Lessons learned from a comparative assessment

Factsheet 1

www.wetwin.eu

Context to the WETwin project

Wetlands provide a wide range of ecosystem goods and services but are increasingly under threat from unsustainable use, both within the wetland and from poor management of upstream catchments. The multiple benefits provided by wetlands often mean that there are competing priorities for wetland use. Management must, thus, balance the competing needs of different uses and users, as well as the threat of degradation from external pressures such as upstream land and water developments, morphological change, climate change and variability, and population growth linked to urban development.

The WETwin project aimed to enhance the role of wetlands in basin-scale integrated water resources management (IWRM) to improve the community service functions they provide while conserving good ecological status. The project draws on case studies from Europe (Austria, Hungary), Africa (Uganda, Mali and South Africa) and Latin America (Ecuador) (Figure 1 and Table 1) (see WETwin Factsheets 9 to 14).

Decisions in wetland management must often be made in the absence of comprehensive information. Providing available data in a form that is useful for wetland management is an important priority (see WETwin Factsheets 3 and 5).

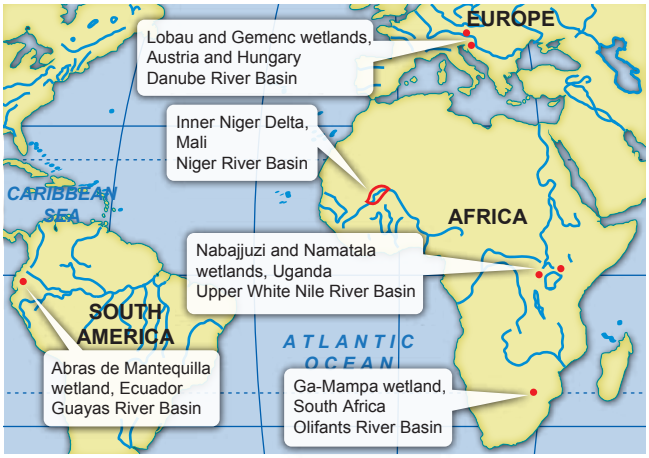


Figure 1:
Location of the WETwin case study sites

Tools of different levels of complexity are appropriate for different users. The project developed and applied a range of different tools in the wetland case studies to generate a rapid

Wetland (size)	WETwin factsheet	Ramsar site	River basin / country (climate zone)	Major issues
Inner Niger Delta (4 million ha)	6, 7, 8	X	Niger Basin, Mali (dry tropics)	Upstream development of hydropower and irrigation; human health, wastewater disposal and sanitation; food security; biodiversity; cultural significance; population growth; climate change; morphological change
Ga-Mampa (100 ha)	10		Olifants Basin, South Africa (semi-arid)	Wetland agriculture; irrigation; population growth; morphological and land use change; climate change
Abras de Mantequilla (AdM) (29,000 ha)	11	X	Guayas Basin, Ecuador (wet tropics)	Upstream development of dams and water diversion schemes; wetland agriculture; biodiversity; cultural significance; population growth; climate change
Nabajjuzi (6,500 ha)	-	X	Upper White Nile Basin, Uganda (wet tropics)	Urban water supply and wastewater treatment; wetland agriculture; biodiversity; cultural significance; population growth; climate change
Namatala (26,000 ha)	13		Upper White Nile Basin, Uganda (wet tropics)	Urban water supply and wastewater treatment; wetland agriculture; biodiversity; population growth; climate change
Lobau (2,200 ha)	6, 9	X	Danube Basin, Austria (temperate)	Flood management; biodiversity; water supply; recreation; morphological change
Gemenc (18,000 ha)	12	X	Danube Basin, Hungary (temperate)	Forestry and wood production; biodiversity; recreation; cultural significance; morphological change

Table 1:
WETwin case studies

understanding of the main goods and services provided by the wetlands, the pressures and impacts acting upon them (including use by wetland communities), potential conflicts and competitive demands, and the institutional capacity and current management practices for wetland management. The tools used to assess the state of the wetland system and impact of management options upon it are summarized in Table 2.

Data scarcity and limited institutional capacity, coupled with the complex nature of multidisciplinary problems, prevented the use of true decision support tools. The use of multiple evaluation criteria is necessary in systems as complex as wetlands, but it may not be possible to score all criteria with sufficient sensitivity or reliability to differentiate between solutions; and the complexity of dealing with large numbers of criteria may mask the really important issues. In practice, it was found that, in all case studies, stakeholder groups simplified analyses by grouping criteria.

The framework developed in WETwin provided a useful set of tools to promote understanding and underpin negotiations, but was not suitable for final selection of management options since these decisions have a strong social and political dimension.

Integrating wetlands into river basin management

Wetlands are often viewed as stand-alone systems rather than as elements of the river basin. As a result, wetlands are poorly integrated into river basin management, both in the case studies from Europe and developing countries. The main barriers to synchronizing the requirements of the wetland with management imperatives from the broader river basin are the mismatch between local and national or catchment level priorities; and lack of recognition of the ecosystem services provided by wetlands to the broader catchment. These failures in mutual understanding across scale are attributed to a lack of accessible information on status, trends, important values and targets for wetland management. This can be addressed through the involvement of stakeholders at all levels, and through structured, transparent methods for assessing ecosystem

		Complexity of tools ←			
		Numerical modelling and spatial mapping		Statistical relationships	Scoring by experts
		High-resolution, complex models	Low-resolution, simple models		
Ecuador	Guayas River Basin	Rainfall-runoff 1D-hydraulic model Water allocation model		Productivity functions for agriculture Regression between aquatic biotic communities and water quality	Institutional capacity
Ecuador	AdM wetland	Wetland module of river basin models	Water quality index		Impact of management options
Mali	Niger River	Rainfall-runoff model			
Mali	Inner Niger Delta wetland	Wetland and inundation module of river basin model	Rice production model	Regression between flood level and disease incidence	Ecosystem services Adaptive capacity
Uganda	Namatala wetland		Mapping of ecosystem services and land use change	Trends in water quality, river flow and rainfall	Ecosystem services Ranking of wetland problems
Hungary	Gemenc wetland	Rainfall-runoff linked to cell-based floodplain model	Habitat model for generic floodplain ecotopes		Ecosystem services
Austria	Lobau wetland	2D surface and subsurface flow		Historic analysis of impact of river regulation on wetland Logistic regression for habitat availability based on hydrological dynamics	

Table 2:
Tools for wetland management (Cools et al Forthcoming)

services, setting priorities for ecosystems and livelihoods, and evaluating management options.

The question arises whether the complexity of truly integrated management of wetlands and catchments is feasible in countries where links in the governance between different levels are not well developed. In practical terms, the most pressing requirement is for cooperation and exchange of information on critical links, rather than full integration of planning processes. (see WETwin Factsheets 2 and 5).

Assessing vulnerabilities and enhancing adaptive capacity

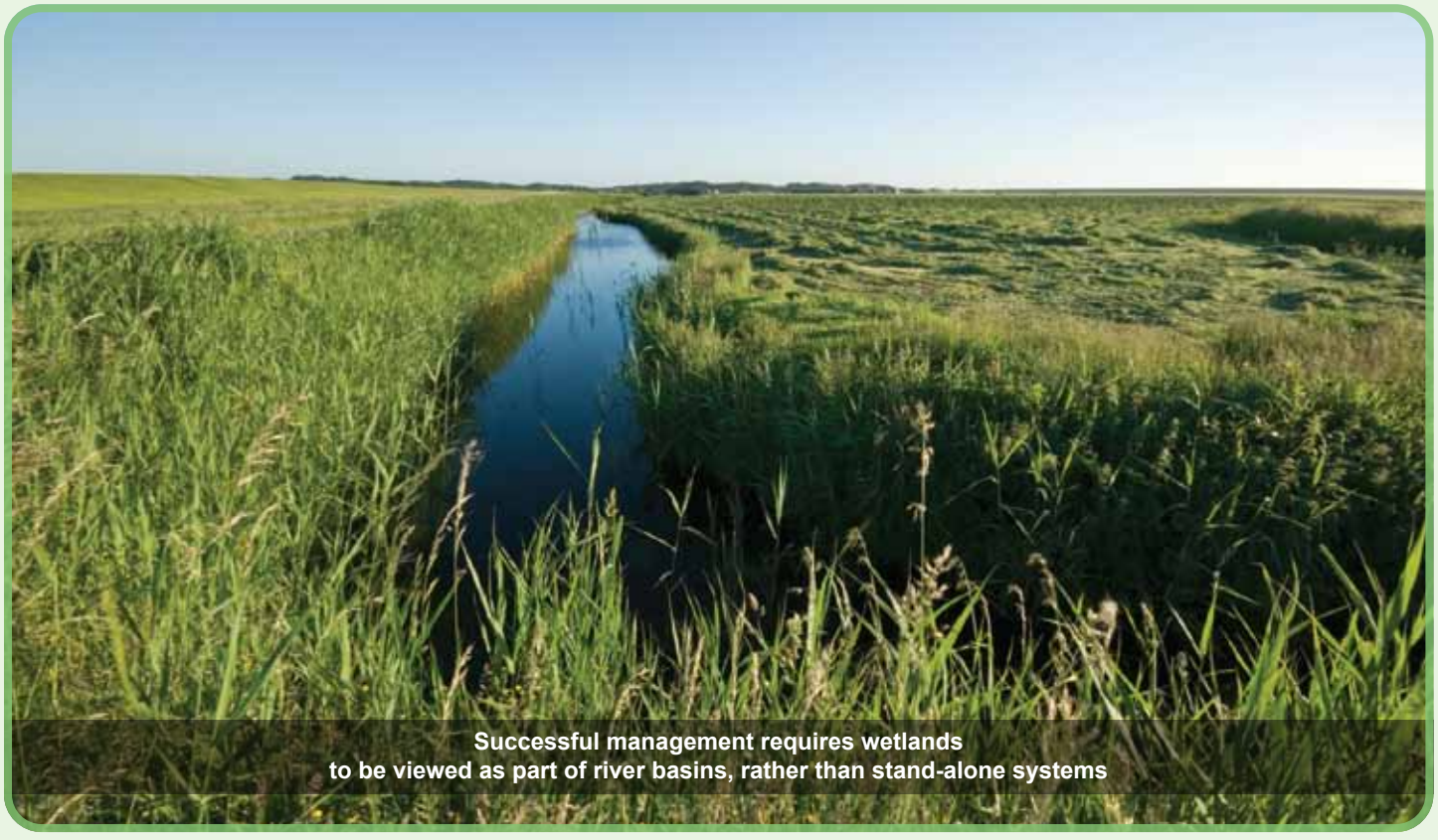
Management has an important role in reducing vulnerability of wetland systems to change. WETwin used an indicator-based framework to assess the adaptive capacity of wetland management relative to the impacts of external change, such as climate and morphological change, population growth, and upstream developments in land and water management. The change in vulnerability of the system as it moves from its initial state to a new state is described by summing the criteria scores of (usually negative) external impacts and (usually positive) adaptive capacity. A system becomes more vulnerable if the external impacts exceed the adaptive capacity and vice versa (see WETwin Factsheet 7 and 13).

The multi-use character of wetlands intrinsically lends itself to compromise solutions. Managing to meet multiple-use objectives inherently requires managing to maintain the overall health of the wetland; and vice versa, maintaining the health of the wetland maximises the range of ecosystem services it can provide.

Trade-offs more acceptable in larger scale wetlands

Scale issues had a large impact on management responses. Wetland stakeholders accepted trade-offs at the larger scale, seeing impacts of large upstream developments and climate change as outside their sphere of influence and hence as inevitable. Case study stakeholders sought "no-regret" solutions at the local scale and were reluctant to frame decisions in terms of direct trade-offs.

Since management will proceed with or without supporting information, it is important to adapt existing knowledge to the local context, through a combination of scientific tools, expert opinion and stakeholder knowledge. Even where the outcomes of future management can be predicted with sufficient certainty, that knowledge will not necessarily resolve competing views of what constitutes the best outcome, and decisions must be negotiated in a social and political context.



Successful management requires wetlands to be viewed as part of river basins, rather than stand-alone systems

Authors: Jan Cools, Robyn Johnston and István Zsuffa

References

Cools, J; Johnston, R; Hattermann, F; Douven, W; and Zsuffa, I. Forthcoming. Tools for wetland management: lessons learnt from a comparative assessment. Accepted for Environmental Science & Policy.

Further reading

Details of the case studies and methods used in the WETwin study can be found in: Johnston, R.; Cools, J.; Liersch, S.; Morardet, S.; Murgue, C.; Mahieu, M.; Zsuffa, I.; Uyttendaele, G.P. Forthcoming. WETwin: A structured approach to evaluating wetland management options in data-poor contexts. Environmental Science & Policy. In press. Available online January 9, 2013. DOI: 10.1016/j.envsci.2012.12.006

Maintaining a wetland's health maximises the ecosystem services it can provide

About WETwin

The WETwin project aims to enhance the role of wetlands in integrated water resources management for twinned river basins in the European Union (EU), Africa and South America in support of EU water initiatives. The objective is to improve community service functions while conserving good ecological status.

Partners

VITUKI Environmental and Water Management Research Institute, Hungary (coordinating partner)
Wetlands International, Mali
Antea Group, Belgium
Potsdam Institute for Climate Impact Research, Germany
WasserCluster Lunz, Austria
UNESCO-IHE Institute for Water Education, the Netherlands
National Water and Sewerage Corporation, Uganda
International Water Management Institute, South Africa
Escuela Superior Politécnica del Litoral, Ecuador

Funding

WETwin is a collaborative project funded under the European Commission's Seventh Framework Programme Grant agreement number 212300.

Factsheet topics

1: Lessons learned from a comparative assessment
2: Enhancing governance in wetland management
3: Devising a Decision Support Framework
4: Balancing ecology with human needs in wetlands
5: Creating an effective Spatial Data Infrastructure
6: Wetlands in a catchment context
7: Assessing vulnerability of wetlands to change
8: Integrating health, urban planning and wetland management
9: Case study: Lobau wetland, Austria
10: Case study: Ga-Mampa wetland, South Africa
11: Case study: Abras de Mantequilla wetland, Ecuador
12: Case study: Gemenc floodplain, Hungary

Contacts

For further information, email:
István Zsuffa: info@wetwin.eu
Tom D'Haeyer: tom.dhaeyer@anteagroup.com