European Commission

NWRM

Natural Water Retention Measures

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

Case Study

Reconstruction and modernization of existing and construction of new reservoirs and ponds

ACTeon environment research & consultancy

Office International de l'Eau

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BEF LATVIA

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REGIONAL ENVIRONMENTAL CENTER

REKK

SLU

SRUC

Environment

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http://www.nwrm.eu

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I. Basic Information

Application ID	*Poland_01*			
Application Name	*Reconstruction and modernization of existing and construction of new reservoirs and ponds*			
Application Location	Country:	*Poland*	Country 2:	
	NUTS2 Code			
	River Basin District Code			
	WFD Water Body Code			
	Description		The long-term national wide programme implemented by the Polish government aiming towards limiting the fast water runoff after snow melting and heavy rains. The measures financed by the programme includes also some examples of NWRM contains, like ponds, revitalization of the wetlands.	
Application Site Coordinates	Latitude: *- ETRS89 or WGS84? Specify*		Longitude: *ETRS89 or WGS84? Specify:*	
Target Sector(s)	Primary:	Agriculture		
	Secondary:	Hydromorphology		
Implemented NWRM(s)	Measure #1:	*N1 Basins and Ponds*		
	Measure #2:	*N2 Wetland restoration and management*		
	Measure #3:			
	Measure #4:			
Application short description	*In Poland, the first major action of promotion of "small water retention" (mainly the construction of small water reservoirs or ponds) was carried out at the turn of 60s and 70s last century. The main Polish governmental agreement on water retention in small scale infrastructures was signed in 1995 to improve the structure of the water balance of small catchments by 2015. The regional authorities (voivodships) had to elaborate the programme of small retention development which was accomplished in 1996 for most of the regions. The planned increase in the volume of retention waters was based mainly on small water bodies (ponds), which was predicted to get the retention of the order of 860 million m3 (4789 reservoirs).*			

II. Policy context and design targets

Brief description of the problem to be tackled	*Since the beginning of the 1990th agriculture have encountered climate changes which manifested themselves by dry years, less snowy winters and rapid floods even in small rivers. It posed periodical problems in water management because Poland is a country of relatively small water resources and their variable spatial distribution. Actions were undertaken to slow down or hamper water outflow from natural and artificial running waters, to store waters in small reservoirs and terrain depressions and to increase the retention of water in soils and aquifers. In Poland such actions are termed "small retention" as opposed to water retention in large reservoirs for power production, flood control, drinking water intakes for large cities etc.*		
What were the primary & secondary targets when designing this application?	Primary target #1:	Self-regulation of water by filtration / storage / accumulation by ecosystems	
	Primary target #2:	Buffering and attenuation of mass flow	
	Secondary target #1:	Regulation of hydrological cycle and water flow	
	Remarks		
Which specific types of pressures did you aim at mitigating?	Pressure #1:	WFD identified pressure	3.1 Abstraction – Agriculture
	Pressure #2:	Floods Directive identified pressure	Natural Exceedence
	Pressure #3:	WFD identified pressure	*4.1.2 Physical alteration of channel/bed/riparian area/shore of water body for agriculture*
	Remarks	The primarily the aim of the measure is to	
Which specific types of adverse impacts did you aim at mitigating?	Impact #1:	WFD identified impact	*Altered habitats due to hydrological changes*
	Impact #2:	Floods Directive identified impact	*Waterbody status*
	Remarks		
Which EU requirements and EU Directives were aimed at being addressed?	Requirement #1:	WFD-achievement of good ecological status	
	The programme was not intended to support the WFD as it was launched before the WFD was adopted. However, its implementation supports integrated water management.		
Which national and/or regional policy challenges and/or requirements aimed to be addressed?	The small retention measures including reservoirs or ponds aimed at addressing the challenge of water balance in small catchments in Poland.		

III. Site characteristics

Dominant Land Use type(s)	Dominant land use	*243 Land principally occupied by agriculture, with significant areas of natural vegetation*
	Secondary land use	*231 Pastures*
	Other important land use	
	Remarks	
Climate zone	cool temperate dry	
Soil type		
Average Slope		
Mean Annual Rainfall	300 - 600 mm	
Mean Annual Runoff		
Average Runoff coefficient (or % imperviousness on site)		
Characterization of water quality status (prior to the implementation of the NWRMs)		
Comment on any specific site characteristic that influences the effectiveness of the applied NWRM(s) in a positive or negative way		

IV. Design & implementation parameters

Project scale	Large (e.g. watershed, city, entire water system)	*The programme covers whole country.*
Time frame	Date of installation/construction (MM.YYYY)	*The implementation of the programme started in 1997 and shall be continued till 2015*
	Expected average lifespan (life expectancy) of the application in years	More than 20 years
Responsible authority and other stakeholders involved	*Name of responsible authority/ stakeholder*	*Role, responsibilities*
	Voijevodships	Planning of the small retention
	Farmers and land owners	Implementation
	NGOs	Implementation
The application was initiated and financed by	*The small retention measures were endorsed by the agreement between the ministries of agriculture and environment which agreed on various common actions aimed at improving the availability of water resources.*	

<table>
<tr><td></td><td colspan="3">Different sources of financing:
– budget of voivodships,
– voivodship funds for environmental protection and water management,
– National Fund for Environmental Protection and Water Management (NFEPWM),
– budget of communes,
– Fund for the Protection of Agricultural Lands (FPAL),
– Agency for Restructuring and Modernization of Agriculture (ARMA),
– other sources (private funds, forest district offices, anglers associations, mines, foundations, structural funds of the EU).</td></tr>
<tr><td>What were specific principles that were followed in the design of this application?</td><td colspan="3">– stop degradation of the existing and start the construction of new reclamation facilities, particularly those intended for irrigation, water lifting and hampering rapid water outflow,
– consider the possibility of flood control,
– facilitate the reduction of surface runoff through planting forests and midfield woods,
– locate the objects in places appropriate for increasing the recharge of aquifers,
– consider the motions of local communities (communes, farmers),
– be agreed on with regional boards of water management.</td></tr>
<tr><td rowspan="2">Area (ha)</td><td colspan="2">Number of hectares treated by the NWRM(s).</td><td>n.a.</td></tr>
<tr><td colspan="2"></td><td>The focus of the programme was on the m^3 of water retained.</td></tr>
<tr><td>Design capacity</td><td colspan="3">Mean volumes of retained water per one object in 1997-2007 are differentiated for particular elements of small retention. Mean unit volume of constructed reservoirs and ponds were from c. 20 up to 200 thousand m^3.</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">The main reason was low financial inputs but also complex formal procedures before realisation of an object due to legal restrictions associated mainly with environmental protection.</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			
Peak flow rate reduction			
Impact on groundwater			
Impact on soil moisture and soil storage capacity			
Restoring hydraulic connection			
Water quality Improvements			
WFD Ecological Status and objectives			
Reducing flood risks (Floods Directive)			
Mitigation of other biophysical impacts in relation to other EU Directives (e.g. Habitats, UWWT, etc.)			
Soil Quality Improvements			
Other			

VI. Socio-Economic Information

What are the benefits and co-benefits of NWRMs in this application?			
Financial costs	***Total:***		*393 million zloti in the period of 1997-2007; unit costs were between 3.63 to 19.60 zloti per m3 of a water reservoir.*
	Capital:		
	Land acquisition and value:		
	Operational:		
	Maintenance:		
	Other:		
Were financial compensations required? What amount?	*Was financial compensation required: Yes /No*		
	Total amount of money paid (in €):		
	Compensation schema:		
	Comments / Remarks:		
Economic costs	*Actual income loss:*		
	Additional costs:		
	Other opportunity costs:		
	Comments / Remarks:		
Which link can be made to the ecosystem services approach?	*Water provision to deliver water services to the economy both for drinking and non-drinking purposes. Amenities (associated to habitat protection): fish and plants, tourism, recreation, and others.*		

VII. Monitoring & maintenance requirements

Monitoring requirements	
Maintenance requirements	
What are the administrative costs?	

VIII. Performance metrics and assessment criteria

Which assessment methods and practices are used for assessing the biophysical impacts?	
Which methods are used to assess costs, benefits and cost-effectiveness of measures?	
How cost-effective are NWRM's compared to "traditional / structural" measures?	
How do (if applicable) specific basin characteristics influence the effectiveness of measures?	

What is the standard time delay for measuring the effects of the measures?	

IX. Main risks, implications, enabling factors and preconditions

What were the main implementation barriers?	*Lack of finances*
What were the main enabling and success factors?	*The Polish Government in 1995 decided to launch the programme of small water retention in rural areas. The aim was to improve water balance as agricultural sector experienced shortage of water.*
Financing	*Different sources of financing:* *– budget of voivodships,* *– voivodship funds for environmental protection and water management,* *– National Fund for Environmental Protection and Water Management (NFEPWM),* *– budget of communes,* *– Fund for the Protection of Agricultural Lands (FPAL),* *– Agency for Restructuring and Modernization of Agriculture (ARMA),* *– other sources (private funds, forest district offices, anglers associations, mines, foundations, structural funds of the EU).*
Flexibility & Adaptability	*The small reservoirs can be and are constructed in different ways and for various purposes - recreational, floristic and faunistic conservation sites, swimming pools, water quality protection (constructed wetlands) and infiltration reservoirs*
Transferability	*The small retention programme is national wide. Initially having focus on agriculture areas, but since 2007 the activities are also implemented in forest areas of Poland. Installation of ponds or small reservoirs is also taking place in nature protected areas where wet habitats play important role.*

X. Lessons learned

Key lessons	*The Polish governmental agreement on water retention in small scale infrastructures was signed in 1995 to improve the structure of the water balance of small catchments by 2015. The regional authorities (voivodships) had to elaborate the programme of small retention development which was accomplished in 1996 for most of the regions. The planned increase in the volume of retention waters was based mainly on small water bodies (ponds), which was predicted to get the retention of the order of 860 million m3 (4789 reservoirs). However, by 2007, the achieved capacity of reservoirs was 9% of planned. The main reason is low financial inputs but also complex formal procedures before realisation of an object due to legal restrictions associated mainly with environmental protection.*

XI. References

Source Type	Journal
Source Author(s)	*Waldemar MIODUSZEWSKI*
Source Title	Small (natural) water retention in rural areas
Year of publication	2014
Editor/Publisher	Journal of Water and Land Development. Volume 20, Issue 1, Pages 19–29

Source Weblink	http://www.degruyter.com/view/j/jwld.2014.20.issue-1/jwld-2014-0005/jwld-2014-0005.xml

Source Type	Journal
Source Author(s)	*Waldemar MIODUSZEWSKI*
Source Title	Small water reservoirs – their function and construction
Year of publication	2012
Editor/Publisher	Journal of Water and Land Development, No. 17 p. 45–52
Source Weblink	http://www.itep.edu.pl/oferta/wydawnictwo/journal/17_2012_VII_XII/artykuly/Mioduszewski.pdf

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Source Weblink	http://www.itep.edu.pl/oferta/wydawnictwo/imuz/wydaw/ofertawyd/journal/no_12_2008/kowalewski.htm		
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