

Application of data management tools at river basin scale: a case study of transboundary water management in Central Asia Programme

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Abstract

Growing competition between sectors and states, increasing signs of climate change makes water resources management in Central Asia a challenge. In fact this situation is more profound in transboundary river basins, where inter-sectoral competition is coupled with interstate aspects. Therefore, application of water resources planning, IWRM (Integrated Water Resources Management) principles in the context of transboundary river basins is the most crucial element for sustainable water management.

The case study presented in this paper implemented within the scope of Transboundary Water Management in Central Asia Programme (TWMP CA). TWMP CA programme is funded by German Foreign Ministry and it is the part of the 'Berlin Process', an initiative by the German Federal Government to support the countries of Central Asia in water management and to make water a subject of intensified transboundary cooperation.

Modern water management decisions use manifold data and information. Application of modern information tools: geographical information systems, mobile communication technologies, remote sensing tools, modeling and data bases could support better decision making in water sector.

The intervention on DM for IWRM has been launched at the middle – operational level where the daily data and information on discharge, flows, quantity and quality of water delivery is produced. At these level complex interactions between different actors (WMO, farmers, industry, local government authorities) for water management is observed through defining water limits, distribution amounts and irrigated agriculture.

The preliminary results of the DM for IWRM activities have shown that in the study locations success of the activities will help to improve performance of the WMOs on planning, distribution of the water resources. The data previously scattered around different water management levels are gathered and systematized, made accessible for water professionals and decision makers. The water professionals of WMOs are able to produce their regular weekly, monthly and annual reports from the Data Base established at their premises (figure 1).

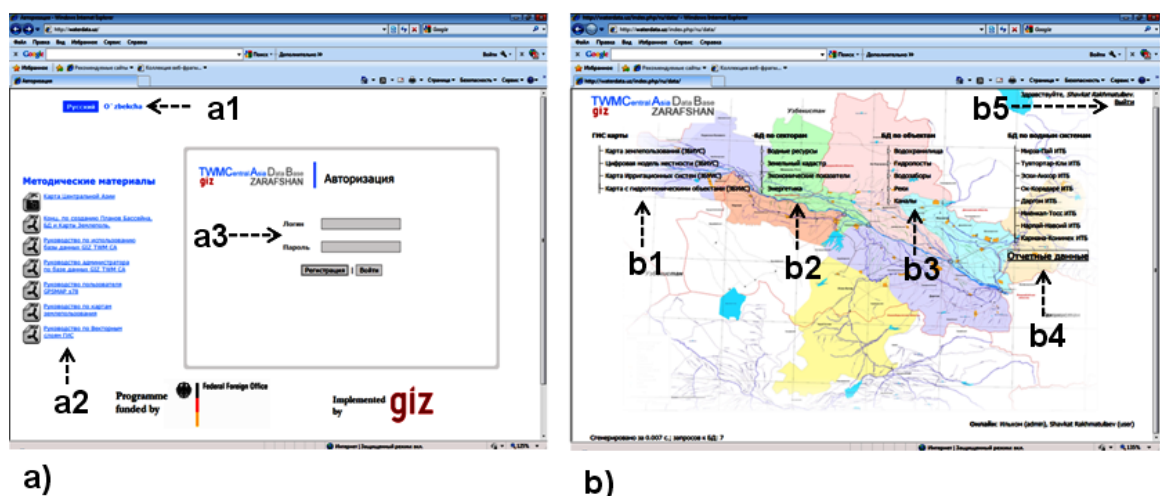


Figure 1. Interface and architecture of database

- A) Interface of main page of database; a1 – Language versions; a2 – Help menu; a3 – Login and password;
- B) Architecture of database; b1 – GIS based maps; b2 – dataset of sectors; b3 – dataset of hydraulic infrastructure; b4 – reporting forms and protocols; b5 – Administration and management menu

In 4 states out of 5 National Water Management Agencies (NWMA) decided to apply nationwide the results of the DM for IWRM activities. In future, wide spread of Data Management tools and approaches will help to enhance more transparent water management decision making, easing of the public access to the water related data and information. More transparent and publicly available data also makes cooperation of different sectors and countries dependent from the same water source much easier than it is at present state.

Conclusion

DM for IWRM activities in selected sites shows that there is DM for IWRM activities are still ongoing and therefore it is action in progress and more learning will be available upon completion of the activities. Yet there are still many challenges on practical application of data management tools in Central Asia, including:

- Diversified understanding of advantages of information technologies across Central Asian staff and decision makers of WMO
- Staff of WMO are generally technically inexperienced on database, GIS and RS tools
- The sub-basin WMO are often geographically dispersed and Internet/Intranet logistics should be carefully examined
- Digital databases should be stored centrally with full access to different users via Internet
- Internet infrastructure is poor for acquisition of large size satellite imagery.