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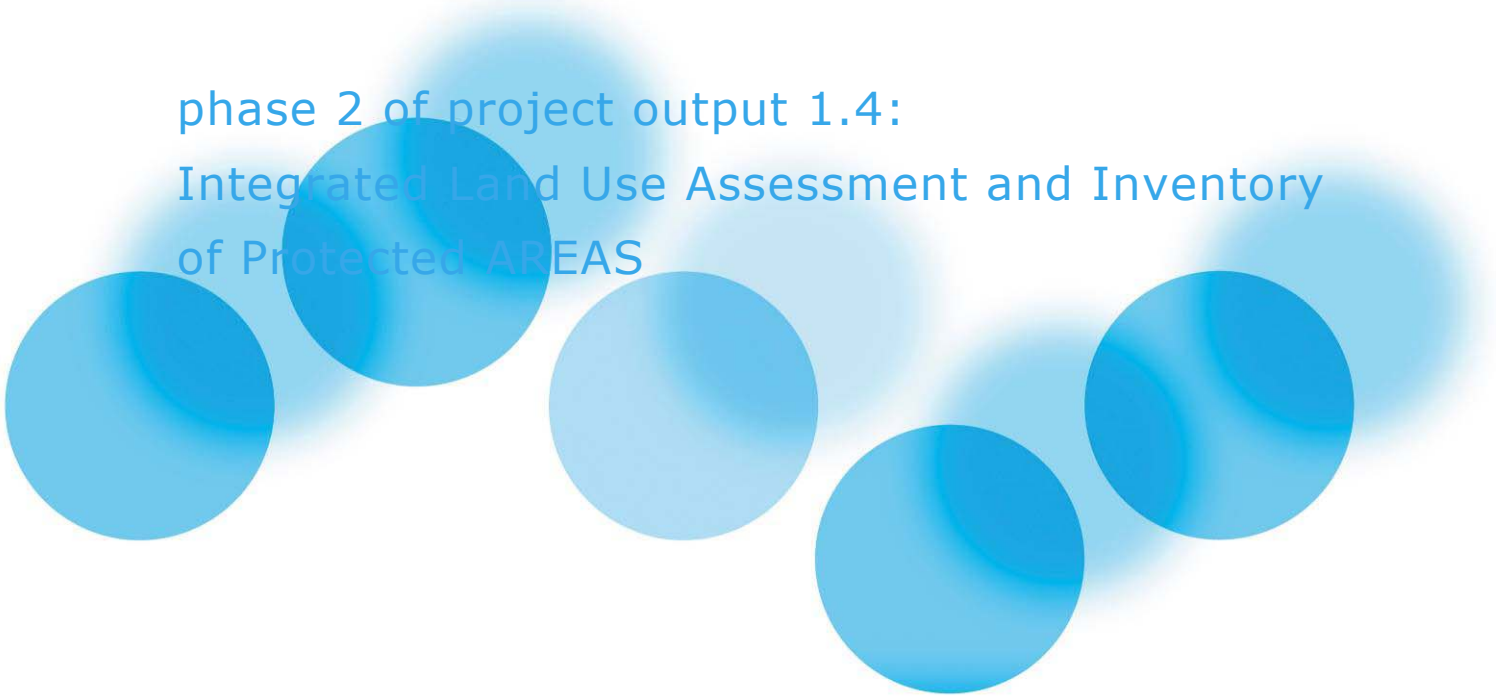
Field and Policy Action for Integrated Land Use in the Danube River Basin – Methodology and Pilot Site Testing with Special Reference to Wetland and Floodplain Management

phase 2 of project output 1.4:
Integrated Land Use Assessment and Inventory of Protected AREAS



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PREFACE

This report has been produced to conclude the activities undertaken as part of the project output 1.4: Integrated Land Use Assessment and Inventory of Protected Areas of the UNDP/GEF Danube Regional Project Strengthening the Implementation Capacities for Nutrient Reduction and Transboundary Cooperation in the Danube River Basin.

The report is aimed to provide a summary of the activities and recommendations resulting from an analysis of both Phase I and Phase II of the project focused on Field and Policy Action for Integrated Land Use in the Danube River Basin – Methodology and Pilot Site testing with special reference to wetland and floodplain management. The report has been written to provide a technical record for those considering wetland restoration activities related to changing of land use.

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ABBREVIATIONS

CAP	Common Agricultural Policy
CIS	Common Implementation Strategy of the EU Water Framework Directive
DRB	Danube River Basin
DRP	Danube Regional Project
EC	European Commission
ECO EG	Ecological Expert Group of ICPDR
EU	European Union
GEF	Global Environment Facility
GIS	Geographical Information System
ICPDR	International Commission for the Protection of the Danube River
IRBM	Integrated River Basin Management
ISPA	EU pre-accession instrument for structural measures
LIFE	The EC financial instrument for the environment
UNDP	United Nations Development Programme
RBM EG	River Basin Management Expert Group of ICPDR
SAPARD	EU pre-accession instrument for agriculture and rural development measures
WFD	Water Framework Directive (2000/60/EC)
WWF	World Wide Fund For Nature

EXECUTIVE SUMMARY

Objective 1 of the UNDP/GEF Danube Regional Project offers support to policy development favouring the creation of sustainable ecological conditions for land use and water management. Within Objective 1, *Integrated Land Use Assessment and Inventory of Protected Areas* (Output 1.4) was one of eight project outputs. The project was implemented in two phases: Phase 1 was conducted between December 2001 and November 2003. Phase 2 started in June 2005 and ended in December 2006. This report covers only the *Integrated Land-use Assessment* element of Output 1.4 (the *Inventory of Protected Areas* is the subject of a separate report).

Overall aim and specific project objectives of Output 1.4:

The overall aim of Output 1.4 was to assist Danube River Basin countries to prepare new land-use and wetland rehabilitation/protection policies and legislation in line with existing and emerging legislation, particularly the EU Water Framework Directive.

The specific objectives of this component of Phase 1 of Output 1.4 were to:

(a) develop a straightforward, yet rigorous, land-use assessment methodology that could be tested and adapted if necessary for use across the region;

(b) select three pilot sites on which the methodology could be tested by implementation of specific site-based activities including the holding of a workshop at each location to ensure stakeholder involvement and wider public participation in the identification and assessment of various future land-use alternatives;

(c) according to the results of the test phase, develop specific proposals for final land-use concepts at each pilot site, including recommendations for the actions and measures required to implement the concepts in practice; and

(d) develop a communications strategy to ensure the dissemination of conclusions and recommendations, including the final land-use assessment methodology, throughout the Danube River Basin.

The specific objectives of this element of Phase 2 of Output 1.4 were to:

(a) implement technical mitigation measures and alternative concepts that have been developed in the first phase to achieve integrated land use management at each pilot site (practical restoration work, regulatory issues, economic fines and incentives, compensation payments etc.);

(b) mainstream wetland conservation and restoration activities into rural development plans and policy on local, regional and national levels and securing governmental commitments to implement the newly proposed concept for integrated land use in the selected case studies;

(c) demonstrate mechanisms for sustainable wetland use and disseminating project results in the Danube basin.

Activities completed successfully by the project Output 1.4 include:

(a) Activities related to the application of the methodology for assessing land use:

1. The methodology was applied in the selected three pilot sites – Olsavica valley, Tisza sub-basin, Slovakia; Lower Elan valley, Prut sub-basin, Romania; and Slovakia Zupanisjski canal, near Budakovac village, Drava sub-basin Croatia;
2. An assessment was completed of the applicability of developing sustainable land-use concepts at each pilot site that aim at reducing nutrient inputs into water bodies, particularly through wetland and floodplain rehabilitation and/or restoration;
3. An assessment was completed of the applicability to find practical and policy measures required to move towards more sustainable land use patterns at each pilot site.

(b) Activities related to the implementation of proposed restoration measures, communication, and policy action at the three selected pilot sites:

The following activities have been completed during the second project phase.

In Slovakia (Olsavica Valley):

1. Construction of small dams on selected streams to control channel erosion;
2. Reopening of small meanders on a canalised stream;
3. Restoration of wet grasslands to act as a buffer zone between agricultural land and the stream;
4. Blockage of an underground drainage system to restore water tables;
5. Planting of trees on steep stream banks to control soil erosion;
6. Springs were fenced off to prevent damage from grazing; and
7. Restoration promoted more widely through public awareness information.

In Romania (Lower Elan Valley):

1. A feasibility study and rehabilitation measures of the lower Elan floodplain downstream of the confluence with Sarat Creek through meander restoration were conducted. (Activities were only partly completed because of two major flood events in the region that hindered the full implementation of activities. The activities will be completed immediately after the project termination. See also below: 'constraints and unexpected events');
2. Parts of the Elan river channel were partly reprofiled (activities have been partly completed because of two major flood events in the region, they will be continued after project termination, see also below: 'constraints and unexpected events');
3. Control of soil erosion on hill slopes through changed land-use, implementation of better agricultural practices, land reclamation and afforestation;
4. Declaration of the Lower Elan floodplain as a protected area; and
5. Improvement of public awareness and the training of civil society organisations especially those in local communities and schools.

In Croatia (Zupanisjski canal):

1. Geographical survey of the area to investigate most suitable measures to reconnect the Drava river to adjacent Podravski Sokolac wetland and Budakovac oxbow and consequently raise local water tables;
2. Feasibility study to implement the most suitable measure to reconnect water from the Drava river to adjacent Podravski Sokolac wetland and Budakovac oxbow and consequently raise local water tables;
3. Dissemination of the findings, conclusions and recommendations from these activities.

Conclusions, lessons learned and implementation constraints

General conclusions

- The methodology for assessing land use was successfully applied in all three pilot sites. Other potential users – including national and local authorities in the Danube River Basin, NGOs and international organisations such as the Ramsar Secretariat – are encouraged to make use of this methodology.
- The technical work and stakeholder involvement during the first phase and at each site was successful in producing outline action plans for the second project period.
- The project supplied evidence that by carefully planned landuse changes, it is possible to provide a significant contribution to wetland restoration and wise management of wetland resources and services.
- It also provided evidence that building the capacity of local people on EU policy and the opportunities that EU policy offer can provide a signification platform for success even for far-off rural areas in new member states and even in proposed new accession states such as Croatia.
- Many of the actions recommended at each pilot site are in line with, and could be more widely encouraged by, existing policy drivers. Four policy measures and socio-economic trends in particular were found to support sustainable land-use and wetland restoration measures:
    - Wetlands are an integral part of the EU Water Framework Directive (WFD);
    - Agriculture is changing across Europe:
    - Wetlands can help to safeguard against floods; and
    - Public participation is now a legal necessity

Lessons learned

The lessons learned from the project indicate clearly that it is important that the key policy drivers and opportunities described above are promoted at all levels, especially by the European Commission, the ICPDR, national governments and statutory authorities within the Danube River Basin and regional authorities. The project supplied evidence that:

- **landuse changes** are able to provide a significant contribution to wetland restoration and wise management;
- **capacity building with local people** on EU policy can trigger major success even at far-off rural areas in the new EU member states;
- **capacity building** on the ground will be key for sustainable management solutions in these areas;

On the other hand, the lessons learned from the project also illustrate the constraints of the selected policy goals:

- **Policy goals on national or international scale** might have been too ambitious. The project received very good feedback on local scales by demonstrating successful impacts on local landuse planning and local landuse techniques. It also received positive feedback on regional scales provided that activities were imbedded in existing structures or concepts (e.g. the Lower Danube Green Corridor initiative). However, the input on national or even international level was only weak or impossible. This would require a longer and more intensive project design.
- The principle of using **"bottom up models"** to influence top down decision-making is important but not entirely sufficient. A pure focus on "bottom up" activities will not show significant large-scale impact unless activities are not coordinated with ongoing "top down elements" (e.g. river districts that are preparing WFD implementation processes, authorities that are working on agri-environmental measures or N2000 designation etc.).
- With regard to this, the **selection of the case study locations** was perhaps not completely appropriate. While the sites provided very adequate opportunities to test and demonstrate restoration activities related to land-use change, all of the selected regions were far-off from central decision makers and only the Slovakian and Romanian pilot case managed to demonstrate a significant footprint on the regional and small footprint on the national level.
- The aim "to assist '**Danube River Basin countries**' to prepare new land-use and wetland policies and legislation in line with existing and emerging legislation" was also too ambitious. To aim to assist "Danube River Basin Districts" would have been the more realistic objective with hindsight.
- Due to administrative delays at UNDP/GEF concerning the set up of the second tender process the policy work during the second project phase was facing major **temporal constraints** and original goals had to be implemented in too tight a timeframe (see below).

One overarching policy finding of Output 1.4 is that information on the policy drivers (i.e. wetlands as integral part of the EU WFD, EU CAP reform, EU Flood Directive, Natura 2000 Directive) is still lacking locally. At local site levels there is still a chronic shortage of information and knowledge about recent, new and emerging policies and the opportunities associated with them, including financial instruments, for promoting sustainable land use. To work with local communities to overcome such serious shortcomings represented the most promising part of Output 1.4.

- In terms of **"hard" policy findings**, many European or Danube-wide policies already support the actions suggested for each pilot site. For instance, the WFD and other EU and international instruments such as the Natura 2000 directives and Bern Convention clearly support wetland restoration as a contribution to Integrated River Basin Management initiatives. However, implementation is still lacking. Similarly, the ongoing reform of the Common Agricultural Policy, SAPARD and Rural Development Directive will offer a range of supportive instruments, although knowledge and uptake of these remains low. The Horizontal Guidance on Wetlands in principle offers guidance on how wetland restoration, protection and sustainable management can actively contribute to achieving the WFD objectives. However, implementation of measures is also quite often lacking.
- Analysis of **"soft" policy aspects** from Output 1.4 showed that there are often different realities in rural areas and at national level possibly as a result of a bottleneck in administrative capacity at local or regional levels. Access to information on many policy instruments should also be improved and there is an urgent need to improve the active involvement of the public, in line with Article 14 of the WFD. The three pilot sites all highlighted the need for immediate capacity building of governmental institutions and administrations at regional and local levels for WFD and other types of policy and programmatic information provision, public awareness and implementation. Such capacity building actions should also be extended to include NGOs and other stakeholders who can play a constructive role in implementation of the WFD and other policy instruments.

Implementation constraints

The implementation of proposed practical rehabilitation work at each pilot site, however, faced several constraints and unexpected events during the second project phase that led to delays in the implementation and highlight a number of the constraints that restoration projects may face:

a. **Adverse weather conditions.** The project region was affected by very hard weather conditions during the second project period between 2005 and 2006: The winter 2005/2006 brought a lot of snow and very low temperatures (down to minus 20 degree) and both years were hit by major flood events (with a flood probability of more than 100 years). Some of the planned restoration measures in Croatia and Romania were influenced or delayed due to these unexpected events.

b. **Loss of local project leader.** Furthermore, project work in Croatia was affected by the dramatic fatality of our local project manager David Reeder, who died completely unexpectedly in September 2006.This caused major delay in the implementation of the work programme in Croatia since the project management was not able to find an adequate substitute for David Reeder within the remaining project period. With support of the DRP headquarters in Vienna, but already with a significant delay, the management team of Output 1.4 succeeded to establish a new coordination team for implementing the remaining measures

at Zupanijski canal in Croatia. This team will be managed directly by Mr. Danko Biondic of Croatian Waters representing a successful integration of the project in national administrative structures.

c. **Administrative delays under the project management**: the start of the second project phase was delayed due to administrative problems at the coordinating office of the Danube Regional Project (UNDP/GEF office in Vienna) to set up the tender process. In consequence the project faced a significant loss of continuity creating partly losses of credibility at the local scale and lack of institutional memory at all levels of project management (caused by staff changes). To reactivate former contacts more time was required than expected. This also triggered some project delays, particularly in Romania. Nevertheless, delayed implementation of individual measures is still ensured due to existing contracting agreements with local consultants.

Delayed activities to be completed under the Output 1.4 by spring 2007:

In Croatia:

- Installing a second hydraulic structure or providing an equivalent solution to raise surface water levels in the channel and adjacent Marcina jama reed beds; if possible realise a solution to reconnect the system with a semi-natural channel and without hydraulic structures.
- Constructing a 150m channel to rehabilitate reed beds around Zanos or providing an equivalent solution.
- A workshop for local stakeholders to review the technical steps described above was postponed until the implementation of the measures by Croatian Waters.

In Romania

- The work on re-profiling the Elan river channel was partly conducted by the natural flood events. In summer 2006, part of the dikes was broken and the old meander system was flooded and re-connected with the Elan river system. Further negotiation is needed to maintain this situation.
- The work to improve hydrological conditions at Mata Radeanu fish farm (at confluence of Elan and Prut rivers) was delayed as the fishpond was completely flooded in summer 2006.
- The planting of native *Salix* and *Populus* saplings along the Elan river had to be postponed due to very high water levels.

1. INTRODUCTION

This report covers activities within the framework of the UNDP/GEF Danube Regional Project (DRP), the long-term development objective of which is *"to contribute to sustainable human development in the Danube River Basin through reinforcing the capacities of participating countries to develop effective mechanisms for regional cooperation in order to ensure protection of international waters, sustainable management of natural resources and protection of biodiversity"*.[1]

The DRP was designed in two independent phases. The goal of the first phase was to prepare and initiate basin-wide capacity-building activities. These initiatives then should be implemented and tested during second phase of the project (December 2001 to November 2003), for further consolidation during DRP Phase 2 (June 2005 to December 2006). The DRP comprises 20 Project Outputs, together covering more than 80 separate activities, which are grouped into four immediate objectives:

Objective 1: Support for **policy development** favouring creation of sustainable ecological conditions for land use and water management;

Objective 2: **Capacity building** and reinforcement of **transboundary cooperation** for the improvement of water quality and environmental standards in the Danube River Basin;

Objective 3: Strengthening of **public involvement** in environmental decision-making and reinforcement of community actions for pollution reduction and protection of ecosystems;

Objective 4: Reinforcement of **monitoring, evaluation and information systems** to control transboundary pollution, and to reduce nutrients and harmful substances.

The present study covers Phase 2 activities within Project Output 1.4 *Integrated Land Use Assessment and Inventory of Protected Areas*, one of eight Project Outputs under the overall umbrella of Objective 1. In particular, this report provides findings and recommendations designed to support sustainable, integrated land-use patterns. These land-use patterns were planned to be capable of delivering multiple socio-economic and ecological benefits, including nutrient reduction in streams and rivers.

The report also introduces an overview of the implementation of floodplain and wetland restoration and management measures, including rehabilitation and/or restoration where appropriate. This report deals only with implementation measures related with the *Integrated Land Use* element of Project Output 1.4. In this respect, it is important to underline that certain activities and outputs under other Project Outputs are of particular relevance to the issues dealt with in this report.

[1] Source: DRP Project Implementation Plan, available at http://www.icpdr.org/undp-drp/

These include the following:

- **Policy development – river basin and water resource management, and agriculture**

  Project Output 1.1 — Development and implementation of policy guidelines for river basin and water resources management (Activities within this Output have been developed to mirror the development of guidelines in the framework of the Common Implementation Strategy (CIS) of the EU Water Framework Directive (WFD). Of particular note is Activity 1.1-11 which has been instrumental in producing a Draft Public Participation Strategy for the DRB, reflecting the emphasis of the WFD on public participation as a key cross-cutting issue. The results of this Output should be seen in the light of the CIS Horizontal Guidance on Wetlands and the WFD, published in November 2003);

  Project Output 1.2 — Reduction of nutrients and other harmful substances from agricultural point and non-point sources through agricultural policy changes;

  Project Output 1.3 — Development of pilot projects on reduction of nutrients and other harmful substances from agricultural point and non-point sources through agricultural policy changes.

- **Public participation**

  Project Output 3.1 — Support for institutional development of NGOs and community involvement (notably through establishment of the Danube Environment Forum);

  Project Output 3.3 — Organization of public awareness-raising campaigns on nutrient reduction and control of toxic substances.

  These two Outputs have also contributed to preparation of the Public Participation Strategy for the Danube River Basin, (see Output 1.1).

- **Monitoring and assessment**

  Project Output 4.3 — Monitoring and assessment of nutrient removal capacities of riverine wetlands. (Activities under this Project Output have also been implemented in both phases by WWF, involving the development of a draft assessment methodology for testing at pilot sites and monitoring the effect of wetland restoration of Lake Katlabuh in the Ukrainian part of the Danube Delta).

The outputs of all of the above Project Outputs will need to be taken into consideration to support to sustainable development in the Danube Basin. Effective mechanisms for regional cooperation to ensure the protection of international waters should reflect the lessons learned from all different project components.

1.1. Aims & Objectives

1.1.1. overall aims

The DRP Project Implementation Plan and the Terms of Reference for Project Output 1.4 identify the following overall aims:

- The primary focus is to assist DRB countries to prepare new land use and wetland rehabilitation/protection policies and legislation in line with existing and emerging environmental legislation.
- The Project Output shall address common inappropriate land uses and subsequent impacts on ecologically sensitive areas and wetlands including the effects of transboundary pollution with particular attention to nutrients and toxic substances.
- While targeting action at a high policy level, the Output is also directed towards demonstrating pragmatic implementation of appropriate land use management on the ground in pilot activities.

1.1.2. Specific purpose and objectives of project phase 2

Based on the results of project phase 1, the purpose of phase 2 (July 2005 – December 2006) was the *implementation* of identified approaches for integrated land use assessment, policy concepts, and mitigation measures. Phase 2 aimed to test the outputs of phase 1 in the context of the three selected pilot sites and tried to demonstrate its feasibility. It also aimed to magnify the pilot study results to support Danube River Basin countries in implementing the WFD on a broader scale.

This comprises the following objectives:

- **Implementing** of proposed technical mitigation measures and alternative concepts for achieving integrated land use management at each pilot site (including practical restoration work, regulatory issues, economic fines and incentives, compensation payments etc.);
- **Mainstreaming** of wetland conservation and restoration activities into rural development plans and policy on local, regional and national levels and securing governmental commitments to implement the newly proposed concept for integrated land use in the selected case studies, and
- **Demonstrating mechanisms** for sustainable wetland use and disseminating project results in the Danube Basin.

1.2. Structure of this report

The structure of the report has been designed to present the project results and analysis according to the structure of the projects objectives and their relation to the separate phases of the project. Section 2 sets out the aims and objectives of activities under the integrated land-use part of Project Output 1.4, with reference to the Terms of Reference established by UNDP/GEF. This is followed by a section providing a description of the project sites and activities undertaken, in three different DRP Pilot Sites in Croatia, Romania and the Slovak Republic, respectively. The final chapter sets out the findings and lessons learned which are relevant at a range of different levels (e.g. field and policy; local, national and international) and for a range of different actors (e.g. Pilot Site stakeholders, national authorities, ICPDR, EC etc).

2. PROJECT SITE DESCRIPTIONS

Figure 1: The Danube River Basin and locations of the selected three pilot sites in the Slovak Republic (Olsavica); Romania (Elan Valley), and Croatia (Virovitica).

2.1. The Olsavica valley, Tisza sub-basin, Slovakia

Activities in Slovakia were focused on the Olsavica valley which is located in Levoca district of Presov county and lies within the Hornad Basin (Tisza sub-basin, Figure 2). The whole district is on the border between Central and Eastern Slovakia, and located in the eastern part of the Levocske vrchy hills, which are part of the Carpathian Mountain range (720–920 m above sea level).

- **Project area**

The total area of the pilot site is 1367 ha. The border was defined on the catchment area of Olsavica stream, which is a tributary and one of the spring systems of the Torysa River. According to the regional geomorphological division (Mazur, Luknis 1980) Levocske vrchy belongs to the Western Carpathians. Levocske vrchy (Levoca Hills) is a mountainous area of north-eastern Slovakia built of flysch rocks with a central ridge. The central part of the area is the Levocska vysocina. The central ridge is huge with forks separated by deep valleys. The highest hill is Cierna hora at 1,289 m above sea level. The Levocska vysocina borders the Levocska vrchovina in the west and the Levocske planiny in the south. The relief has an upland character, but also has plateau characteristics.

- **Land-cover**

The most dominant land-cover types are spruce forests, grasslands, extensive pastures with European larch (*Larix decidua*) and arable land. The regional geological structures mean that the area has an abundant groundwater supply, with the sandstone yielding a number of fissure springs. Wetlands are represented by fragments of submontane and montane floodplain forests, fens, tall sedges and wet grasslands, though these are much reduced due to human impacts (see below).

Figure 2: Olsavica river basin is located in Levocske vrchy Mts. (Hornad – Tisza Basin) with total area 13 km^2.

- **Major threats**

The village Olsavica has been subjected to significant flooding with consequent property and personal damage, since the mid-1980s. The flooding is thought to be largely the result of agricultural intensification, during the late 1970s and early 1980s. Intensification measures included installation of a dense network of subsurface and surface drainage canals, and removal of the historical terraces and grassland buffers. Springs and wetlands in upper part of Olsavica valley have been drained and subjected to intensive agriculture, fertilizer and manure use.

In addition to local flooding, the area suffers from massive soil erosion, which, together with excessive runoff, contributes to sediment and nutrient loading of watercourses. These factors together are likely to have a negative impact on downstream water quality and to increase the risk of flooding elsewhere in the basin. Soil erosion has led to a decrease in the area of land available for arable cultivation.

- **Conservation values**

The area has high nature conservation value, but Olsavica valley is not included within any formally recognised protected area, although a significant part of it is designated as a water supply protection area. Zone A, established in 1983 should positively influence some 1,062 ha of agricultural land, while Zone B, established in 1993 by a decision of the District Environment Department in Presov, should apply to a further 562 ha of farmland. In practice, the farming

cooperative does not strictly respect the water supply protection areas, because there is no compensation/incentive for doing so.

- **Socio-economical situation**

Olsavica depends on farming and has suffered from rural depopulation in recent years. The principal economic stakeholder is the agricultural enterprise 'Olsavica–Brutovce' which farms some 2,290 ha, of which approximately 1,936 ha is grassland. The remaining c.350 ha are located mainly in the upper part of the valley and subject to intensive arable production. The process of land (re-)privatization in Olsavica Valley was initiated several years ago but is still incomplete. Most private landowners rent their land to the agricultural cooperative.

2.2. Lower Elan valley, Prut sub-basin, Romania

Activities in Romania were concentrated on the Elan River, a tributary of the Prut River, in Vaslui and Galati Counties (Figure 3). The Elan basin lies within the Moldavian Plateau of eastern Romania. The total surface of the basin is of 601 km^2. The local topography shows typical features of a range of "rolling hills".

- **Project area**

The 'Lower Elan' Basin pilot site comprises an area of almost 3,300 hectares being situated immediately upstream of the confluence between the Prut and Elan Rivers. The main village of Murgeni within the Lower Elan basin lies 35 km east of the city of Barlad (Vaslui County) and 90 km north of the city of Galati (Galati County) as measured by road distance. Within the pilot project site, about 620 hectares represent the floodplain, out of which permanent wetlands cover 382 hectares (divided into 364 hectares of reed swamp and 18 hectares of water bodies).

- **Major threats**

The natural Elan ecosystem has been disrupted in several ways. Upstream, the Posta Elan Reservoir was intended to fulfill combined flood protection and water supply functions. However, due to construction of the reservoir, dike-building along the right bank of the Elan River, and canalisation of the main channel, this side of the floodplain is no longer flooded and large areas were developed for agricultural use during the Ceaucescu period. The land was leveled and extensive drainage systems were installed. After the political changes of the 1990s the collective farms were broken up and ownership was reclaimed by local inhabitants. The former floodplain drainage system collapsed and the land is now cultivated by the landowners. The left-bank floodplain has effectively acted as a sedimentation basin, with a rapid build-up of sediment.

Excessive hillside erosion is recognized as a major environmental threat throughout the Moldavian Plateau of eastern Romania. In 1950, the traditional hillside agricultural system of cultivation up and down slopes (i.e. across, not with, the contours) prevailed. Most of the land was split into excessively small plots, each of less than one hectare in size. Except in a few localised areas, there were no concerns about the threat from soil erosion and a minimum awareness of conservation practices. After 1950, theses areas were incorporated into collective farms. Many innovative research studies on soil erosion control were initiated and conservation practices were considered a national priority. By the end of 1989, up to 30 percent of the agricultural land with erosion potential had been ameliorated. To make things worse, during the last decade, the state has ceased funding for soil erosion control and such investment does not represent a priority for landowners.

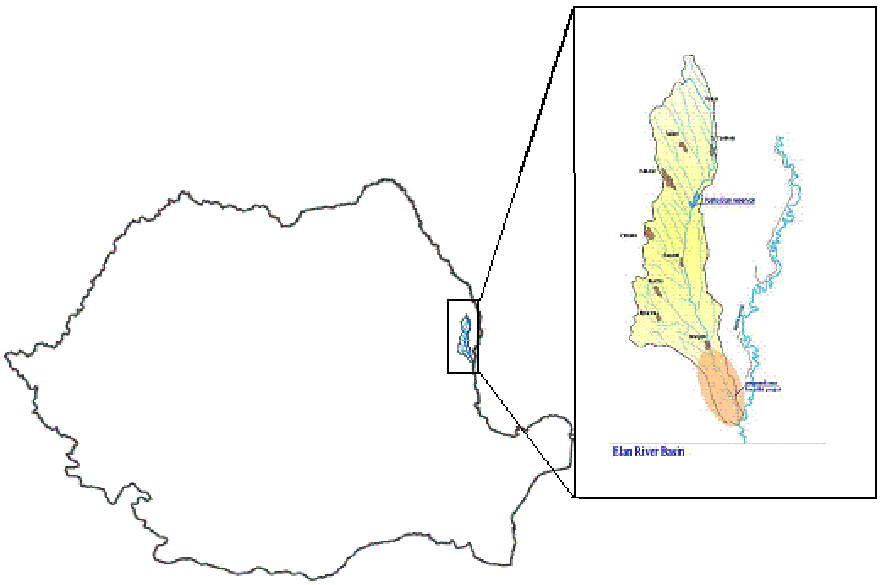


Figure 3: Location of the pilot project site in Romania (3300 ha total, 382 hectares represent wetlands) in the Elan River Basin, with a total area of 601 km^2.

- **Conservation values**

The Lower Elan wetlands are extremely important, for both people and biodiversity because of their functions for flood peak mitigation, agriculture, water supply, fisheries, and habitats for flora and fauna: The Lower Elan wetlands also help to reduce flood peak mitigation, provide agriculture support, water supply, fisheries support and habitat provision for flora and fauna. Although damaging floods are far less prevalent than formerly (due to dam construction upstream) the Lower Elan Floodplains may still have a vital role to play during exceptional rainfall events.

- **Socio-economical situation**

The local commune, Murgeni, has around 8,660 inhabitants and an area of 13,240 hectares. Because there is very little industry in the area the inhabitants use their land for livestock rearing (sheep and cattle) and extensive cultivation of crops (especially maize and sunflower but also some vineyards) without any assistance from irrigation. Cattle are allowed to graze in certain areas throughout the year, and, after the hay crop is cut, graze the whole floodplain. In case of severe drought (as in 2003) the reed beds are used as food for cattle. There is a fishpond complex close to the confluence of the Elan and Prut, but collapse of the retaining dike means that there is insufficient water for fish production and biodiversity values have also decreased.

The resource functions of the floodplain are also significant. Drinking water for people and livestock, small-scale irrigation and groundwater replenishment is desperately needed in the area given that the average water deficit is about 200 mm/year. Provision of potable water is a

major challenge given that the water from the three groundwater boreholes in the area cannot be used for drinking purposes without treatment.

The Lower Elan wetlands also support the deposition of nutrient-rich sediments carried by the river. This brings important benefits further downstream to the Prut and Danube Rivers, through the reduction of nutrient loads, mainly nitrogen and phosphorous from agricultural sources, but also from human wastes and industrial discharges. Some of these nutrients are taken up by wetland/floodplain vegetation and reed harvesting in winter effectively removes them from the system, as well as providing important raw materials for local villagers.

2.3. The Zupanijski canal, near Budakovac village, Drava sub-basin Croatia

Activities in Croatia were focused on the Budakovac wetlands. They lie on the old floodplain of the River Drava in Croatia, southeast of the city of Virovitica (Figure 4). Before river regulation, drainage and land reclamation works were carried out, from the late Eighteenth Century onwards. This was a flood-prone region where the river meandered extremely, creating an extensive pattern of oxbow lakes, river branches and islands on both sides of the river.

- **Project area**

The entire study-area, extending laterally towards the river, covers some 18 km^2 and contains four villages. The pilot site is 2350 ha in extent in a section of the River Drava, which forms the basis of the border between Hungary and Croatia. Some oxbows remain, although atrophied, but the meander scars are clearly evident on modern maps – through land-use variation – and particularly on multi-band satellite images. Many of these oxbows, both in Hungary and Croatia, are suitable for rehabilitation. This section is a classic expression of European lowland, lower-course rivers.

- **Major threats**

River regulation and drainage works since the Nineteenth Century have lowered the river-level and the water-table, such that the wetlands are now much reduced. This has been exacerbated in 2002 by the deepening of the Zupanijski canal, a canalized river, which runs alongside the wetlands, in such way that the level of the Budakovac oxbow lake has fallen by one meter, as has the groundwater, and many old oxbows and branches have almost dried out.

Where the treated mix of municipal and industrial wastewater enters the Zupanijski canal, the presence of nitrates and phosphates remains so high that the water is Category V in quality. Further downstream the canal passes several villages and the quality drops, presumably indicating that untreated wastewater from these settlements reaches the canal. None of the villages benefits from a piped water supply or from any form of wastewater treatment. The result is that by the time the canal reaches the Drava River, the water is Category II in terms of nitrate and phosphate content. Under certain circumstances, water quality entering the Drava is thought to be significantly lower. For example, during annual maintenance at the Viro facility, municipal wastewater is fed directly into the Zupanijski canal without treatment. Furthermore, though nutrient concentrations are theoretically diluted in wet periods, the fact that storm water and sewage are not separated in the municipality of Virovitica makes treatment difficult due to the excessive volumes involved.

Figure 4: Location of the pilot study site in the Drava river basin southeast of the city of Virovitica with total area of 2350 ha.

- **Conservation values**

The Zupanijski Canal and the former floodplain wetlands show a high potential for bio-remediation and therefore also a high potential for raising the average quality of water reaching the Drava-Danube system. This triggers additional conservation benefits, including improved fishery production and a general improvement in wetland habitat extent and quality. The most effective bio-remediation is on a stretch where the canal could not be straightened because of inaccessibility to machinery, so it follows the curve of the old natural oxbow for a few hundred metres. Here, water quality reaches Category I.

- **Socio-economical situation**

Most people living in the villages within the pilot site make their livings from agriculture and some from forestry. Rural development is urgently needed so that people in the region can share the same opportunities as those elsewhere in Europe, with provision of piped drinking water and adequate sanitation being a basic step. The area is environmentally rich and a path of sustainable development has great potential; the development of long-term environmental management schemes and peaceful transboundary co-operation are fundamental. Following the fall of the former Socialist Federative Republic of Yugoslavia and the establishment of the Croatian Republic in 1990, land (re-)privatization began in 1995. As elsewhere in Central and Eastern Europe, this process has been very complex; many owners failed to claim back their land or could not substantiate their claims. As a result, some land is now owned privately, some by the state; some is owned privately but used by the state, and vice-versa. In addition, *Hrvatske vode* (Croatian Waters) owns all waterways and some six metres of bank on either side.

3. IMPLEMENTATION OF ACTIVITIES IN PHASE 2

3.1. Summary of Activities

In line with the aims and objectives described in Section 2, the activities set out in the Terms of Reference were planned to be implemented primarily between September 2005 and June 2006. A project team was formed by WWF International's Danube-Carpathian Programme to coordinate this work at international level and to ensure field-level implementation at the selected Pilot Sites. The methodology for assessing land use was successfully applied at all three pilot sites and other potential users – including national and local authorities in the Danube River Basin, NGOs and international organisations such as the Ramsar Secretariat – are encouraged to make use of this methodology.

In summary the following activities have been completed successfully by the project Output 1.4:

(a) Activities related with the application of the methodology for assessing land use:

1. Application of the methodology at the selected three pilot sites – Olsavica valley, Tisza sub-basin; Lower Elan valley, Prut sub-basin, Romania; and Slovakia Zupanijski canal, near Budakovac village, Drava sub-basin Croatia;

2. Assessment of the applicability of the methodology to develop sustainable land-use concepts at each pilot site and to find practical and policy measures required to move towards more sustainable land use patterns at each pilot site.

(b) Activities related with the implementation of proposed restoration measures, communication, and policy action at the three selected pilot sites:

In Slovakia (Olsavica Valley):

1. Building of small dams on selected streams to control channel erosion;
2. Reopening of small meanders on canalised stream;
3. Restoring wet grasslands to act as a buffer zone between agricultural land and the stream;
4. Blocking of underground drainage system to restore water tables;
5. Planting trees on steep stream banks to control soil erosion;
6. Fencing of springs to prevent damage from grazing; and
7. Promoting restoration more widely through public awareness information.

In Romania (Lower Elan Valley):

1. Conducting a feasibility study and rehabilitation measures of the lower Elan floodplain downstream of the confluence with Sarat Creek through meander restoration (activities have been partly completed because of two major flood events in the region, they will continue after project termination, see also below: 'constraints and unexpected events');
2. Re-profiling of parts of the Elan river channel (activities have been partly completed because of two major flood events in the region, they will continue after project termination, see also below: 'constrains and unexpected events');
3. Control of soil erosion on hill slopes through changed land-use, implementation of better agricultural practice, land reclamation and afforestation;

4. Declare Lower Elan floodplain a protected area; and
5. Improve public awareness and train civil society organisations especially those in local communities and schools.

In Croatia (Zupanijski canal):

1. Geographical survey of the area to investigate most suitable measures to reconnect the Drava river to adjacent Podravski Sokolac wetland and Budakovac oxbow and consequently raise local water tables;
2. Feasibility study to implement the most suitable measure to reconnect water to reconnect the Drava river to adjacent Podravski Sokolac wetland and Budakovac oxbow and consequently raise local water tables;
3. Dissemination of the findings, conclusions and recommendations from these activities.

Some of the activities to implement restoration measures, however, had to be postponed due to the following unexpected events:

- In both years 2005 and 2006 the Danube basin was affected by very hard weather conditions. In summer 2005 and in spring 2006 the lower Danube region was hit by extreme flood events. More than 80 people were killed and more than 40,000 people had to be evacuated in the region of the Lower Danube Green Corridor alone. In addition, the winter 2005/2006 was very hard and brought a lot of snow and very low temperatures. Some of the planned restoration measures in Croatia and Romania were influenced or delayed due to these unexpected weather events. It was agreed with the coordinator of the DRP coordinator to postpone some of the activities to ensure their successful implementation. The results of the final project output needs to be evaluated in the context of these adverse weather circumstances.
- Furthermore, project work in Croatia was affected by the fatality of our local project manager David Reeder who died in September 2006. This caused a major delay in Croatia since the project management was not able to find an adequate substitute for David within the remaining project period. With support of the DRP headquarters in Vienna, the project team of the Output 1.4 managed to establish a new coordination group for implementing the remaining measures at Zupanijski canal in Croatia. This team will be managed directly by Mr. Danko Biondic of Croatian Waters. This represents a successful integration of the project in national administrative structures. The final implementation of the project activities is contractually terminated in Spring 2007.
- Finally, the start of the second project phase was delayed due to administrative problems at the coordinating office of the Danube Regional Project (UNDP/GEF office in Vienna). In consequence the project faced a significant loss of continuity creating partly losses of credibility at the local scale and lack of institutional memory at all levels of project management (caused by staff changes). To reactivate former contacts more time was required than expected. This also triggered some project delays, particularly in Romania. Nevertheless, implementation of individual measures is still ensured due to existing contracting agreements with local consultants.

(c) The following specific activities of the Output 1.4 are delayed and will be completed by spring 2007:

In Croatia:

1. Installing a second hydraulic structure or providing an equivalent solution to raise surface water levels in the channel and adjacent Marcina jama reed beds; if possible realise a solution to reconnect the system with a semi-natural channel and without hydraulic structures;
2. Constructing a 150m channel to rehabilitate reed beds around Zanos or providing an equivalent solution;
3. A workshop at which local stakeholders have to review the technical steps described above was consequently postponed until Croatian Waters will implement the measures.

In Romania

1. The work on re-profiling the Elan river channel was partly conducted by the natural flood events. In summer 2006, parts of the dikes were broken and the old meander system was flooded and re-connected with the Elan river system. Further negation is needed to remain this situation.
2. The work to improve hydrological conditions at Mata Radeanu fish farm (at confluence of Elan and Prut rivers) was delayed after the fish pond was permanently flooded in summer 2006;
3. also the planting of native *Salix* and *Populus* saplings along the Elan river had to be postponed due to very high water levels.

In Slovakia:

No significant project delay occurred.

3.2. Activities related to the application of the methodology for assessing land use

3.2.1. Applying the methodology in the selected three pilot sites

In the first project period (2001-2003) WWF's project coordination team together with its partners produced a methodology consisting of seven stages:

1. GIS mapping of the pilot site, including **key water and wetland features**;
2. Identifying all **strategies, plans and policies** that relate to activities undertaken in and around the pilot site and the **threats, impacts and pressures** to wetlands and floodplains at the pilot site;

3. Assessing the **ecologically optimal conditions** for wetland management and nutrient reduction at the pilot site[2].
4. Undertaking a **gap analysis** to assess the difference between current and 'ecologically optimal' land-use for wetlands and nutrient reduction in the area as a step towards generating options for appropriate land-use;
5. Organising **participatory stakeholder workshops** to generate appropriate land-use options including a vision and objectives for the catchment;
6. Undertaking a **policy analysis** to identify the policy and funding obstacles or opportunities for each of the management options;
7. Selecting options and **developing action plans** to take the work forward.

This methodology has been applied in three pilot sites in the Slovak Republic (Olsavica valley, in the uppermost Tisza basin), in Romania (Lower Elan Basin, Prut River Basin) and in Croatia, Romania (Drava floodplain, near Virovitica; see Figure 1). It is important to bear in mind that the application of the methodology was not a strictly chronological sequence and many of the stages were developed simultaneously. Indeed, the need to treat the methodology as a flexible tool and not as a prescriptive, step-by-step, strictly controlled 'recipe' was a key point that underlined in the findings of the first project phase.

3.2.2. Lessons learned from applying the methodology at the three different pilot sites

3.2.2.1. GIS mapping - a crucial starting point

For each pilot site, GIS maps were prepared showing the theoretical 'ecological optimum' for land cover/land use, taking into account the former distribution and extent of wetlands based on field evidence (e.g. geomorphology/topography, pedology and surviving natural/semi-natural vegetation and habitats), historical maps/documents, and discussions with local people. The 'ecological optimum' was then used to defining feasible and appropriate alternatives for future land use and other inputs including the constraints inherent to working in the 'real world' (see Romanian example in Figure 5). At all three pilot sites GIS mapping was considered to be the most successful tool to support an ecological assessment and to provide potential restoration alternatives. This approach was appreciated at all three pilot sites. However, it was also emphasised that a successful use of the mapping tool requires qualified institutions, equipment and experts. This might create difficulties if the methodology was to be transferred to other distant rural regions.

[2] Note that the terminology of "ecological optimum" does not imply that this is necessarily the desired state of land-use. Rather, it is the land-use that would, if no other factors were operating, provide the best ecological conditions. Socio-economic factors may mean that, while the ecologically optimal conditions are not themselves realistically achievable, land-use that incorporates some elements of the ecological optimum might be appropriate.

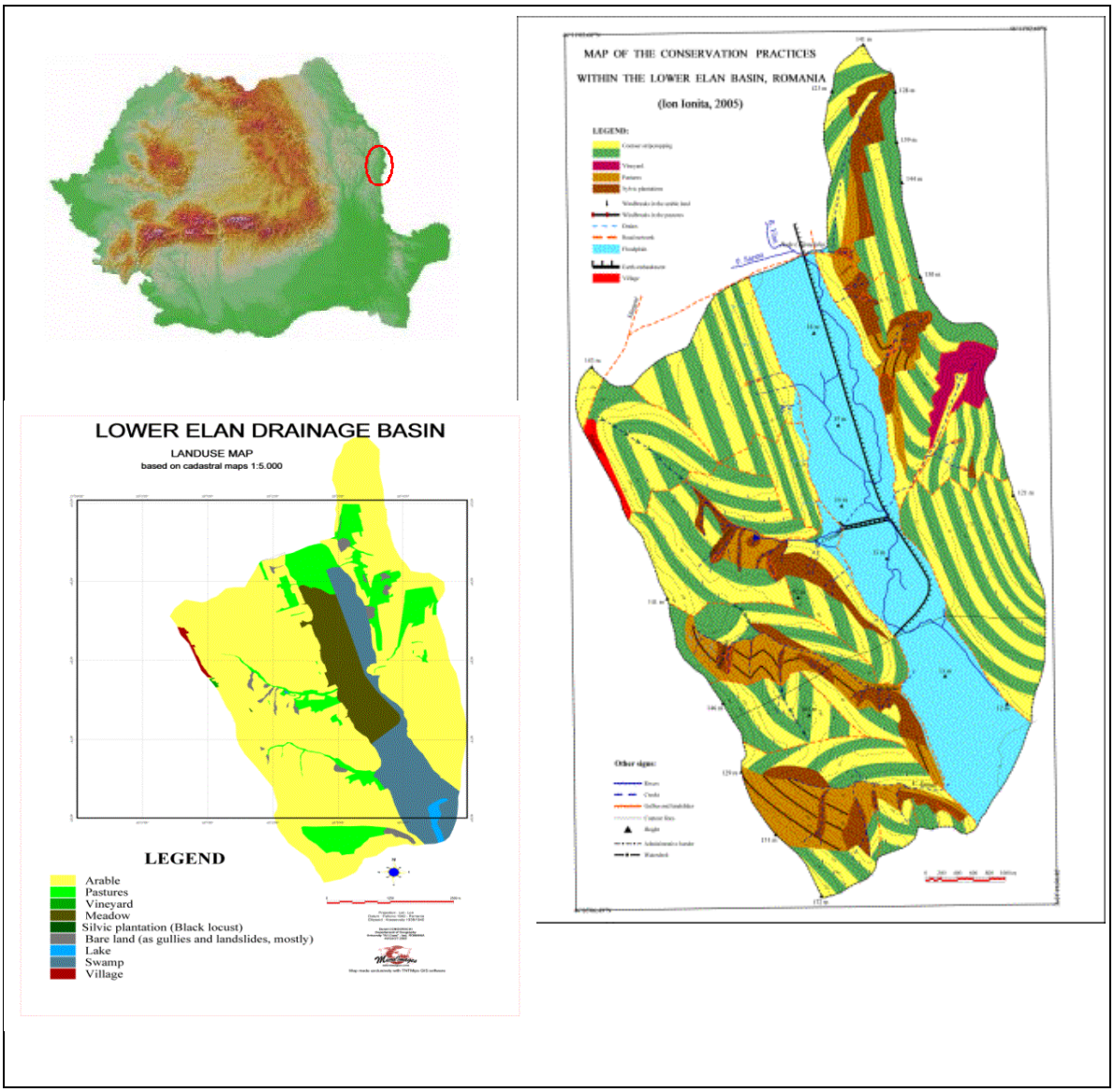


Figure 5: Romania example for GIS mapping: (top left) project location in Romania, (bottom left) current land-use; (right) proposed alternative landuse to halt ongoing soil erosion along the hills.

3.2.2.2. Data availability – the essential baseline

At all three pilot sites good maps and data were available. Detailed studies, however, had to be produced according to the needs of each pilot site. In Slovakia, e.g. the Slovak Technical University, Department of Water Management carried out four studies for the Grassland Medium Sized GEF project oriented for flood prevention and soil erosion. In Romania, good maps of the project site were available both at the local and regional levels. The project team was able to gather all key socio-economic and biodiversity data required. Local authorities were extremely cooperative, providing the requested maps at suitable scales and all needed information. The most useful was the information on the local agriculture conditions and landownership. In Croatia data access was very good at local scale but rather difficult on regional scales. Support by national authorities was weak. At all three pilot sites it was stressed that success and failure of applying the

methodology depends on sound data availability and therefore indirectly on the power of existing personal networks. Future wetland restoration projects should therefore focus on establishing a well-linked and well-coordinated network of scientists, authorities and project staff, which can guarantee continuity on the ground. The main gap was identified as the difficulty to receive detailed information e.g. on precise position, contours and slopes of small streams or on the hydrological functioning of the site. Since this information is essentially needed to design sound restoration measures the temporal project frame was sometimes too strict. Further projects in other regions should therefore include already a "buffer" in the project proposals to ensure that the compilation of reliable background information will be feasible.

3.2.2.3. Visible information material – a key to create convincing arguments

At all three pilot sites the importance of visible and communicative information material was demonstrated. Translating administrative, cadastral, topographic, soil and vegetation information into GIS based overview maps to demonstrate the differences between historical and current land use practices created a lot of stakeholder support. In particular GIS mapping proved to be a very helpful tool to integrate various information, especially for land use assessment. The maps produced served as a very good basis to select the necessary measures in order to improve land and water resources and management techniques at each pilot sites. They also played a key role during the various stakeholder meetings to educate local participants. Visible information (photos, maps, animations) have been considered to be key to create convincing arguments on local stakeholder level. However, it is very important that the information material will be used in a simple language without including too many scientific data. Therefore, the comparison between historical maps, images or data with current situation should be applied whenever the methodology would be used in other regions or river basins.

3.2.2.4. The influence of individuals - "go or no go" for project success

Key for gathering successful baseline data and general project support was the fact that local consultants are closely connected with the local, regional and if possible national administration (e.g. as the Romanian project consultant was employed by 'Romanian Waters'). Unless, there is no such direct link to relevant authorities, the impact of individual projects on a larger scale is very much restricted. Our lessons learned from Croatia clearly indicate that information has been available at county level. Copies of the maps of the study area and detailed satellite maps were provided for free. However, within the central government, it was very difficult to gain information more abstracted from the project site. At the ministerial level, personal contacts were helpful to receive specific information. Support and follow-up activities were also more difficult to maintain at the central government level.

Given the fact that this project was implemented under the umbrella of the UNDP/GEF Danube Regional Project some of the project activities might have been implemented under unusually advantaged conditions. In contrast, the applicability of the methodology in other regions could be rather difficult unless prominent donor support was provided. Finding the right contact person on the ground who will be able to connect authorities, institutions and highly recognised partners (e.g. donors, VIPs, international organizations) will be key for success or failure of future projects.

3.2.2.5. Identifying strategies, plans & policies – necessary but not sufficient

During this project phase one of the biggest challenges was getting in contact with the Croatian Waters Company (HV), who holds all of the technical data, which were needed for the implementing the second project phase. The physical planning of this study area was entirely within the jurisdiction of the county authorities. Lack of access to the right key persons at national administrative level caused therefore significant project delays. This constraint marks a critical lesson learned from the project. It is vital to the success of the project to identify individuals within the local and national government that will remain in their position over a long period of time that will support the restoration activities and feel responsible for the successful implementation of the project. A "system-inherent ambassador" has to be found who will ensure that the suggested alternatives will be also implemented in practice. Sufficient buy-in with key stakeholders is required to ensure smooth access to resources and decision-makers.

3.2.2.6. Gap analysis to assess the difference: current state & 'ecologically optimal'

The assessment of the *ecologically optimal conditions* for wetland management and nutrient reduction was designed to portray the ecological conditions that are best suited to the site. However, this does not imply that this is necessarily the desired state of land-use and therefore a blueprint for restoration. This part of methodology was important to identify root causes of biodiversity loss and the consequences of ignoring those causes.

It was also essential to help plan the future restoration measures. All three case studies found it a very useful tool and supported discussions with stakeholders. The principle of this part of the methodology is shown in Figure 6. However, at all three pilot sites it was shown that the 'ecological optimum' concept can be an unwanted distraction, since even with most careful explanation it is likely to be misinterpreted by some stakeholders as the 'target scenario' for environmentally oriented organizations such as WWF and its partners. It seems to be the use of the word 'optimum' that generates this misunderstanding, so an alternative, such as 'former land-cover situation' may be more appropriate. However, it is also important to carefully stress that 'former' means prior to the most adverse land-use changes, rather than to a theoretical situation before humans were present at all. A very successful application of this part of the methodology was provided by the Slovakian pilot site, in Olsavica Village, one of the oldest settlements in the Spis region. This region is an historical territory of Eastern Slovakia, which was constituted as an independent territorial and administrative unit at the end of the 12th century. At the beginning of the 19th Century, the land was owned by two farmers, but in the second half of the century local farmers bought the land to set up small properties. The main source of livelihood was agriculture and crafts. A cooperative farm was established in 1959 and the majority of local people are economically dependent on it. This agricultural enterprise Olsavica-Brutovce is located in the mountainous region, which is not very favourable for intensive agricultural production. The daily life of local people is connected with farming. During the recent decades, the village has experienced a considerable decrease in the number of inhabitants. Due to lack of possibility for getting jobs, many young people left to find jobs in neighbouring cities.

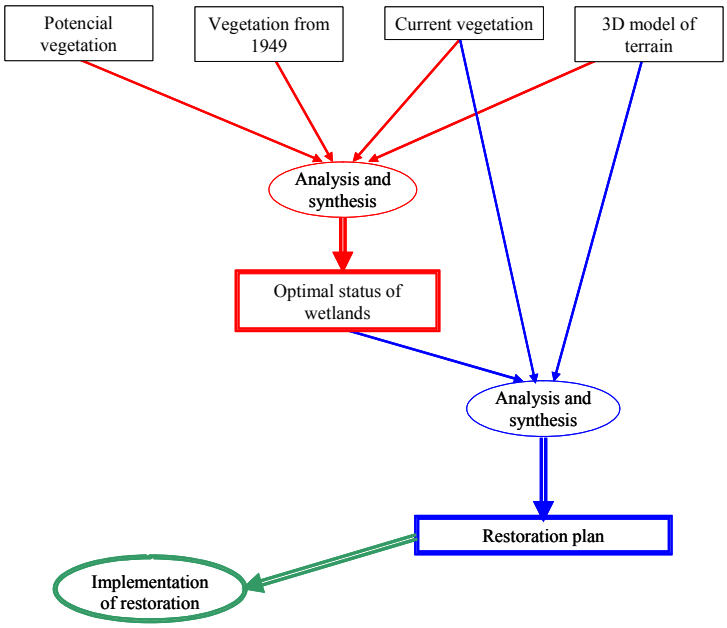


Figure 6: Principle overview on how to find / define the optimal status of wetlands (example from the Slovakian pilot case).

Since erosion is a persistent problem for farming in Olsavica and because the proportion of arable land has decreased as a consequence, the discussion about implementation of new environmentally friendly management techniques has been received positively by the staff of the enterprise, in spite of the fact that this new type of farming is more complicated. The gap analysis and GIS based demonstration of "optimal state of wetlands" (Figure 6, Figure 7) provided a lot of helpful support to convince farmers to try to switch to another type to cultivate their lands. In particular the habitat map was an essential part of the restoration plan. It was used as a baseline information layer to compare old aerial photos with the potential vegetation of an ecologically optimal status.

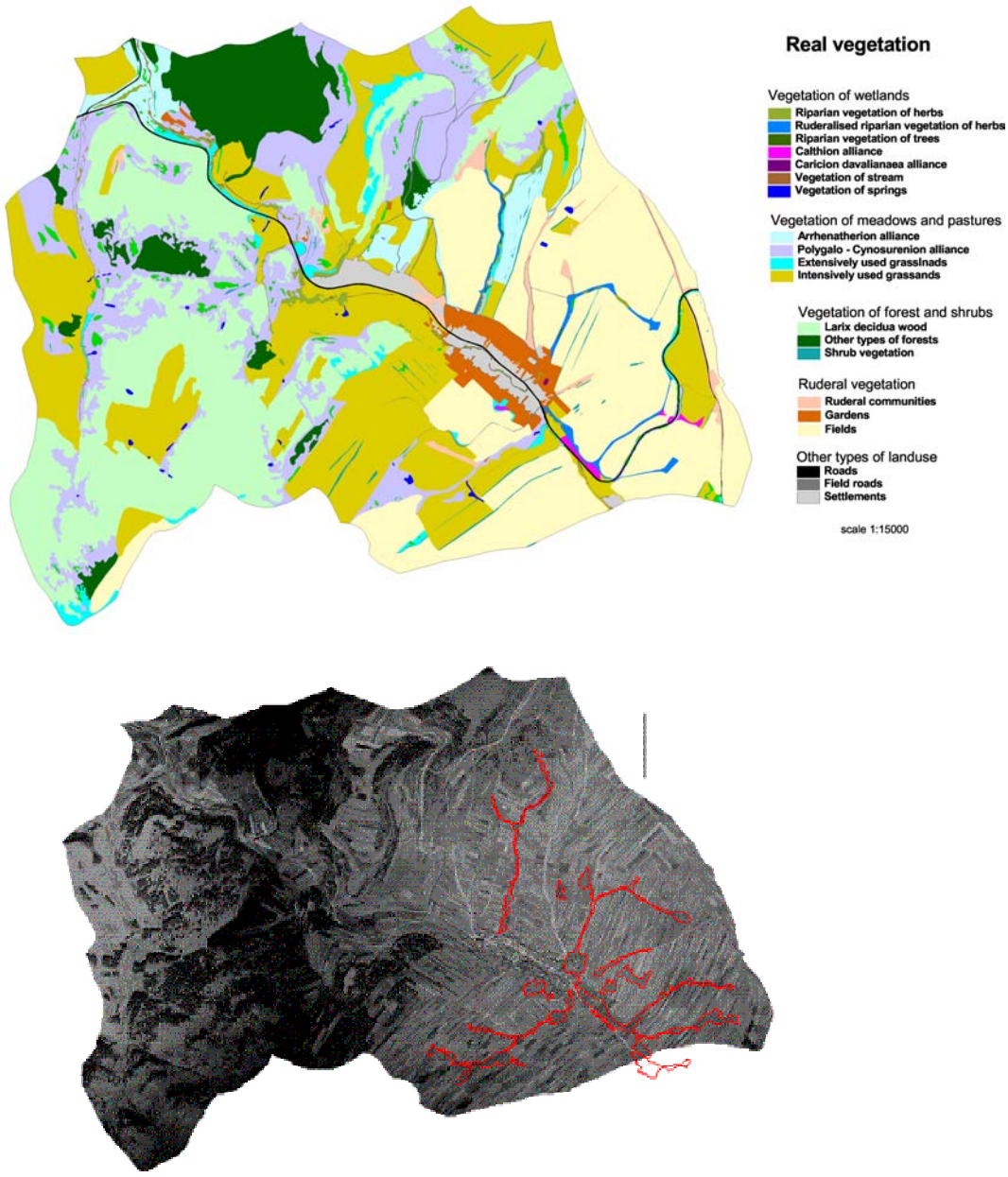


Figure 7: Real (top) and optimal (bottom) status for of wetlands in Olsavica Village (Slovakia). The image illustrates a possible optimal and realistic occurrence of wetlands in the Olsavica basin. The maps are based on four sources of information: (1) a geo-botanical map incl. predicted potential vegetation, (2) an aerial photo from 1949 showing detail land-use situation and delineated wetlands, (3) the comparison of wetland types in well preserved down stream parts, and (4) a 3D model of the terrain used for defining erosive sections of the channels.

3.2.2.7. Participatory stakeholder workshops for appropriate land-use options

At all three pilot sites, most of the key stakeholder groups were generally supportive of any efforts to reduce pollution, flooding or to take efforts to improve groundwater levels and revive fishponds. Key stakeholders – generally the majors of the village - were strongly supportive to the projects and all public stakeholder events turned out to be a success, in particular on local scale. During recent years water relevant stakeholders have learned more about environmental protection and its advantages. Mainly through collaboration between farmers and agricultural and environmental institutions the proposed measures could be achieved.

However, timing and project continuity are extremely crucial parameters for successful and fruitful participation of stakeholders. In Slovakia, a long-term cooperation between local stakeholders and our consultation institute have already been built up before the project started. This helped a lot to ensure that all restoration measures were implemented according to the original planning. The participation was used to identify the design of implementation measures but also to ensure a sustainable grassland management afterwards. This actually created an even better relationship between the different partners.

On contrary, public participation in Croatia and Romania was suffering significantly from the long project delay and the long break between phase one and two[3]. During the first phase of this project, many expectations were raised by the project team and stakeholders were enthusiastically participating in the process. Key stakeholders from national, regional and local levels were involved right from the start of the project. In particular these stakeholders became frustrated after the second project phase started so lately. Based on the lessons learned from this period, we would strongly recommend to apply this part of the methodology only if continuity (in human and financial resources) can be ensured over an entire project period. In Croatia both, the project delay and the death of our local project manager caused scepticism on all project scales. More then two years without any project input turned out to be a major stumbling block and threatened to kill off the activities entirely. Credibility and trust are essential elements for successful project outcomes – the loss of credibility may cause failure.

3.2.2.8. Policy analysis to identify the policy and funding obstacles or opportunities

This part of the assessment methodology gained quite different results in the three pilot study areas. In Slovakia, the Ministry of the Environment (division of Nature and Conservation), the Ministry for Agriculture, the State Nature Conservancy (SNC) of the Slovak Republic (that ensures the implementation of nature and landscape protection measures) and the Administration of the National Park Slovensky Raj ('Slovak Paradise'; responsible for protection of the National Park) plus the local Water Management Authorities of Bodrog and Hornad Rivers were involved in the project. Specifically, the involvement of the lower Water Management Authority was crucial for the approval of planed wetland restoration measures. In general, the policy analysis in Slovakia was well supported and successful integration of the project work and ongoing policy was ensured. Even the preparation of Rural Development Plan was influenced by this project and the Ministry of Agriculture accepted the proposal of our local consultant for the re-designing of the agri-environmental measure for the conservation of semi-natural and natural grasslands.

[3] This delay was caused by administrative problems at the UNDP/GEF to set up the tender of the second phase of the DRP.

In Croatia, the area was part of a proposed UNESCO Danube-Drava-Mura Biosphere Reserve. First nominated in 1997 as a transboundary reserve and accepted at a river-basin level, lack of support at national level halted progress. The new nomination (2003) was for Croatian territories only. So far, the application has been delivered to the Croatian MAB Committee. In the Biological and Landscape Diversity Strategy of Croatia (Ministry of Environment, 2000), the Drava was declared a priority ecosystem; however, implementation lags significantly behind such proposals.

The physical planning of this study area, as already mentioned, was entirely within the jurisdiction of the county authorities, who were in the process of re-drafting their development plans to take greater account of nature protection and sustainable development. Although they could see the rural development potential in this rehabilitation scheme the final decision was made by Croatian Waters (HV) who postponed the final decision until a leading staff member took over responsibility late in 2006. The two examples demonstrate that individual contacts, continuity and well established networks are as important as detailed theoretical analyses. Defining opportunities and obstacles should be a subject of private contacts, wherever possible.

3.2.3. Assessment of applicability, usefulness, and assignability of the methodology

Table 1 provides an overview about the applicability, usefulness and assignability of the applied method for integrated land use. In the following most important lessons learned are briefly summarized.

Overall, the project methodology was judged to be applicable, useful and also – in principle – assignable to other river basins or regions. The following advantages and challenges of the concept have been recognized:

- GIS mapping was an important element that supports both the ecological assessment to find and optimal land use status and communication with different stakeholder groups. Historical data and aerial photos are very helpful to create optimal conditions. Sound and visible information material is therefore key to create convincing arguments, in particular for the information of stakeholders.
- The strong emphasis on promoting public awareness of the project's overall aims and objectives amongst local people and provision of participation opportunities was a strong element of the first phase of the project. Although time-consuming, it helped a lot to find appropriate and well-accepted land use measures.
- Practical experience from the different pilot sites underlines the important key role of local project mangers. Their skills need to include good communication, interpersonal skills, and very effective local co-ordination. The unexpected loss of our highly skilled local co-ordinator in Croatia meant the halt of further implementation measures and the project was significantly delayed.
- Approaching local and regional authorities is relatively easy and the partnership has been acknowledged by all pilot sites. Good contacts with local majors are crucial elements for successful project implementation.
- Gathering information on relevant policies and plans is time-consuming and likely to require the establishment of working relations with relevant ministries and other national/regional authorities at a very early stage if a complete picture is to be obtained.

- Successful approach of national authorities, however, requires well established (personal) networks. Even a sound analysis about planned programs and projects can not compensate personal contacts to develop broadly accepted management plans.
- The use of standardised table format for reporting is useful for summarising and generating of products that are broadly comparable from one site to another. However, the need for such standardization should not prevent the preparation and submission of additional, sites-specific supporting materials.
- Credible relations request long-term involvement and governments are changing frequently in some countries
- Timing and project continuity are extremely crucial for project success. As soon as institutional memory gets lost the influence becomes significantly weaker.

Table 1: Assessment of the applicability, usefulness and assignability of the methodology. Data collected at three different pilot sites in the Slovak Republic (upper Tisza basin), Romania (Elan river), and Croatia (Drava river).

low value / specification
medium value / specification
high value / specification

1) Assessment of applicability of methodology at the pilot site
2) Assessment of usefulness according to the experiences at the pilot site
3) Estimation on how easy/difficult the applicability in other regions could be

	applicability[1)]			usefulness[2)]			Assign-ability[3)]	Comments
	Tisza	Elan	Drava	Tisza	Elan	Drava		
1. **GIS mapping** of the pilot site, including **key water and wetland features**								• GIS mapping was the most successful tool for ecological assessment and communication; • all 3 pilot sites appreciated approach • requires qualified institution, equipment and experts what might create difficulties in far rural areas
2. Identifying **strategies, plans & policies** and **threats, impacts & pressures**								• personal contacts are essential to receive sufficient documents • consultants should be based locally to ensure regular contact • local/regional level was easy to identify – national level difficult without "system-inherent ambassadors".

	applicability[1)]			usefulness[2)]			Assign-ability[3)]	Comments
	Tisza	Elan	Drava	Tisza	Elan	Drava		
3./4. Assessing **ecologically optimal conditions** at the pilot site and **gap analysis** to assess difference: current state & 'ecologically optimal'								• historical data and aerial photo material is very helpful to create optimal conditions • gathering sound information is time consuming (ecological, historical, and socio-economical information) • the outputs are very supportive for stakeholder discussions and convincing farmers to shift to an other mode of land cultivation • if GIS mapping or aerial photo material is lacking the applicability in other regions might be less successful • in this case all three pilot sites considered the method as useful
5. **Participatory stakeholder workshops** for appropriate land-use options								• To identify and work with as many key stakeholders as possible from the beginning of the process at national, regional and local levels was a very successful tool during the first phase in all 3 pilot sites. • Among the key stakeholders local majors played a crucial role. • The usefulness of the methodology, however, depends strongly on continuity. Due to the delay of the 2nd project phase, many expectations got lost and were turned into scepticism. • This part of the methodology should only be applied if continuity (in human and financial resources) can be ensured over the entire project period. In Croatia both, the project delay and the death of our local project manager caused perhaps more scepticism on all project scales than trust.

	applicability[1)] Tisza	Elan	Drava	usefulness[2)] Tisza	Elan	Drava	Assign-ability[3)]	Comments
6. **Policy analysis** to identify the policy and funding obstacles or opportunities								• gathering information is very time-consuming • requires working relations with relevant ministries and national/regional authorities • weakest point of the methodology in terms of assignability: credible relations request long-term involvement and governments are changing frequently in some countries • the experience from the case study sites underlines importance of personal relationships: As soon as institutional memory gets lost (e.g. in Croatia) the influence becomes significantly weaker.
7. **Developing action plans** to take the work forward.								• The identification of alternative land-use concepts was successful in each of the case studies. • All of the suggestions were technically feasible and locally acceptable and appropriate • However, adaptive management is key for implementaion success • Successful implementaion of project measures depends strongly on well established contacts with local and regional authorities • Therefore, the usefulness of the methodology, depends also strongly on project continuity. • Due to the delay of the 2nd project phase, some of the planned measures had to be changed or could not fully be implemented (in case of Croatia and Romania).

3.3.3 Implementation of action plans in each site

In all three case studies, measures resulting from application of the methodology were successfully defined during the first project period. In each case, the land-use proposal was briefly described at the end of the first project period and an indication of the corresponding spatial and temporal scales was given. In summary the following actions were supposed to be implemented during the second phase to help to increase wetland conditions in the individual pilot areas.

IN SLOVAKIA:

Building of small dams on selected streams

As a consequence of the intensification of agriculture resulting in low retention capacity of the areas, the main channel of Olsavica was deeply eroded. The geological substrate was sensitive to erosion and during heavy rains water was not retained and runoff speed was high. It was proposed to build a small dam, 2-3 m high. In addition two smaller dams in another valley were constructed to restore wetland habitats. This was supposed to create small sedimentation pools with surrounding saturated zones suitable for wetland restoration.

Reopening of small meander on the canalized stream

Upstream of Olsavica village is the main canalized stream, which collects surface water from the adjacent sub-basin and underground drainage. Before a comprehensive regulation was undertaken in 1987, there was a meandering stream and one of the larger former meanders is still visible, but water was flowing directly through the canal and not via the meander. It was suggested to close the canal by small dikes to guide the water back to old meander. In addition it was planned to deepen the upstream section of meander was to secure the dike against the press of the water during bigger floods.

Restoration management of wet grasslands

Former wet grasslands have been degraded through drainage and fertilization. Some remnants are still left along small streams or around the sites of former springs, where they are in direct contact with arable land. They create a buffer zone between the arable land and streams or springs. Application of high amounts of fertilizers and manure caused degradation and had an adverse impact on biodiversity. Wet grasslands have not been managed for at least 20 years. Mulching of biomass was suggested to be applied in the first year and the cooperative farm was supposed to continue with the management measure (mowing) in subsequent years.

Blocking of underground drainage system

The total area of agricultural land, which is influenced by underground drainage, is 183 ha. Information about the functionality and efficiency of drainage network was lacking. It was planned to block certain parts of the drainage system to create small scale wetlands. Soil erosion control by planting of wood species on the steep banks of streams will support the measure.

Fencing of springs to prevent damage from grazing

In the lower and central part of Olsavica valley, some well-developed spring wetlands are still present. The area is used by cattle grazing and springs are used as a source of water. Cattle are causing damage to the wetlands. Simple wooden fences will be built to protect these wetlands.

IN ROMANIA:

Soil erosion control on slopes by land reclamation works and afforestation of the most degraded agricultural lands

Excessive hillside erosion has been recognized as being a major environmental threat throughout the Moldavian Plateau of eastern Romania. Being bordered by eroded hillsides the Lower Elan floodplain is often affected by erosion from the surrounding hills. Most of the land, accounting for roughly 85 percent of agricultural area, was split into excessively small plots, each of them less than one hectare in size and being oriented up-to-down the slope. The project aimed to set up and perform an anti-erosion works and afforestation of the eroded and/or salinized areas, as well as to implement the best agricultural practices on those affected slopes. These measures were supposed to contribute to the decreasing of runoff and soil loss on slopes.

Planting of native Salix species along the current course of Lower Elan River and fencing of the planted area

The Prut River represents an important Bird Area and fly-route for many migratory bird species on their way to the Danube Delta. The project aimed to plant native *Salix* species along the current way of Lower Elan River to contribute to the conservation and improving of biodiversity in the area.

Increasing of water storage capacity up to the original designed level of the Mata Radeanu fishpond

Two fishponds have been established in the project area for a long time (situated exactly at the confluence of the Elan with the Prut River). The Galati County Association of Hunters and Fishermen own them. The project aimed to increase the water storage in the reservoir by repairing and increasing the elevation of the existing dam.

IN CROATIA

Installation of sluices on the Zupanijski canal

Groundwater data from official monitoring of wells and piezzometric meters at several locations around the canal showed a fall of more than one meter in the period since the canal was deepened by 1 – 2 meters in 2000. Thus it was anticipated that by raising the level of the canal's waters upstream of a sluice will raise groundwater levels through existing underground connections.

Increase water quality in the main channel of Drava river

Water quality data from Phase 1 showed that where the Zupanijski canal was not straightened because of access problems, the slower flow and abundance of aquatic vegetation at this place improved the quality of the water to Category 1. Subsequently, untreated water from settlements and agricultural runoff reduced this to Category 2, a situation that would be improved by diverting part of the canal's flow through the wetlands.

Measures for improved fish migration and fish breeding

Species whose natural habitat is the main river-course have been found in the canal, and the assumption was that their presence results from ovipositing. It is known that many fish species need conditions such as shallow waters, slow flows, limited water-level fluctuations and aquatic vegetation to be successful in this activity. These factors are present in the canal but not in the main stream. The canal also provides migration routes between the river and the wetlands that are currently blocked as the canal is isolated by dikes. Thus the project recommendations included provision of fish-passes beside the proposed sluices to allow fish to migrate freely along the canal, and into the wetlands via our restored stream-channels.

Increase mosaic effect of habitats

The wetlands have been drying since the canal was deepened in 2000. Succession was taking place, reducing the variety of habitats in the area. The planned restoration measures were supposed to provide more open water in the restored channels and the revitalized oxbows: raising the level of shallow waters increases their surface area and that of the related ecotones. The degree of biodiversity is directly related to the diversity and complexity of habitats, as well as their overall size: thus the project team felt confidently that these restoration measures would increase biodiversity in the area.

Introduce extensive grazing

In the region of the pilot site there was scope for investigating extensive grazing. Only one local farmer was practicing semi-extensive grazing and he was satisfied with its economic result. The project aimed to increase the number of entrepreneurs who will change their production mode. Traditional hardy breeds were being successfully introduced across the river in Hungary and should also be established along the Drava.

3.3. Activities related to the implementation of proposed restoration measures, communication, and policy action at the three selected pilot sites:

3.3.1. Activities implemented in Slovakia (Olsavica Valley):

To improve the situation of the wetlands along the Slovakian pilot site all planned six technical measures were implemented successfully during the second phase of the project (Figure 8-Figure 10). These measures included the following:

a) small dams on selected streams were built to control channel erosion;
b) small meanders on canalized streams were re-opened;
c) wet grasslands were restored to act as a buffer zone between agricultural land and the stream;
d) underground drainage systems were blocked to restore water tables;
e) native trees on steep stream banks were planted to control soil erosion and;
f) springs were fenced to prevent damage from grazing.

As a consequence of intensive agriculture the main channel of the village Olsavica was deeply eroded. This caused several major impacts for both the aquatic ecosystem and flood protection measures. To solve these problems, the original project design included the construction of three to four small dams (about 2 m height). Building small dams, however, creates always a trade-off situation between reduced soil erosion and reduced stream connectivity. Therefore, the projected team decided to change to original plan. Additional revitalization work along the stream plus the implementation of one single small dam would lead to a higher ecological standard and also to improved technical results. In September 2006 both measurers were implemented without any major constrains. The dam has already increased the water table and serves as sediment trap. Since the dam was only finalized in September 2006 detailed ecological monitoring will be available after the first next vegetation period.

Before comprehensive river regulation work took place in 1987, the river section upstream the village Olsavica was meandering in small arms through agricultural land. After the intensive land regulation work took was finalized the original stream was canalized to collect surface waters from

adjacent sub-basins and underground drainage systems. One of the larger former meanders, however, was still visible, blocked by small dams and water flow was diverted to the canalized section or subsurface canal system. During spring and autumn 2006, this meander was opened along about 100 m and at the same time the former drainage canal was blocked. Additionally, 250 m the drainage canal was filled up with solid material and the entire terrain was adapted for restored stream. In summary a total section of 350 m of drainage canals were revitalized and retransformed into a natural like stream system. It represents the first revitalization of drainage system in Slovakia and includes about 30% of original drainage canal.

(a)

(b)

(c)

(d)

Figure 8: Technical implementaion of measures to improve the situation of wetlands in the Slovakian pilot site – building small dams to control channel erosion (a,b) and re-opening of small meanders to improve ecological integrity of the canalized river and to lower discharge velocity (c,d).

Between June and September 2006 the project team organized mulching activities of wet grasslands to act as a buffer zone between agricultural land and the stream. These activities were implemented together with the Olsavica municipality and covered a total area of approximately 1.5 ha. Mulching represents an essential tool for the restoration of degraded wetland habitats. It induces the removal of ruderal species and improves the original species composition. In Slovakia, former wet grasslands have been degraded because of drainage activities and fertilization. Some remnants, however, are still left along small streams or around the sites of former springs, where they are in direct contact with arable land. This creates buffer zones between the arable land and streams or springs. Application of high amounts of fertilizers, on contrary, has an adverse impact on biodiversity. In the Slovakian pilot site, wet grasslands have not been managed over the least 20 years. As a result of this project the cooperative farm will continue with the mulching of biomass as, applied during the second project phase, and with other regular management measures (e.g. mowing).

(a) (b)

Figure 9: Technical implementation of measures to improve the situation of wetlands in the Slovakian pilot site – mulching of wet grasslands.

In April 2006, more than 3200 specimens of native tree and shrub species were planted manually on steep stream banks to control soil erosion and several packages of waste and litter were collected from the wetland area. These activities were organized together with the local NGO ZLM in cooperation with two other local NGOs - Letanovsky Mlyn and OZ Tatry. In total, 54 participants (mainly school kids) were participating in a three days youth camp - the first youth camp for students and citizens to support the "Revitalisation of the Olšavica 2006". This part of the project aimed to reach two goals: Measures to protect wetland restoration should be integrated in a broader public awareness and communication program with local stakeholders. The tree days event was held between April 21 – 23, 2006 and received broad support form the Major and citizens of Olšavica village. All 54 participants were accommodated in private homes to trigger intensive discussions about wetland restoration with local people. The entire event received a lot of positive feedback and was broadly presented in the daily newspapers. To prepare the next event, a cooperation with a local journalist has been set up to prepare a short TV documentary including interviews with local authorities and people to promote the idea even broader.

Finally, with the support of the Olsavica agriculture cooperative farm, also the last technical measure was successfully implemented in September 2006. A spring area of about 0.2 ha in the pasture was fenced to prevent further habitat degradation caused by cattle grazing

(a) (b)

Figure 10: Technical implementation of measures to improve the situation of wetlands in the Slovakian pilot site – planting of native species on stream banks to control soil erosion organized in close cooperation with local NGOs and authorities.

3.3.2. Lessons learned from the Slovakian pilot site

- **Local, regional and national support from administrations**

In general, the Slovakian project received a broad support from various administrative bodies. The strongest support, however, was been given from Olsavica municipality, which implemented restoration measures under the supervision of our local partner 'Daphne' – the Institute of Applied Ecology. In this combination the 1.4 component of the DRP was able to implement e.g. the first revitalization of a drainage system in Slovakia. The only obstacle relates to the administrative process to gain construction permission.

A crucial element for the successful implementation was the long-term and active involvement of DAPHNE in both on regional and national scale. Due to this, it was possible to maintain a credible relationship between the partners although the previous project phase was delayed and the implementation of measures started significantly later than expected. Furthermore, DAPHNE was able to organize a parallel campaign to raise awareness about the importance of wetlands in river basin management (RBM) in Slovakia. This campaign was targeted on regional and local decision-makers and water managers and from October to November 2006 ten seminars throughout Slovakia were held as part of an overall information strategy. These seminars covered all major river basins of Slovakia and provided knowledge transfer from nature conservationists (DAPHNE and the State Nature Conservancy staff) and the water managers (Slovak Water Management Enterprise and regional and local environment officers). In the seminars water managers were trained on values and functions of wetlands and their particular presence in the certain river basins of Slovakia.

Participants gained basic information about the current schedule and development of the Water Framework Directive implementation in particular with regard to the development of the River Basin Management Plans. The Olsavica case study was largely presented during the series of workshops to underline the importance of wetlands in implementation of WFD as example of integrated management of river basin.

In total, 289 participants joined 10 workshops. This includes 41 participants from SNC, 122 representatives from Slovak Water Management Enterprise and 82 local decision-makers.

- **"buy-in" from key players on the ground**

Another key element for the successful project implementation in Slovakia was the "buy-in" form several key players on local scale. If the cooperative farm Olsavica-Brutovce had not changed its production mode from intensive land use towards more extensive system the whole project implementaion would have been at risk to meet the original objectives. Implementing alternative concepts for landuse and wetland protection requires a trustful and close cooperation with such key players.

In the Slovakian pilot case this cooperation has been set up during the first project phase and continued throughout the second phase. Our local partner DAPHNE assisted the Agriculture Cooperative Olsavica to prepare a successful application for the national Agricultural Paying Agency to receive subsidies for agri-environmental measures as mentioned in the national Rural Development. The proposal has received a positive approval for the next five years and in 2006, first measures with focus on the appropriate management of grasslands (including wet meadows) were implemented. This means in other words: the DRP in this pilot site triggered the magnification of measures and includes now a total area of 15 ha grasslands under sustainable management in the Olsavica basin and 676 ha of grassland in its adjacent valley.

- **cooperation with other NGOs**

The last lessons learned from Slovakia concerns the integration of important local and regional supporters. Successful land use changes and wetland restoration requires scientifically sound and technically applicable planning and implementation at each individual project side. This, however, is not sufficient to magnify the results and to promote the lessons learned from one site to another. In the current pilot site, the close cooperation with the local NGO ZLM and the cooperation with two other local NGOs (Letanovsky Mlyn and OZ Tatry) created the "critical mass" to attract a broader audience. As a result of this, more than 50 school children were interested to participate at the youth camp and this again served as a hook for the local and regional newspapers and the national TV. Both, the number of planted trees in the pilot area and the public feedback on the project activities exceeded the original project expectations by far. We assume this was triggered by the set up of an NGO coalition.

3.3.3. Activities implemented in Romania (Lower Elan Valley):

To improve the situation of the wetlands along the Romanian pilot site parts of the five planned technical types of measures were successfully implemented and parts of them were postponed to 2007 because of unexpected weather conditions (details: see below and Figure 11). These measures included the following:

a) A feasibility study and rehabilitation measures were conducted to restore the lower Elan floodplain downstream of the confluence with Sarat Creek through meander restoration to increase water circulation;

b) parts of the Elan river channel were prepared to become re-profiled;

c) improvements of hydrological condition of Mata-Radeanu fishpond were planned to increase water storage capacity but has been modified due to flood events in summer 2005 and spring 2006

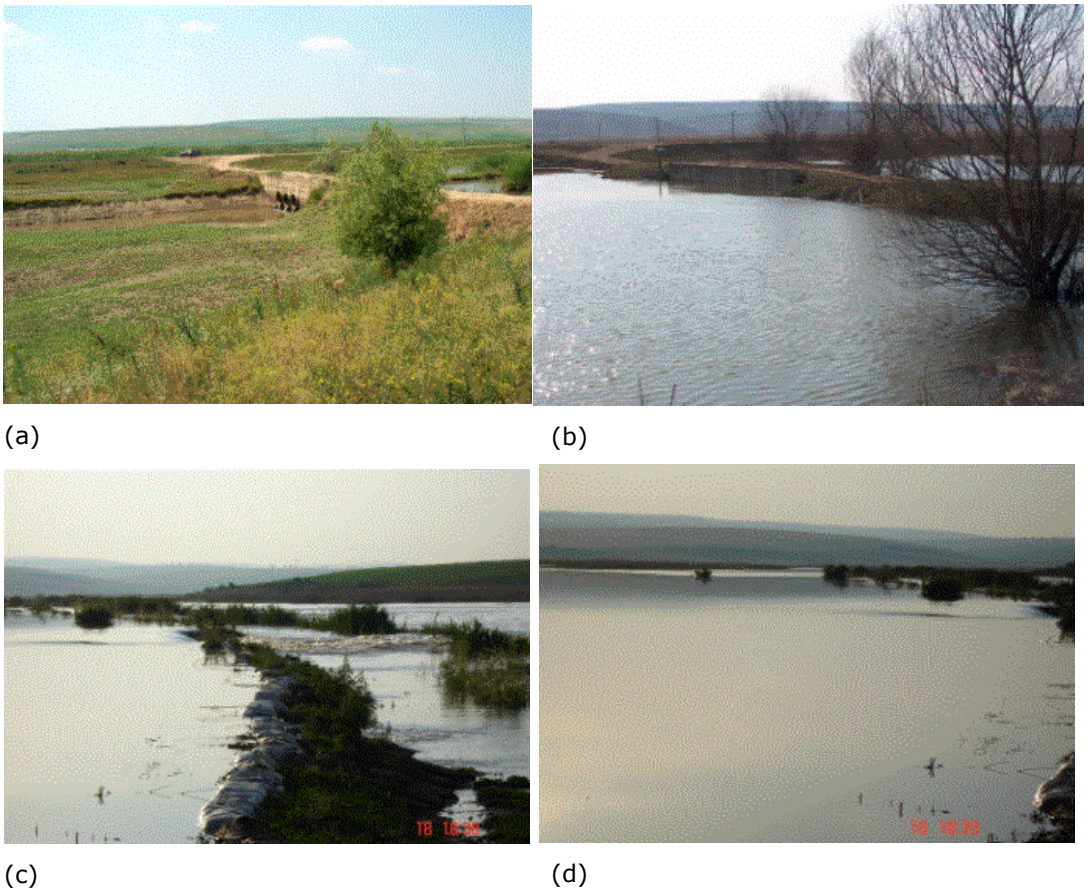
d) soil erosion on hill slopes was mitigated through the introduction of different land-use techniques, demonstration of better agricultural practice, and afforestation measures; finally,

e) the Lower Elan floodplain at the confluence with Prut River has been declared as a protected area (SPA).

During the second project period the Romanian pilot site was hit twice by serious flood events. Long and unexpected strong rain events inundated large parts of Romania in summer 2005. The project area, as much as most parts of the lower Danube catchment area, was severely affected by these floods. Several measures of the planned restoration work had to be postponed because of the long duration of the flood events in this year.

Unfortunately, the situation did not change and became even worse in the next year. Already in spring 2006 – caused by rapidly increased snowmelt and rain - the pilot area was hit by the next flood event (see Figure 11). In April, the Danube River hit its highest level in Romania in the last 111 years, swamping thousands of hectares of land. On the Prut River, the levels were also very high due to backwater. The levels on the Prut affected water discharges of the tributaries, such as the Elan River. At that time, the technical team made visits in the field in order to take measurements for the topographical map but it was simply impossible. A maximum discharge of 580 $m^3 s^{-1}$ was recorded for the Prut river at the hydrological station in Falciu (upstream the confluence of the Elan river and Prut river) in June 2006. The surface of the project area was completely flooded (100%) between April 10 and July 23, 2006. Half of the project area (59%) was

already inundated between March 16 and April 10, 2007 and still 25% were covered until November 21, 2006. Due to such these long-lasting flood events the soil maintained humid over more than half a year and access to the project area was practically impossible.



(a) (b)

(c) (d)

Figure 11: Lower Elan – situation under normal flow conditions (a) and during increasing flood in spring 2006 (b, c, d). The floods reconnected some of the old meanders and destroyed dikes on the left site of the river course. However, the originally planed restoration work had to be postponed.

Although the feasibility study for reactivating the old meander system along the Elan river was ready before the second flood events in 2006, the implementaion was planned to start afterwards. The new meander should follow the course of the old meander over a length of 2.5 km and should start about 7 km upstream the confluence of Elan and Prut rivers. As positive side effect the floods actually worked with the project and not against it. A breach of the left bank dike of the Elan River reconnected parts of the old meanders and parts of the protected areas of Mata-Radeanu fishpond through natural inlets. The original plan was to re-connect the meanders and fishponds with tubes (Figure 12) and not by dike removal. Increased water flow in the meanders system and enlarged storage capacity in Mata Radeanu fishponds should be regulated on technical instalments not by natural re-connection. Based on the new situation the project is currently and continuously lobbying to maintain the newly created situation. So far, however, it is not clear if this situation will have a chance. It might also be likely that the owners of the fish farm will request to repair the dikes.

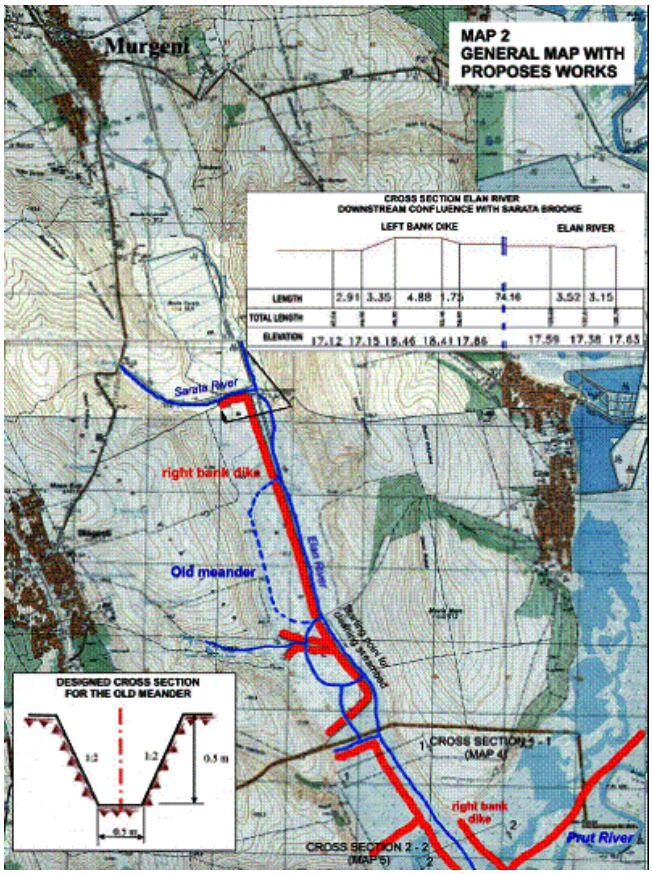


Figure 12: Original plans to re-connect the old meander system along the Lower Elan with the main river course. Parts of the meanders were naturally reconnected through the breach of the left bank dike of the Elan River. Current negotiations with local land-owners aim to maintain the improved situation that has been caused by the floods.

Also the work on soil erosion control on the slopes along the river was affected by unexpected weather conditions. Though some land reclamation works on the originally selected demonstration field of 27 ha and afforestation on the demonstration field of 32 ha (on the slopes and along the river course) started in 2005. Parts of the work, however, had to be postponed due to snow and frost in winter and the flood in 2006 (coldest winter since years with degrees below minus 20 and largest flood since 111 years, see above). Some detailed topographical measurements for the evaluation and design of the works were also delayed but will be finished in spring 2007.

Nevertheless, and despite harsh weather conditions, restoration activities on land reclamation and afforestation started in April 2006: The tree material to be planted was selected and species suitable for the project area were selected with the in-kind participation of the Vaslui County Forestry Directorate. The composition included 30,000 saplings (or 75 %) of black locust (*Robinia pseudacacia*) and 10,000 saplings (25 %) of other species (*Fraxinus excelsior*, *Fraxinus ornus*, *Prunus cerasifera*, *Elaeagnus angustifolia*), plus additional 3,000 saplings of *Glaeditschya triacanthos*.

Also first land reclamation work started in April 2006. The first measures taken into account were land filling measures (smoothing) by bulldozers. In particular the areas round "Vulparia" (5.6 ha)

and "Lutaria" (2.4 ha) have been selected since the two landscapes were severely gullied and the rate of soil erosion was very high (Figure 14). Here, the land is divided in very small up and down hill private plots most of them averaging 0.50 ha in size and involving quite a number of land owners (Figure 13).

In this region, restoration work was needed on almost one-third of the entire project area in order to level significant uneven (corrugated) land, namely small depressions, rills and some gullies. Therefore, land filling was defined as important preparation to fieldwork, allowing for the layout of conservation practices. In this context GIS mapping proved to be a very useful tool to integrate various information, especially for land use assessment.

Digging on the on the most degraded agricultural lands (on the hills) started in early May. Since then a total volume of 7,000 cubic meters were dug and transported 20-30 m away. This work was finished by December 2006.

Figure 13: Typical situation of traditional land use on the slopes along the Elan river. 85% of the total area is split into excessively small plots. Each site is smaller than 1 ha and arraigned in uphill-downhill directions causing massive problems with soil erosion.

**Technical
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In spite of several harsh and unexpected conditions, the Romanian pilot study represents a successful project. Over the project period the cooperation among the technical team on the ground, the coordination team in Bucharest and Vienna and the Basin Committee in its role as water authority increased significantly. The water authority coordinates activities of 20,267 square

km and 15 members represent different stakeholders from the entire basin. The presentation of the component 1.4 of the DRP prepared the opportunity to publish an article in the Prut Directorate magazine "Arual Albastru" and to put a project documentary on the web page of the Prut Water Directorate. Based on this, the Elan DRP 1.4 model site was discussed in a much broader context of the Lower Danube Green Corridor region. This again helped that the Prut Water Directorate proposed the Mata-Radeanu area as Natura 2000 site (SPA). The site has already been validated at national level (see Figure 15).

Figure 15: Proposed Natura 2000 site along the floodplains of the Elan River (Mata-Radeanu). The site has already been validated at national level.

3.3.4. Lessons learned from the Romanian pilot site

- **Temporal framework of project design**

The most important "lesson learned" from the Romanian pilot site concerns the overall project design, planning and implementation. In retrospect it became clear that only 15 months are very short to implement both, sound restoration work on the ground and major changes on policy level. Unpredictable and stochastic events (e.g. like harsh weather conditions) are likely to occur in any river basin.

In the case of the Romanian pilot site two major flood events caused several delays and severe pressure for the technical team on the ground. Also the policy goals might have been too ambitious for the proposed project period. Although the improvement of public awareness and training of local landowners on best agricultural practices was very successful and reached more then 50 local people, the project team still had to deal with about 400 additional landowners. Taking the previous communist expropriation into account many people reacted sceptically with regard to new land use interventions. To ensure a successful implementation on a larger scale in other regions, a project extension phase of about at least five to ten years seems to be more suitable. It seems to

be almost impossible to introduce new mechanisms without long term support and long term involvement of key contact persons. This relates also to the issue of credibility and well-established local contacts (discussed below).

- **Credibility needs continuity and well established local contacts**

Due to administrative delays at UNDP/GEF to set up the tender process of the second project phase the project team was facing significant loss of institutional memory (internally) and loss of contacts with external partners. The key advantage at the Slovakian pilot site (continuity in the project team) was not ensured in the Romanian case. Staff members had to start building up new personal relationships with key project partners and personal networks. If the local mayor had not been a strong and continuous supporter and key driver of the project, most of the measures would have failed to be implemented under the harsh weather and constrained project conditions. The lessons learned out of this experience underline that continuity in project design and continuity in the implementation process should be ensured. On contrary, long delays between two project phases should be avoided.

- **Attraction of regional and national support from administrations**

"Increasing the support of the Water Framework Directive implementation" represents the most interesting but also challenging part of this project component. With regard to this, only the Romanian pilot case managed to demonstrate a significant footprint on the regional and a small footprint on the national level. The key element for this success was the attraction of the regional Prut-Barlad basin committee that signifies a great project success. The Basin Committee represents different stakeholders from the entire basin. They have presented the Elan project as a demonstration project that could set a landmark for the management in the entire region of the Lower Danube Green Corridor. Based on this cooperation the article in the Prut Directorate magazine "Aurul Albastru" was produced and leading persons of the administrative body were starting to "sell the idea" on a boarder scale. Based on this dynamic the Prut Water Directorate proposed the Mata-Radeanu as Natura 2000 site (SPA). As mentioned above, the site has already been validated at national level.

However, the overall aim of the project "to assist 'Danube River Basin *countries*' to prepare new land-use and wetland policies and legislation in line with existing and emerging legislation" was perhaps too ambitious right from the beginning of the project. In retrospective, we would suggest to aim to assist "Danube River Basin Districts" might have been a more realistic objective.

3.3.5. Activities implemented in Croatia (Zupanijski canal):

To improve the situation of the wetlands along the Croatian pilot site the originally planned measures had to be revised and the following technical measures were implemented successfully during the second phase of the project:

a) A geographical survey of the area to investigate most suitable measures to reconnect the Drava river to adjacent Podravski Sokolac wetland and Budakovac oxbow has been conducted and consequently raise local water tables small dams on selected streams were built to control channel erosion;

b) a feasibility study to implement the most suitable measure to reconnect water to reconnect the Drava river to adjacent Podravski Sokolac wetland and Budakovac oxbow and consequently raise local water tables has been elaborated, and

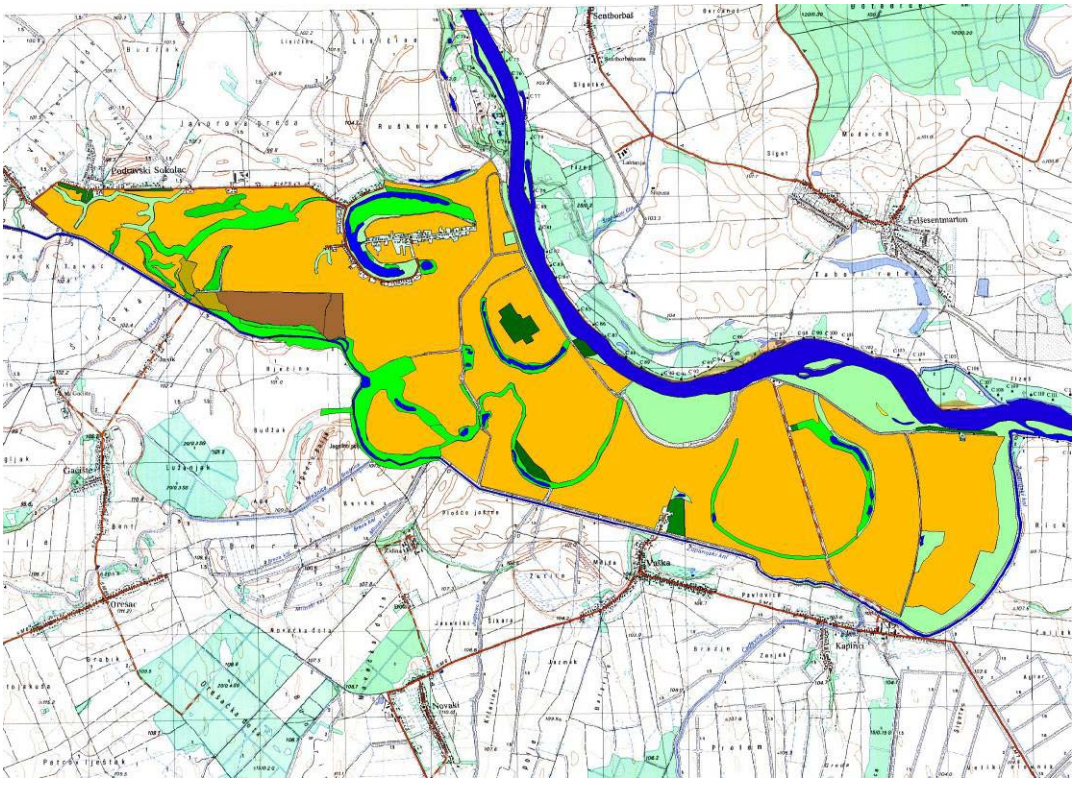
c) the dissemination of the findings, conclusions and recommendations from these activities has been .

Because of the death of David Reeder, our local project coordinator, the following activities were delayed and will be implemented by end of April 2007:

A joint inspection of the condition of the meander of the old Drava riverbed has been conducted and according to an agreement, a complete section of Šarovka and Marčina jama has been surveyed. The first phase encompasses 2920 meters long section of Šarovka- Marčina jama with excavation for minor-riverbed restoration alongside the route of the first phase within the old riverbed of the River Drava. A juncture with Županijski Canal will be completed at the mouth Brežnica Canal so that the elevations of the bottom of minor riverbed are below the minimal water-level in Županijski Canal. This solution enables water inflow into the meander of the Old Drava even at lower water-levels in Županijski Canal. Marčina jama will also join in this system and form a unique river surface of the first phase.

Furthermore, pipe culverts with a diameter of 120 cm should be implemented at the intersections of the Old Drava and public earth paths. Plants on the route can be removed (reed and scrub) in the width that is necessary for machines maneuver, excavations and disposing of dug material. Individual trees will be left (both in the riverbed and on the bank) according to the agreement with a representative of the Natural Society „Drava" from Virovitica (Mr. Grlica).

As an important detail for a full-functioning habitat, it is suggested to build barrier at a junction with Županijski Canal. It is planned that the elevation of the fill crest where water would overflow is 98 meters above the sea level so that water decantation from the Old Drava riverbed would be prevented even if the water level in Županijski Canal is lower than 98 meters above the sea level.



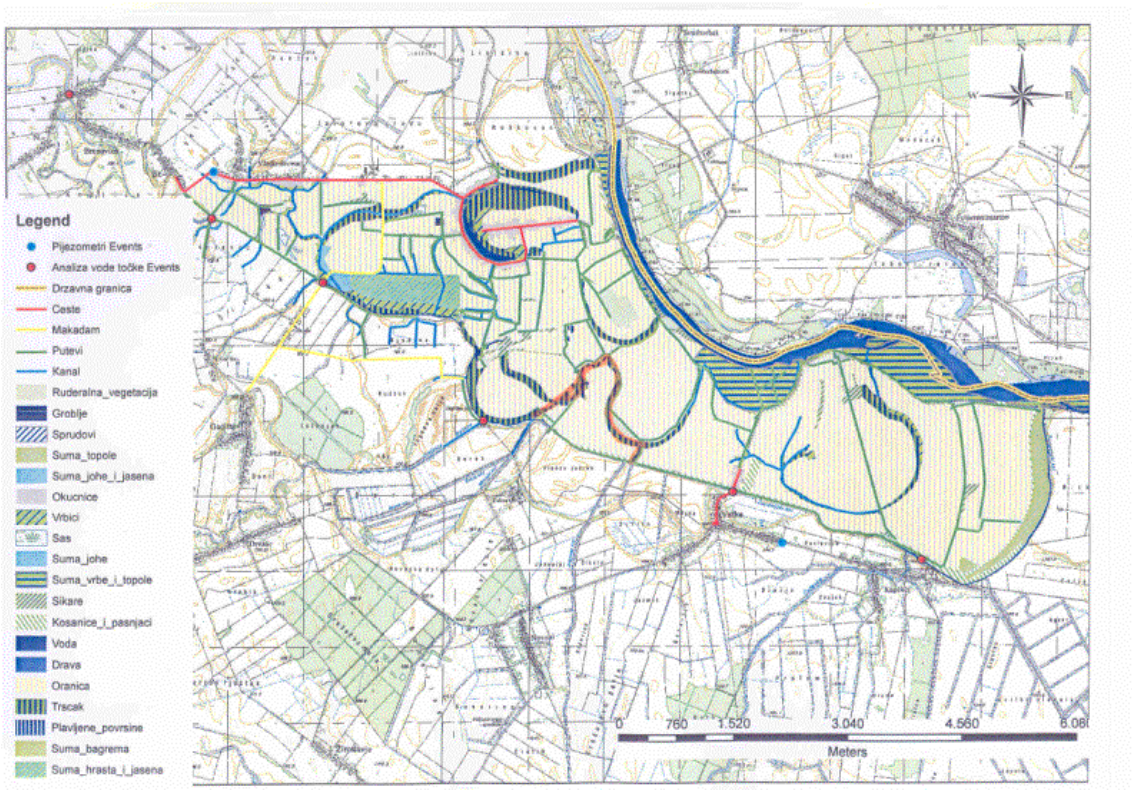


Figure 16: Map to illustrate technical measures to improve the situation of wetlands at the Croatian pilot site – reconnecting old oxbow system with the main river channel. Original plans (top) and reviewed situation after finalisation of the topographic survey (bottom).

3.3.6. Lessons learned from the Croatian pilot site

- **success or failure depends on individual project managers and "administrative ambassadors"**

The project work at the Croatian pilot site was suffering from the dramatic fatality of our local project manager David Reeder. We had to conclude on the sad experience that success and failure are strongly (if not ultimately) dependent on the quality and dedication of local project managers. Despite the fact that the technical work was coordinated by local experts none of them were able to push the project after David's death. Neither were they able to establish relevant contacts with the national water administration. In consequence, the project was significantly delayed. After several months without any respond from official Croatian partners, the project coordination team was almost approaching the point to make the decision to step out of Croatia and declare the project officially to be failed.

In this specific situation, however, Mr. Danko Biondic, Director of Development at Croatian Waters, stepped in and committed his personal interest in this project. This moment represented the tipping point in the entire process. From then on - although delayed - the project created a new dynamic. Measures that have been delayed for months were implemented within weeks and a new workplan was set up to restore the entire oxbow region.

In summary this experience identified three key issues for successful project implementation: (a) wetland restoration in EU accession countries or new member state countries still seem to require a very close connection among local, regional and – in the case of Croatia – also national administration. On national or even ministerial level, only personal contacts were helpful to receive rather important information. Local activities tend to fail, if they are not supported on higher administrative levels.

(b) Support and follow-up activities were even more difficult to maintain on these high level and a "internal ambassador" seems to be essential to drive successful project implementation that has not been developed by the national authority itself.

(c) Individuals on each site of the project (project management or administration) are essential for the project success. Finding the right manager and contact person on the ground to connect authorities, institutions and highly recognised partners (e.g. donors, VIPs, international organizations) is essential for the success of future projects.

3.3.7. Lessons learned on how to use the methodology to influence policy decision makers in the three pilot sites (synthesis)

- **Role of experts and scientific institutes was crucial**

All three project areas represent far-off rural areas. With regard from an "objective observer's point of view" it became quite evident that farming practices and landscape structure should be changed in all three cases. However, changing the minds of a local community (in particular farmers' minds) is not an easy task. Many farmers still believe that all the technical measures, which were implemented on their land decades ago, are useful and represent progress and development. The strategy of this project - to cooperate with water and soil management specialists - turned out to be quite successful. These experts represent authorities that are not only accepted and respected by local people, but also by regional governmental institutions (water management, agriculture, land cadastre etc.). In this context the project was successful in shaping policy decision processes – although predominantly on a local scale. In particular the cooperation with Technical Universities or institutes was crucial for convincing of stakeholders to implement new restoration plans.

- **Proper use of existing regulatory framework is essential for project success**

At least at the Romanian and Slovakian case study sites the following political tools have been identified to significantly contribute to sustainable wetland management. These tools include Rural Development Plans, the Water Framework Directive (WFD) and Natura 2000 sites, but also some activates related with the upcoming EU Flood Directive.

Over the last decades, profound changes in agriculture use have been observed in all three pilot areas. The impact on rural European landscapes and communities was also recognized in these far-off regions of this project. Wetland and floodplain restoration and sustainable use were encouraged by applying agri-environmental, rural community development measures etc. from the EU CAP reform, including measures necessary for better water or river basin management under the WFD.

The contribution of the project for the preparation of Rural Development Plans for the period between 2004-2006 was mainly focusing on the sustainable management of grasslands (including of wetland types) in the framework of Measure 5 – the horizontal measure on agri-environment support. In Slovakia, e.g. a submitted proposal was based on the expertise with sustainable management and knowledge gained from the project implementaion. During the period of 2004-2006 certificates for more then 100,000 hectares of semi-natural grassland types were provided.

In this case, the Slovakian Ministry of Agriculture accepted the proposal for re-designing agri-environmental measures to support the conservation of semi-natural and natural grasslands. Now, the follow up activities of the project will focus on requirements for the management of wet and fen meadows. These activities will focus on the new Rural Development Plan 2007-13. As one project outcome the management plans for Slovakia suggest e.g. that sensitive wetland types of grasslands should be mown only by hand or by light machinery and the payment should rise significantly to cover the costs of such precise management.

The Slovakian project site also managed to magnify the project outcomes on a much broader scale. Motivated by the project outcomes, our local partners organized a meeting with the head of the Rural Development Department on Ministry of Agriculture, participants from Agricultural Paying Agency, State Nature Conservancy and from Soil Conservation Institute. At this meeting it was agreed to prepare a national register of semi-natural grassland habitats to be incorporated in the official Land Parcel Information System (LPIS). Farmers could check such register on the web and the register would help with the administration and implementation of agri-environmental measures.

- **Support wetlands as integral part of the EU Water Framework Directive is not an easy but feasible task**

Although the WFD does not define wetlands or set specific objectives for them, it does include important provisions that will assist their protection. In addition, within the WFD Common Implementation Strategy process, a 'Horizontal Guidance' document on wetlands and the WFD has been jointly developed by all EU Member State, the EC, and water stakeholders from across the continent. This document attempts to ensure that the links between WFD ecological objectives and wetland values and functions will be fully considered by Member States during the implementation process. In particular, the sustainable management including rehabilitation and restoration of wetlands should be included among the basic and supplementary measures included in the Programme of Measures necessary for reaching the ultimate WFD goal of good ecological and chemical status of all waters in each River Basin District.

At all three pilot sites the Water Framework Directive represented a relatively new piece of legislation (at least during the first project period) that has been considered to have great potential for sustainable wetland management. In Romania and Slovakia on-the-ground implementation is closely linked with the preparation and implementation of River Basin Management Plans, which could include and synthesize all aspect of land-use in the basin. In both countries, we observed a long-term tradition in preparing sound management plans on different spatial and land-use scales. The practical realization, however, failed in many cases. With regard to this, in particular the Olsavica pilot case was able demonstrate very useful examples on how to prepare realistic and feasible management plans that have already been tested and proven during the second phase of this project. The convincing argument to receive respect from different authorities was the involvement of highly educated and well accepted experts in the planning phase. Restoration activities e.g. in the Olsavica basin were prepared and planned by a team of ecologists from our local partner 'Daphne' in close cooperation of water engineers from the Slovak Technical University. Both organisations are well recognised by state administrations. This again, created a very good starting point to influence policy decision making processes - in this case not only on local but also on regional and national levels. Without such a close and well established network of experts, the influence on the WFD implementation would haven been impossible.

In addition to this, our Slovakian partner 'Daphne' also organized a campaign to raise awareness about the importance of wetlands in river basin management (RBM) in 2006. This campaign was linked to the "International Wetlands Campaign" of the Danube Environmental Forum (DEF) and targeted on regional and local decision-makers and water managers. It began with an evaluation of

current perception of wetlands within specific target groups. The survey showed that 93% of respondents were aware of any importance of wetlands, however only a minority was aware of any socio-economic importance of wetlands (except nature protection). The majority of respondents were not able to refer to any concrete example where wetlands help to solve problems within RBM.

Based on this outcome, the ten seminars were organized throughout Slovakia to cover all river basins and to train water managers about values and functions of wetlands and their particular presence in the certain river basins of Slovakia (see also above). The seminars succeeded to identify some barriers in better incorporating wetlands into RBM. Among other issues, conflicts within legislation, lack of communication and coordination between relevant actors within the river basins, complicated landownership and insufficient funding were identified.

- **Natura 2000 Network demonstrate to be a successful tool for wetland protection in particular in the New EU Member States**

In 1992, in response to the significant and ongoing deterioration of many habitat types and the growing number of threatened or rare species, EU Member States adopted the Directive on the Conservation of Natural Habitats and of Wild fauna and Flora, also known as 'Habitats Directive'. The Habitats Directive aims to contribute to the protection of biodiversity by setting up a European wide network of protected areas called Natura 2000 and by protecting threatened species in their natural range. It complements the 1979 Bird Directive, which establishes protected areas for threatened bird species. In this combination the Directive was also useful to include most important wetland sites into a protected area system. In order to join the European Union, also new EU Member States have dad to transpose the requirements of the Birds and Habitat Directive into their national legislation. This includes submitting their lists of proposed sites of Community Importance (pSCI) to the EC.

In Romania and Slovakia, this project has prepared a scientific proposal of pSCIs which was taken by the Ministry of Environment as a basis for governmental proposal. In Romania, the Prut Water Directorate proposed the Mata-Radeanu as Natura 2000 site (SPA) and the project received already national approval. Whereas substantial parts of the scientific proposal in Slovakia were cut (about 30%) during the process of approval of SCIs. In order to improve the situation the Slovakian team used bio-geographical seminars (organized by EC) to propose missing sites. Due to fact that our local partners hold an extensive data base on occurrence of non-forest habitat types and species, they were able to prepare a sound analysis of (un)sufficiency of the Natura 2000 network for particular habitat types and species. Finally, many of the Slovakian arguments were picked up by the EC and the Slovak government. They are now obliged to prepare proposals for additional sites.

Summarized it can be stated that in Romania and Slovakia the impulses coming form this project were quite successful to shape the discussion about the integration of wetland areas into the Natura 2000 network.

- **Wetlands demonstrated to be able to help to mitigate flood risks in the Danube River Basin**

Central and Eastern Europe – indeed most of the continent – has recently suffered greatly from catastrophic flood events which have resulted in loss of life and damages to health, property, and businesses in and around former floodplains. In particular our Romanian pilot site suffered dramatically – even during the implementation period of this project (see above). Now a new consensus is emerging on how more ecologically balanced approaches to flood risk management contribute to lower risk and upstream preventative measures, driven by governments (such as

Romania, Germany and Hungary) who recognise this necessity, and who – together with the EC – have started working on integrating flood management.

Although the new Floods Directive is still under preparation, some of the ecologically balanced approaches that rely heavily upon the natural capacity of wetlands are well accepted. To use floodplains to minimise, absorb and buffer the effects of flood events becomes more and more an issue of public and political debate. Wetland restoration – both for enhanced storage capacities downstream in floodplains and for increased retention capacity or sponge effect upstream - is therefore becoming recognised as a tool for preventative, flood minimisation. In particular the Slovakian and Romanian pilot site were able to demonstrate the positive effect of floodplains during the latest flood events. As a reaction on the severe flood damage in Romania in 2005 and2006, the government has recently launched a feasibility study to investigate the overall potential of former Romanian floodplains in the Lower Danube region to contribute to sustainable flood risk mitigation. Restoration work within the floodplains and re-connection of former floodplain areas has been considered to be an essential part of the overall plan for sustainable flood risk management. The lessons learned from this project are able to provide helpful support for such a planning process and our Romanian team (national WWF staff members) have already started to discuss these issues with the Romanian Ministry of Environment.

4. CONCLUSIONS AND RECOMMENDATIONS

4.1. General lessons learned

4.1.1. Setting goals and objectives

This project component set out to achieve the development of a methodology for planning wetland restoration in a landuse context and to test the methodology including implementation of the direct restoration activities at three pilot sites over the period of June 2005 to December 2006. The goal of the project was to use this pilot work to help refine wetland and wetland restoration policy at different scales within the Danube basin. The following general conclusions and recommendations were made:

- The project supplied evidence that through carefully planned **landuse changes** , it is possible to provide a significant contribution to wetland restoration and wise management of wetland resources and services.
- It also provided evidence that **building the capacity of local people** on EU policy and the opportunities that EU policy offer can provide a signification platform for success even for far-off rural areas in new member states and even in proposed new accession states such as Croatia.
  The project finally provided evidence that **capacity building** on the ground is key for sustainable management solutions in these areas.
- The **policy goals** of the project, however, were too ambitious: The project received very good feedback on local scales by demonstrating successful impacts on local land use plans and local landuse techniques. It also received good feedback on regional scales when activities were imbedded in existing structures or concepts (e.g. the Lower Danube Green Corridor idea). However, the input on national or even international level proved to be difficult within the scope of the project activities. The benefits of wetland restoration were not considered at the national level and therefore interest in the activities and results of the project was largely confined to the local authorities and other stakeholders.
- The principle of using **"bottom up models"** to influence top down decision makers is important but not sufficient. The limited focus on bottom up activities will not show any significant large-scale impact unless activities are not coordinated with ongoing "top down elements" (e.g. river districts that are preparing WFD implementation processes, authorities that are working on agri-environmental measures or N2000 designation etc.).
- With regard to this, the **selection of the case study locations** was perhaps not appropriate according to goals. All regions were far-off from central decision makers and only the Romanian pilot case managed to demonstrate a significant impact on the regional and small impact on the national level.
- The aim "to assist '**Danube River Basin countries**' to prepare new land-use and wetland policies and legislation in line with existing and emerging legislation" was also too ambitious. To aim to assist "Danube River Basin Districts" would have been the more realistic objective in hindsight.

- The achievement of the goals and objectives particularly those under Phase II proved to be too ambitious due to the significant gap between Phase I and Phase II, severe weather conditions during the field implementation phase and the tragic loss of one of the local coordinators.

4.1.2. Applying the methodology

A key activity of the project under phase I was the design and testing of a methodology for undertaking landuse changes to support wetland restoration. This methodology may well be applied in the Danube and in order river basins in the world.

- The methodology to assess land-use practice works in the frame of river basin management. In particular the **GIS mapping** was supported as the most useful tool for any further activities. The maps served as a key decision making tool but also as an important communication tool for stakeholder and public participation processes.
- The identification of **strategies, plans and policies** that relate to activities undertaken around the pilot sites and threat analysis worked also quite well although the quality depends strongly on the local situation and the expertise and commitment of local partners. Historical data and in particular historical maps turned out to be an essential and important part to support the analysis and the further public participation processes.
- The level of detail related with the "**gap analysis"** of the assessment methodology" was not precisely defined. In consequence, the quality of the different case study results varies and depends on available data (based on existing land use plans, technical capacity at local authorities, key player at local/regional authorities etc). The involvement of local authorities (i.e. mayors) seems to be essential to provide a sound gap analysis.
- The organization of **participatory stakeholder workshops** turned out to be as important and helpful as the GIS mapping. These meetings were clear tipping points for the local implementation process of the project. In general, the learning curves of local participants were steep, the commitment very high, and people felt strongly supported as "they have been selected" for an international project. Cooperation with local and regional authorities helped to translate theoretical ideas into "understandable" languages. "Strategic alliances" with local, regional or national authorities that were formed during the workshops turned out to be key for the entire project success.
- At all pilot sites most of the "local leaders" and "local supporters" were selected during the workshops. Together with these partners (e.g. mayors as organizations, water management authorities, individual hydraulic engineers) **technical plans, implementation concepts, and funding opportunities** were discussed, developed and finally implemented. This approach worked quite well. However, there was also a downside of the applied procedure. The **workshops and accompanying conceptual discussions created a lot of expectations.** During the first phase, most success outcomes were based on private relations and trust of individual key players. Therefore, the project lost a significant amount of credibility and major opportunities since the start of project phase II was so delayed. More then two years without any project input was a major stumbling block in some of the project areas. Credibility and trust are essential elements for successful project outcomes and the loss of credibility might cause failure.
- In summary the project provided evidence that the methodology works and can be applied to different river basins and different landuse plans. Identifying and evaluating alternative land-use scenarios, with special attention to the multiple benefits of floodplain

rehabilitation and restoration is key and should involve stakeholders and public participation right from the beginning. The organization of workshops is key since the quality will not only define the program of measures but is also likely to attract local leaders. The methodology, however, should only be applied if the implementation process could start within a reasonable period of time or expectations are not raised unrealistically.

- A weak point of the methodology concerns the missing monitoring or evaluation concept. Monitoring or evaluation measures are not included in the planning process and not explicitly requested by the procedure. In general, the pilot project managers tend to like to implement projects and declare the ongoing project realization process as project success. However, the implementation of measures is not identical with a successful ecological effect of the measures. **We recommend using the methodology to support other river basin management plans but to extend it with a systematic monitoring and evaluation tool.**

4.1.3. Implementing restoration measures on the ground

A significant component to the project was the practical active implementation of the action plans in partnership with the local leaders and supporters identified during the planning process under Phase I.

- **Key player on the ground are essential**: The critical factor for successful implementation is to ensure that there is a least one local person to maintain the management of the process and maintain the support and participation of the various actors and stakeholders. This/these person/s must be able to commit to the process on a long-term basis (see next point) and must be able to nominate a "successor" should the key person not be able to continue.
- **A long-term process:** When resources are limited and the activities rely on the participation and support of a wide variety of stakeholders the process from site identification to completed restoration project will be long. The period provided in this project proved to be far too short.
- **Field conditions considered in workplan:** The project experienced a number of setbacks due to adverse weather conditions including flooding and freezing winters. These factors have to be included and considered in the development of the implementation plan and will impact the length of time that the project will require implementation.
- **Remote sites need significant support:** Remote, rural sites proved to have some advantages and some significant disadvantages. Local enthusiasm for projects that support the improvement of their living conditions can be a very powerful force for achieving land use changes that support wetland restoration. However the intensity of support and input that the local actors require to ensure the long-term successful implementation of the project should not be under-estimated. Very often the changes are quite significant. The methodology new and the approaches alien to local communities so the process needs careful, intensive management.

4.1.4. Using pilot sites for influencing policy decision makers

The project aimed to use the results of the field implementation and the use of the methodology to influence the development of policy at several levels from the local to the national and to the river basin as a whole.

- At local, pilot site level, there is a **chronic shortage of information and knowledge** about recent, new and emerging policy drivers and the opportunities associated with them, including financial instruments, for promoting sustainable land-use.
- Questions relating to CAP, WFD, Natura 2000 and so on are asked by **few stakeholders** and there are even fewer people – generally in 'faraway' capital cities or international bodies – who might be able to provide the answers.
- **Agriculture is particularly important** and is seen by many as the greatest challenge to WFD implementation. Reflecting this, promoting best agricultural practice towards achieving good ecological status in line with the WFD is an essential task for wetland restoration.
- In particular in Slovakia, the future implementation of the **Rural Development Directive** demonstrated to offer a range of instruments for such work, whether through agri-environment or through diverse rural development programming. The problem in other regions remains low awareness and uptake and implementation of these options.
- **The WFD is not consistent in its references to wetlands**. Article 1 says that the aim of the WFD is to encourage action that prevents further deterioration and protects and enhances the status of aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands directly depending on the aquatic ecosystems. However the rest of the WFD refers to "water bodies", i.e. rivers, lakes, transitional waters and coastal waters, without any inclusion of other wetland areas that are hydrologically or ecologically linked to these water bodies. This has not been overcome, although the Horizontal Guidance on the role of wetlands in WFD implementation exists since 2003. Further lobby work in working groups on high policy level is still urgently required.
- There seems to be sufficient legislation already in place to ensure and promote the nature conservation aspects of water management. However, **problems lie with enforcement**, especially as a result of insufficient funds being made available to nature conservation activities. There is a huge gap between plans and policies developed or transposed at the national level and what is happening in the rural areas, especially when the rural area in question is markedly peripheral, as these pilot sites each undoubtedly are.
- **Magnification:** With very little interest shown from the national level in the individual project sites and the activities of the project, the chance of spontaneous replication and magnification of the project activities is unlikely. Local success may lead to further extensions or copy cat activities in vicinity of the pilot sites. There may also be some reflection of the approach in connected wetland restoration activities such as in the Romanian case where the pilot site is linked to a larger process such as the Lower Danube Green Corridor Initiative and the Lower Prut Directorate. However, wider magnification will require a specific intervention to promote and publicize the results of the project to interested parties. This report would be a useful contribution to that process and visits to the sites would be a useful tool.

In conclusion, the activities undertaken in the three pilot sites under this component of the UNDP/GEF project have provided a very valuable contribution to the development of wetland restoration activities in the Danube basin. The activities have shown that it is certainly possible to restore wetlands by changing the landuse and creating win-win-win solutions for local people, local economies and nature including the restoration of the natural functions of the river Danube. The project has also highlighted a number of constraining factors and shown the limitations of activities without stakeholder support. This report and the living examples of wetland restoration created under this project will hopefully prove to be a critical stepping stone to large scale restoration in the Danube and other rivers basin.