DIRECTORATE GENERAL
ENVIRONMENT
Directorate C
Unit C1

Service contract n°ENV.D.1/SER/2013/0010

Pilot Project - Atmospheric Precipitation - Protection and efficient use of Fresh Water: Integration of Natural Water Retention Measures in River basin management

Synthesis of the

Western Regional Workshop

Brussels, 22-23 January 2014

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Note to the reader

This note was prepared by Heather Williams, AMEC, with contributions from Angela Heim and Nick Jarritt, AMEC and Verena Mattheis and Guillaume Michel, ACTeon. Support in workshop preparation and facilitation was also gratefully received from Pierre Strosser (ACTeon), Gonzalo Delacamara (IMDEA), Natacha Amorsi (OIEau) and Dominic Moran (SRUC).

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1. The context

a. The NWRM initiative in a nutshell

In the context of the EU Green Infrastructure Policy, there is an increasing policy interest in the so-called Natural Water Retention Measures (NWRM) for improving the water status on hydromorphology and diffuse pollution. NWRMs have been brought to the water policy arena because of their potential contribution for water management[1], among other important contributions to attain environmental policy objectives. More specifically, "among the measures that can greatly contribute to limiting the negative effects of floods and droughts, is green infrastructure, particularly natural water retention measures. These include restoring and maintaining floodplains and wetlands, which can hold water in periods of abundant — or excessive — precipitation for use in periods of scarcity. Green infrastructure can help ensure the provision of ecosystem services in line with the EU Biodiversity Strategy. Reducing soil sealing is another measure that can diminish flood risks. These measures should be included in both RBMPs and [Flood Risk Management Plans] (FRMPs) and, as mentioned, should become a priority for financing under the [Common Agricultural Policy] (CAP), Cohesion and Structural Funds" (COM (2012) 673).

To respond to this interest, DG ENV launched a dedicated study entitled **Pilot Project - Atmospheric Precipitation - Protection and efficient use of Fresh Water: Integration of Natural Water Retention Measures in River basin management**. This study has a dual aim:

- To develop sound and comprehensive **European (web-based) knowledge on NWRM**. The knowledge base will structure available information on technical, environmental, socio-economic, governance and implementation aspects of NWRM, mobilizing existing practical experiences, studies and stakeholders' knowledge.
- To contribute to the development of an **European NWRM "community of practice"** by bringing together all parties interested in the design and implementation of NWRM the creation of partnerships and information exchange. This is achieved by the development of **four informal regional networks:** the Danube river basin, the Mediterranean sea region, Northern Europe/the Baltic Sea and Western Europe.

In close interaction with NWRM practitioners and experts, the initiative will ultimately produce a **NWRM practical guide** that can **support the design and implementation of NWRM** in Europe.

b. Objectives of the workshop

The Regional Workshops are part of the Regional Processes outlined above. The overall objectives of these workshops are to:

- Update participants on activities within the NWRM initiative;

[1] Other mentions to NWRMs in the Blueprint to Safeguard Europe's Water Resources (COM (2012) 673), its Impact Assessment (SWD (2012) 382) or the Stella Report develop a particular aspect: NWRMs are a type of Green Infrastructure; NWRMs are one amongst other kinds of measures to enhance resource efficiency; etc.

- Consolidate the exchange of experiences and knowledge initiated in the regional networks and web fora, ultimately strengthening the regional networks.

The present workshop is the first to be held in the context of the Western Regional Network; a second workshop will be held in July 2014. The two rounds of workshops are held in parallel in all four Regional Networks established under the NWRM initiative and have common overall objectives. This first round of workshops, in particular, aims at:

- Introducing NWRM
- Presenting the NWRM initiative and regional process;
- Sharing views on constraints, difficulties, factors for success that are relevant to the design and implementation of NWRM;
- Collect views on the structure of the knowledge base, and the facilities that are offered to users to extract information;
- Identify expectations vis-à-vis the practical guide to be developed as part of Task 3;
- Agree on follow-up steps for the regional network, while encouraging contribution to the case studies.

The present document provides a synthesis of the main elements and lessons learnt which emerged during the Western Workshop.

2. NWRM in the Western Region

a. Main features of NWRM implementation in the Region

The Western workshop showed that there are already people in the region with a good understanding of NWRM, including experience of practical implementation. This understanding and experience was very focussed on Natural Flood Management (NFM): while wider benefits of NWRM were well recognised, they were generally not the main aim or purpose of existing cases of practical implementation.

This gives good insight in to the features of the Western Region, with considerable focus on risks from flooding throughout the region. The region is characterised on the whole by a relatively wet and mild climate. However problems with water scarcity are also present, and this may become increasingly prevalent with climate change. Therefore NWRM could have an increasingly important role to play in helping to regulate the hydrological cycle, in terms of managing both flood peaks and dry periods. NWRM implementation was also of interest to workshop participants in relation to river restoration, biodiversity improvements (habitat restoration) and water quality improvements (sediment management and other aspects of diffuse pollution control).

Insightful presentations were given by six participants in the workshop, of their own experiences of NWRM implementation. In keeping with the theme of the Western region, these were focussed on flood management, and therefore provide a useful overview of the types of measures and approaches that may be relevant in the region. A summary of each of the presentations is provided in Table 1.

The majority of the examples of implementation were in relation to research projects or pilot studies. Nevertheless it is clear that NWRM are already being implemented in the region (e.g. the River Elbe dyke restoration example) and there is increasing interest in their use (e.g. in Scotland and Northern Ireland). It was also evident through discussion that participants believed NWRM are being implemented more widely, but under different names. Other suggested terms included natural/sustainable flood management, habitat restoration, river restoration, sustainable drainage, weather-sensitive urban design, de-central/diffuse measures, catchment systems engineering.

The term ‘Natural Water Retention Measures’ generated discussion, in particular consideration of what ‘natural’ means. The project definition is that the measure itself does not have to be natural, but that it simulates natural processes, and participants generally agreed with this. Delivery of multiple benefits was considered to be important in allowing a measure to be defined as an NWRM, with NWRM fitting well in to an ecosystem services-based approach.

Natural Flood Management in Scotland **Roy Richardson, SEPA (UK)** 	**Summary of case study**: This presentation described the approach being taken in Scotland to Floods Directive implementation. A full review of flood risk management was undertaken, and an integrated catchment-based approach, based on Natural Flood Management (NFM), is being taken. National 'opportunity maps' have been produced, showing areas with potential for runoff reduction, floodplain storage and sediment management. Four NFM pilot catchments have been established (see Eddleston Water presentation below). An NFM handbook will be produced later this year. **Main driver**: Floods Directive
Sustainable Drainage Systems in Northern Ireland **Peter Close, NIEA (UK)** 	**Summary of case study**: Described a pilot study for the implementation of sustainable stormwater management in the town of Ballyclare, Northern Ireland, as well as aspirations for a similar approach in the city of Belfast. The aim of the studies is to re-direct stormwater out of the sewerage network and waste water treatment plant, to reduce flooding and help improve water quality. Retrofit solutions are proposed, as well as stringent requirements for runoff management for all new developments. **Main driver**: flood risk management
Dyke relocation on the River Elbe, Germany **Thomas Borchers, BMU (Germany)** 	**Summary of case study**: The main aim of this project was to restore the floodplain habitats, which was brought together with a more comprehensive plan incorporating flood benefits. The dykes containing the River Elbe were to be relocated to allow flooding of the floodplain. An extensive land consolidation process was required. The original dykes were breached but not removed, allowing a dynamic system to evolve over time. Modelling has shown benefits to flood heights both upstream and downstream. **Main driver**: Biodiversity and flood risk management

Natural Flood Management in Belford catchment, England **Mark Wilkinson, James Hutton Institute (UK)** 	**Summary of case study**: natural flood management scheme implemented as a more cost-effective solution for addressing flooding problems in a small town downstream. A network of runoff attenuation features was developed in the upstream catchment, in a predominantly agricultural area (pasture and arable). Nested monitoring network allowed the effectiveness of the measures to be assessed, showing increased benefits from increased numbers of measures, and the effects of different sizes of rainfall events. Benefits to water quality were also considered, with improved sediment management. Working with stakeholders and taking time to develop and implement a sustainable solution have been important. **Main driver**: flood risk management
Eddleston Water Pilot Project, Scotland **Chris Spray, University of Dundee (UK)** 	**Summary of case study**: Detailed pilot study linked to NFM implementation in Scotland. Small catchment with a straightened and embanked river. Detailed monitoring network installed to look at flows throughout the catchment. Surface flood modelling and groundwater modelling have both been used. Meanders have been re-introduced to the river, improvements in the riparian zone; changes to land use; introduction of wetland features. **Main driver**: River restoration and flood risk management
Flood Mitigation by Forestry, Germany **Gebhard Schueler, Research Institute for Forest Ecology and Forestry, Rheinland-Pfalz (Germany)** 	**Summary of case study**: Test catchment used to investigate effectiveness of forestry measures for controlling runoff. Identification and control of runoff generation in a forested headwater catchment. Used a GIS-based system to identify hotspots for runoff generation, and an inventory of linear structures (that could accelerate runoff). These allow prioritisation of appropriate locations and types of measures. Runoff management measures considered include a range of silvicultural practices; road network design and management; restoration of retention areas (e.g. wetland areas) **Main driver**: flood risk management; climate change

b. Main challenges and issues with respect to NWRM implementation in the Region

NWRM implementation was discussed during the workshop in two sessions. The first of these was a general breakout session allowing people to discuss the concepts of NWRM, their general thoughts about implementation, and their expectations from the project. For the second set of breakout sessions, participants were split in to three groups: urban, agriculture and forestry/natural, to allow more specific discussions about measures. Key points from these discussions are outlined below.

A key requirement for encouraging implementation, which is also inherent in the purpose of this project, is the need to provide an evidence base. The majority of participants felt that they needed to see clear evidence, both of the effectiveness of the measures and of cost-benefit assessments, in order to justify their implementation. It is also important that the effectiveness and costs of NWRM can be compared to other more conventional measures (e.g. hard engineering).

Catchment-scale implementation of measures was of interest, with selection and placement of multiple measures in the catchment likely to be important for their overall effectiveness. The case study presentations (as described in Section 2) were mostly based at the catchment-scale and looked at cumulative benefits from multiple measures. Intensive monitoring networks such as in the Eddleston Water and Belford catchment examples allowed the cumulative effects to be monitored throughout the catchment. The placement of measures in the catchment could make a difference to their effectiveness. There were a small number of examples mentioned by participants where measures were not as effective as expected, which may occur in relation to interactions with other measures and between rainfall events. The project also needs to provide evidence of negative effectiveness (where relevant) as well as positive.

One difficulty recognised with cost-benefit assessment of these types of measures is that those who receive the benefits are not necessarily the same as those who incur the costs: in many cases, it may be 'private cost for public benefit'. While multiple benefits were seen as being key to the definition of NWRM, the wide spread of benefits may make it challenging to identify and incentivise key parties sitting within a single sector or policy area. There is a risk of NWRM being seen as a burden rather than an opportunity for those with key roles in implementing them. Partnership working to see benefits cumulatively and collaboratively was seen as being very important for successful implementation on NWRM.

A further constraint may be having confidence that measures will be effective over the long-term. One participant felt very strongly that measures need to be self-sustaining, i.e. should not require continuing intervention to maintain them. However on the whole, maintenance will be required, and even if the costs are relatively low, this does require long-term agreements and/or funding mechanisms. Adoption of measures needs to be considered (e.g. by public bodies after private development). For measures on agricultural land, farmers may need the reassurance of long-term funding for maintenance, before being prepared to participate.

In relation to the points above, the need to develop partnerships and get funding in place contributes to relatively long planning timescales. This was recognised in the Water Framework Directive context: it was felt that the outputs from this project, and these types of measures, were likely to be more relevant for third cycle river basin plans, with not enough time before the second cycle plans.

In the forestry discussions, it was noted that the majority of forestry occurs in headwaters, and may be in parts of catchments that do not have WFD designated waterbodies within them. Furthermore, measures often do not directly interact with the river. Although what happens in these headwater catchments will contribute to downstream impacts, it means there is less of a direct connection between forestry measures and WFD, so practitioners may be less aware of it. The necessity for clarifying links to WFD, which are often less evident than the links to the Floods Directive, was recognised during discussions throughout the workshop.

3. Feedback on NWRM project tasks

a. Task 1: the database and other project tools

A key aim of the project is to produce a database of case studies for practitioners to refer to. An introduction to the database and other on-line tools was provided in one of the presentations. In addition, example case studies from the draft database that was being developed prior to the workshop were made available for workshop participants to view. There were two main themes to the comments that were received.

Firstly, many participants were very concerned that best use needs to be made of existing information from previous studies. A representative from the RESTORE project was present, and highlighted how much time and effort had been taken in that three-year project to collate a database of river restoration case studies. Other databases and collations of best-practice information also already exist. This project should not start from scratch, but should build on the existing sources of evidence.

Secondly, a database filled with hundreds of fields is not necessarily the most useful tool for practitioners. An analytical approach is needed, to provide interpretation of data that is then more useable by practitioners. Having a smaller number of exemplar case studies, covering different types of measures and situations, may be more valuable. The case studies should illustrate the experiences of implementation, considering lessons learnt and developing best practice. They should also consider application and benefits at different scales, with catchment-scale application being particularly important.

b. Task 2: the regional fora

The first Western workshop was a good opportunity for practitioners and researchers from Western European member states to learn about and share their experiences of NWRM. The workshops are one part of Task 2, which aims to engage practitioners around Europe in NWRM, and will continue with on-line discussions and a second series of workshops later in 2014.

Particular points that workshop participants made regarding their interest in the regional workshop and forum included:

- Developing a network and being able to share experiences
- Collaborating with and using examples from other countries
- Taking ideas from other practitioners
- Being able to learn from failed case studies, as well as the positive ones
- Adding weight from the European network

As noted in previous sections, participants in the Western region workshop were generally knowledgeable about the principles of NWRM, with examples of implementation. This was very valuable for the workshop, allowing good discussion and relevant and useful case study information to be gathered. However some workshop participants commented on the importance of encouraging participation from people who are not currently familiar with or not implementing NWRM.

c. Task 3: the proposed Practical Guide

An introduction to the practical guide was provided in one of the presentations during the workshop, along with a consultation note. The target audience of the guide includes staff from relevant authorities, experts and stakeholders involved in the planning and implementation of NWRM. It will be produced in English with the main text in all EU languages. It will complement a more general policy document promoting NWRM, developed under the CIS.

Workshop participants were asked for their feedback regarding the proposed guide. Many of the issues raised by workshop participants in discussion are relevant to development of the guide. For example:

- It was strongly felt that the guide needs to link clearly to policy objectives, for example to show explicitly how implementing NWRM can contribute to meeting Good Ecological Status under WFD;
- The multiple benefits provided by NWRM are an important component of both their characterisation and encouraging implementation. The guide must make this clear, and consider how the costs and benefits may be relevant to different parties and how this can best be addressed.

It was felt that the guide should focus on common themes across the four regions, in order to understand key challenges and barriers to implementation. Understanding regional specifities is a valuable part of the project but not necessarily everything needs to be split regionally.

4. Key messages and lessons learnt for advancing with the NWRM project

The workshop was very valuable for the project team in helping to understand the issues and tailor the outputs of the project to meet people's needs and make best use of existing information. Key messages from the workshop include:

1. The project needs to make best use of existing studies and data collation exercises, and build on these. It also needs to learn from the experience of those previous projects, and tailor data collation and presentation accordingly;
2. Provision of a strong evidence base is critical in encouraging implementation, including evidence of biophysical effectiveness and of the costs and benefits. Collation and presentation of evidence should also include evidence of any measures or situations that have been found not to be effective, and needs to provide comparisons between NWRM and more 'conventional' (e.g. hard engineering) measures;
3. The format of the database and case studies should be carefully considered to ensure that the most useful information for practitioners is provided. This is likely to be achieved by focussing on a relatively small number of case studies, and highlighting the experiences of implementation and 'lessons learnt';
4. In developing the project outputs, the range of end users needs to be clearly defined, particularly since NWRM covers a wide range of sectors and different parties who may be involved in implementation;
5. The focus of NWRM in Western Europe is Natural Flood Management, therefore tying most directly to the Floods Directive. Benefits relating to the Water Framework Directive can be seen, but in the examples that were discussed in the workshop, in no case was WFD the main driver for implementation of measures. Multiple benefits are extremely important for implementation of NWRM, but require spreading the understanding of NWRM across a potentially wide range of parties to ensure that the collective benefits can be understood and realised;
6. The catchment-scale application of measures is key. Individual measures may have little effect, particularly when considered further downstream, however it is the cumulative effect of measures appropriately situated throughout a catchment that is relevant when considering benefits, for example to flood risk or water quality.

All of these considerations are being taken forward to the later stages of the project.

Annex I - Workshop Agenda

Regional Workshop (Western Network)
Renaissance Hotel, Brussels
22-23 January 2014

OBJECTIVES
The objectives of this workshop include:

- Support the establishment of the regional NWRM network of practitioners and interested parties;
- Exchange experiences about how NWRM are currently used and implemented, including sharing views on constraints, difficulties, and factors for success that are relevant to the design and implementation of NWRM;
- Develop understanding of what information Member States, local practitioners and other key stakeholders need in order to more effectively implement NWRM and to support their role in WFD and Floods Directive implementation;
- Discuss the on-line tools and guidance that will form outputs of the project ;
- Agree on follow-up steps for the regional network, including encouraging contributions of case studies.

AGENDA

Wednesday 22nd January	
12:30-14:00	Registration and lunch
Session 1 14:00-15:00	Opening *Nick Jarritt, AMEC*
	Context and expectations of the NWRM initiative *Evdokia Achilleos, DGENV*
	Introduction to the NWRM initiative *Natacha Amorsi, OIEau*
	Introduction to NWRM *Heather Williams, AMEC*
	Participants' introductions
Session 2 15:00-15:40	Experience of practical application of NWRM: Natural Flood Management in Scotland *Roy Richardson, Scottish Environment Protection Agency*
	A contrasting view: NWRM in the Mediterranean region *Gonzalo Delacámara, IMDEA*
	Questions and discussion
15:40-16:10	Coffee break

Session 3 16:10-16:50	Introduction to the project web-based tools *Natacha Amorsi, OIEau*
	Introduction to the practical guide *Pierre Strosser, ACTeon*
	Questions and discussion
Session 4 16:50-17:55	Breakout session: Understanding of NWRM and what this project should seek to contribute
	Report back from breakout groups, with time for questions and discussion *Chair: Pierre Strosser*
17:55-18:00	Wrap- up from the first day *Nick Jarritt, AMEC*
	Conference dinner

Thursday 23rd January		
9:00-9:10	Introduction and recap of first day *Nick Jarritt, AMEC*	
Session 5 9:10-10:15	Introductions to each of the thematic areas	
	Urban- Peter Close *Forestry- Prof. Dr. Gebhard Schueler*	*Agriculture- Dr. Mark Wilkinson* *Cross-cutting- Thomas Borchers*
	Discussion sessions: by thematic areas	
	Urban (Chaired by Nick Jarritt) *Forestry (Chaired by Gonzalo Delacámara)*	*Agriculture (Chaired by Dominic Moran)* *Natural areas (Chaired by Pierre Strosser)*
10:15-10:45	Coffee break	
Session 5 cont. 10:45-11:45	Continuation of breakout groups	
	Report back from breakout groups and discussion *Chair: Nick Jarritt*	
Session 6 11:45-12:20	Building a common understanding: Discussion session *Chair: Pierre Strosser*	
12:20-12:30	Synthesis of discussions and closing speech *Nick Jarritt, AMEC*	

Annex 2 – List of participants

Participants in the NWRM Western network workshop, 22-23 January 2014

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