

## *Pilot testing of Water Framework Directive in Eastern Slovakian Lowlands*

Andrea Čimborová<sup>a</sup>, PhD; RNDr. Eleonóra Bartková<sup>b</sup>

<sup>a</sup> Office of Laborec – Uh project, Slovak Water Management Enterprise - Slovenský vodohospodársky podnik, š.p., Správa povodia Laborca, Vajanského 3, 071 80 Michalovce, Slovak Republic  
[andrea.cimborova@seznam.cz](mailto:andrea.cimborova@seznam.cz)

<sup>b</sup> Office of Laborec – Uh project, Slovak Water Management Enterprise - Slovenský vodohospodársky podnik, š.p., Správa povodia Laborca, Vajanského 3, 071 80 Michalovce, Slovak Republic  
[bartkova@ovsiste.roburnet.sk](mailto:bartkova@ovsiste.roburnet.sk)

---

**Abstract:** The Water Framework Directive adopted (WFD) in 2000 takes an Ecosystem Approach, explicitly demanding that water resource management considers the whole river basin, without stopping at administrative boundaries. To deliver practical example when implementing both WFD and Natura 2000, UNDP/GEF support project "Integration of Ecosystem Management Principles and Practices into Land and water Management of Laborec-Uh region". The water quality of the rivers in the project area varies from good to poor in terms of their ecological status, as defined by the WFD. By adoption of WFD, adjustments of the water management systems can be made to restore semi-natural floodplain habitats while preserving the flood protection function in the area. Slovak Water Management Enterprise has developed draft of Čierna Voda River Basin Management Plan aiming at achievement of good status of water bodies. It is the first pilot Water Management Plan elaborated within Slovakia, which provides opportunities for further application in other River Basins in Slovakia. Preparatory works included ichthyological mapping, biotope mapping, hydrological mapping, elaboration of Digital Elevation Model and hydrological modelling. Proposed measures aim not only at improvement of water quality but also at biodiversity protection and socio-economic development of the area. Since similar situations have occurred throughout the Danube River catchment floodplains, testing such approach of implementing WFD can contribute to developing best practice for future interventions.

**Keywords:** Water Framework Directive, flood protection, integrated management, biodiversity protection, Natura 2000, floodplain habitats

### **1 Water Framework Directive**

The EU Water Framework Directive (Directive 2000/60/EC or WFD) solves the problem of increased water requirements with the aim to ensure its sustainable usage for future generations. The basic instrument of the Directive is development of River Basin Management Plan (RBMP) as a tool of integrated management of human activities on the river basin level. The most important aspect of the Directive is the focus on preserving the hydroecological needs and the fact that water is the key for the sustainable land development. The main goal of the planning process is that all surface and ground waters within defined river basin districts must reach at

least ‘good’ status by 2015<sup>1</sup>. The result will be a healthy water environment achieved by taking due account of environmental, economic and social considerations.

## 1.2 Key advantages of WFD

The Water Framework Directive (WFD) takes an Ecosystem Approach, explicitly demanding that water resource management considers the whole river basin, without stopping at administrative boundaries. Furthermore, it demands an integration of strategies for the use and protection of water as a resource with management plans covering the complete river basin. Key actions include integrated management, international co-operation, environmental assessment, and public participation, including coordination with implementation of Natura 2000 network. Thus, the WFD can ensure the maintenance of biodiversity in aquatic ecosystems and contribute to wider biodiversity objectives.

The “good status of waters” will be reached by implementation of the Programme of measures as, a key component of the river basin management plan. Amongst the basic measures to be included in the Programme of Measures reflecting ecosystem approach, we can mention:

- Protection of underground waters against nutrient discharges
- Optimal usage of fertilisers on the agricultural land
- Conversion of arable land into extensive grasslands
- Prevention and reduction of erosion – increase of land retention capacity and implementation of anti-erosion measures
- Implementation of Integrated Pollution Prevention and Control Directive.

Among the supplementary measures reflecting ecosystem approach, we can mention:

- Restoration of wetlands
- Regulation of water off take

## 1.3 Development of the River Basin Management Plan

A key component of the Water Framework Directive is development of river basin management plans which will be reviewed on a six yearly basis and which set out the actions required within each river basin to achieve environmental quality objectives. The structure of the Plan is defined upon the requirements of the EU WFD 2000/60/EC, Annex VII. It consists of the following chapters:

1. General description of the characteristics of the *river basin district*, including a map showing the location and boundaries of the surface and ground water bodies and a further map showing the types of surface water bodies within the basin.
2. Summary of the significant pressures and the impact of anthropogenic activity on the status of surface and ground waters, including point source pollution, diffuse pollution and related land use, the quantitative status of water including abstractions and an analysis of other impacts of human activity on water status.
3. Map showing any protected areas.
4. Map of the monitoring network and a presentation (in map form) of the results of the monitoring programme showing the status of all water bodies and protected areas.

---

<sup>1</sup> Reflecting undisturbed conditions or minimal disturbance. Values of the biological quality elements for the *water body* type show low levels of distortion resulting from anthropogenic activity but deviate only slightly from those normally associated with the *water body* under undisturbed conditions.

5. List of the environmental objectives set for all water bodies, including those where the use has been made of derogations.
6. Summary of the economic analysis of water use.
7. Summary of the programme of measures.
8. Register of any more detailed programmes and management plans and a summary of their contents.
9. Summary of the public information and the consultation measures taken, their results and the changes to the plan as a consequence.
10. List of competent authorities.
11. Contact points and procedures for obtaining background documentation and information, including actual monitoring data.

## **1.4 Monitoring**

Important part of the formulation and implementation of River Basin Management Plans is integrated monitoring programme that embraces the physical, chemical and biological data needed to assess the status of surface and groundwater bodies in each river basin district. The monitoring programme should provide data for the formulation of river basin management plans and programme of measures. The monitoring programme will provide the following:

- Data from the reference sites to enable class boundary conditions to be established for all groups of water body types.
- The data to enable the classification of all individual water bodies.
- The means of monitoring progress with the implementation of the river basin management plans and associated programmes of measures and the basis for their subsequent revision.
- Early warning of new problems.

In order to monitor success of implementation of measures, the maps of anticipated improvements will be developed and included into the River Basin Management Plans.

## **2. Implementation of WFD**

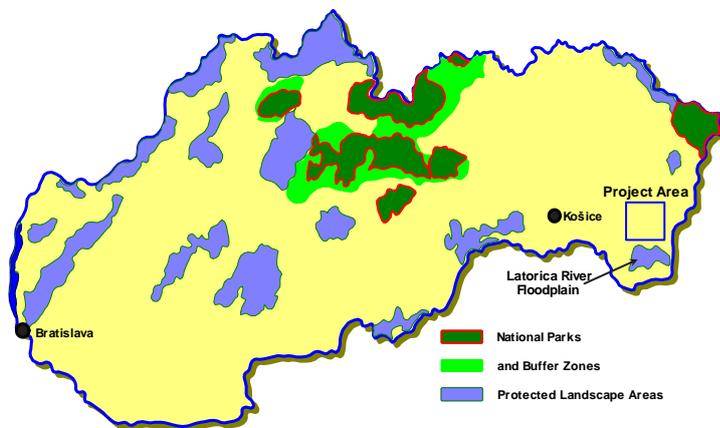
To deliver practical example when implementing both WFD and Natura 2000, UNDP/GEF support project "Integration of Ecosystem Management Principles and Practices into Land and water Management of Laborec-Uh region", [www.laborceuh.sk](http://www.laborceuh.sk).

Activities relating to the development of the Čierna voda RBMP are carried out by the implementation agency – Slovak Water Management Enterprise Žilina (SVP), branch Bodrog and Hornád Basin. Costs related to development of RBMP are covered by SVP as part of cofinancing. This activity is also supported by the Slovak Hydrometeorological Institute (SHMU) and Water Research Institute (VUVH). It is the first pilot Water Management Plan elaborated within Slovakia, which provides opportunities for further application in other River Basins in Slovakia.

### **2.1 Project location**

The project is located in Eastern Slovakia Lowlands, bordered by rivers Uh and Laborec. The area is bisected by Čierna Voda River (tributary of Laborec) whose catchment is largely within the project area.

Picture No.1: Project location



Source: (Čimborová et al., 2005)

## 2.2 Biodiversity protection

Within the area several protection zones were designated: Ramsar site Senné, State Nature Reserve Senné, Special Protection Area (SPA) under Bird Directive and 2 candidate Special Areas of Conservation (SAC) under Habitats Directive with the aim to protect and stabilize wetland ecosystems. These can create conditions for extensive agricultural practices and rural tourism development.

The area supports 57 breeding species and further 99 species have been recorded as visitors. For 25 of the breeding species, Senné is the only or the most important breeding place in Slovakia and 22 species using the site are subject to special protection under Annex I of the EU Birds Directive, including *Ardea purpurea*, *Egretta garzetta*, *Egretta alba*, *Platalea leucorodia*, *Nycticorax nycticorax*, *Botaurus stellaris*, *Circus aeruginosus*, *Chlidonias hybridus*, *Recurvirostra avosetta*, *Limosa limosa* and *Tringa totanus*. The protected habitat type is a natural eutrophic lake with *Magnopotamion* or *Hydrocharition* (EUNIS 3150), and three species listed in the EU Habitats Directive: invertebrates *Unio crassus*, *Anisus vorticulus* and amphibian *Bombina bombina*. More than 300 higher plant species have been recorded in the project site, of which some 15 % are recognized as rare and endangered, including: *Fritillaria meleagris*, *Orchis palustris*, *Allium angulosum*, *Ceratophyllum submersum*, *Gratiola officinalis*, and *Veronica anagalloides*.

The surviving flood meadows serve as valuable seed banks for restoring further areas of wet grasslands. They represent four types of seminatural grasslands with a total area of 1,293 ha. The dominant type (1,082 ha) is a mosaic of two habitat types: continental (*Cnidion* – forming the second largest site in the region) and wet grassland (*Potentillion anserinae*).

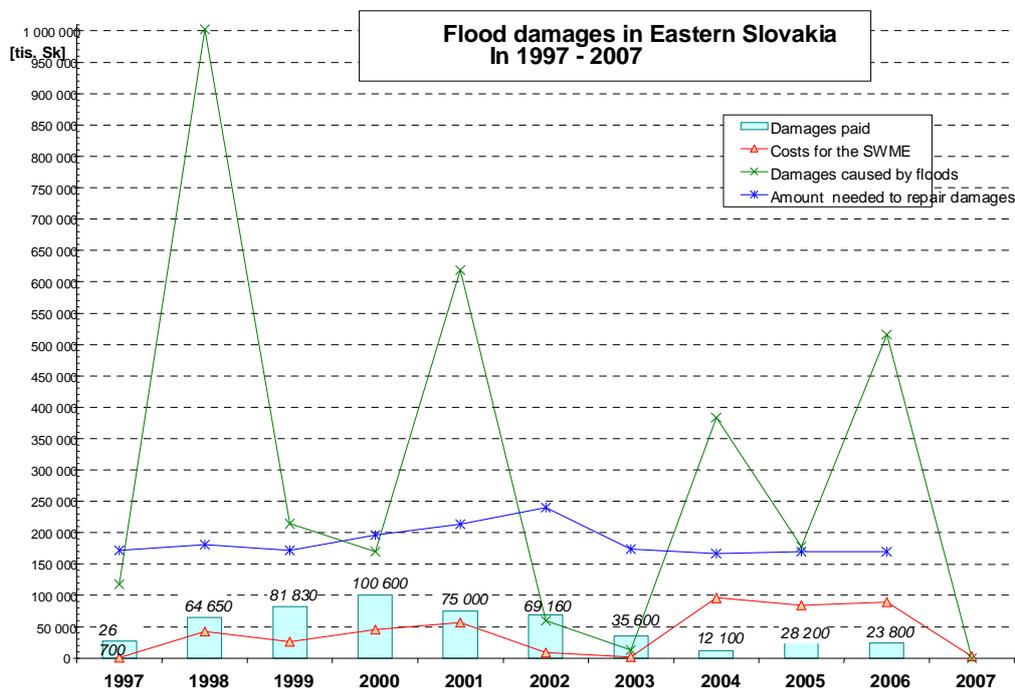
## 2.3 Water management

Water management provides flood protection and provision of water for economic and recreational activities. Under unmodified conditions, large floods occurred in the area. In the past, engineering works were taken to protect area from floods, especially drainage and irrigation systems. However, these caused negative effects. Most important are water drainage and change of water regime.

In terms of biodiversity conservation, these practices have led to severely reduced area of natural floodplain habitats, reduced water quality because of pollution by fertilisers from agriculture and by PCBs from industry (Chemko Strážske factory situated upstream) and declined populations of threatened species such as Chequered Lily, Spoonbill, Bittern and Otter. In addition, they have reduced the floodplain ecosystem functions (flood attenuation, nutrient reduction, pollution control, groundwater recharge, fish spawning areas).

At present, water levels and its availability are entirely artificially managed. The local land use and urban development has become accustomed to this situation. The water quality of the rivers in the project area varies from good to poor in terms of their ecological status, as defined by the WFD.

Figure no. 1: Situation in Flood damages in Eastern Slovakia in the period 1997 – 2007.



Source: (SVP, 2007)

## 2.4 What is the solution?

Due to implementation of WFD, it will not be possible to revert to the former unregulated flood regime across the whole site, but judicious adjustments of the water management systems can be made to restore semi-natural floodplain habitats in substantial areas.

Such adjustments are supported by the Slovak Water Management Enterprise (SVP) because they will lower long-term management costs. Therefore, SVP has developed draft of Čierna Voda River Basin Management Plan (RBMP) aiming at achievement of good status of water bodies.

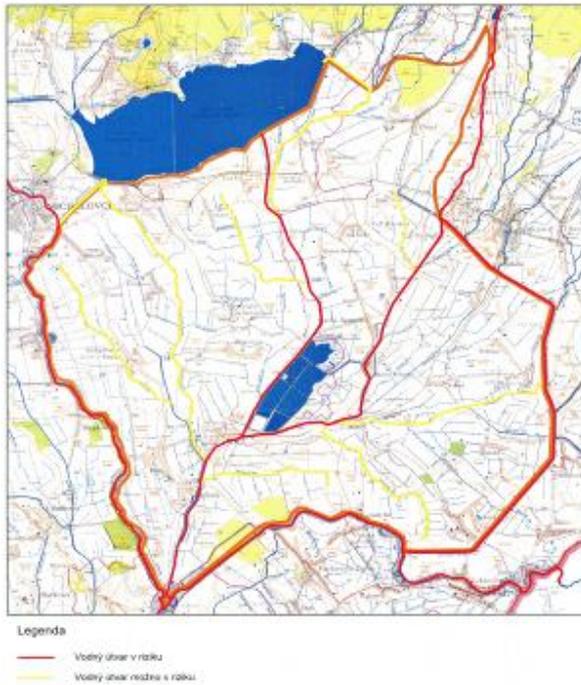
Preparatory works included research of available studies provided by Slovak Hydrometeorological Institute (SHMU) and Water Research Institute (VUVH), survey of the channel system and revision of its functionality consultations with Slovak Technical University on possibilities for floodplain restoration using existing water management systems. Further studies included ichthyological mapping, biotope mapping, hydrological mapping, elaboration of Digital Elevation Model and hydrological modelling.

When preparing Monitoring maps, a network of monitoring stations was evaluated (ground waters and protected areas) whereas assessment of human impacts on the state of the water bodies will be confirmed and further adjusted based on the monitoring results. Subsequently water bodies were assessed from point in view to achieve good status and a list of environmental objectives was formulated.

## 2.5 Preliminary results of the analysis

The River BMP was developed and submitted for internal comments on December 2008. It describes assessment of the water quality and proposes possible measures for achieving good status of waters by end of 2015 in the river basin: 14 surface water bodies have been identified within the river basin. Five of them are at risk to achieve good status (Laborec, Uh, Čierna voda, Kanál Veľké Revištia – Bežovce, Okna). 9 water bodies are at possible risk due to failure of reaching the ecological status criteria (organic pollution, hydromorphological change and diffusive sources of pollution). Due to insufficient monitoring data on remaining water courses such as channels, an expert judgment to estimate water status of these waters was used. However, it is necessary to confirm these preliminary results by undertaking more detailed monitoring.

Picture No.2: Assessment of the water quality in the Čierna voda River Basin



Legend: red – water body at risk; yellow – water body at possible risk

Source: (SVP, 2008)

## 2.6 Proposal for measures

Programme of measures includes the timeframe for implementation, financial work plan and analysis of sources of financing.

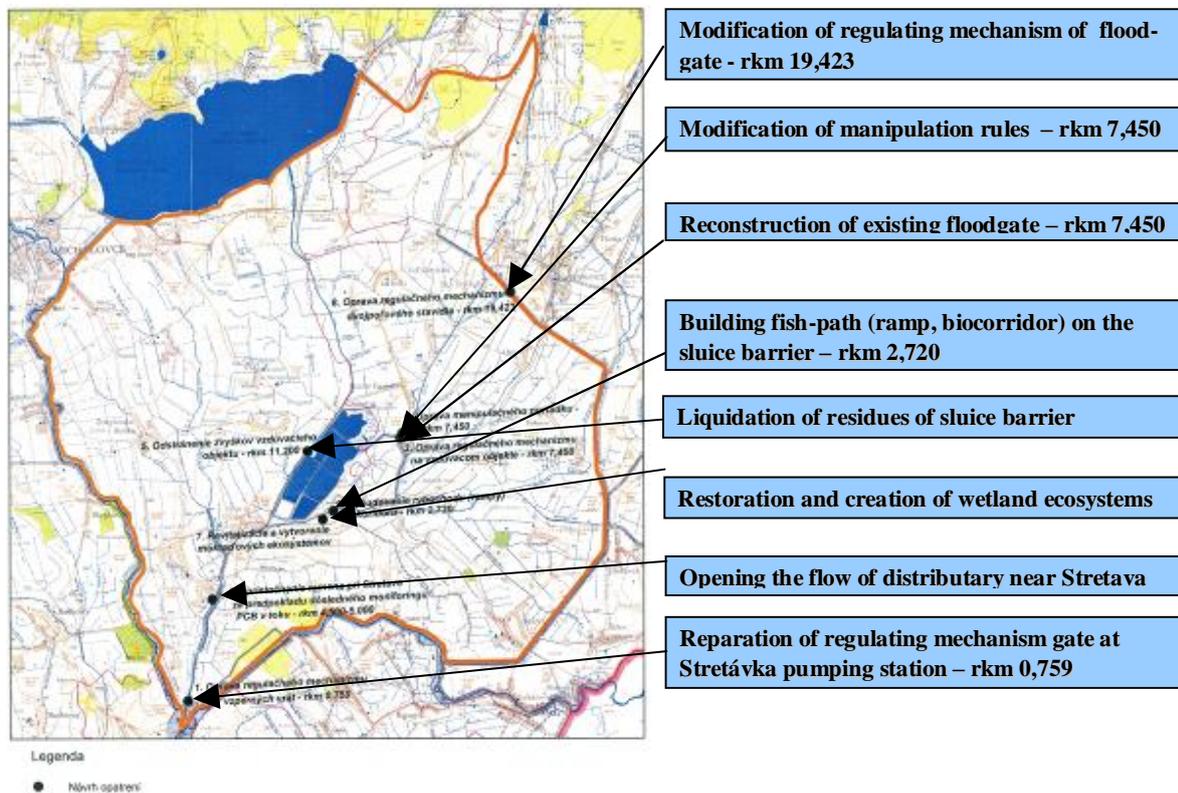
Based on the analysis, following general measures were proposed:

- Decreasing of surface water pollution
- Improvement of quantitative status of ground water bodies
- Restoration of lateral continuity of water courses
- Restoration of disturbed longitudinal continuity of surface water bodies

Specific measures proposed:

- Reduction of migration fish barriers by reparation of water management objects and construction of artificial or natural bio corridors
- Restoration and creation of wetland ecosystems
- Reduction the transport of hydraulic sluicing by implementation of antierosion measures on the agricultural land
- Improvement of water quality monitoring in the river basin area, focusing specifically on harmful substances in the waters
- Improvement of ground water quality (water diversion and destruction of soil water)

Picture No.3: Examples of specific measures



Source: (SVP, 2008)

## **2.7 How do we take an integrated ecosystem approach?**

Crucial aspect of the RBMP formulation process is harmonisation of the RBMP with biodiversity protection and socioeconomic development of the area, which are being implemented at the same time as other components of the project. Thus, by implementation of the measures proposed, improvement of life quality should be reached not only in biodiversity protection, but also in socioeconomic development of the area.

address

By the end of the project, an innovative stakeholder partnership (i.e. a Leader Local Action Group) will be in place in the project area that can continue to implement a self-sustaining water and land management programme resulting in environmentally sound agricultural practices, alternative non-farm livelihoods, and further expanding the extent of (semi-) natural floodplain habitats that support a representative range of species. In addition, the project will simultaneously work on preparation of the Integrated Local Development Strategy and the Plan for restoration and management of meadows, by which the existing conflicts could be resolved by the parties concerned.

The objective of the Integrated Local Development Strategy, which is being developed is to harmonize priorities of particular municipalities to ensure balanced development in the project area. Measures that will be proposed in the RBMP need to be transposed into the Integrated Local Development Strategy. These measures should be divided into two categories: those to be implemented by Local Action Group, and those to be implemented on political level.

Plan for restoration and management of meadows within the whole project area will include measures for management of semi-natural habitats, meadows and measures for restoration of degraded meadows. This plan can be used during elaboration of Terrestrial systems of ecological stability as a part of land consolidation process as well as for farmers, which will have legal access for funding of alternative agricultural practices under Rural Development Plan.

## **2.8 Implementation of measures**

The project had already selected a pilot investment measure to test the feasibility of such approach and to have an opportunity for public consultations on concrete measures with local stakeholders. This investment was selected especially due to its low investment needs. It is reconstruction of existing floodgate (by 3 wooden boards) Okna channel located south of the Senne fish ponds (see Picture No. 4). SVP has already started the preparatory works for the approval procedures. It is expected that the final approval of the investment by District authorities will be issued in summer 2009.

Proposed intervention will reduce flood risks by decreasing of water discharge into Stretavka pumping station and simultaneously will allow retention of water into designated floodplain. Thus, the investment will lead to improvement of floodplain conditions. Intervention will supply the former floodplains and/or wetlands by water during flood events and thus will improve natural wetland habitats.

Picture No. 4: Localisation of measure for reconstruction of existing floodgate at Okna



Source: (SVP, 2008)

## 2.9 Public consultations

Crucial part of WFD implementation is public consultation. In order to ensure these, the project will use the Communication and Information system established within the project for motivation and involvement of local stakeholders in socio-economic development of the area. It also includes publication of the RBMP at the project and SVP websites ([www.laborecuh.sk](http://www.laborecuh.sk), [www.svp.sk](http://www.svp.sk)).

During first half of 2009, Laborec Uh project will undertake public consultations of Čierna voda RBMP with local stakeholders. This will be good opportunity to discuss and involve local municipalities also in flood protection issues. It is expected that project will find monetary benefits for farmers to use the land for water flooding. Participatory process includes discussions with local stakeholders, specifically:

- public
- local self-administration
- Local thematic associations
- NGOs
- farmers
- State and public administration on local/regional/national level, mainly those involved in water management
- Water Management Authority – responsible for the RBMP development

Pilot testing of such activity on local level is valuable example for the state authorities, especially for the Ministry of Environment and can provide practical experiences when implementing European policies on local level and negotiate gaps or deficiencies of the RBMP directly with

local actors, which will be mostly affected by the implementation of WFD. Such information can be used for further formulation of state water management policies.

### **3. Project cycle management – UNDP requirements**

Since this activity is implemented on the project level, it is worthwhile to mention the monitoring tools which are used by United Nations Development Programme (UNDP)/Global Environmental Facility (GEF). Monitoring of UNDP/GEF projects starts at the project planning stage and continuously follows during project implementation. The key is to ensure efficient project management, project accountability and learning and feedback. The core advantage of UNDP/GEF projects is that the projects are results oriented and allow flexible revision of project outputs reflecting the current needs and changes of current environment during the project implementation.

#### **3.1 UNDP monitoring tools**

The basic project implementation and monitoring (M&E) tool is Logical Framework Matrix that provides a summary of most important project information:

- WHY the project is carried out (objective, outcomes)
- WHAT the project is supposed to produce (outputs)
- HOW the project is going to achieve the outputs (activities)
- HOW the success of the project can be measured (indicators)
- WHERE the data can be found (means of verification)
- WHICH external factors influence the project (risks and assumptions)
- WHICH inputs are required for the project (inputs/budget)

The Logical Framework Matrix is developed when formulating the project proposal and is reviewed on yearly basis during project implementation.

#### **3.2 Indicators**

Indicators are one of the parameters used in Logical Framework Matrix and are used to provide a simple and reliable basis for assessing change or performance. At the project planning stage, they must be accompanied by baselines and targets. Baseline and targets are values associated to the verifiers that define how much change the objective will achieve compared to the situation prior to project start. Intermediate targets (milestones) allow assessment of progress and benchmarks and can provide reference points or standards to define realistic targets.

Another important monitoring aspect is assessment of risks. Risks are factors that influence, or even determine, the success of the project, but lie outside the control of the project. They provide a basis for necessary adjustments. They can:

- Clarify the scale and scope of a result in the results framework
- Demonstrate progress when things go right
- Provide early warning when things go wrong
- Assist in identifying changes that need to be made in strategy and practice
- Inform decision making
- Facilitate effective evaluation

#### **3.3 Monitoring of project implementation**

Specific GEF M&E requirements during project implementation are:

- Quarterly project reporting, and includes revision of:
  - Risks and Issues
  - Activities
- Annual Project Reviews
  - Includes revision of target, baseline and indicators at the beginning of the year
  - Results are reported at the end of the year
- External Midterm and Final Evaluations
- Focal Area Program Studies
- Overall Performance Studies

## **References**

Čimborová, A., Minárik, B., Šeffer, J., Szabó, Š., Goriup, P. 2005. Integration of Ecosystem Management Principles and Practices into Land and Water Management of Laborec-Uh region (Eastern Slovakian Lowlands), UNDP/GEF project proposal, Bratislava.

European Commission (2000), Directive 2000/60/EC of the European Parliament and of the Council of 23rd October 2000 establishing a framework for Community action in the field of water policy, Official Journal 22 December 2000 L 327/1, Brussels: European Commission.

European Commission (2003) Guidance Document on the Identification and Designation of Heavily Modified and Artificial Water Bodies, Common Implementation Strategy Working Group 2.2, Brussels: European Commission.

Evaluation Office, 2002. Handbook on Monitoring and Evaluation for Results. United Nations Development Programme, New York, USA.

Giba, M. Et al. 2008. Čierna voda River Basin Management Plan (draft). Slovenský vodohospodársky podnik, š.p., Košice, Slovakia.