



Natural Water Retention Measures

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

Case Study *Ciobarciu wetland restoration*



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<http://www.nwrn.eu>*

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I. Basic Information

Application ID	Romania_01			
Application Name	Ciobarciu wetland restoration			
Application Location	Country:	Romania	Country 2:	none
	NUTS2 Code	RO21-Nord-Est		
	River Basin District Code	RO1000		
	WFD Water Body Code	RORW13.1.15_B5		
	Description	Valley of the Prut River; former floodplain of the Jijia River the most important tributary of the Prut River; 4 flood protection polders of around 250 ha between the villages Costuleni and Prisecani.		
Application Site Coordinates (in ETRS89 or WGS84 the coordinate system)	Latitude: - WGS84 Specify: 47.0488889	Longitude: - WGS84 Specify: 27.8597222		
Target Sector(s)	Primary:	Hydromorphology		
Implemented NWRM(s)	Measure #1:	N3		
	Measure #2:	N2		
	Measure #3:	N4		
Application short description	<p>The short term project objectives were to create 250 ha of wetland, carried out in four polders by:</p> <ul style="list-style-type: none"> - Raising the water level of the embanked area with a regulating water outlet structure. - Creation of a variety of habitats -from dry land to spots with deep water- by digging. - Opening up of old river meanders that have been filled up. <p>The project is a good experience in the field of ecological restoration, involving purchase of land, participatory planning and co-operation with other organizations, including NGO's.</p> <p>The project also had long term objectives related to the creation of a network of wetlands, integration and nature and water policies, the implementation of European directives and the strengthening environmental NGOs and education. The project was implemented by a Romanian regional water authority with the support of Dutch partners.</p> <p>The Ciobarciu project was evaluated at the end of the project by the project team and by a Romanian University, who interviewed 55 inhabitants of villages where the (previous) owners lived. After a period of five years, the project was evaluated again.</p>			

II. Policy context and design targets

Brief description of the problem to be tackled	<p>Prior to the execution of the hydrotechnical works, the common floodplain of Jijia and Prut was flooded in the spring, being transformed into a lake, which was used by migrating birds for resting and feeding. In summer, the water level was lower, but there still remained many wet areas in the lower spots.</p> <p>In order to prevent flooding and to extend agricultural surfaces, the common floodplain of Prut and Jijia was embanked. Jijia river</p>
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	<p>course was deviated by digging a channel to the Prut at Chiperești. The last 56 km of the Jijia River (Old Jijia), which is parallel to the Prut, has been cut-off and it can be supplied with water from the Jijia by the hydrotechnical knot at Chiperești when needed. Otherwise, the old Jijia is only supplied from its own river basin by four small tributaries with intermittent flow. In the floodplain an irrigation and drainage system has been developed, which, however, was never finished completely. In the same area two fishing ponds were built which now have been abandoned for financial reasons (Osoi and Gorban fishing ponds). The land from the floodplain was intensively used as cropland. Starting with the political changes from 1989, the agricultural activity in this area has been reduced pastures took the place of the crops. The irrigation system was no longer in use and the drainage system worked only partially. Agriculture in this former wetland area now suffers from lack of water and locally the soil is getting brackish</p>		
What were the primary & secondary targets when designing this application?	Primary target #1:	Regulation of hydrological cycle and water flow	
	Primary target #2:	Biodiversity and gene-pool conservation in riparian areas	
	Secondary target #1:	Flood control and flood risk mitigation	
Which specific types of pressures did you aim at mitigating?	Pressure #1:	WFD identified pressure	<i>4.1.2 Physical alteration of channel/bed/riparian area/shore of water body for agriculture</i>
	Pressure #2:	WFD identified pressure	<i>4.2.2 Dams, barriers and locks for flood protection</i>
	Pressure #3:	Floods Directive identified pressure	<i>Natural Exceedence</i>
Which specific types of adverse impacts did you aim at mitigating?	Impact #1:	WFD identified impact	<i>Altered habitats due to morphological changes</i>
	Impact #2:	WFD identified impact	<i>Altered habitats due to hydrological changes</i>
	Impact #3:	Floods Directive identified impact	<i>Waterbody status</i>
Which EU requirements and EU Directives were aimed at being addressed?	Requirement #1:	WFD-achievement of good ecological status	<i>Mitigation of physical/hydrological alterations and flow diversions of the river</i>
	Requirement #2:	Floods Directive-mitigating Flood Risk	<i>Room for the Rivers</i>
	Requirement #3:	Other EU-Directive requirements (Specify)	<i>Habitats Directive and Bird's Directive</i>
Which national and/or regional policy challenges and/or requirements aimed to be addressed?	<p>RBMP of Danube River District RBMP of the Prut-Barlad</p>		

III. Site characteristics

Dominant Land Use type(s)	Dominant land use	321 – <i>Natural grasslands</i>
	Secondary land use	
	Other important land use	
	Remarks	
Climate zone	cool temperate dry	
Soil type	Siliceous Silt	
Average Slope	nearly level (0-1%)	
Mean Annual Rainfall	300 - 600 mm	
Mean Annual Runoff	0 - 150 mm	
Average Runoff coefficient (or % imperviousness on site)	0 - 0.2	
	Remarks	
Characterization of water quality status (prior to the implementation of the NWRMs)	Status of the old Jijia was characterized in moderate water quality status.	
Comment on any specific site characteristic that influences the effectiveness of the applied NWRM(s) in a positive or negative way	<i>Positive way: The 4 flood protection polders were chosen because of the technical possibilities for creating a wetland there. Furthermore, the site had high potentials for ecological restoration due to the possibilities to restore water flow in the Old Jijia, the absence of roads and buildings and the decline of agriculture and it had a low economic value.</i>	
	<i>Negative way: n.a.</i>	

IV. Design & implementation parameters

Project scale	Medium (eg. public park, new development district)	<i>Approx.. 250 ha</i>
Time frame	Date of installation/construction (MM.YYYY)	<i>10.2006 (2001-2003 public information and involvement 2003 – land evaluation 2003-2004 agreement with landowners 2005-2006 land purchase 2006 first flooding of the area)</i>
	Expected average lifespan (life expectancy) of the application in years	<i>50</i>
Responsible authority and other stakeholders involved	<i>Name of responsible authority/ stakeholder</i>	<i>Role, responsibilities</i>
	1. Apele Romane (Prut Directorate) - regional water authority in the Northeast of Romania	Responsible
	2. Institute for Inland Water Management and Waste Water	Support

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	Treatment (RIZA)	
	3. 'Regional Water Board Hunze & Aa's	Support
	4. 'Het Drentse Landschap (NGO for nature management)	Support
The application was initiated and financed by	<p>Application was initiated by Apele Romane and financed based on the below set-up: PIN-MATRA - Dutch (pre-accession) programme. 254.141EUR- (66%); The project partners supply the rest of the costs, namely: Apele Romane 22,900 EUR (6%); RIZA 87,100 EUR (22%); Het Drentse Landschap 23,712 EUR (6%)</p>	
What were specific principles that were followed in the design of this application?	<i>To develop ecological restoration measures which can lead to a win-win situation, profitable not only for nature, but also for the population in the area and what is socially acceptable.</i>	
Area (ha)	Number of hectares treated by the NWRM(s).	<i>Approx.. 223,42 ha</i>
		<i>Approx 250 ha</i>
Design capacity	<p>Area flooded in spring, creating areas of waters with various depths, which drain gradually during summer. Aquatic surface of four ponds, two ponds have water about 0,5-1 m depth, the third presents small puddles and swampy areas, while the fourth can receive waters from the Prut River in case of flooding risks. First flooding of the area done in October 2006.</p>	
Reference to existing engineering standards, guidelines and manuals that have been used during the design phase	<i>Reference</i>	
	<i>URL</i>	
	1.	National standards and protocols
	2.	
	3.	
	4.	
Main factors and/or constraints that influenced the selection and design of the NWRM(s) in this application?	<p>Technical conditions, from which the most important is the availability of water for the wetland.</p> <p>Social conditions, including the acceptance of the project by the people and authorities in the area and the willingness of the about 425 landowners to sell their land.</p>	

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	No published data or estimation	n.a.	n.a.
Peak flow rate reduction	No published data or estimation	n.a.	n.a.
Impact on groundwater	No relevant data.	n.a.	n.a.
Impact on soil moisture and soil storage capacity	No relevant data.	n.a.	n.a.
Restoring hydraulic connection	<i>Significant role in re-connecting former floodplain</i>	% restored water regime	85%
Water quality Improvements	No published data or estimation.		
WFD Ecological Status and objectives	Proven positive impact on morphological parameters (connectivity) as well expected positive impact on BQEs – birds and fish fauna. NWRM contributes to the conservation objectives of water-dependant protected areas.		
Reducing flood risks (Floods Directive)	<i>Floodplain reconnected with the objective to restore the retention capacity and ecosystem functions.</i>		
Mitigation of other biophysical impacts in relation to other EU Directives (e.g. Habitats, UWWT, etc.)	<i>Contributed to the quality improvement of an important migratory route for waterbirds.</i>		
Soil Quality Improvements	<i>No relevant data</i>		
Other	<i>N/A</i>		

VI. Socio-Economic Information

<p>What are the benefits and co-benefits of NWRMs in this application?</p>	<p>2007-2008: The bird fauna list consisted of 105 species, out of which 29 bird species are included in the Annexe 1 of the Birds' Directive and 19 species are present in the Romanian Red Book of Vertebrates. No available data for fauna, excepting the fish presence after about 1 year from the flooding 8 fish species were recorded. During field observations different aquatic and terrestrial invertebrates groups, amphibians, reptiles and some small mammals were observed.</p>		
<p>Financial costs</p>	<p>Total:</p>	<p>388,000 €</p>	<p>1) restoration of Old Jijia (topographic study, cleaning of the river bed, reconstruction of the Chiperesti Bridge, cleaning the streambed of the river-15km, management plan of the Chiperesti inlet); 2) development Restoration Plan Ciobarciu wetland (evaluation of the land in the project area; inventory of landowners and agreement, aquisition of land, field works: channel 1, breach in the dikes between compart 1 and II and II and III); 3) stakeholder involvement, communication and participation at village level as well as at county level and beyond</p>
	<p>Capital:</p>	<p>n.a</p>	
	<p>Land acquisition and value:</p>	<p>180 €/ha</p>	<p>Evaluation price of land done in October 2003; 150 EUR/ha (Prisecani) and 170 EUR/ha (Costuleni); During the purchase 1 EUR = 3.3-3.5 lei RON)</p>
	<p>Operational:</p>	<p>n.a</p>	
	<p>Maintenance:</p>	<p>n.a</p>	
	<p>Other:</p>	<p>n.a</p>	
<p>Were financial compensations required? What amount?</p>	<p>Was financial compensation required: Yes / No NO</p> <p>Total amount of money paid (in €): -</p> <p>Compensation schema: -</p> <p>Comments / Remarks: -</p>		
<p>Economic costs</p>	<p>Actual income loss: No relevant data.</p> <p>Additional costs: No relevant data.</p> <p>Other opportunity costs: No relevant data.</p> <p>Comments / Remarks: No relevant data.</p>		

<p>Which link can be made to the ecosystem services approach? <i>Hint: The actual benefits of improving nature's water storage capacity are essentially linked to an improved provision of some of the following ecosystem goods and services:</i></p> <ul style="list-style-type: none"> - <i>Freshwater for drinking.</i> - <i>Water provision to deliver water services to the economy both for drinking and non-drinking purposes.</i> - <i>Water security (reliability of supply and resilience to drought).</i> - <i>Health security (control of waterborne diseases).</i> - <i>Flood security and protection.</i> - <i>Storm surge protection.</i> - <i>Biomass production.</i> - <i>Amenities (associated to habitat protection): fish and plants, tourism, recreation, and others.</i> - <i>Benefits of improved coastal water quality and ecological status for a sustainable commercial production of shellfish with human health and welfare values.</i> 	<p>Positive outcomes closely related to the implementation of the measure:</p> <ul style="list-style-type: none"> • Increased possibility of non-commercial fishing • Increased possibilities for horticulture along the Old Jijia • Increased natural values (more birds and animals) • Increased underground water <p>Additional positive impacts:</p> <ul style="list-style-type: none"> • Increased agriculture/horticulture along the Old Jijia • Increased tourism, leading to potential economical benefits originating from the interest of investors
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VII. Monitoring & maintenance requirements

Monitoring requirements	<p>The project was evaluated at the end of the project by the project team (2006) and by a Romanian University of Iasi, who interviewed 55 inhabitants of villages where the (previous) owners lived. After a period of five years, the project was evaluated again by a researcher.</p> <p>In the spring 2007 birds' monitoring program started, in order to propose the new wetland for a protected status in the national Natura 2000 network.</p>
Maintenance requirements	<p>Maintenance of the hydraulic facilities on annual basis and management of water flow is done by Apele Romane, having the ownership of the land.</p>
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?	Field observations during two summers, 2007-2008. Birds' monitoring: transect method, observation from fixed point, males' sound's counting and band counting (for waders and aquatic birds)
Which methods are used to assess costs, benefits and cost-effectiveness of measures?	No economic and financial analysis was carried out prior or after the implementation of the project because of the emphasis on wetlands restoration and biodiversity conservation, as opposed to revenue generation.
How cost-effective are NWRM's compared to "traditional / structural" measures?	Not applicable
How do (if applicable) specific basin characteristics influence the effectiveness of measures?	A special quality in the Prut valley is the quietness and openness of large parts of the floodplains and the absence of roads and buildings. Human activity has been positive in field of flood protection and water supply, but also has led to an enormous loss of ecological values. It is impossible to restore the original large scale flooding of the floodplain and even if it was possible from technical viewpoint, it would be socially unacceptable. The values related to the large scale flooding, however, can be restored partly by creating a network of smaller wetlands in the river valley metaphorically named "string of pearls". The high costs investments in ecological restoration are not realistic, in the floodplains there are many possibilities to make use of existing dikes, former fishponds, low spots etc., which make possible to keep the costs low.
What is the standard time delay for measuring the effects of the measures? NWRM are multi-purpose and multi benefit measures but like other green infrastructures and on the contrary to grey infrastructure, their effects are not always immediately visible and need a certain time lapse to be fully operational and effective (free text allowed to enter the anticipated delay and the effective deviation from this finally found)	At the end of the project and five years later, the wetland was functioning well but in between it had not been functioning for a period of two years due to construction works. The absence of water in this period had been a disaster for the biodiversity of the area. In the evaluation in 2011 some of the outcomes could not be attributed easily to the project. For example, the improved cooperation between the regional water authority and other actors, the development of ideas for additional wetlands and the existence of courses on ecological restoration at the university may have resulted partly from the project but were certainly also the result of other factors, such as the implementation of EU directives.

IX. Main risks, implications, enabling factors and preconditions

<p>What were the main implementation barriers?</p>	<p>Administrative difficulties in the process of land purchase, due to "fuzzy property" issues. (At the end 75% of the intended 250 ha wetland was either purchased (60%) from the local landowners or was leased with a long-lease contract (15%). 25% cannot be bought. These parcels are in the most upstream part of the wetland, where the desired land use by the owners (extensively managed grassland) does not conflict with the goals of the wetland.</p> <p>Situation after 5 years showed that there were no funds for creating other wetlands, and the Ciobarciu wetland had not been functioning for two years due to construction works (e.g. beginning of June 2008 the water was lost through the outlet junction Ciobarciu).The absence of water in this period had been a disaster for the biodiversity of the area.</p>
<p>What were the main enabling and success factors?</p>	<p>Financing possibilities: Without funding from the PIN-MATRA program. The project would have been financially not feasible. If no subsidy would have been received, Apele Romane would have tried to restore water flow in the Old Jijia, but the Costuleni Wetland Project would have not been carried out. Situation after 5 years showed that there were no funds for creating other wetlands.</p> <p>The mayors have been very much involved, both in the meetings and also in bilateral visits. They also participated in the Advisory Committee meeting. Local people have been involved in different ways and at different stages. In addition the personal motivation and dedication of all the team members contributed to the success.</p>
<p>Financing</p>	<p>'PIN-MATRA - Dutch governmental fund to protect and rehabilitate areas for nature in Eastern European countries of € 254.141,- (66%); The project partners supply the rest of the costs, namely: Apele Romane 22,900 EUR (6%); RIZA 87,100 EUR (22%); 'Het Drentse Landschap 23,712 EUR (6%)</p>
<p>Flexibility & Adaptability</p>	<p>No relevant data</p>
<p>Transferability</p>	<p>The project results and relations developed were used as input for other projects and for new project proposals in the framework of the Dutch-Romanian collaboration. E.g. The Integrated Water Management (flood risk management, drinking water and wastewater) planning for the Tecucel river basin (2008-2011) built on some of the relations that were developed in the Participatory planning and implementation for the restoration of the Ciobarciu wetland project.</p> <p>Conditions:</p>

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	<ul style="list-style-type: none"> - technical conditions (e.g. availability of water for the wetland), - social conditions (acceptance of the project by the people and the authorities); - organisation conditions (willingness of authorities, sufficient capacity available for implementation, an organization capable to manage the wetland in the future) - financial conditions (for the purchase of land, planning of the project and implementation of the works)
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X. Lessons learned

Key lessons	<ul style="list-style-type: none"> - Experience in the field of ecological restoration, involving purchase of land, participatory planning and co-operation with other organizations, including NGO's. - increased water availability (e.g. the continuous flow in the Old Jijia allows people to irrigate their kitchen gardens along the Old Jijia and even larger parcels) - the functional wetland contributes to the improvement of the quality of an international migratory route for waterbirds, confirmed also by monitoring data - Careful consideration should be given whether there is an alternative for land purchase. If not, a concise overview of the land ownership situation should be done at an early stage. Project has partly contributed to the provision of possibilities for students of the universities in Iasi to participate in project planning, monitoring and evaluation. - The project has contributed to the development and implementation of sound nature and water policy.
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XI. References

Source Type	<i>Website</i>
Source Author(s)	N/A
Source Title	Ciobarciu Wetland Project website
Year of publication	2004
Editor/Publisher	N/A
Source Weblink	http://www.ciobarciu.ro/

Source Type	<i>Website</i>
Source Author(s)	N/A
Source Title	Restoring Europe's Rivers - Case Study Ciobarciu Wetland Project
Year of publication	page last modified on 30 October 2013, at 11:27.
Editor/Publisher	RESTORE
Source Weblink	http://riverwiki.restorerivers.eu/wiki/index.php?title=Case_study%3AThe_Ciobarciu_Wetland_Project

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Source Type	<i>Other (specify)</i>
Source Author(s)	Dan Badarau, H.Clipa, A. Savin and A. Remelzvaal
Source Title	A String of Pearls: Towards Restoration of Wetland Values in the Prut Basin
Year of publication	2004
Editor/Publisher	ECRR
Source Weblink	http://www.ecrr.org/archive/pdf/3rd_conference_abstracts/07%20badarau%20clipa_savin_remelzvaal.pdf

Source Type	<i>Project Report</i>
Source Author(s)	N/A
Source Title	The Costuleni Wetland Project Plan
Year of publication	2003
Editor/Publisher	N/A
Source Weblink	http://www.ciobarciu.ro/web/download/

Source Type	<i>Project Report</i>
Source Author(s)	N/A
Source Title	Pilot Info
Year of publication	N/A
Editor/Publisher	N/A
Source Weblink	http://www.ciobarciu.ro/web/

Source Type	<i>Project Report</i>
Source Author(s)	N/A
Source Title	Evaluation report Ciobarciu Wetland
Year of publication	2006
Editor/Publisher	N/A
Source Weblink	http://www.ciobarciu.ro/web/download/

Source Type	<i>Grey Literature</i>
Source Author(s)	Eng. Dan Badarau, Dr. Eng. Anca Savin
Source Title	Ciobarciu Wetland Pilot Project on ecological Reconstruction
Year of publication	2007
Editor/Publisher	www.undp-drp-org
Source Weblink	http://aws.undp-drp.org/pdf/Workshops_and_Meetings%20-%20Phase%20II/2007-04-18_Wetlands_Wshp/12%20D%20Badarau.pdf

Source Type	<i>Other (specify)</i>
Source Author(s)	N/A
Source Title	ECRR Addressing practitioners

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Year of publication	2008
Editor/Publisher	ECRR
Source Weblink	http://www.ecrr.org/publication/ecrrbrochure.pdf

Source Type	<i>Other (specify)</i>
Source Author(s)	Joanne Vinke-de Kruijf et. al.
Source Title	How to facilitate the transfer of water management knowledge Lessons from Dutch-Romanian project experiences for project implementers, advisors and financiers
Year of publication	2013
Editor/Publisher	Partners Voor Water
Source Weblink	http://edepot.wur.nl/288797

Source Type	<i>Other (specify)</i>
Source Author(s)	Joanne Vinke-de Kruijf
Source Title	Transferring Water Management Knowledge How actors, interaction and context influence the effectiveness of Dutch-funded project in Romania
Year of publication	2013
Editor/Publisher	Wöhrmann Print Service, Zutphen
Source Weblink	http://doc.utwente.nl/85809/1/thesis_J_Vinke_de_Kruijff.pdf

Source Type	<i>Other (specify)</i>
Source Author(s)	RESTORE
Source Title	Rivers by Design
Year of publication	2013
Editor/Publisher	Environment Agency (UK)
Source Weblink	http://www.restorerivers.eu/Portals/27/Publications/Rivers%20by%20design.pdf

Source Type	<i>Other (specify)</i>
Source Author(s)	Carmen Gache
Source Title	Ecological Restoration Project "Ciobarciu-Costuleni" (Iasi-Romania): Monitoring of the Birds' Fauna Evolution
Year of publication	(?2009)
Editor/Publisher	NATURA MONTENEGRINA, PODGORICA
Source Weblink	http://restorerivers.eu/wiki/images/2/24/Ecological_restoration_project_Ciobarciu_monitoring_of_birds_fauna_evolution.pdf

Source Type	<i>Other (specify)</i>
Source Author(s)	Societatea Ecologică „BIOTICA”
Source Title	CONFERENCE “ECOLOGICAL NETWORKS – INTRODUCTION TO EXPERIENCES AND APPROACHES

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Year of publication	2012
Editor/Publisher	Societatea Ecologică „BIOTICA”
Source Weblink	http://www.biotica-moldova.org/library/ECO-net_Conference_1.pdf

Source Type	<i>Other (specify)</i>		
Source Author(s)	Apele Romane		
Source Title	River Basin Management Plan Prut-Barlad		
Year of publication	2009		
Editor/Publisher	N/A		
Source Weblink	http://www.rowater.ro/daprut/Plan%20management%20bazinal/Plan%20Management%20%20SH%20Prut-Barlad%20-%20vol.%20I.pdf		
Key People		<i>Name / affiliation</i>	<i>Contact details</i>
	1	<i>Dr. Eng. Anca Savin . Prut - Barlad River Basin Authority</i>	<i>nca.savin@dap.rowater.ro</i>
	2		
	3		

XII. Photos Gallery



Restoring flow on the Old Jijia river (from left; before, during and after work)

© Prut-Barlad Water Administration Iasi (ABAPB)

(Source : Rivers by Design, 2013, RESTORE

<http://www.restoreivers.eu/Portals/27/Publications/Rivers%20by%20design.pdf>)