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Natural Water Retention Measures

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Synthesis document n°11

Financing NWRM

How can NWRM be financed?



Environment

This report was prepared by the NWRM project, led by Office International de l'Eau (OIEau), in consortium with Actéon Environment (France), AMEC Foster Wheeler (United Kingdom), BEF (Baltic States), ENVECO (Sweden), IACO (Cyprus/Greece), IMDEA Water (Spain), REC (Hungary/Central & Eastern Europe), REKK inc. (Hungary), SLU (Sweden) and SRUC (UK) under contract 07.0330/2013/659147/SER/ENV.C1 for the Directorate-General for Environment of the European Commission. The information and views set out in this report represent NWRM project's views on the subject matter and do not necessarily reflect the official opinion of the Commission. The Commission does not guarantee the accuracy of the data included in this report. Neither the Commission nor any person acting on the Commission's behalf may be held Key words: Biophysical impact, runoff, water retention, effectiveness - Please consult the NWRM glossary for more information.

*NWRM project publications are available at
<http://www.nwrn.eu>*

The present synthesis document has been developed in the framework of the DGENV Pilot Project - Atmospheric Precipitation - Protection and efficient use of Fresh Water: Integration of Natural Water Retention Measures (NWRM) in River basin management. The project aimed at developing a knowledge based platform and a community of practice for implementation of NWRM. The knowledge based platform provides three main types of elements:

- the NWRM framework with access to definition and catalogue of NWRM,
- a set of NWRM implementation examples with access to case studies all over Europe,
- and decision support information for NWRM implementation.

For this last, a set of 12 key questions linked to the implementation of Natural Water Retention Measures (NWRM) has been identified, and 12 Synthesis Documents (SD) have been developed. The key questions cover three disciplines deemed important for NWRM implementation: biophysical impacts, socio economic aspects and governance, implementation of financing.

They rely on the detailed delineation of what NWRM cover as described in *SD n°0: Introducing NWRM. Natural Water Retention Measures (NWRM) are multi-functional measures that aim to protect water resources and address water-related challenges by restoring or maintaining ecosystems as well as natural features and characteristics of water bodies using natural means and processes*. Evidences included into these synthesis documents come from the case studies collected within this project (see the catalogue of case studies) and from the individual NWRM factsheets which are available on the page dedicated to each measure (see catalogue of measures). This information has been complemented with a comprehensive literature review.

More information is available on the project website nwrn.eu.

Key words:

Please consult the NWRM [glossary](#) for more information.

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I. Introduction

Lacking financing sources is seen as a main barrier to the implementation of NWRMs. Although NWRM implementation is usually less expensive than “grey” infrastructure –and, likely, more cost-effective as well- funding is still needed for the construction and maintenance of measures (Stella Consulting, 2012).

Overall, this synthesis document aims at **identifying available sources and new opportunities opening up to finance NWRM implementation**. This will be achieved by:

- Providing an overview of how measures have been financed so far: this will include both a review of the in-depth case studies elaborated in the present project and an overview of how EU funding sources have contributed so far to NWRM implementation;
- A critical review of the main challenges to financing encountered so far;
- An overview of funding opportunities opening up in the current EU programming period, as well as a short review of promising innovative financing mechanisms involving the private sector.

II. How have NWRMs been financed so far?

II.1. Financing in NWRM case studies: an overview

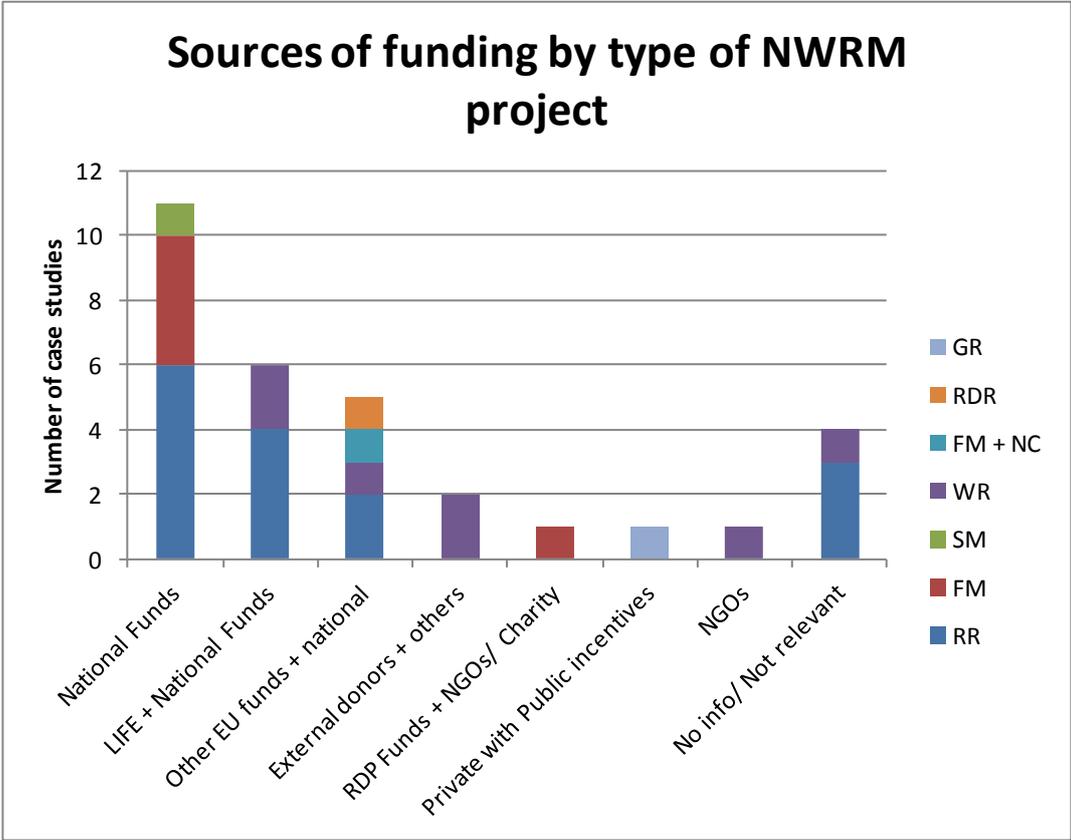
The analysis of the major part of the in-depth case studies, collected within the NWRM Initiative, can help us building a first overview of how NWRMs have been financed in the past. Figure 1 illustrates the main (broad) funding sources deployed to finance NWRM projects chosen as case studies.

Overall, **national sources** – be it national, regional, local or, in many cases, a combination of them- were more often used to finance NWRMs, followed by **LIFE+ funds combined with national funds**. In the past programming period (2007-2013) LIFE+ funds covered 50% of the total project costs. In other cases, NWRM projects were financed by other EU funds (e.g. Cohesion and Structural funds or, in some cases, unspecified EU funds) combined with national funds. External donors (e.g. GEF) combined with other sources of funding came into play in two cases, in Bulgaria and Romania. In other cases, information on financing was not available or not relevant: this gives the flavour of how it can be difficult, in some cases, to find information on financing NWRMs.

Figure 1 also provides an insight on the type of project funded by each main source. **River restoration** projects are the most common ones, and are funded from both national and EU sources – especially LIFE+ funds, but also other sources. **Wetland restoration** projects are also very common, but these are never funded by national sources: EU funds (e.g. LIFE+), external donors and NGOs (e.g. WWF) normally come into play. The lack of wetland restoration projects financed through national sources might depend from the fact that wetland restoration is often one of the most expensive NWRM, as also reported by JRC (2013) for agricultural contexts. **Natural flood management** projects are also an important share of the in-depth case studies,

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and they are financed by national funds in most cases which might indicate that flood protection is considered as a national priority in several MS.



Legenda:

RR= River Restoration; **FM**= Flood Management; **WR**= Wetland Restoration; **NC**= Nature Conservation; **SM**= Stormwater Management; **RDR**= Rural Development and Restoration; **GR**= Green Roofs

Figure 1. NWRM Initiative – In-depth case studies: overview of financing sources by type of project

The table below provides some examples of NWRM projects financed by national funds and LIFE+ funds (combined with national funds).

TABLE 1 EXAMPLE OF PROJECTS IMPLEMENTED WITH NATIONAL FUNDS AND WITH LIFE+ FUNDS IN COMBINATION WITH NATIONAL FUNDS (SOURCE: NWRM INITIATIVE, DETAILED CASE STUDIES).

National funds				
Project	MS	Project type	Measure(s)	Financing sources
Room for the Waal 	NL	River Restoration	<i>N3 Floodplain reconnection</i>	The entire project was financed by Rijkswaterstraat as part of the Room for the Rivers program.
Restoration of the Aurino river 	IT	River Restoration	<i>N8 Riverbed N3 Floodplain reconnection</i>	The application was initiated, financed and implemented by the Special Enterprise for River Regulation and Land Protection, which is a body of the Autonomous Province of Bozen.
Flood-breaking hedgerows 	FR	Flood management	<i>A2 Buffer strips and shelter belts</i>	Sources of financing for the period 2007-2011: <ul style="list-style-type: none"> - The French State: 4425,42 € - The SMIVAL: 8970,51 € (each municipality of the SMIVAL is involved in its budget) - Conseil Général (authorities at the level of each Département): 1008,36 € - Conseil Régional (authorities at the level of each Region): 2144,37 € - FEDER Programme: 456,95 € Adour-Garonne Water Agency: 5306,35 €
Run-off attenuation 	UK	Flood management	<i>N1 Basins and ponds F10: Coarse woody debris F13: Overland flow areas F14: Peak flow control structures</i>	Funding was provided by the Environment Agency and Northumbrian Regional Flood Defence Committee (public funding).

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National funds combined with LIFE+ Funds

Project	MS	Project type	Measures	Financing sources
Arga-Aragon rivers 	ES	River Restoration	<i>N2 Wetland restoration and creation</i> <i>N3 Floodplain reconnection and restoration</i> <i>N4 Re-meandering</i> <i>N8 Restoration of the river bed</i> <i>N5 Revitalization of flowing water</i> <i>F1 Afforestation of riparian areas</i>	EU-funds (LIFE+): 3,877,164 € Rest: Ministry of Agriculture, Food and the Environment + Government of Navarre and Ebro River Basin Authority. Total budget: 6,323,807 €
Mura banks 	SI	River Restoration	<i>N2 Wetland restoration and creation</i> <i>N7 Hydraulic annexes</i> <i>N10 Natural bank stabilisation</i>	<ul style="list-style-type: none"> - EU LIFE NATURE (49%) : 969385€ - Republic of Slovenia – Ministry of Environment and Spatial Planning (34%) : 676778€ - Project leader (beneficiary)- Institute for water of Republic of Slovenia (11%) - Partners (6%): (IZVO) Engineering for waters, (Mura VGP) Mura water management company, (ZRSVN) Institute of Republic of Slovenia for Nature Protection, RRA Mura Regional Development Agency, (PRA giz) Prleška Development Agency, (DPPVN) Society of bird research and nature conservation, WWF Austria
Western area of Dümmer lake 	DE	Wetland restoration	<i>A1 Meadows and pastures</i> <i>A7 Reduced/conservation tillage</i> <i>A12 Reduced stocking density</i> <i>N2 Wetland</i>	EU LIFE, State of Lower Saxony
Amalvas and Zuvintas wetlands 	LT	Wetland restoration	<i>N1 Basins and ponds</i> <i>N12 Lakes</i>	Total budget 1,603,996 € 50% EC contribution (LIFE+) 801,998 € Republic of Lithuania (extent of contribution unspecified)

II.2. Focus on European financing sources

CAP – Pillar 2

The selected case studies include mostly large NWRM projects, such as for example river and wetland restoration and flood management, as these were considered more relevant and/or significant. However, this might give a bit of a distorted picture of financing sources, as “smaller” measures –e.g. **agricultural measures** implemented at the farm level- are taken out of the picture.

The 2010-2012 mandate of the “River Basin Network on WFD and Agriculture” was aimed at providing practical examples or good case practices in RBMPs by assessing agricultural measures and WFD-related issues in the agricultural sector. Part of this review also focused on financing sources for agricultural measures, including NWRMs, in selected countries (DK, England and Wales, FI, FR, IT, NL, Scotland, ES, SE and NO). The study revealed that in all countries (except Norway), the main financing source for agricultural NWRMs was the **Rural Development Programme (RDP – Pillar 2 of the CAP)**, in some cases complemented by national funds.

Generally speaking, the new European Agricultural Fund for Rural Development (EAFRD) offers various funding opportunities for measures of direct WFD relevance, as highlighted in a technical paper prepared for the CIS Working Group on Agriculture¹. Such opportunities can be found, in particular, under EAFRD priorities 4 and 5, and namely: (i) Priority 4 - Restoration, preservation and improvement of ecosystems; and (ii) Priority 5 - Resource efficiency. More in detail, several Rural Development Regulation articles provide funding opportunities for NWRM –some examples are provided in the table below (CIS WG Agriculture, 2014).

¹ <https://circabc.europa.eu/w/browse/5926d2a7-4118-4344-bccd-cc142761fd57>

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TABLE 2 ARTICLES OF THE RURAL DEVELOPMENT REGULATION WITH RELEVANCE FOR NWRM IMPLEMENTATION, WITH EXAMPLE OF NWRM INCLUDED IN ACTIONS ELIGIBLE FOR FUNDING (CIS WG AGRICULTURE, 2014)

Rural Development Regulation - Articles	Examples of NWRM included in actions eligible for funding
Art. 17 – Investments in physical assets	Artificial wetlands for treatment and reuse of waste water Reconnection of floodplains Creation of natural banks Re-meandering of rivers Pond restoration and creation Restoration of terraces
Art. 18 – Restoring agricultural production potential damaged by natural disasters and catastrophic events, and introduction of appropriate prevention actions	Flood prevention measures (e.g. afforestation upland to prevent erosion)
Art. 22 – Afforestation and creation of woodlands	Establishment of forests and their maintenance – if done in the right place with the right species can maintain stable water tables, protect and improve water quality, and slow down flows (reduce flash floods). Targeted woodland creation to improve water quality and flood alleviation, eg, afforestation of montane areas, of reservoir catchments, of riparian areas, and targeted planting in Mediterranean areas for catching precipitation. Plant tree shelter belts on slopes. Preserve or re-establish native trees along river margins/buffers
Art. 23 – Establishment of agro-forestry systems	Establishment of agro-forestry systems in agricultural land and corresponding infrastructures - if done in the right place with the right species can maintain stable water tables, protect and improve water quality and slow down flash floods.
Art. 28 – Agri-environment-climate	Wetland creation, restoration and management Restoration/management/protection of sediment capture ponds. Riparian buffer strips (with vegetation or woodland) Riparian trees in agricultural landscapes Soil management practices, tillage methods, diversified crop rotations and patterns, catch crops, cover crops, winter cover crops, nitrogen fixing crops, choice of drought tolerant species or varieties. Planting hedgerows; reintroducing/maintaining terraces
Art. 30 – Natura 200 and Water Framework Directive payments	Large buffers, wetlands, conversion of arable to forestry/extensive grassland

At least 30% of the RDP budget must be allocated to voluntary measures for the environment and climate change –this is true for both 2007-2013 and 2014-2020 programming periods.

NWRMs potentially covered by CAP – Pillar 2 payments:

Re-meandering of rivers
 Pond restoration and creation
 Replanting of vegetation such as trees or shrubs
 Wetland restoration/ Constructed wetlands
 Buffer strips
 Flood prevention measures such as afforestation of uplands
 Restoration/management/protection of floodplains.
 Continuous cover forestry
 Hedgerows

Total amount allocated in the periods 2007-2013 and 2014-2020

Agri-environment measure: 38 B€ (38% of the total Pillar 2 budget)

Non-productive investment: 1.1 B€

In the current programming period (2014-2020), the total budget of Pillar 2 was decreased by 7%, from 95,58 to 89,94 B€².

LIFE Programme

The LIFE Programme is the specific funding instrument supporting the Birds and Habitat Directive, and it is therefore specifically tailored to support environmental conservation and restoration in Europe. However, LIFE funds covered 50% of the total project costs in the programming period 2007-2013, and the rest was covered by national or private funds. In the current programming period (2014-2020), LIFE+ funds cover on average 60% of project costs, but this share can be higher in some cases³.

A second novelty introduced in the current programming period is the identification of two sub-programmes: Environment and Resource Efficiency (with a clear focus on water, waste and air) and Climate Action. Both sub-programmes can be relevant for NWRM implementation⁴. The current programming period introduced funding for integrated projects, such as environmental and climate plans and strategies concerning large territorial areas, including RBMPs, Natura 2000 networks, or cross-border flood protection strategies. This type of projects was introduced to ensure coordinated mobilization of other EU, national and private funds⁵. Water, floods and droughts are one of the areas of interventions and, in particular, NWRM are a key funding priority, and they are defined in the LIFE Multiannual Work Programme as follows: “*Planning and establishment in urban and rural areas of natural water retention measures that increase infiltration, storage of water and remove pollutants through natural, or "natural-like" processes and thereby contribute to the achievement of the WFD and the Floods Directive (FD) objectives and to drought management in water scarce regions*” (EC, 2014, p. 7).

In the current programming period, the LIFE Programme also includes the Natural Capital Financing Facility (NCFE). The NCFE is particularly interesting because it is aimed at promoting the development of innovative financing schemes for the preservation of natural capital, and such schemes can be particularly relevant for financing NWRM implementation –as also

² http://ec.europa.eu/agriculture/policy-perspectives/policy-briefs/05_en.pdf

³ For more detail, see the new LIFE+ Regulation: <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013R1293&from=EN>

⁴ NEW LIFE+ Regulation, see above

⁵ http://ec.europa.eu/clima/policies/finance/budget/life/faq_en.htm

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illustrated in detail in section III of this document. More details on this instrument are provided in the box below.

The Natural Capital Financing Facility (NCFF)

The NCFF is directed at natural capital projects that generate revenues or save costs, while achieving biodiversity and climate adaptation objectives at the same time.

Projects potentially eligible for funding fall into the following categories: (i) Payments for Ecosystem Services (PES): these schemes have a strong potential for financing and supporting NWRM implementation; (ii) Green Infrastructures (GI) –thus including NWRM: GI can generate revenues or save costs based on the provision of environmental goods and services; (iii) Biodiversity offsets: these are conservation actions intended to compensate for the residual, unavoidable harm to biodiversity caused by development projects. NWRM can be part of offset programmes; and (iv) Innovative and pro-biodiversity adaptation investments: these include projects involving the supply of goods and services, mostly by SMEs, aimed at preserving biodiversity or increasing the resilience of communities and other business sectors.

In the current programming period, € 100 – 125 million have been allocated to NCFF. Loans and investments are mainly provided by the European Investment Bank (EIB), but the European Commission also contributes € 50 million as a guarantee for the investments and finances a € 10 million support facility for capacity building and project preparation and implementation⁶.

LIFE Programme: Key facts

NWRMs potentially covered by LIFE+ Programme:

LIFE+ funds are widely used for ecosystem restoration and conservation including, in particular, river and wetland restoration.

LIFE+ integrated projects can be particularly relevant for NWRM, as funding can be granted to RBMPs, Natura 2000 networks, cross-border flood protection strategies.

Total amount allocated in the period 2007-2013 and 2014-2020

In the period 2007-2013, the total LIFE+ budget amounted to 2,14 B€.

For the current programming period, the budget has increased up to 3,46 B€, corresponding to a 43% increase⁷.

In addition, 100 – 125 million have been allocated to the Natural Capital Financing Facility.

Cohesion Policy

In the programming period 2007-2013, only a few funding opportunities for biodiversity projects were identified within the Cohesion Policy and, in particular, within ERDF (European Regional Development Fund) allocation, in the programming period 2007-2013, and namely:

- ERDF Territorial Cohesion: some Interreg projects used funding to restore and maintain ecosystems and biodiversity;
- ERDF Category 51 aims at promoting biodiversity and nature protection, including Natura 2000 sites.

⁶ http://ec.europa.eu/environment/life/funding/financial_instruments/ncff.htm

⁷ <http://ec.europa.eu/environment/life/about/index.htm#life2014>

In contrast, the funding priorities for the period 2014-2020 open up significant opportunities for financing NWRM and these are, in particular, priorities identified under two thematic objectives (TOs):

- Thematic objective 5: Promoting climate change adaptation, risk prevention and management. ERDF and Cohesion Fund support investment for adaptation to climate change, including ecosystem-based approaches. The latter, in particular, is seen as one of the preferred options in implementing measures to prevent natural disasters and/or adapt to climate change: so, for instance, flood plain restoration should be preferred to dykes. Ecosystem-based adaptation can cover several NWRM, which become then an investment priority in EU Regional Policy. In addition, MS Partnership Agreements and Operational Programmes must reflect flood risk plans required by the Flood Directives –and this opens up additional financing opportunities for NWRM⁸.
- Thematic objective 6: Preserving and protecting the environment and promoting resource efficiency. Under this objective, green infrastructures are key funding priorities, as they are seen as measures which can protect and restore biodiversity while ensuring the provision of several ecosystem services and side economic benefits to societies. In addition, investment priorities include integrated spatial planning and innovative approaches to environmental protection, such as Payments for Ecosystem Services, and these can indirectly support NWRM implementation⁹.

Cohesion Policy: Key facts

NWRMs potentially covered by Structural and Cohesion Funds:

In the past, ERDF was also used for ecosystem restoration and catchment, landscape and urban planning: so several NWRMs can be included.

In the current programming period, significant funding opportunities have opened up for NWRM implementation. TO5 includes ecosystem-based approaches as priority measures in climate change adaptation. TO6 specifically targets green infrastructures as key interventions for protecting the environment.

Total amount allocated in the periods 2007-2013 and 2014-2020

Although it is difficult to estimate, the total allocation on biodiversity in the programming period 2007-2013 seems to be less than 1% (IEEP, 2013).

In the period 2014-2020, the total budget allocated to Regional and Cohesion policy amounts to €351.8 billion EUR. However, the allocation of funding to the different thematic objectives varies across EU MS, so at present it is not yet possible to provide estimates of the amount allocated so far to TO5 and TO6.

In summary...

- So far, NWRMs in Europe have been mostly financed by **public budgets**, either national or EU funds.
- **National funds** have mostly been used for river restoration and flood management projects. Often, measures are co-funded by institutions at different levels (national, RBD, local).
- Among **EU financing sources**, two mechanisms have been widely used: (i) LIFE+ funds combined with national funds, for large river and wetland restoration projects; and (ii) Rural Development Programme – Pillar 2 of the CAP, particularly for agricultural measures implemented at the farm level (in some cases,

⁸ http://ec.europa.eu/regional_policy/sources/docgener/informat/2014/guidance_fiche_climat_change.pdf

⁹ http://ec.europa.eu/regional_policy/sources/docgener/informat/2014/guidance_fiche_biodiversity_n2000.pdf

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complemented by national funds).

- In the **current programming period**, LIFE and CAP funds will still have an important role in financing NWRM. In addition, Structural and Cohesion Funds are expected to open up significant funding opportunities for these measures: specific thematic objectives and funding priorities, targeting ecosystem-based approaches and green infrastructures, were in fact introduced in Regional and Cohesion Policy.

III. Emerging financing sources

As mentioned earlier, scarce financing sources can be a major break to NWRM implementation. Experiences collected under this project, as well as the available literature, suggest that so far NWRMs have been mainly financed through public sources, among which national sources have played a major role. Since the onset of the financial crisis in Europe, governments’ (and local administrations’) budget have undergone sever cuts, and this appears to have affected the rate of implementation of the Programmes of Measures (EC, 2012c). And there is no reason why this should not have affected NWRM implementation too.

Emerging and innovative financing sources can then come into play to address this challenge. All over the world, a variety of **schemes and instruments involving private stakeholders** are being developed to sustain and enhance protection, conservation and restoration activities in different environmental domains, such as for example carbon, biodiversity and, of course, water. Many of these schemes have already been used to finance NWRM implementation, or have the potential to sustain it. Globally, investments in watersheds exceeded \$ 8 billion in 2011, and annual investments have constantly increased in recent years, as also illustrated in the figure below (Bennet et al, 2013).

Figure 1: Global Annual Transactions, 2008-2011

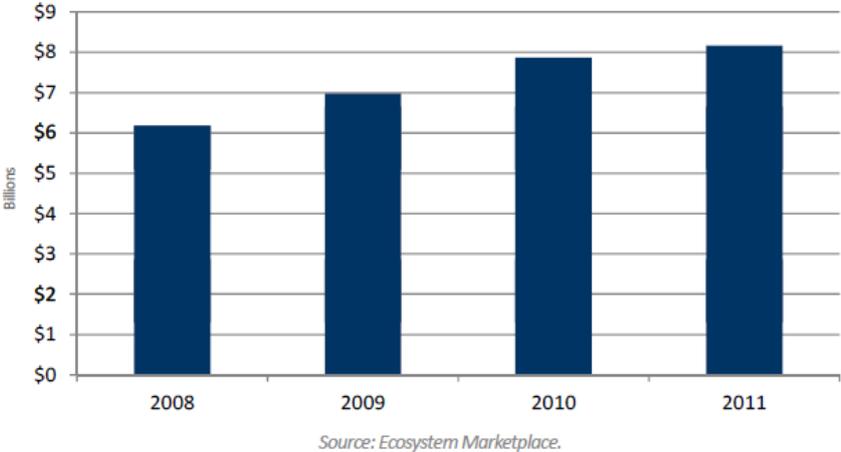


FIGURE 2 GLOBAL INVESTMENTS IN WATERSHEDS IN THE YEARS 2008-2011: ANNUAL TRANSACTION VOLUMES IN THE WORLD (SOURCE: BENNET ET AL, 2013)

An even more significant increasing trend in recent years is shown by the number of new investment programs implemented each year worldwide, presented by the graph below (Bennet et al, 2013).

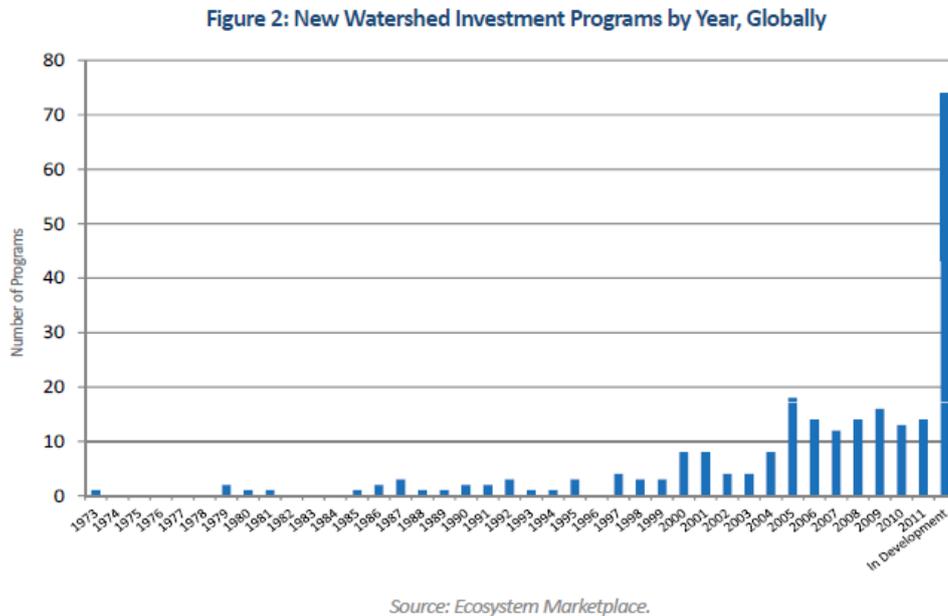


FIGURE 3 NEW WATERSHED INVESTMENT PROGRAMS BY YEAR IN THE PERIOD 1973-2011 (AND FORTH, INDICATED IN THE GRAPH AS PROGRAMS IN DEVELOPMENT). (SOURCE: BENEET ET AL, 2013).

It must be noted, however, that these figures include all types of investments in watersheds¹⁰, such as Payment for Watershed Services (PWS) schemes, water funds, water trading markets and so on; such mechanisms are applied worldwide to a wide variety of watershed management practices which also include –but they are not limited to- NWRMs. Nevertheless, such figures give the flavour of the increasing importance of alternative financing sources for watershed management.

The following paragraphs illustrate the two financing schemes which, so far, have been successfully used to finance NWRM around the world, and namely **Payment for Watershed Services (PWS) and Water Funds**. When possible, examples of their application to NWRM implementation in the EU are provided; in other cases, examples from other continents are presented. A third paragraph describes some additional promising or emerging schemes/instruments, such as **product labelling and certification and bio-carbon markets**: at present, the use of these instruments to fund NWRMs is limited, but they have a good potential of being applied to NWRM implementation, often in combination with other financing instruments.

¹⁰ Bennet et al (2013) define “investments in watersheds” as follows: “we use the term ‘investments in watershed services’ to cover the broad diversity of incentive- or market-based mechanisms being used to protect the natural infrastructure of watersheds – including payments for ecosystem services (PES), payments for watershed services (PWS), water quality trading markets, and reciprocal or in-kind agreements” (Bennet et al, 2013, pag. i).

III.1. Payments for watershed services

PWS schemes belong to the wider category of Payments for Ecosystem Services (PES). PES are voluntary mechanisms where suppliers of ecosystem goods and services (ESS) are paid by the beneficiaries to manage the ecosystems so that the provision of ESS is maintained and/or enhanced. PWS, in particular, are focused on the ESS provided by sound watershed management, **linking upstream land and water management and downstream benefits** (Smith et al, 2006). PWS are particularly relevant for financing NWRMs, as these measures are applied (or should be applied, to maximize their effectiveness) at the watershed level, and their impacts and related benefits also concern the watershed and, in particular, downstream areas.

PWS schemes present differences in terms of (Bennet et al, 2013):

- **Management actions** rewarded through the scheme (e.g. reforestation, ecosystem restoration, good agricultural practices, etc);
- **Services provided** by management actions and marketed within the scheme (e.g. water quality improvements, increased water security, flood protection, recreation, etc.). In addition, watershed services might be marketed within a scheme in different ways: (i) a **single service** is supplied and bought (e.g. water quality improvement); (ii) **bundled services**: multiple services are bought and sold altogether, in one single “package”; and (iii) **stacked services**: management actions produce multiple services which are sold separately, also to different groups of buyers (e.g. reforestation for groundwater recharge: one group of buyers will pay for water provision, whereas carbon credits can be sold on carbon markets);
- **Buyers**: the watershed services provided can be bought by beneficiaries of watershed protection (e.g. a downstream city), by polluters or water users compensating for their impacts (e.g. a water-intensive industry can offset its water use by financing a project to enhance groundwater infiltration and recharge), or by a public good payer like Governments or NGOs.

The boxes below summarize some successful PWS schemes developed to finance NWRM implementation in Europe.

Germany	Drinking water forests¹¹	
Bionade Corporation, a beverage manufacturer, in partnership with Trinkwasserwald e.V. (Drinking Water Forest Association), is creating "drinking water forests" all over Germany. The project involves afforestation of privately and publicly owned land with deciduous broadleaved trees, with the aim of enhancing groundwater regeneration. Bionade aims to offset its own water use in doing so, with a target of about 100 million liters each year or 130 hectares of reforested lands. Forest land holders sign contracts with Trinkwasserwald e.V. agreeing to	NWRMs involved in the scheme	F4 - Targeted planting for "catching" precipitation
	Watershed services marketed within the scheme	

¹¹ Source: Watershed Connect http://www.watershedconnect.com/projects/bionade_trinkwasserwald
 Some (little) more information can be found at: <http://www.bionade.de/en/partners-and-projects/environment/trinkwasserwald>
 and <http://www.trinkwasserwald.de/de/trinkwasserwald/>

reforest monoculture coniferous plots with deciduous trees.

Water supply (quantity - groundwater regeneration)

Italy

Bosco Limite¹²

The Province of Padua, with the support of other local administrations, universities and consultancies, recently implemented the "Bosco Limite" project, which aims at creating a forested area aimed at "catching" precipitation and increase groundwater recharge.

The case-study site is located upstream of a captage area, where aqueducts abstract water for Venice, Vicenza and other towns: there is thus a demand for increased groundwater recharge and water purification. In addition, Bosco Limite provides a wide range of goods and services, such as groundwater recharge, CO₂ fixation, biodiversity safeguard, production of high quality wood and biomass for energy production, and recreational-touristic services.

The measure was implemented in an area previously used for intensive agriculture, and activities with high economic returns.

Therefore, the main challenge of the project was to find alternative, competitive sources of income for landowners who made their land available for reforestation.

A PES scheme was thus established to ensure that participating to the project is financially attractive for farmers (who made their land available for reforestation), targeting the following services:

- Water provision: ten-years contracts between landowners and the local Consorzio di bonifica (irrigation managing authority);
- Carbon storage: contract with enterprises, also linked to green marketing and social responsibility;
- Green energy (wood products);
- Biodiversity: no actual contracts have been established, but there are agreements with the hunting association and environmental associations. Furthermore, there is a contract with a municipality for environmental education activities.

The establishment of a PES scheme for a variety of services was key for the success of the project.

NWRMs involved in the scheme

F4 - Targeted planting for "catching" precipitation

Watershed services marketed within the scheme

Water provision (quantity)
Carbon storage
Green energy
Biodiversity

UK

Sustainable Catchment Management Programme (SCaMP)¹³

Sustainable Catchment Management Programme (SCaMP) was developed by United Utilities in association with the Royal Society for the Protection of Birds (RSPB), Natural England and the Forestry Commission to protect peatland bog habitats in the upper catchment. Drainage and livestock grazing-caused degradation of the upland heath and peatlands, which dried out and eroded releasing sediments into water courses. Such sediments in water requires that additional water treatment is performed by water utilities to meet drinking water quality standards, significantly increasing annual operation costs of treatment plants. Instead of engaging in expensive treatment operations, since 2005 United Utility has opted for investing in moorland restoration, woodlands, farm infrastructure and protecting watercourses, working together with farmers and in conjunction with

project partners. In the period 2005-2010, United Utilities invested £10.6m to these activities. In the project's second phase, activities have expanded to include a focus on the carbon sequestration services

NWRMs involved in the scheme

N2 – Wetland (peat bog restoration)

Watershed services marketed within the scheme

Water supply (water quality)
(Under development: Carbon sequestration, other wildlife values)

¹² See the NWRM case study on the project website

¹³ Source: Watershed Connect http://www.watershedconnect.com/projects/sustainable_catchment_management_programme and <http://corporate.unitedutilities.com/scamp-index.aspx>

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provided by peat habitats, as well as their wildlife values.

Interestingly enough, two of these schemes were developed to finance the implementation of targeted planting for “catching” precipitation, and in all cases the service delivered is linked to **water supply/provision** (linked to either quantitative or qualitative aspects): this is perhaps the easiest service to identify, quantify and trade among the services provided by NWRMs. In fact, there is a constant demand for this service: in Italy and the UK, water utilities finance improved water supply obtained through NWRM implementation; in Germany, a water-intensive industry finances the establishment of drinking water forests to offset its own water consumption. All around the world, securing or improving existing water supply is probably the main driver for watershed management actions and the development of related PWS schemes¹⁴.

However, the Bosco Limite project in Italy goes beyond the simple enhancement of groundwater resources: although increasing water supply is the main driver for implementation, reforestation activities provide other services (carbon sequestration, green energy and biodiversity). To make reforestation activities attractive for landowners, different compensation mechanisms were established for different services within the PES scheme –different services are thus stacked by the scheme. In this case, it was reported that this **diversification of financing mechanisms was key to the successful implementation of the measure**.

The WATER (“Wetted Land: the Assessment, Techniques & Economics of Restoration”) Project is one of the first attempts in Europe to go beyond single service transactions, and to develop mechanisms capturing a wide range of ecosystem services provided by watershed conservation (including NWRMs). Under this trans-boundary project¹⁵, France and the UK are working together to develop a PES scheme to drive financing for watershed restoration in the English Channel; seven river catchments and sub-catchments are being assessed for PES viability. The project will develop a series of cost-benefit guides demonstrating economic benefits of the mechanism, and it will demonstrate a model Channel-wide framework for cooperating on development cost-effective models for catchment management. The PES scheme will be developed for a broad set of ecosystem services provided by several conservation and restoration practices, including water treatment, flood mitigation, carbon offsetting, biodiversity and catchment food branding; it is also part of a larger workstream also examining wetland PES and carbon sequestration payments¹⁶.

¹⁴ A comprehensive review of PWS programs around the world can be found on Watershed Connect, at the following link: <http://www.watershedconnect.com/projects/>

¹⁵ INTERREG Project - Partnership between a number of English water trusts, led by Westcountry Rivers Trusts, and French environmental NGOs

¹⁶

http://www.watershedconnect.com/projects/water_project_creating_payments_for_ecosystem_services_catchment_schemes
More information can also be found on the project website: <http://www.projectwater.eu/index.html>

III.2. Water funds

Water funds are an innovative way to finance watershed management, paying for the services that ecosystems provide to humans; their implementation has been spreading in recent years and in Latin America in particular. Water funds **pool together capital contributions from different stakeholders** involved in watershed management such as water supply companies, hydropower plants, irrigation districts and agricultural associations, among others. Capital contributions are invested in the financial market through trust funds, and the financial returns are invested to finance watershed management activities, such as for example conservation measures, protected areas, promotion of eco-friendly agriculture and so on.

The aim of the funds is to **ensure the supply of environmental services from a healthy watershed**; to achieve an impact on conservation and management, water funds implemented so far normally establish a long-term work plan. By gathering together all relevant stakeholders and consumers, these funds not only ensure funding for management and conservation activities, but promote integrated and participated watershed management. Usually, these funds complement public resources and efforts in watershed protection, and **actions are coordinated with national and local water management policies** (Calvache et al, 2012).

As these funds are directed to integrated watershed management, they do not specifically target NWRMs alone; however, NWRMs are a crucial component of integrated watershed management, so they are part of existing programmes financed through these mechanisms. The box below illustrates an example of water fund established in Ecuador, whose management programme also includes NWRM implementation.

Ecuador	FONAG (Fondo para la Protección del Agua) ¹⁷	
<p>The Guayllabamba River upper basin provides water supply to the capital city of Quito and the cantons Quito, Mejía, Cayambe and Pedro Moncayo Rumiñahui. The watershed is one of the most populated areas of the country, and water resources face shortages, competition and pollution problems. The FONAG water fund was then established to pool contributions from major water users for watershed protection activities in the upper basin.</p> <p>In this scheme, management activities concern both public protected areas and privately owned land and, in the latter case, landowners are the suppliers of the watershed services at stake. The fund receives the contributions of metropolitan water and sanitation and electricity utilities, private brewery and bottled water companies, and NGOs/conservation agencies. Other NGOs, development and conservation agencies participate to the scheme as intermediaries.</p> <p>Management activities funded through the scheme include:</p> <ul style="list-style-type: none"> • Targeted planting for “catching” precipitation (including afforestation, reforestation and planting of other vegetation cover); • Integrated water management: assessment, monitoring and modeling plans on water allocation and 		<p>NWRMs involved in the scheme</p> <p>F4 - Targeted planting for “catching” precipitation</p>
		<p>Main watershed service concerned by the fund</p> <p>Water supply (quantity and quality)</p>

¹⁷ Sources: (i) Watershed Connect: <http://www.watershedconnect.com/projects/fonag> and (ii) FONAG website: <http://www.fonag.org.ec/inicio/english-version.html>

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- management, hydrology, climate and climate change, biodiversity;
- Capacity building in local communities;
 - Monitoring and surveillance of protected areas;
 - Communication and environmental education.

III.3. Other instruments

Besides the two instruments described above, other mechanisms can come into play with respect to financing NWRM implementation. According to IEEP (2013) the most promising innovative economic instruments for biodiversity restoration are PES (or more precisely, as described above, payments for watershed services), but also **product labelling and certification, and bio-carbon markets** (carbon markets for carbon credits gained through ecosystem restoration). The application of such mechanisms has the greatest potential in all those cases where compensations to farmers come into play, as they could in principle substitute public compensation payments and provide farmers with an alternative/complementary source of income (IEEP, 2013). All these instruments are means to put the benefits gained into value for those responsible to take care of the correct implementation of NWRM.

Product labelling/certification and carbon markets, in particular, can come into play as **complementary financing sources** for implementing several NWRMs. In PWS schemes, for example, carbon credits can be traded in addition to other watershed services. This is the case, for example, in the Bosco Limite project: the main objective of the scheme is to secure water supply to nearby cities through reforestation and afforestation, and landowners are compensated for this service; at the same time, afforestation and reforestation activities provide carbon sequestration, and local enterprises have signed contracts for carbon offsets.

Looking more in detail at **bio-carbon markets**, it can be observed that several NWRMs (and not only afforestation/reforestation) can sequester and/or reduce carbon emissions, so that in principle carbon credits can be sold. In 2012, for example, the **new carbon trading category “Wetlands Restoration and Conservation” (WRC)** was approved by the Verified Carbon Standard¹⁸ (VCS)¹⁹, following an initiative led by Restore America’s Estuaries (RAE)^{20,21}.

¹⁸ The Verified Carbon Standard is a greenhouse gas accounting programme used by projects around the world to verify and issue carbon credits in voluntary markets. VCS is the leader in the voluntary carbon market with a 58 percent global share. It is considered by many market and policy professionals as the most sought-after certification in the world today. Source: Wetlands International

¹⁹ Source: Wetlands International - <http://www.wetlands.org/News/tabid/66/ID/3100/Global-carbon-markets-now-open-to-Wetland-Restoration-and-Conservation.aspx>

²⁰ The initiative is aimed at creating greenhouse gas offset opportunities for wetlands

²¹ Source: ESA Consulting firm, <http://www.esassoc.com/news/global-carbon-markets-now-open-wetland-restoration-and-conservation>

Labels and certifications identify to consumers those agricultural products supporting a certain type of ecosystem maintenance or restoration, as well as other environmental-friendly management practices, to incentivize purchase (IEEP, 2013). Often, these certifications and labels are awarded to farms carrying out several environmental-friendly activities/ sustainable practices on their farms which, in some cases, also include NWRMs. Sometimes, labels are linked to ecosystem restoration and conservation, such as for example wetland conservation –in this case, a direct link is established between a NWRM and label award. The table below summarizes two examples of certifications involving also NWRM implementation.

TABLE 3 CERTIFICATION SCHEMES ADDRESSING AGRICULTURAL PRODUCTS AND FARMS ADOPTING SUSTAINABLE PRACTICES, INCLUDING NWRMS

Certification Scheme	Description	NWRMs concerned
<p>Food Alliance Certified²²</p>  <p>United States</p>	<p>Food Alliance is a nonprofit organization that certifies farms, ranches, and food processors and distributors for sustainable agricultural and facility management practices.</p> <p>To be awarded the certification, farms and food processors must meet a series of criteria, including better conditions for thousands of workers, more humane treatment of hundreds of thousands of animals, reduced use of toxic and hazardous materials, and healthier soils, cleaner water, and enhanced wildlife habitat on millions of acres of range and farmland.</p>	<p>NWRMs are included in the Sustainability Standards for both Crop and Livestock Operations. In particular, the following good practices are mentioned in the evaluation criteria:</p> <ul style="list-style-type: none"> • Continuing Education for Soil and Water Conservation • Buffer Strips Around Waterways • Soil Erosion Prevention • Tillage Selection Practices and Soil Compaction Prevention • Irrigation Water Conservation
<p>Rainforest Alliance Certified²³</p>  <p>United States</p>	<p>The Rainforest Alliance Certified™ seal is awarded to products coming from farms and forest managed according to the standards developed by the Sustainable Agriculture Network (SAN)²⁴. Certified farms and forests ensure that management practices protect the environment and promote the rights and well-being of workers, their families and communities. Products that carry the green frog seal include coffee, tea, chocolate, fruit, ready to drink beverages and juices, flowers, paper and tissue products, furniture and more.</p>	<p>Among others, farm and forest operations must conserve existing ecosystems and aid in the ecological restoration, by:</p> <ul style="list-style-type: none"> • taking steps that protect waterways and wetlands from erosion and contamination; • prohibit logging and other deforestation; • maintain vegetation barriers; • prevent negative impacts on natural areas outside farmlands.

²² Sources: Food Alliance: <http://foodalliance.org/crops/crop> and <http://foodalliance.org/livestock/livestockops> - Ecolabel Index <http://www.ecolabelindex.com/ecolabel/food-alliance-certified>

²³ Sources: Rainforest Alliance: <http://www.rainforest-alliance.org/> and <http://sanstandards.org/sitio/subsections/display/7> - Ecolabel Index : <http://www.ecolabelindex.com/ecolabel/rainforest-alliance-certified>

²⁴ For more information: <http://sanstandards.org/sitio/subsections/display/7>

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In summary...

- Emerging and innovative financing sources involving private stakeholders can then come into play to address the challenges posed by the economic crisis and shrinking public budgets. In fact, **investment in watersheds** (through a variety of schemes and programmes) has been constantly increasing in recent years.
- This paper identifies some of the most promising innovative financing sources for NWRMs, such as **Payments for Watershed Services (PWS)** schemes and **Water Funds**. In addition, **carbon markets** and **labeling/certification** schemes can come into play as complementary financing sources for implementing several NWRMs.

IV. Mobilizing financing sources: main challenges and opportunities

IV.1. Overall challenges

To gain an overview of the key challenges with respect to financing NWRM, it is useful to get back to the diagram already presented in the synthesis document on NWRM barriers and success factors –re-proposed below in a simplified version. These challenges are in fact the direct or indirect consequence of some key features of NWRMs.

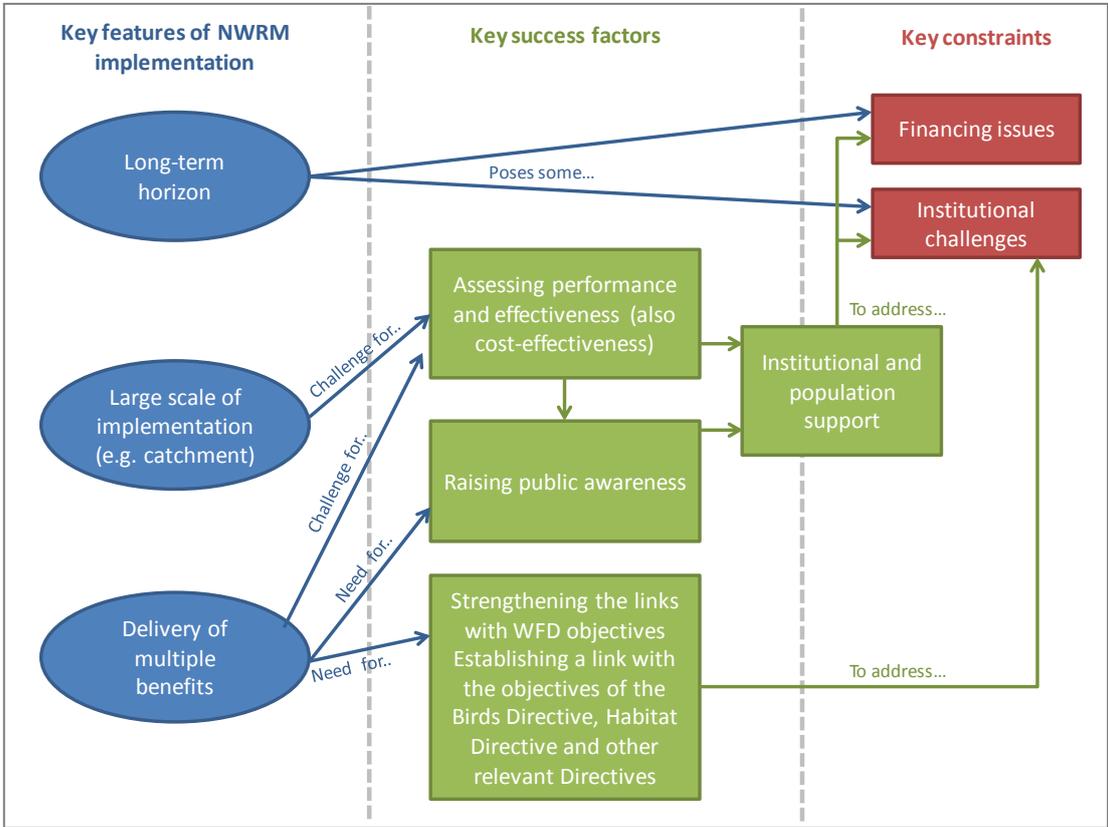


FIGURE 4. KEY COMMON ASPECTS OF NWRM IMPLEMENTATION IN THE FOUR REGIONS

NWRMs have a **long-term planning horizon**, and this often results in a lack of institutional and financial support. **Financing issues** arise, in particular, when it comes to maintenance costs. Some measures can indeed be self-sustaining, but in many cases maintenance is needed over a long period of time: if this is the case, there is the need for long-term agreements and/or **specific funding mechanisms**.

A second issue with financing NWRMs is related to the assessment of their cost-effectiveness, which faces two main challenges (see also the synthesis document on NWRM cost-effectiveness):

- NWRMs have proven to perform at their best when implemented at the catchment scale in a territorial planning perspective. However, benefits are often widespread, and interventions in one place easily generate benefits elsewhere (i.e. downstream), posing some challenges while assessing their cost-effectiveness;
- NWRMs provide multiple benefits, which go well beyond water retention itself and include, for example, water quality improvement, biodiversity improvement, enhancement of soil features, better ecosystem adaptation capacity to climate change and so on. If some of the multiple benefits are overlooked or unknown, NWRMs might not appear cost-effective, and thus key stakeholders might not have an incentive to engage in NWRM implementation.

In addition to this, there is often a lack of tangible indicators related to NWRM performance, which further hampers cost-effectiveness assessments (EC, 2012a; see also the synthesis document on NWRM biophysical impacts).

Building a strong evidence base on NWRM performance and, especially, on their cost-effectiveness, is thus perceived as a crucial step to induce a change in the policy processes and in public awareness. Legislative and policy support, as well as population support, are crucial success factors for the implementation of NWRMs. Ensuring institutional support can also ensure **financial support**, for example through the establishment of appropriate funding mechanisms. Promoting multiple benefits, in particular, is key to ensure such support –provided that such multiple benefits can be demonstrated.

Understanding the multiple benefits of NWRMs would also help in strengthening the links with all relevant EU Directives. These links appear even more evident if one thinks about the multi-dimensionality of NWRMs, and the multiple benefits they can deliver. The multi-dimensional character of NWRMs also calls for a full integration not only of FD and WFD, but also of the Bird and the Habitat Directives and other relevant EU policies. Such approach would also **unlock additional financing opportunities** linked to different EU funding instruments –as well as addressing current institutional challenges.

IV.1.1. Challenges and opportunities related to EU funding instruments

Despite the availability of financing instruments potentially suitable to finance NWRM, overall the Stella study (2012) highlighted a lack of funding sources to implement NWRMs at the EU

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level. The main challenges and opportunities related to existing EU funding instruments are summarized in the table below (main source: Stella Consulting, 2012; complemented with additional information on the current funding period).

Funding instrument	Challenges	Opportunities
CAP	In some cases, NWRM implementation on agricultural land can lead to a loss of revenues for farmers –e.g. extensification of farming practices, decreased productivity etc. As previously seen, through some CAP measures farmers can receive compensation, but payments are usually low –i.e. providing a low incentive to land use change.	Two out of the six priorities outlined for the RDP 2014-2020 are of direct relevance for NWRMs: (i) restoring, preserving and enhancing ecosystems dependent on agriculture and forestry; and (ii) Promoting resource efficiency and supporting the shift towards a low-carbon and climate resilient economy in agriculture, food and forestry sectors ²⁵ . LEADER could be promoted as a funding instrument for local and regional authorities to share best practices on climate change and trans-boundary NWRM implementation.
LIFE Programme	Although the budget of the LIFE Programme has increased by 43% with respect to the funding period 2007-2013, up to 3,64 B€, it is still low if compared to other EU funds, such as the Framework Programme for Research and Innovation (80 B€) or the Cohesion Policy Fund (376 B€). In the previous funding period, LIFE funds were reported to be insufficient to promote a widespread NWRM implementation.	The emphasis on integrated project, introduced in the current funding period, will surely widen the scope of LIFE projects and opens up opportunity for further policy coordination and integrated funding – LIFE funds, for example, can now be used to co-finance RBMPs and trans-boundary flood protection strategy. This is likely to have a positive impact on the uptake of NWRMs. In addition, the Natural Capital Financing Facility provides additional funding opportunities for NWRM implementation, by promoting the development of innovative financing schemes for the protection of natural capital.
Cohesion Policy	The specific funding allocation between the different thematic objectives is country-specific, so at the moment it is difficult to estimate the impact of Structural and Cohesion Funds on NWRM implementation across the EU. Nevertheless, climate change adaptation and environmental protection are given strong emphasis, so significant investments can be expected.	In the current programming period, significant funding opportunities have opened up for NWRM implementation. TO5 includes ecosystem-based approaches as priority measures in climate change adaptation. TO6 specifically targets green infrastructures as key interventions for protecting the environment.

At a more general level, it can be said that not only the scarce availability of EU funds is a constraint to NWRMs implementation. A major opportunity for NWRM implementation could lie in the **integration of different EU financing sources** –which might also include national

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http://enrd.ec.europa.eu/policy-in-action/cap-towards-2020/rdp-programming-2014-2020/policy-overview/en/policy-overview_en.cfm

and private funds: NWRMs, in fact, can address different EU policy targets at the same time, which could make the case for co-financing. However, such co-financing potential appears to have been largely unexploited so far, and a lack of binding targets both within policies and funding instruments was observed. In addition, co-financing is often seen as unattractive for certain MS and regions, or even unattainable for some of them (EC, 2012b). In this light, the introduction of **Integrated Projects within the LIFE** programme goes in the right direction, and might open up substantial funding opportunities for NWRMs.

IV.2. Emerging and potential alternative financing sources

All instruments presented in section 3 have a good potential to boost NWRM; however, their implementation in the EU context might present both opportunities and challenges, as summarized below.

Payments for Watershed Services	
Advantages	Several schemes implemented so far have proven effective in pursuing their environmental objectives , providing a strong incentive for resource protection and enhancement. The main strengths of the schemes is that they can achieve both positive social and environmental outcomes , by empowering local land and water users in the conservation of natural resources. In fact, watershed management is developed through positive investment on social capital rather than on technical capital. As a consequence, PWS schemes have also the ability to manage potential social conflicts over resource use (EPI-Water, 2012).
Disadvantages	The establishment of PWS schemes in the European context might face some challenges due to the advanced regulatory and institutional settings . Moreover, in the EU water resources are public goods , and constraints are posed on private rights: this might also limit the potential for their implementation (EPI-Water, 2012), as also shown by the case of Romagna Acque S.p.A. illustrated in the box below. However, the successful implementation of some PES schemes in Europe suggest that these challenges can be overcome by an appropriate program design (EEA, 2013). These institutional and regulatory brakes to PWS establishment seem to be confirmed by the fact that, so far, Europe has been less receptive than North America and Oceania to incentive based approaches –and, in fact, a few PWS schemes have been implemented so far in Europe. However, the high costs involved in WFD implementation might result in a larger uptake of these schemes (Bennet et al, 2013).
Applicability to NWRM implementation	As previously mentioned, PWS schemes can be developed to finance a variety of good watershed management practices, which also include NWRMs. So far, many schemes have been aimed at securing or enhancing water supply , both in quantitative and qualitative terms: this service, in fact, is relatively easy to identify and quantify, and a large, constant demand exist for this service (e.g. water utilities). Several NWRMs can contribute to this objective, so PWS can be considered as a suitable financing scheme. In contrast, a very few schemes target other functions and services provided by NWRMs, such as for example flood protection. Further research would be therefore needed to assess the potential of PWS schemes to finance flood management measures at the watershed scale. When developing a PWS scheme for NWRM implementation, it is important to consider the multiple benefits provided by these measures: as shown for example by the Bosco Limite project, the provision of multiple services within the same PWS scheme diversifies financing sources , and it can be key for the financial sustainability of the scheme itself. Multiple services can be sold to beneficiaries either as a bundle of service (one payment for a “package” of services) or as stacked services (different payment mechanisms for different services).

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The challenges posed by European regulatory and institutional settings to PWS schemes for NWRM implementation – The example of Romagna Acque S.p.A., Italy

Romagna Acque S.p.A., a public water company, compensates landowners for forest management practices that limit erosion and thus sedimentation of the basin surrounding a key reservoir in the municipality of Bagno di Romagna. Romagna Acque S.p.A. allocates to this program a part of water tariff revenues.

However, according to the Italian regulatory structure, the public water company is not allowed to make direct payments to landowners when the good or service in question is not well defined, so Romagna Acque has invested instead in forest roads used by landowners or has directly acquired land (Pettenella et al, 2012, in Bennet et al, 2013).

Water Funds	
Advantages	<p>Water Funds are proving effective in promoting integrated and participatory watershed management. In particular, its advantages are the followings:</p> <ul style="list-style-type: none"> • Ability to gather new financial resources for water management; • These mechanisms are managed through transparent financial mechanisms which can be sustained in the long term; • They are aimed at long-term conservation; • Due to their participatory nature, water funds can become a communication tool within public authorities at different levels (e.g. municipalities, environmental authorities) and private stakeholders/ water users.
Disadvantages	<p>To the author's knowledge, these mechanisms have not been applied in Europe so far, so the issue of whether they could be implemented in the EU context should be further investigated.</p> <p>However, in some cases the same challenges highlighted for PWS schemes might also face water funds, and namely the regulatory and institutional settings, the public nature of water and the constraints posed on private rights.</p>
Applicability to NWRM implementation	<p>Water Funds have mostly been applied, so far, to wide watershed management plans including a variety of measures. In fact, if the scheme covers the provision of a variety of ecosystem services, it will also be attractive for a variety of beneficiaries, thus attracting larger financing sources. It is thus unlikely that this mechanism can perform well if it is only directed at the implementation of single NWRMs, or NWRMs at a small scale.</p> <p>Water Funds could be best established to finance large watershed management plans, including a variety of NWRMs aiming at different water management objectives. Watershed management plans based on NWRMs could address, for example, flood protection issues and enhancement of water provision at the same time -both in terms of quantity, e.g. by implementing 'drinking water forests', and in terms of quality, by e.g. restoring wetlands for nutrient reduction.</p>

Bio-Carbon Markets

Advantages	<p>Carbon markets and carbon offset schemes could attract additional financing sources for NWRM implementation.</p> <p>Existing carbon markets could be adapted to trade bio-carbon, i.e. carbon sequestered by restoration activities. To support market confidence, and reduce transaction costs, clear standards for measuring bio-carbon credits from ecosystem restoration could be defined (IEEP, 2013). In this sense, the recent inclusion of the new carbon trading category 'Wetland restoration and conservation' by VCS opens new perspectives for (complementary) financing of NWRMs.</p>
Disadvantages	<p>At present, the adaptation of carbon markets to include bio-carbon faces</p>

	<p>technical and institutional challenges. Moreover, ecosystem restoration credits still need to be better verified and defined.</p> <p>Overall, a weak global commitment to climate change issues might limit confidence in carbon markets (IEEP, 2013).</p>
Applicability to NWRM implementation	<p>Although carbon sequestration is not the main purpose of NWRM implementation, it is often included in the bundle of multiple benefits delivered by certain measure, such as for example wetland restoration and afforestation/ reforestation. In these cases, bio-carbon market can be a complementary funding source for NWRM implementation.</p> <p>Carbon credit markets and/or offset schemes have been successfully implemented as a complementary funding source for targeted forest planting for 'catching' precipitation (Bosco Limite project). Since 2012, carbon credits obtained through wetland restoration can also be traded. However, the carbon sequestration potential of other NWRMs (e.g. peat land restoration) still needs to be verified.</p> <p>In addition, weaknesses in global commitment and in global carbon markets itself suggest that this mechanism could be better used as a complementary funding source, e.g. in combination with payments for securing water supply.</p>

Labelling and certifications	
Advantages	<p>Labelling and certification are a potential large financing source to support ecosystem maintenance activities linked to provision services. Moreover, these mechanisms are widely applied and understood by the public (IEEP, 2013).</p>
Disadvantages	<p>The scope of these mechanisms is, obviously, limited to ecosystems delivering commercial products, or to environmental-friendly agricultural activities.</p> <p>In some cases, it was observed that the additional price paid by consumers for certified products does not always cover restoration costs. Moreover, higher prices of certified and labelled products might discourage consumers in the current tough economic context (IEEP, 2013).</p>
Applicability to NWRM implementation	<p>Current certification and labelling schemes are not specifically targeting NWRM implementation, but NWRMs are a component of the good practices recognized by the scheme. For example: (i) certification schemes for sustainable agricultural product sometimes include good practices and intervention belonging to the NWRM category; (ii) certification schemes for forestry products might also apply to forests with natural water retention functions.</p> <p>It seems thus difficult to imagine a certification and labelling directly linked to NWRM implementation only, also because these schemes imply the production of commercial products (which is rarely the case for NWRMs).</p> <p>However, labelling and certification scheme can be a valid complementary funding source for those farmers engaging in the implementation of agro-environmental measures and non-productive investment measures on their farms.</p>

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In summary...

- NWRMs deliver multiple benefits over a long time horizon, and often intervention in one site generate benefits elsewhere (e.g. downstream): this poses challenges for the evaluation of NWRM benefits, as some benefits can be overlooked. Eventually NWRMs might thus not appear cost-effective, and stakeholders might not have an incentive to engage in NWRM implementation.
- A major opportunity for NWRM implementation could lie in the **integration of different EU financing sources** –which might also include national and private funds: NWRMs, in fact, can address different EU policy targets at the same time, which could make the case for co-financing. However, such co-financing potential appears to have been largely unexploited so far.
- **Payments for Watershed Services** have so far proven very effective in achieving environmental objectives, and they are a promising instrument to finance NWRM implementation. The European regulatory and institutional framework might limit the potential for these schemes; however, these constraints can be (and have been) addressed by an appropriate program design.
- **Water Funds** are proving effective in promoting integrated and participatory watershed management, attracting new financial resources. However, their applicability to the EU context should be further investigated. Water Funds could be best established to finance large watershed management plans, including a variety of NWRMs aiming at different water management objectives (e.g. flood protection and water provision).
- **Carbon markets** are expected to be best applied to NWRM implementation as complementary financing sources.
- **Labelling and certification schemes** can be a valid complementary funding source for those farmers engaging in the implementation of agro-environmental measures and non-productive investment measures on their farms.

V. In conclusion: which are the available funding opportunities for NWRMs?

This paper reviewed the available financing opportunities for NWRMs, by: (i) getting an understanding of how NWRMs have been financed so far, reviewing the project case studies and investigating relevant EU funding mechanisms; (ii) identifying some promising alternative, innovative financing instrument, involving the private sector; and (iii) analysing the opportunities and challenges for financing NWRM implementation.

To summarize key findings, let us suppose we are an administration wanting to implement a NWRM project: which are the available funding opportunities? Where should we look up for funding? Although not exhaustive, the table below attempts to identify, by type of measure, the available funding sources at the EU level as well as potentially suitable payment schemes. The table focuses on EU financing sources and emerging economic instruments²⁶. Unfortunately, almost no information was found on the financing of urban measures, which are thus not included in the table.

²⁶ An exhaustive review of available financing sources at the national level across the EU was out of the scope of this synthesis document.

European financing sources		
Instrument	Detail	For which NWRMs?
CAP – Pillar 2 (Rural Development Programme)	CAP – Pillar 2 (Rural Development Programme) <ul style="list-style-type: none"> • Agri-environment measures; • Non-productive investment measure; • Natura 2000 payments and payments linked to WFD 2000/60/EC; • Forest environment measure; and • First afforestation of agricultural land. 	On-farm measures: Blocking of drains or ditches to increase water levels Replanting of vegetation such as trees or shrubs/ Afforestation Wetland restoration/ Constructed wetlands Buffer strips
LIFE (Combined with national funds)	Project-based LIFE Funds ('traditional' LIFE funding)	Large restoration projects: River restoration Wetland restoration Reforestation
	LIFE Integrated Projects (new category introduced in the programming period 2014-2020)	These funds target specifically the implementation of environmental or climate plans and strategies on a larger territorial scale. Funds can then be obtained to co-finance RBMPs and trans-boundary flood protection strategy . NWRM are indicated as a key funding priority, so Integrated Projects are thus a relevant opportunity to enhance policy integration (water, biodiversity, climate change) at the EU level.
	Natural Capital Financing Facility	Innovative financing schemes can be developed to support the implementation of several measures and good management practices, thus including NWRM. Some examples of NWRM are provided in the table below on emerging financing instruments (e.g. PES).
Cohesion Policy	ERDF and Cohesion Funds	Ecosystem restoration Catchment, landscape and urban planning Climate change adaptation (Several NWRMs can thus be included)

Emerging financing instruments		
Instrument	For which NWRMs?	To what extent?
Payments for Watershed Services	PWS schemes can be developed to finance a variety of good watershed management practices, which also include NWRMs So far, most PWS schemes have been aimed at securing and enhancing water supply. The measures included are,	PWS schemes are suited for financing large NWRM project implemented at the catchment scale. To enhance the success and the financial sustainability of the scheme, the implementation of several measures, providing several ecosystem services is

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	<p>among others:</p> <ul style="list-style-type: none"> • Targeted plangent for 'catching' precipitation; • Erosion control measures (e.g. reforestation and vegetation cover); • Wetland and peat land restoration (also for water purification, not only retention). 	<p>key, as it allows for diversifying financing sources within the scheme.</p>
Water Funds	<p>Large watershed management plans, including a variety of NWRMs</p>	<p>Watershed level Water Funds perform better if the scheme covers the provision of a variety of ecosystem services, as it will also be attractive for a variety of beneficiaries, thus attracting larger financing sources.</p>
Bio-carbon markets	<p>For the moment, this mechanism has been applied to two measures:</p> <ul style="list-style-type: none"> • targeted forest planting for 'catching' precipitation • wetland restoration 	<p>This mechanism could be better used as a complementary funding source, e.g. in combination with payments for securing water supply.</p>
Labelling and certifications	<p>Agricultural measures The scope of these mechanisms is limited to ecosystems delivering commercial products.</p>	<p>Labelling and certification scheme can be a valid complementary funding source for those farmers engaging in the implementation of agro-environmental measures and non-productive investment measures on their farms.</p>

VI. References

- Bennett, G., Carroll, N., Hamilton, K., 2013. “Charting New Waters: State of Watershed Payments 2012”. Washington, DC: Forest Trends. <http://www.ecosystemmarketplace.com/reports/sowp2012>.
- Calvache, A., Benítez, Ramos, S., 2012. “Water funds: Conserving green infrastructure. A guide for design, creation and operation”. MSA y Banco Interamericano de Desarrollo. Bogotá, Colombia. 144p. http://www.watershedconnect.com/documents/files/water_funds_conserving_green_infrastructure_a_guide_for_design_creation_and_operation.pdf
- CIS Working Group on Agriculture, 2014. “Assessment of opportunities for water in greening and the Rural Development Programmes - Technical Paper prepared by consultants to inform CIS WFD and agriculture working group”. May 2014. <https://circabc.europa.eu/w/browse/5926d2a7-4118-4344-bccd-cc142761fd57>
- EEA, 2013. “Assessment of cost-recovery through pricing of water”. Technical report No 16/2013. <http://www.eea.europa.eu/publications/assessment-of-full-cost-recovery>
- EPI-Water, 2012. “WP3 EX-POST case studies – Deliverable no. 3.2: Comparative analysis report”. “Evaluating Economic Instruments for Sustainable Water Management in Europe” (EPI-Water) is a research project conducted under the EU 7th Framework Programme.
- European Commission, 2014. “COMMISSION IMPLEMENTING DECISION of 19 March 2014 on the adoption of the LIFE multiannual work programme for 2014-17 (Text with EEA relevance)”. Official Journal of the European Union, 2014/203/EU, Non-legislative acts, L116/1-L116/56. <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014D0203&from=EN>
- European Commission, 2012a. “Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A Blueprint to Safeguard Europe’s Water Resources (COM(2012) 673 final. Accompanying the document Impact Assessment: SWD(2012) 382 final (2/2)”.
- European Commission, 2012b. “Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A Blueprint to Safeguard Europe’s Water Resources (COM(2012) 673 final. Accompanying the document Impact Assessment: SWD(2012) 382 final (1/2)”.
- European Commission, 2012c. “European Overview Accompanying the document Report from the Commission to the European Parliament and the Council on the Implementation of the Water Framework Directive (2000/60/EC)”.
- IEEP, 2013. “Estimation of the Financing needs to implement Target 2 of the EU Biodiversity Strategy - Revised draft final report”. Study for the European Commission, DG Environment - Study Contract No. ENV.B.2/ETU/2011/0053r
- JRC, 2013. “River Basin Network on Water Framework Directive and Agriculture – Practical experiences and knowledge in support of the WFD implementation (2010-2012)”. JRC Scientific and Policy Reports – Report EUR25978EN

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Smith, M., de Groot, D., Perrot-Maître, D. and Bergkamp, G. (2006). Pay – Establishing payments for watershed services. Gland, Switzerland: IUCN. Reprint, Gland, Switzerland: IUCN, 2008. <https://portals.iucn.org/library/efiles/documents/2006-054.pdf>

Stella Consulting, 2012. “Final Report – Costs, benefits and climate proofing of natural water retention measures (NWRM)”. Study for the European Commission, DG Environment - Study Contract 070307/2010/581332/SER/D1581332/SER/D1