European Commission

NWRM

Natural Water Retention Measures

www.nwrm.eu

Service contract n°07.0330/2013/659147/SER/ENV.C1

Case Study

Alzette river restoration in Dumonsthaff

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.nwrm.eu

Table of content

I. Basic Information

Application ID	*Luxembourg_01*			
Application Name	**Alzette river restoration in Dumonsthaff**			
Application Location	Country:	Luxembourg	Country 2:	
	NUTS2 Code		LU00	
	River Basin District Code			
	WFD Water Body Code			
	Description		The project is located in Schifflange	
Application Site Coordinates *(in ETRS89 or WGS84 the coordinate system)*	Latitude: 49.5057481		Longitude: 6.014291800000024	
Target Sector(s)	Primary:	Agriculture		
	Secondary:			
Implemented NWRM(s)	Measure #1:	*N4*		
	Measure #2:	*A1*		
	Measure #3:			
	Measure #4:			
Application short description	In the 50' and the 60', the alluvial plain of the Alzette river was deeply modified in order to develop intensive agriculture. As a result, the water retention was reduced and ecological value declined. The project aimed at restoring the ecologic state of the Alzette in Drumontshaff. The two mains tasks of the project were to restore the natural functioning of the Alzette river (frequent overflowing and flooding of aside land, wetland habitats restoration) and to develop an extensive management of aside meadows (late mowing, no fertilizer or biocidal product, etc.). The first step was to determine the floodplan through past and current reference values. After the feasibility study, a reallocation scheme was drown. An agronomic feasibility was made to determine socio-economic solutions. The river and hydraulic annexes was restored (lateral enlargement or displacement of river bed into natural thalweg). Finally, the restoration of the complete flood plain was possible.			

II. Policy context and design targets

Brief description of the problem to be tackled	In the 50' and the 60', the alluvial plain of the Alzette river was deeply modified. The river planning aimed at intensifying agriculture, building transversal roads, extending the city area and planning and extend industrial areas. To achieve these goals, the river was channelized, the valley bottom was drained and dried, and wetlands were filled. Therefore, this land planning increased flood risk downstream and had a huge impact on biodiversity and landscape.		
What were the primary & secondary targets when designing this application?	Primary target #1:	Biodiversity and gene-pool conservation in riparian areas	
	Secondary target #1:	Flood control and flood risk mitigation	
	Remarks	Even if the flood risk mitigation was not the main project of the project, it had a real impact on it. Indeed, due to the large area concerned by the project, the impact on water retention and flood mitigation was relay important. Although, as it was not the main objective, the impact downstream was not assessed.	
Which specific types of pressures did you aim at mitigating?	Pressure #1:	WFD identified pressure	Physical alteration of channel/bed/riparian area/shore of water body for agriculture
	Pressure #2:	Floods Directive identified pressure	*Other pressure contributing to flooding / flood risk*
	Remarks		
Which specific types of adverse impacts did you aim at mitigating?	Impact #1:	Floods Directive identified impact	Protected areas
	Impact #2:	Floods Directive identified impact	Landscape
	Impact #3:	Floods Directive identified impact	Rural Land Use
	Impact #4:	WFD identified impact	Altered habitats due to morphological changes
	Remarks		
Which EU requirements and EU Directives were aimed at being addressed?	Requirement #1:	Other EU-Directive requirements (Specify)	Habitat directive 92/43/EEC
	Requirement #2:	WFD-achieving objectives for Protected areas	A bird protection area was implemented
	Requirement #3:	WFD-mitigation of significant pressure	Restoration of the water course itself
	Remarks		
Which national and/or regional policy challenges and/or requirements aimed to be addressed?	The project targets are in line with the Luxembourg legislation. Thus, the law published the 19th January 2004 about nature protection provides conservation and restoration of ecological values.		

III. Site characteristics

Dominant Land Use type(s)	Dominant land use	211
	Secondary land use	*Type in the relevant Code Level3*
	Other important land use	*Type in the relevant Code Level3*
	Remarks	
Climate zone	cool temperate moist	
Soil type	*Type in the relevant soil type (FAO class) from the list in Annex 3*	
Average Slope		
Mean Annual Rainfall	600 - 900 mm	
Mean Annual Runoff		
Average Runoff coefficient (or % imperviousness on site)		
	Remarks	
Characterization of water quality status (prior to the implementation of the NWRMs)	There is no detailed information available about the water quality status prior to the implementation of the NWRM.	
Comment on any specific site characteristic that influences the effectiveness of the applied NWRM(s) in a positive or negative way	*Positive way:*	
	Text *Negative way:*	

IV. Design & implementation parameters

Project scale	Medium (eg. public park, new development district)	*Specify*
Time frame	Date of installation/construction	1999
	Expected average lifespan (life expectancy) of the application in years	The river restoration is expecting to stay several decades and even more.
Responsible authority and other stakeholders involved	*Name of responsible authority/ stakeholder*	*Role, responsibilities*
	1.Sutainable development and infrastructure ministry and Agriculture, vineyard and rural development ministry	Project management and financing
	2. Famers (Friedrich from Bertange, Friedrich from Aspelt and Witry from Bergem)	They developed extensive agriculture and extensive grazing.
	3. Shifflange, Bettembourg, Mondercange and Roeser municipal administrations	Project partner. They owned a part of plantations.
	4. Acacia hotel, An der Schmedd restaurant, De Pefferkar	They propose meals including meat produced in the area of the

<table>
<tr><td></td><td colspan="2">restaurant</td><td>project.</td></tr>
<tr><td></td><td colspan="2">5. Proactif association</td><td>This association helps people remote from the labour market. They have breeding activities.</td></tr>
<tr><td>The application was initiated and financed by</td><td colspan="3">The project was partly financed by European Union through a Life project.</td></tr>
<tr><td>What were specific principles that were followed in the design of this application?</td><td colspan="3">The project was designed to restore the natural functions of the river and of its flood plain. Works were designed on this principle. Another important target was the management of the area after the project. This involved extensive agriculture and extensive grazing. The overall land planning led to enrich the landscape and its aesthetic value.</td></tr>
<tr><td rowspan="2">Area (ha)</td><td colspan="2">Number of hectares treated by the NWRM(s).</td><td>40</td></tr>
<tr><td colspan="2"></td><td>The area of the project is approximately 40ha. The biodiversity is affected by the project in the area itself. Concerning the flood risk, it is reduced downstream, about 2km away from the area.</td></tr>
<tr><td>Design capacity</td><td colspan="3">The project was designed to restore a natural wetland area. The dimensions were based on the original area. This information comes from old military maps recording wetlands, swamps and bogs.</td></tr>
<tr><td rowspan="6">Reference to existing engineering standards, guidelines and manuals that have been used during the design phase</td><td colspan="2">Reference</td><td>URL</td></tr>
<tr><td>1.</td><td></td><td></td></tr>
<tr><td>2.</td><td></td><td></td></tr>
<tr><td>3.</td><td></td><td></td></tr>
<tr><td>4.</td><td></td><td></td></tr>
<tr><td>5.</td><td></td><td></td></tr>
<tr><td>Main factors and/or constraints that influenced the selection and design of the NWRM(s) in this application?</td><td colspan="3">Land was owned by farmers. The possibility to proceed to land exchange was a good opportunity; otherwise farming activities would have been a big constraint.</td></tr>
</table>

V. Biophysical impacts

Impact category (short name) Select from the **drop-down menu** below: ⇩	**Impact description** (Text, approx. 200 words)	**Impact quantification** (specifying units)	
		Parameter value; units	% change in parameter value as compared to the state prior to the implementation of the NWRM(s)
Runoff attenuation / control	Wetland functions of the area were restored. The flood plain is filled by rain falls and then restitutes water. Therefore, the project led to a runoff reduction. As it was an environmental project, this was not assessed.		
Peak flow rate reduction	The rainwater storage in the wetland shifts the peak flow and reduces it thanks to the overall vegetation and natural pounds. As it was an environmental project, this was not assessed.		
Water quality Improvements	Wetlands have self-purifying capacities. To the contrary of channeled rivers, wetlands and pounds increase oxygen exchange. This oxygen allows the development of micro-organisms activities which degrade organic matter. Wetlands are also a place of sedimentation.		
Reducing flood risks (Floods Directive)	Due to the peak flow shift and reduction, the project contributes to reduce flood risks. As it was an environmental project, this was not assessed.		

VI. Socio-Economic Information

What are the benefits and co-benefits of NWRMs in this application?	There are many benefits. First the river restoration led to reduce the flood risks downstream. Then, the development of extensive grazing and the production of beef meat led to develop a local and specific sector. The meat is commercialized through local restaurants. The extensive grazing and the restoration of the river and of wetlands were beneficial for water quality and for the development of biodiversity (insects, birds, bats, etc.). The development of a didactic path is beneficial for local citizens and tourist who can walk in the area to learn about its management.		
Financial costs	***Total:***		
	Capital:		
	Land acquisition and value:		
	Operational:		
	Maintenance:		
	Other:		
Were financial	*Yes*		

compensations required? What amount?	*Total amount of money paid (in €):*
	Compensation schema:[2]
	Comments / Remarks:
Economic costs	*Actual income loss:* weak
	Additional costs: works
	Other opportunity costs: weak
	Comments / Remarks:
Which link can be made to the ecosystem services approach?	The wetland rehabilitation led to reduce flood risks downstream. The wetland also has a water purification function.

VII. Monitoring & maintenance requirements

Monitoring requirements	A biological monitoring is realized. Animal and plant species are observed and counted.
Maintenance requirements	N/A
What are the administrative costs?	N/A

VIII. Performance metrics and assessment criteria

Which assessment methods and practices are used for assessing the biophysical impacts?	The biophysical impacts were not assessed.
Which methods are used to assess costs, benefits and cost-effectiveness of measures?	N/A
How cost-effective are NWRM's compared to "traditional / structural" measures?	N/A
How do (if applicable) specific basin characteristics influence the effectiveness of measures?	N/A
What is the standard time delay for measuring the effects of the measures?	N/A

IX. Main risks, implications, enabling factors and preconditions

What were the main implementation barriers?	N/A
What were the main enabling and success factors?	N/A
Financing	N/A
Flexibility & Adaptability	N/A
Transferability	N/A

X. Lessons learned

Key lessons	The Alzette restoration led to the development of extensive agriculture. The river restoration has many benefits for biological diversity and landscape beauty. It can be economically rewarding by changing the type of land-use and socio-economic settings. Although the main objective was to improve the ecological state of the area, the project has big impact on flood prevention and flood mitigation. The hydraulic effects (flood protection) and public awareness rising are essential to increase public acceptance for such projects.

XI. References

Source Type	*Project Report*		
Source Author(s)	Bureau d'études Bunusevac		
Source Title	La nature mise en valeur		
Year of publication	2011		
Editor/Publisher	Luxembourg Nature and Forest administration		
Source Weblink	http://www.environnement.public.lu/conserv_nature/publications/Dumontshaff_ZN/index.html		
Key People		*Name / affiliation*	*Contact details*
	1.	*Micha Bunusevac*	*m.bunusevac@bureaumb.lu*