Management of Transnational Groundwater Resources East of European Union – Challenges and Opportunities

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ABSTRACT

The climate changes affect the life of more and more numbers of people. This fact is clearly visible in water-related issues, where water is crucial medium for human life and living quality. Until recently, water management issues have been limited to a single area of the country. Now, statistics show that 60 million of EU citizens live at less than 25 km from the borders. That is why transnational cooperation is a key issue in the implementation process of Water Framework and Groundwater directives and to minimise the disparities in the status in national water management.

The paper present the main aspects concerning water management cooperation in the Bug river basin, comprising significant areas of Ukraine and Poland, which has been recognized by the international community as the area under the serious ecological stress. It is worth emphasizing that this river basin is also an eastern border of European Union.

The Science for Peace and Security NATO pilot study project "Sustainable Use and protection of Groundwater Resources - Transboundary Water Management - Belarus, Poland, Ukraine" and other scientific activities aimed at identifying and solving environmental problems in Bug river basin. The main principle of SPS NATO project is to prepare an expert platform for discussion about rational groundwater management and the efficient way of protection of transnational resources in Central and East Europe. The first steps to identify the main problems have been done, but there are many challenges to be undertaken. Among others there are the legal aspects of environmental activities cooperation in riparian countries to be solved, as well as preparing united methodology for research and measurement carried out in transnational area need assignment.

Developing of groundwater research and water management issues will be a great opportunity for the region to strengthen the environmental protection activities as well as understanding of those issues in local society. On the other hand solving transnational water related problems of eastern EU neighbours require understand and assistance of worldwide community to implement common standards there.

Key words: transboundary area, water management, Bug river basin, groundwater monitoring

1. INTRODUCTION

Groundwater resources play a tremendous role in Poland and increasing trend of its use by households is observed form 80s in last century. Groundwater resources will be of increasing significance for the domestic economy in the future because surface waters - the main water source used by humans over ages - become progressively more contaminated. Now in Poland 70% of water use is based on groundwater. Generally over the last 35 years the per capita quantity of globally available freshwater has decreased by about 30% and now amounts to 7,300 m^3/year.

Water is crucial medium for human life and living quality. Water has profound importance for biodiversity and protection of water resources and is a prerequisite for environmental sustainability. On the other hand it is highly relevant for regional economics as well.

The history of interest in water management issues on transboundary scale is a relatively new phenomenon, which kept growing during the last few decades. These issues include globalization, the development of civil society and an increasing competition among economy sectors for limited natural resources. In a transboundary context water management is much more complex and multifaceted than water management within a single country.

For a long time the knowledge of water resources protection has been wide spread, but the activities in that field were not complex enough because of lack of specific law instruments. Now when the Water Framework Directive (2000/60/EC) was introduce in 2000, water has been defined as

a not commercial product like any other, but rather a heritage which must be protected, defended and treated as such. Complementary statements concerning groundwater protection against contamination as well as its status deterioration were established in the Groundwater Directive (2006/118/EC). Transnational cooperation is a key issue in the implementation process of those directives and to minimise the disparities in the status in national water management.

When Poland signed the accession treaty with the European Union in 2004, it was automatically obliged to comply with tasks specified in the existing European directives and now water management in Poland is based on European policy (Water Act). But Poland is also east border country of UE and divide Bug and San river basins between Ukraine and Belarus. Both neighbors use different definitions and terms applicable to the issues of water protection and management.

2. INTEGRATED GROUNDWATER MANAGEMENT IN BUG RIVER BASIN

The history of cooperation on border waters has a long track, but it was mainly focused on surface waters. The cooperation on groundwater had rather bottom-up form, non-institutionalized initiatives developed due to hydrogeologists' meetings. In 2006 the new Science for Peace and Security NATO Pilot Study project "Sustainable Use and protection of Groundwater Resources - Transboundary Water Management - Belarus, Poland, Ukraine" has been launch (Nałęcz, 2010).

Figure 1 Bug River Basin area

Integrated water management becomes a particularly complex challenge when two or more countries share a river and its drainage basin. The same situation we encounter on the territory of Bug river basin where three riparian countries Belarus, Poland and Ukraine manage water system (Fig. 1). The major challenge of the management of transboundary waters is that the waters must be manage in the contest of anarchy where is no single government to take control. There are different quality and quantity methods of research in every riparian country. Till now there have been some international projects aimed to cover that issue. Although most of the projects mainly emphasize the surface water management with little care of groundwater.

What distinguishes today's water management and makes the traditional, nationally focused solution less effective is the transnational and global character of many trends. That's why main principle of SPS NATO project is to prepare an expert platform for discussion about rational groundwater management and the efficient way of protection of transnational resources in Central and East Europe.

Project activities focused in the Bug river basin which is a border area between Belarus, Poland and Ukraine as well as eastern border of European Union. First of all it was very important to strengthen out the knowledge about water management systems in riparian countries. Very helpful in this case there were experience of other projects (Dobrovolski, at el., 2008; Zań, Goś, 2010) which have been done in that area. Gathering not only hydrogelogical experts, but introducing all participants of water management system will be a great advantage in accomplishing the objectives of the project. Presenting of different systems of water management and discussion enable understanding specific local problems and are the great goal for building up common transboundary water strategy.

The subsequent crucial element connected with transboundary issues is identification of the natural environment in the neighbouring countries. So a lot of activities were expended for presenting hydrogelogical and geological structures along the border as well as environment related issues.

The monitoring system is essential in a process of analyzing factors influencing water medium. The importance of building united transnational groundwater monitoring system was emphasised while project discussion. The coordinated measures should include other means aimed at achieving a good ecological status of waters and their reasonable management in order to protect groundwater resources and the environment.

Based on the measurements done by Polish-Ukrainian team comparison of probes taking methodology as well as chemical analyzes clearly indicate that considerable effort should be performed to establish united research systems (Nałęcz, 2010). There are two main levels which should be taken into consideration. Firstly field tests measurements equipment ought to be modified

and united. On the other hand the chemical laboratories in riparian countries should be equipped into high-tech machines. Only this will allow to fulfil international standards of water measurements.

3. CHALLENGES AND OPPORTUNITIES

As far as environmental issues are taken into consideration natural processes do not stop at borders. Transnational water management is the great challenge not only for riparian courtiers, but also for European or even global community. There is strong demand for starting coordinated activates in eastern Europe in the scope of water management. According to the NATO project, among many others, the major challenges could be enumerated:

- Identification of differences among groundwater policies of EU and eastern neighbours countries;
- Development of research concerning groundwater transboundary flow;
- Creating the transnational area monitoring system base on united methodology;
- Providing united, high quality on-site measurement tools as well as chemical analyzes equipment for the national surveys responsible for groundwater measurements;
- Establish international body responsible for integrated water management system in Bug river basin (procedures, reports, measurements);
- Creating common, available for all interested parties the geoinformation system for archiving, managing and presenting transboundary environmental information for decision makers as well as for scientists.

Water occurring in areas separated by conventional administrative boundaries can also be a reason of conflicts with a very different medium. One of the objectives of joint management of water resources in the transnational areas, inter alia, is to prevent such problems through the implementation of common solutions. That is why cooperation between riparian countries which divide river basin allow to understand common problems and create reasonable solution for all interested parties. Starting projects dealing with water management one should remember taking into account not only surface water, but also groundwater. There is no doubt that joint research are a challenge on a scientific, social and economic level, but on the other hand, addressing such activities provide opportunities to cope with the negative impact of climate change occurring in the environment, disrupting the natural water cycle. Pursuing the idea of sustainable development locally within each country should be remembered also for the establishment of linkages across borders. The cooperation of scientists from various neighboring countries supported by external experts will on the basis of homogeneous data from water monitoring prepare homogeneous, regional studies showing trends in the environment.

Cooperation on transnational areas is not only limited to the countries participating of NATO project. Lessons learnt during the NATO project show a great need to expand for the whole area of East Europe and focus on developing Integrated Water Management System in that transnational area. That idea should cover the whole of Eastern Europe, with the support of international programs (NATO, UNIDO, Eastern Partnership). There are many challenges in the Bug river basin related to water management, but on the other hand working on them in international expert groups is the opportunities to find united solutions. Management of transnational water is challenge itself because of amount of different issues, which should be taken into account. When the whole water system is considered including rainwater and groundwater the task is even more complicated. The first step to be done in Bug river basin in the close future is to unify the water law issues. Of course, the methodology resulting from scientific papers is fundamental element contributing to the achievement of objectives. However, equally important are international legal agreements between countries of the region constituting the legal basis for expert groups cooperation. EU experience in the field of cooperation on transboundary waters (The International Water Commissions) using also the local knowledge of the partner countries should in future lead to present fit for purpose solution. The efforts should be directed to institutional capacity building for one international body for water management tasks supervision in that area by the use of Integrated Water Management System. Establishment of

professional body as well as creation of the basement for the system is the next step for riparian countries to control their water issues.

The unification of water issues in Bug river basin will also help to identify and in the next steps to solve many environmental problems which affect not only to the water dependent ecosystem degradation. Among the most important issues the identification of environmental threats should be indicated. The knowledge of environmental hot-spots would supplemented by the integrated groundwater monitoring system. The permanent groundwater monitoring chemical components and a level of water table provided on the united methodology as well as exchange of information between riparian countries would allow to develop wider understanding of environmental processes which could influent human life standards.

4. CONCLUSION

The Bug river basin, comprising significant areas of Belarus, Ukraine and Poland, has been recognized by the international community as the area under the serious ecological stress. Working on transnational groundwater system could not be complete without taking into account the whole water circulation medium especially surface waters. It is a great challenge for scientist to work out the unified system of water issues monitoring as well as introducing the whole management structure and activities procedures. But on the other hand creating international projects and establishing a body for its management calls for enormous funds. That is one of the opportunities incorporate efforts to prepare basis for transnational scientific platform to solve regional water issues. The Bug river basin can be treated a test area and in future the project should evaluate into a regional one where more countries form the central and eastern Europe would be involved. Encouraging different groups of scientists from many European countries embroiled into close-subject issues to exchange their experience will also be one of the important benefit of undertook activities.

One should remember that Bug river basin is not only of tree riparian countries interest, but it is also an eastern border of European Union. That is why the scientific works on unification of water management system in that area should be fully supported by European society. Creation of united groundwater monitoring system in Bug river basin would be a test project to strengthen environmental initiatives in Eastern Partners countries. Today, when climate changes influence on our environment is well know, it is very important to solve transnational problems not only in areas of Europe, but also have a look at our neighbours. Unfortunately, due to the transition economies of Ukraine and Belarus, it is clear that these transboundary environmental problems requires assistance of worldwide community to implement common standards there.

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