IWRM Action Hub

CASE STUDY

Transboundary: Water Management Plans for Slovakian-Hungarian Transboundary Groundwater Bodies

Summary

Climate Change is expected to have severe impacts on river discharges and water quality and quantity. In an effort to proactively find solutions to the current and future challenges of water, the project Environmental state and sustainable management of Hungarian-Slovakian transboundary groundwater bodies was initiated. The key lesson is the importance of evaluating all resources, including the links between groundwater and surface water.

Background

Projected changes in temperature and precipitation are expected to have severe impacts on river discharges and water resources availability. Temperatures are the most important drivers for the water cycle and changes in the parameters are expected to have considerable impacts.

During the last century temperatures have shown an increasing trend over Europe. Higher temperatures in winter mean that less precipitation will be falling as snow and snowmelt will be occurring earlier, thus changing the seasonal time of river discharge.

Summer precipitation is projected to decrease in southern, western and central Europe with drought periods becoming more common. Climate change will hence strongly change variability of summer climates both for precipitation and temperature.

Climate change will not just affect water quantity; low water levels can have a negative impact on water quality by bringing physico-chemical and biological changes. Higher runoff will increase pollution from diffuse sources, (e.g. capacity overloads of urban sewer systems), further deteriorating water quality.

On the other hand reduced water levels mean that pollutants will be less diluted. However, concerning the Hungary-Slovakia transboundary areas overall water availability is projected to decrease although not as drastically as in south and south-eastern Europe, in general.

Nevertheless, water management strategies need to adapt to climate changes that are distinguished at regional scales considering potential impacts in general.

Actions taken

In an effort to proactively find solutions to the current and future challenges of water, a project "Environmental state and sustainable management of Hungarian-Slovakian transboundary groundwater bodies (ENWAT)", supported by EU Initiative INTERREG IIIA was launched in 2006. The main participants of the ENWAT project were the Geological Institute of Hungary and Geological Survey of Slovak Republic. Geological Survey of Finland (GTK), Smaragd-GSH, Hungary and HYDEKO, Slovakia were subcontractors of the project. GTK was responsible for the water management plans. Comprehensive work has been done on delineation of the ground water groups, preparation of existing data sets for harmonization.

The main objectives of GTK were to create water management plans for Slovakian-Hungarian transboundary groundwater bodies: Ipoly valley, Bodrog region and Aggtelek-Slovakian karst, applying the hydrogeological evaluation and the regional hydrogeological model of the transboundary subsurface water-body groups, for the given scenarios of water usage and environmental impacts:

- Scenario I: Present or increased water usage under current climatic conditions
- Scenario II: Sustainable water usage considering the effects of global climate change, till 2050.

During the creation of water management plans, the following was evaluated:

- The trend of the relationship of surface and subsurface water, especially for ecosystems depending on subsurface waters
- The effects influencing the current water usage and the future possibilities and limitations of water production
- The effects influencing the chemical status of subsurface water, so that the present unfavourable influences could be stopped, that the expected adverse effects could be avoided, and that the necessary actions could be formed.

River basin management plans were made to cover the elements defined in Annex VIII of the WFD so that they can support the creation of the WFD required action plans. For example, Programme of measures is presented based on the hydrogeological evaluations and regional models in order to optimally sustain water management. Besides the WFD requirements, also other relevant EU and national (Hungarian, Slovakian) regulations and legislations were considered. Furthermore, additional information necessary for the successful completion of GTK´s work was gathered during two fact-finding travels to the research areas both in Hungary and Slovakia.

Outcomes

Water management plans were developed for three transboundary groundwater bodies in Hungary and Slovakia Ipoly River Valley, Bodrog River Region and Aggtelek-Slovak Karst. It also provided data on groundwater quality and quantity for decision makers as well as local inhabitants.

The characteristics of the river basin district and review of the environmental impact of human activity have been carried out by authorities. At the same time, physico-chemical parameters and the ecological indicators relevant for the surface water ecological and chemical status were also analyzed in Hungary-Slovakia. The physico-chemical parameters measured included mineral nitrogen concentrations, which do not suggest good status for any of the sub-catchments.

A research group also did a risk classification of Hungarian rivers according to hydromorphological risk led by Hungarian Academy of Sciences. The assessment has been carried out based on comprehensive analysis of the information available for the whole water body.

In general, the final classification of the surface water bodies in the study areas directly associated with groundwater bodies have important implications on the classification of the chemical status of groundwater bodies in central Europe.

The study signalled great need for consistent characterization of pollution spread and the risks for groundwater resources, which could be achieved by throrough sampling and perspective modelling on both sides of the border. Direct links and co-operation between regional, municipal authorities and expert organizations provide logistical advantages and save both time and financial resources, at the same time being prepequisites for successful implementation of the WFD. Particularly for management of pollution cases and in crisis situations requiring fast response and actions, the cross-border authorities should be familiar with information channels and communicating directly with their transboundary counterparts rather than appealing to high-level representatives as middle-men without practical knowledge of field conditions.

Lessons Learned

Cross border co-operation works better on the lowest possible level, i.e. local municipalities and expert organizations rather than on the higher level.

The problems with groundwater quality occur locally rather than at water-body scale. More so, localized pollution within a groundwater body does not mean that the groundwater body does not have a good water quality.

The results of water quality studies in Slovakia are consistent with the Hungarian studies of groundwater quality. The quality standards for nitrates and pesticides are exceeded in a few sampling points.

Using independent third party in preparing groundwater management plan gives a good overview of actual strength or weaknesses related to groundwater.

The observation in the nature protection areas in Aggleteki-Slovakian karst areas suggests that groundwater levels are getting lower.

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