeWater www.bewaterproject.eu	FP7	n/a	Multi-actor approaches, knowledge transfer, targeted agri-environmental measures	Ongoing	<p>Innovative tools to facilitate the adaptation of river basins to global change and improved water management practices through the involvement of local society in an iterative process of stakeholder workshops and desk work (targeting five river basins in Cyprus, Slovenia, Spain and Tunisia). The project developed proposals for adaptive management with a high degree of social acceptance and technical feasibility. A handbook for practitioners was also produced: http://www.bewaterproject.eu/final-results/handbook</p>	<p>Lessons learned/Recommendations</p> <ul style="list-style-type: none"> - Clearly define roles and divide responsibilities from the outset, while ensuring sufficient in-depth knowledge of the river basin, local stakeholders, scientific methodology. - Minimise barriers to stakeholder engagement by e.g. choosing easily accessible locations, and selecting dates, times and durations that accommodate local customs. - Create appropriate conditions to encourage debate while reaching the objectives (workshops, consultations, interviews, etc.). - Ensure policy provides the adequate legal framework to enable different types of actors to make use of their

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23	Spain (Catalonia)	Demonstration and validation of innovative methodology for regional climate change	LIFE program	n/a	Sustainable management of water, Targeted AE	(2013-2018)	MEDACC aims to test innovative solutions in order to adapt agro-forestry and urban systems to climate change in the Mediterranean basin. Thus, MEDACC contributes to the design and implementation of adaptive strategies and policies which are being developed at national and regional level in the	<p>capabilities in becoming agents for change towards sustainable water management.</p> <ul style="list-style-type: none"> - Ensure water management options included in the plan are truly adaptive (it is crucial that these are flexible, robust and integrate a multidisciplinary perspective). - Participatory adaptation planning for river basins is still a developing concept and could benefit greatly from wider application across a range of basins and the subsequent sharing of best practices and experiences learned. - Building a shared understanding of the key problems and needs at the local level through an open and transparent participatory process is necessary. - Society is willing to engage in intense participatory experiences when their involvement in the decision-making process is clear and their role is acknowledged and legitimised. <p>Lessons learned/Recommendations The development of an indicator has four basic requirements:</p> <ul style="list-style-type: none"> - Simple to achieve, with the necessary information being easy to access; - Available historical data allowing quantification of the indicators; - Easy to interpret outcomes; and

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		adaptation in the Mediterranean area www.medacc-life.eu/					Euro-Mediterranean area. In order to achieve these objectives, MEDACC will implement pilot actions to test adaptation measures in the agriculture, forestry and water management sectors. These measures will be designed and assessed by local stakeholders.	- Information and data specific to the basin/territory
24	Spain (Aragon, Navarra, Castilla La Mancha, Castilla y Leon)	Crops for better soil www.cultivos-tradicionales.com	LIFE program	n/a	Soil management, Nutrient management plans	Completed (2011-2016)	<p>The project aimed to:</p> <ul style="list-style-type: none"> • Demonstrate that organic farming with crop rotation is profitable without calculating CAP subsidies; • Reintroduce autochthonous crops with added value for the soil and the production; and • Develop new practices to improve performance and product quality and motivate farmers to move to organic farming. <p>Participating farmers who volunteer receive professional training on organic production. Farmers contributed their own ideas which were evaluated by the agronomists. Soil samples were taken in all the plots to analyse respiration, pH, EC, MO, N-P-K, structure and texture. At the end of the project measurements were repeated.</p>	<p>Barriers/Bottlenecks</p> <ul style="list-style-type: none"> - In practice, the plans, such as the time of preparation of the land, choice of crop variety, time of sowing and harvesting and marketing were often different from what was done due to problems of climate and seed availability. - Only half of the farmers have taken the project very seriously and the other half lost interest along the way. Some farmers are not mentally prepared to convert to organic. In the past they have done it mostly because of financial incentives. - By definition, organic farming means reduction in inputs. There may be a need to use a weed control machinery once extra. For this reason farmers often contacted agronomists for advice. The reality is that the costs of such advice would have been too high if it were not supported by the LIFE project.

Country No	Country (organisation)	Title	Funded by	RDP measure	Sub-theme	Ongoing (Y / planned / completed)	Short summary	Lessons learned / recommendations
25	Spain (INTIA)	sigAGROases or - Customized advanced GIS advisory tools for the sustainable management of extensive crops http://agroasesor.es/es/	LIFE program	n/a	Nutrient management plans, Water management plans	Completed (2012-2015)	The main objective of the project is to help farmers and farm managers to manage their crops more efficiently and sustainably, by making accessible all the available technical knowledge for self-management through a web tool, capable of making recommendations customised in real time for each agricultural plot, based on a series of specific variables and values. The project developed several Decision Support Tools (HAD) including: a HAD to recommend varieties; a HAD on fertilisation which analyses the nutrient balance at plot level and recommends the quantity and the optimal moment of application; a HAD for irrigation which assesses the water balance at the plot level and recommends quantity and time of irrigation; and a HAD on control which estimates the risk of the appearance of a disease at plot level. 25 pilot programmes have been launched among the five participating Spanish regions (Andalusia, Basque Country, Castilla-La Mancha, Catalonia and Navarre) to manage the validation and calibration of the various tools of the sigAGROasesor platform.	Lessons learned/Recommendations <ul style="list-style-type: none"> - Need to simplify the traceability so that it is actually used by users either directly or through its advisers or managers. - Necessity to offer sigAGROasesor services in current mobile media such as smartphones and tablets. - Need to establish collaborative strategies with technology companies to offer complementary services to end users. - Need to reinforce the alignment of sigAGROasesor services with the administrative requirements of agricultural policies (CAP, RDPs, etc).
26	EU Wageningen	SYSTEMIC (systemic	H2020	n/a	Soil quality and nutrient	Ongoing (2017-	The project aims to facilitate a move towards a more circular economy	n/a

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	University Research coordinator	large scale eco-innovation to advance circular economy and mineral recovery from organic waste in Europe) http://www.risefoundation.eu/projects/systemic-h2020			management	2021)	(recovery of valuable mineral components – nitrogen and phosphorus – from organic waste streams). They aim to demonstrate that anaerobic digestion and recycling technologies can produce valuable fertilisers and soil improvement using bio-waste streams abundant in the EU (manure, sewage sludge, food waste). The project also aims to identify circular economy business cases, a business development package and derive policy recommendations, as well as develop a roadmap for the roll-out of circular economy solutions for bio-waste valorisation. Integral to the project is a continuous science/business-policy dialogue through various working groups, collaboration clusters, workshops, etc. The SYSTEMIC consortium has 15 partners from seven EU Member States.	
27	EU Wageningen University and Research	LANDMARK (Land Management : Assessment, Research, Knowledge base) www.landmark2020.eu	H2020	n/a	Sustainable management of soils & nutrients	Ongoing (2015-2019)	The objective of the project is to develop a coherent framework for soil management for sustainable food production across Europe, preserving the 'soil functions' – ecosystem services provided by the soils. Through multi-actor development of the framework, LANDMARK will address challenges at the local, regional and EU scales by developing toolkits, indicators and an	n/a

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							assessment of EU policy instruments. LANDMARK will produce three concrete outcomes: a Soil Navigator that provides advice to farmers on the sustainable management of on farm soils; a framework for monitoring of soil quality and soil functions applicable across Europe; and an assessment of policies that can ensure that we 'make the most of our land'.	
28	Italy (University of Bologna)	PROVIDE (providing smart delivery of public goods by EU agriculture and forestry) http://www.provide-project.eu/	H2020	n/a	Sustainable water management	Ongoing (2015-2018)	PROVIDE was launched in 2015 to develop a conceptual basis, evidence, tools, and incentive and policy options for the smart provision of public goods by the EU agriculture and forestry ecosystems. PROVIDE will work with 14 partners, both at the EU level and with case studies from 13 EU countries, to develop an inventory of public goods and identify 'hotspots' for mechanisms to produce public goods and policy development. A comparative evaluation of policy tools and mechanisms will be performed. A framework and 'toolbox' will be developed based on the collected information and analysis.	Lessons learned/Recommendations - Results of studies carried out show that the current amount of financial contribution devoted by the CAP to public good provision is generally considered as acceptable by EU households (with more than 60% of citizens agreeing with the current expenditure devoted to that aim). - Participatory or collaborative governance approaches, which involve regional stakeholders, decision makers and land managers in the governance processes are seen as suitable for improving decision making.
29	Denmark Danish Ministry of Food and Environment	Targeted N-regulation	National	n/a	Sustainable water management		Targeted nitrogen regulation (TR) is a scheme which reduces nitrogen leaching to waterbodies in a targeted and cost-efficient way. Under TR, the need of nitrogen reduction in the particular	Lessons learned/Recommendations - The Danish government wishes to see greater flexibility in supporting environmental initiatives across directives in the coming reform

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							areas is converted into an area of catch crops, and a legal basis is introduced in order to establish the required number of hectares of catch crops by the farmers. To start with, however, the effort is carried out through a voluntary application round, where farmers can apply for support for the establishment of catch crops. The targeted regulation is mandatory, but includes a semi-voluntary, bottom-up dimension in order to improve cost effectiveness and support from farmers.	period, as well as better options for compensating voluntary management of environmental requirements and flexible choice of instruments for the fulfilment of requirements.
30	Denmark Danish Ministry of Food and Environment	Bio-refining of grass	n/a	n/a	Sustainable water and soil management , Multi-actor approaches	n/a	Promising Danish test results show that grass can prove to be a new and more sustainable source of protein. Grass is normally used as fodder for ruminants, but through bio-refining it is possible to produce protein for monogastric animals. Currently, the EU is highly dependent on imported soy which contributes to deforestation. An increased use of bio-refining could contribute to reducing the amount of soy imported, minimise the environmental and climate impact from farming in the EU, and provide new sources of revenue by allowing for the production of high-value products. At the same time the emissions of nitrogen from grassland to the aquatic	Bio-economy, and more specifically bio-refining of grass, holds the potential to provide new sources of revenue for rural areas while minimising the environmental footprints from farming. Lessons learned/Recommendations - Further investments in R&D activities are needed in order to develop current test facilities into fully operational production facilities. - Greater possibilities to support respectively the supply of grass and the demand for the refined products (the whole value chain) are required.

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31	Finland (Ministry of Agriculture and Forestry)	Nutrient management plans	National	n/a	Nutrient management plans	Ongoing	<p>environment are much lower compared to most other common agricultural crops.</p> <p>During the RDP preparation for the 2014-2020 period the Ministry of Agriculture and Forestry analysed possibilities to use nutrient field balances in nutrient management plans. The idea was rejected mainly due to difficulties in estimating yield and defining what is a good balance for different plants and soils and weather conditions. While relatively easy to calculate, their interpretation is not straightforward due to a lack of a solid scientific basis. A project was then financed to gather more information about this theme. The purpose of this project 'Benefit from nutrient field balances' was to quantify the variation in nitrogen balances in practical farming and in controlled field experiments as affected by fertilisation, soil properties and crop rotations, and analyse it with modern statistical methods.</p>	<p>Barriers/Bottlenecks</p> <ul style="list-style-type: none"> - Nutrient balances are a good tool for advisory services and for comparing different years, but at the field level it is difficult to set absolute target values or even measure the balance reliably.
32	United Kingdom (Scotland, Scotland's Rural College –	Soils Research to deliver Greenhouse Gas REmovals	National Environment Research Council	n/a	Collective approaches, Nutrient management plans, Targeted	Ongoing (started in 2017)	<p>Soil Carbon Sequestration (SCS) has relatively low land and resource use impacts compared to other negative emissions technologies. However, more research is needed to quantify and specify its application at a regional level.</p>	<p>Barriers/Bottlenecks</p> <ul style="list-style-type: none"> - The heterogeneity of agricultural soils and practice is a challenge to consider when defining the global potential of measures. <p>Lessons learned/Recommendations</p>

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	SRUC)	and Abatement Technology (Soils-R-GGREAT)	(NERC)		environmental measure, knowledge transfer		Based on existing literature, the project will examine the uptake potential of various SCS practices – the output will be the assessment of the technical and cost-effective potential for soil based methods for greenhouse gas removals (GGR). The project involves several universities and research institutes in Scotland.	<ul style="list-style-type: none"> - Take into account not only the technical, but also the social and economic applicability of measures planned. - Define an objective set of criteria to assess the many types of soil carbon sequestration technologies/measures.
33	Turkey	<i>Targeted AE measures to prevent soil erosion</i>	IPA-RD	n/a	Sustainable soil management	n/a	The objectives of the measure is to prepare Turkey for the future implementations of the agri-environment measure and to contribute to the sustainable management of natural resources by the application of agricultural production methods compatible with the protection and improvement of the environment and more specifically soil erosion. The accreditation has been given for the erosion sub-measure as it is a pilot measure for Turkey. Objectives of the sub-measure in the pilot district are to decrease soil erosion; maintain soil fertility, organic matter content, soil structure and soil biodiversity; test the effectiveness of these sub-measure packages; and to raise awareness about environmentally-friendly farming practices.	n/a

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34	Luxembourg (EurEau – Aluseau)	Water management in Luxembourg	Water utility expenses	n/a	Sustainable management of water	Ongoing (since 1995)	The main objective of the project is to protect water resources to limit the application of fertilisers and pesticides through the introduction of a series of measures, including manure storage, application limits for nitrogen, compulsory soil cover, tilling permanent grassland, mechanical weed control and alternative cultures (miscanthus, oil flax).	n/a
35	Netherlands (Fertilizers Europe)	EU Nitrogen Expert Panel www.eunep.com	Private funding	n/a	Sustainable management of soils & nutrients	Ongoing (2014-2015)	Key representatives from scientific, policy and industry communities were invited by Fertilizers Europe to establish the EU Nitrogen Expert Panel in 2014. The general objective of the Expert Panel is to contribute to improving Nitrogen Use Efficiency (NUE) in food systems in Europe, by communicating a vision and strategies on how to improve NUE in food systems in Europe; generating new ideas, and recommending effective proposals and solutions; and acting as referee in controversial issues, and communicating as an authority. The Panel agreed in September 2014 on a common definition of NUE as indicator for crop production at field, farm and national scales and also produced guidelines in 2015.	Barriers/Bottlenecks <ul style="list-style-type: none"> - Farmers, industry, policy makers and citizens currently have insufficient information, tools, guidance and incentives to increase nitrogen use efficiency at field, farm and national levels. - There are various barriers and constraints to improving NUE in practice, due to the tendency of academia, governments, industry and practitioners to work in isolation, and due to bureaucratic inertia.

Country No	Country (organisation)	Title	Funded by	RDP measure	Sub-theme	Ongoing (Y / planned / completed)	Short summary	Lessons learned / recommendations
36	Netherlands (EurEau – Vewin)	Various projects	Water utilities expenses	n/a	Soil quality and nutrients, collective approaches	90s, 2000s, most of them after 2010	The objective of various projects in the Netherlands is to protect drinking water resources by reducing nitrate/nutrients and pesticide emissions to groundwater and surface water; improving sustainability of cultivation methods; and creating awareness among farmers. Various interventions include precision fertilisation, mechanical weeding, reduced use of pesticides, monitoring of water and soil quality. Communication and knowledge transfer is done through workshops, group meetings, study groups, individual consultation and evaluation, individual advisory services, groundwater application development, SMS advisory services, effect modelling, benchmark analysis, brochures, sharing results on website, newsflashes, field visits and demonstrations.	n/a
37	Serbia	Nutrient management	Private	n/a	Sustainable soil management , Nutrient management plans	Ongoing (2015-)	Backa and Banat counties – fertile steppe soils with good structure with high organic carbon and nutrient content, intensive agriculture cause soil degradation (both chemical and physical). State-owned lands are leased to farmers for limited periods which does not motivate them to introduce sustainable management. The farm in the example introduced soil mapping for 2 400 hectares and specified zones for	<p>Lessons learned/Recommendations</p> <ul style="list-style-type: none"> - The technological change to minimum till and the nutrient management improved both the physical and the chemical soil structure. <p>Lessons learned/Bottlenecks</p> <ul style="list-style-type: none"> - Policy environment can be a major constraining factor (leasing of state-owned land to farmers for limited periods causing farmers' low willingness to invest).

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							soil management, followed by a soil survey. Full technological change was introduced for sustainable soil management (limiting ploughing, optimising nutrient management, optimised input usage). There was a one-year intensive collaboration between the farm and the consultant – in addition to optimising the farm, several demonstration farm events were also organised for farmers from the West Balkans and Serbia.	- Proper collection of information can lead to limiting further soil degradation.
38	United Kingdom (EurEau – Water UK)	<i>Protect water resources by limiting the application of pesticides</i>	<i>n/a</i>	<i>n/a</i>	Sustainable management of water, Multi-actor approaches	Ongoing (since 2009)	The main objective of the project is to protect water resources to limit the application of pesticides, mainly metaldehyde. A series of measures were taken including: the use of better quality metaldehyde pellets; the use of alternative to metaldehyde e.g. ferric phosphate; and the use of lower dose of metaldehyde pellets on voluntary basis. The tools used in the collaboration projects were: identification of high-risk fields to target measures e.g. hotspot mapping; water companies or CSF paying for farmers to undertake training on the good use of pesticides; advice and training through water companies own agriculture advisors or through partnership projects with Nature England (CSF)/Environmental Agency;	<i>n/a</i>

Country No	Country (organisation)	Title	Funded by	RDP measure	Sub-theme	Ongoing (Y/ planned / completed)	Short summary	Lessons learned / recommendations
39	France	<i>Fight against water runoff and soil erosion</i>	EAFRD. ERDF. Water management agency, regional authority and other local authorities	not specified	water management /sustainable management of water	completed (2015-2016)	<p>and farmer engagement through various media, visits, leaflets, etc.</p> <p>Intensive crop farming and a rapidly declining breeding sector characterise the Vimeu water catchment area. The Vimeu rural area is located in Northern France, near Abbeville. It is an agricultural area with intensive farming production systems mainly oriented towards cereals. Around 33% of UAA is grown in wheat and 8% is grown in barley.</p> <p>Over last 10 years the amount of livestock has declined in the territory. Changes in farming practice and frequent flooding episodes led the local authorities to draw up a water and soil management plan in the early 2000s.</p> <p>EU funding was used to fight against soil erosion and water runoff on farming plots; along rural roads and nearby villages. A series of buffer strips, hedgerows, drainage ditches and small water storage areas, slowing water down and diverting it away from buildings and people. Knowledge transfer, information and advice are crucial elements of the process. An intermediary body called SOMEA – delegated by the local authority and the</p>	<p>The water and soil management plan has helped to:</p> <ul style="list-style-type: none"> • Characterise the existing rain water system and its evolution over time; • Define the water catchment area and its components: networks, storage, drainage devices, capacities... • Provide an overview of all potential solutions and facilitates the decision-making process for establishing priorities; • Defines solutions that are either curative or preventive with financial details that include investments and running costs; and • Summarises the contractual and legal framework conditions for planning work. <p>The local approach to rain water management follows standard planning habits in France:</p> <ul style="list-style-type: none"> • The implementing entity (in French: <i>maître d'ouvrage</i>) designs, launches and takes delivery of the project. It is responsible for the overall planning and management. • The prime contractor (<i>maître</i>

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						<p>Chamber of Agriculture – is in charge of negotiating with farmers when the work has to be undertaken on their plots.</p> <p>Their approach relies upon visible and ‘on land’ solutions – whereas former traditional techniques would favour underground works. This visual aspect raises the awareness of the presence of water and its risks for the residents.</p> <p>The latest water and soil management plan was achieved in 2016. It included 15 works:</p> <ul style="list-style-type: none"> • 4 buffer strips (in French: fascines) for 85 ml of water; • 8 hedgerows of native species for 1 350 ml of water; • 7 drainage ditches (<i>noues</i>) allowing storage of 1 560 m³ of water; • 32 water storage areas for 4 200 m³ of water. 	<p><i>d’oeuvre</i>) is in charge of the technical conception of the work.</p> <ul style="list-style-type: none"> • The entrepreneur undertakes the work. <p>The smooth relationship between the parties is an essential component of a successful project. The outcomes of the feasibility phase represent an important step, too: if the quality of the initial assessment shows methodological weaknesses or does not provide all the necessary data sets, it might jeopardise the efficiency of the planned works.</p>

3. Results based payment schemes

Summary of main findings from case studies

<i>create an open, multi-stakeholder process where farmers are trusted – from the beginning</i>	<i>in addition to environmental, socio-economic considerations/facilitation are also important</i>	<i>get your baseline data right – do a pilot - create buffers for errors</i>	<i>strengthen dialogue for better understanding of regional/local realities, specificities, requirements</i>
<i>rules under current RDP funding can be inflexible for some approaches</i>	<i>pay for the environmental outcome/results – not for administrative adherence to pre-defined rules</i>	<i>establish a clear link between environmental/biodiversity objectives and compensation/payment to farmers</i>	<i>controls should focus on results/benefits/achievements – not on administrative issues</i>

Summary table of examples

(Source: [case studies](#) / [survey responses](#) / [other sources](#))

No	Country (organisation)	Title	Funded by	RDP measure	Sub-theme	Ongoing (Y/ planned / completed)	Short summary	Lessons learned / recommendations
40	Belgium (Flanders)	Water quality RBPS/MBPS	EAFRD	M10.1	Results Based Payment Schemes	Ongoing (2014-2020)	This agri-environment-climate scheme replaces an MBPS water quality scheme in the 2007-13 RDP, which required reductions on fertiliser use. The new scheme was	Lessons learned / Recommendations - Technical advice and soil testing requirements are compulsory. Before signing the agri-

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							<p>widened to include soil and water objectives. It aims to:</p> <ul style="list-style-type: none"> - Safeguard and improve water quality by reducing the risk of nitrates leaching from arable land; - Reduce the risk of soil erosion; and - Encourage farmers to improve the levels of organic matter in their soil. <p>The RBPS result indicator is the residual soil nitrogen at the end of each growing season in all the fields on the farm, and the threshold for payment is a residual soil nitrogen level on all fields (grassland and arable) which is at least 4 kg N ha⁻¹ yr below the lowest threshold value set by Flemish regulations for permissible soil nitrogen levels on farmland.</p> <p>Farmers in the scheme must grow no less than four main crops, of which three must be low-risk crops other than grassland, and the low-risk crops must occupy at least 90% of their arable land each year.</p>	<p>environment-climate contract, the farmer must receive on-site advice from a specialist farm adviser, who will explain the requirements of the scheme and discuss how these will fit with the farm's crop rotation system and nutrient management planning.</p> <ul style="list-style-type: none"> - In the first year of the contract the farmer also must carry out a soil analysis for carbon content (organic matter) and pH (acidity). This data is useful for nutrient management planning, but are not part of the result indicator. - The payment applies to the total area of low-risk arable crops on the farm each year (the precise area varies a little from year to year because of the crop rotation), but the result indicator must be achieved on all fields, not just these arable fields. This ensures that the farmer does not 'compensate for' reducing nutrient inputs on one part of the farm by increasing inputs elsewhere.
41	Ireland	The Burren Programme	- BurrenLI FE (2005-2010) - Burren	M10	Results Based Payment Schemes, Targeted AE	On going (2016 -)	<p>Each eligible field is assessed annually in summer by a farm advisor using a 10-point scoring card. This is submitted to the local office</p>	<p>Lessons learned / Recommendations</p> <ul style="list-style-type: none"> - In the next RDP it would be useful to have an Article dedicated to

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			Programme – Art. 68 of Pillar 1 (2010-2015) - EAFRD (2016 – 2022)		measures		<p>for checking and verification. The farmer then receives a sheet showing all eligible fields, their area (ha), score (0-10) and payment (0-180 €/ha) as well as bespoke management recommendations on how the score/payment could be improved.</p> <p>The farmer and his/her advisor also develop a Work Plan for farm works which should, in most cases, help to improve the field score. The farmer nominates the jobs (farmer-led approach), each one of which is 'priced' by the advisor and checked by the local team. Once approved, the farmer does the work and claims the payment due (all tasks are co-funded 25-75%).</p> <p>The scoring system acts as the impact monitoring: every field has a score for every year and this score reflects the environmental health of the field. Scores can be compared year on year at a field, farm and programme level providing a very robust, real-time picture of the impact of the programme for the individual farmer or for the programme funder.</p> <p>Now (2016-7) that the programme</p>	<p>Results-based (or Hybrid) AES which would allow MS more flexibility in the design, development, administration and reporting on such programmes. In terms of reporting, more emphasis needs to be placed on the environmental, and not just the financial, aspects of the programme performance.</p> <ul style="list-style-type: none"> - It would also be beneficial to accommodate longer timeframes for results-based AES – up to 10 years – and to revisit the justification for payment calculations as the current parameters (income foregone, opportunity costs etc.) may not always be sufficient to reflect the true cost of ecosystem service delivery. - The Burren Programme experience would suggest that locally-targeted, farmer-centered, highly adaptable, results-based (or hybrid) payments approach can be really effective in delivering environmental objectives, providing better value for money and greater farmer buy-in. These key principles should be carefully considered in future AES

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							has transitioned to M10 funding, some significant challenges are emerging. Many of these relate to accommodating a results-based programme into an Article designed for action-based AES. While this has been done thanks to some creative thinking by DG Agri, DG Env and DAFM, challenges remain. These include, for example, simple things like accommodating a field-based scoring system into a LPIS-based administration and reporting system, developing a fair penalty system for results-based payment scheme, and perhaps most significantly the ongoing issues around land eligibility and the fact that payments are made only on 'eligible' land which results in an incentive for farmers clearing the habitats that we are trying to protect.	design in the RDP.
42	Portugal	Efficient use of water - RBPS/MBPS	EAFRD	M10.1	Results Based Payment Schemes, Sustainable water management	Ongoing (started in 2016)	The aim of this agri-environment-climate scheme is to improve efficiency of water use and to reduce water consumption compared to a reference level. The RBPS result indicator is the measured water consumption of the irrigated area of the farm, and the required threshold value is at least 7.5% below a	<p>Barriers/Bottlenecks</p> <ul style="list-style-type: none"> - Farmers have improved their water use efficiency, but equipment to measure the water consumption at farm level is expensive and the controls are very much focused on administrative issues rather than on results.

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							reference scenario established by the National Irrigation Authority for the different irrigated crops and methods of irrigation under pressure, for the three main Portuguese agroclimatic regions. MBPS requires farmers to: <ul style="list-style-type: none"> - Use only sprinkler, localised (micro sprinkler, drip irrigation) or below ground irrigation systems; - Implement an irrigation plan based on recommendations made on the weekly water balance, using a rain gauge and taking into consideration the irrigation equipment, soil type, climate and vegetative phase of the crop to be irrigated; - Define and implement a fertilisation plan; and - Ensure that irrigation equipment is inspected in the first, third and fifth years of the contract by an accredited authority and implement the recommendations of the inspection. 	Lessons learned/Recommendations <ul style="list-style-type: none"> - Issues with implementation included the need to train technicians (this was done through specialised courses in the first phase of implementation). - The large data sets generated will be useful in drawing technical conclusions on water productivity.
43	Romania (ADEPT Foundation Transylvani a)	RBPS for Biodiversity: New Pilot Agri-Environment Scheme for	EAFRD Private funds (ADEPT Foundation)	n/a	Results Based Payment Schemes, Biodiversity	Ongoing (started in 2016)	The results-based agri-environment scheme (pilot scheme) is targeted at High Nature Value hay meadows. The project uses a total of 27 species as indicators of HNV meadows and engages 76 farmers in Tarnava Mare	Barriers/Bottlenecks <ul style="list-style-type: none"> - In some cases, it is not possible to design indicators of biodiversity results. - Managing authorities do not always have access to expertise to

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		the Târnavă Mare and Pogány-havas, Romania www.fundatia-adept.org/	Other (Deutsche Bundesstiftung Umwelt)				and Pogány Havas. Farmers can manage their meadows according to local conditions and weather. There is a gradual payment scheme – more indicators species used results in a higher rate paid per hectare managed. The contract holders cannot step down during the contract period.	<p>set up a RBAPS.</p> <ul style="list-style-type: none"> - Farmers must be willing to accept a results-based approach. <p>Lessons learned/Recommendations</p> <ul style="list-style-type: none"> - The nature and practicality of the advice and support needed are criteria that increase or decrease the project's attractiveness. So, the training and guidance booklets together with the usefulness, availability and quickness are key. - Farmers appreciated been engaged and directly involved in the control system, - A critical aspect to take into consideration was the selection of the targeted areas of HNMF, to avoid double financing and thus the rejection of the proposal. - After implementing half of the project, it was observed that the amount of necessary documentation (prepared by farmers) is reduced and the payment is made directly based on the obtained results, leading to a smoother, more friendly approach. - It is necessary to simplify the administrative aspects (in the application part) for farmers/involved stakeholders.

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44	United Kingdom (Natural England)	Winter bird food and pollen/nectar plots on arable land	DG ENV	n/a	Results Based Payment Schemes	Ongoing (2016 – 2019)	<p>This pilot RBPS scheme is running alongside a well-established MBPS M10.1 scheme with the same biodiversity objectives. There is strong evidence that these two options are key to the survival of farmland birds and pollinators. When they are established and managed well, these wildlife crops provide vital food resources at key times of year which ultimately affects the species' ability to breed successfully and ensure that populations grow.</p> <p>The aim of the pilot is to test the environmental cost effectiveness of the RBPS approach and assess farmers' attitudes to it. Payment rates for the RBAPS plots are tiered and linked to the result indicators which show how well the sown species have established and grown. Only those species that are known to deliver the necessary seed or nectar resources will be counted towards the indicator. The result indicator for the bird food plots (which are sown afresh each year but must be retained until the end of the winter) is a threshold number of seed heads of specific crops; for the</p>	<p>Lessons learned / Recommendations</p> <p>- Early results show that farmers who have participated in both the MBPS and RBPS versions of the scheme are making additional management efforts to achieve the RBPS indicators.</p>

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45	France	An agri-environmental measure fully dedicated to soil management : conversion to no-till under cover for field crops	EAFRD	M10 Agro-environment-climate measure for the conversion to no-till under cover (in French: MAEC_SOL_01 - also known as 'Permanent soil cover'). Main Focus Area: 4C	result-based payment schemes	2017-2023	<p>pollen/nectar plots (which take some time to establish and are sown then left in place) the result indicator is based on the presence of species that were sown, and also (from the second year) the percentage cover of sown species.</p> <p>A five-year scheme for the conversion to no-till under cover is introduced in 2017 to the list of agro-environment and climate schemes under M10. Some also call it 'permanent soil cover' as it is essentially focusing on soil management techniques stemming from the 'conservation agriculture' model.</p> <p>Several regional managing authorities are opening up this possibility in their RDP as a way to address the issues of erosion, organic matter, biological activity and soil settlement, and to shift towards alternative farming practices for large field crops. The scheme includes an important facilitation and training strand, included in the unitary amount of</p>	<p>For the first programming year, some regions including Centre Val-de-Loire, Bretagne and Auvergne were engaged.</p> <p>In Bretagne, financial commitments on agro-environmental schemes showed high absorption rates after two years of the programme. A newly founded movement called 'Sols d'Armorique¹' is advocating precisely this soil management model.</p> <p>More regions are considering launching the scheme in 2018, such as Hauts de France (Picardie and Nord-Pas-de-Calais), Bourgogne - Franche Comté, Occitanie (Midi-Pyrénées and Languedoc-Roussillon) and Provence-Alpes-Côte d'Azur.</p> <p>As the measure was only launched since 2017, it is still too early to</p>

¹ Created in February 2017 – see <http://atvbv.fr/event/assemblee-generale-de-l-association-sols-d-armorique>

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							<p>support per hectare and per year (€163 per hectare). Agri-environment-climate measures are defined in the National Framework, which was approved by the European Commission. At regional level, managing authorities specify their intervention strategy in their Rural Development Programmes by identifying the areas with environmental and climate issues and by choosing the measures of the national framework that can be implemented in each area.</p> <p>At local level, operators such as chambers of agriculture, regional natural park or local authorities submit AEC projects within the areas defined by the regional RDPs, in response to calls for projects. Once the managing authority has selected the project, the local operator helps the farmers to sign up for the AECMs and provides technical support for the five years of the contract. This innovative governance mechanism allows for joint actions and involves various stakeholders in land management, whether on-farm or off-farm.</p>	<p>assess the results.</p>