Integrated Water Cycle Management in Kazakhstan

Tempus

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6.2 Management and Planning at River Catchment scale

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A basin – or reservoir – water system consists of a series of interconnected water bodies and hydraulic structures designed to ensure the rational use and protection of water resources. This includes the abstraction of waters from and discharge of wastewater effluents from agriculture, industry and the domestic sector into receiving water bodies: it is administered under a single water policy developed by the Government of Republic of Kazakhstan.

Basin management principle is a fundamental principle of IWRM

In the context of the river basin management, the operation of most of hydraulic facilities, as well as regulation of river flow and territorial distribution of water resources, are determined by a set of general rules for water resources use within the basin, regardless the location of specific water facilities, water consumers and water users. Firstly, it refers to water bodies and to intra-and inter-basin stream flows, which contribute to the regulation of the river basin as a whole. Each hydraulic unit in the basin is designed to regulate the contributing flow in accordance with predefined discharge schedules, calculated on the basis of the water basin management. Whilst the behaviors of water systems have certain autonomy within each basin, they characteristically interact at a basin level and are hence a kind of enlarged part of a larger basin system. Water systems of major river basins are accepted as major functional units, which serve as the basis for river basin water authorities. Small rivers are generally included in the control zone of river basin water management associations of major rivers. The Committee on Water Resources (CWR), a governmental organisation based in Astana, manages the use of water resources within the boundaries of all water basins and serves for the benefit of all sectors of the economy. A Basin Inspectorate on the Regulation of the Use and Protection of Water Resources has been formed in each of the 8 major river basins in KZ and regulates the use and protection of water resources within river basin boundaries. There is a Basin Water Management organization (BWM) within the CWR, which includes a Basin Inspectorate on the Regulation of the Water Resource Use and Protection for each of the 8 river basins. These Basin Inspectorates develop integrated water resources management plans and facilitate coordination between the stakeholders in each basin. These regional bodies of the CWR support an integrated water resources management and coordinate activities of the stakeholders in each the 8 major river basins: Balkash-Alakol, Zhaik-Caspian, Shu-Talas, Aral-Syrdarya, Nura-Sarysu, Tobyl-Torgai, Irtysh and Yesil.

The objectives of the regional bodies of the CWR are: 1) regulation of the water resources use to meet the needs of the population and industries, achievement and maintenance of an environmentally safe and economically optimal level of water use; 2) organization of the state control over the water resources use and protection.

The main functions of the regional bodies of CWR are: (Anonymous. 2010, Anonymous. 2013a)

1) support to integrated water resources management of hydrographic basin based on the basin principle;
2) coordination of the all parties of water relations on the use of water resources in order to achieve a positive economic effect based on reasonable, equitable and environmentally sustainable water use;
3) preparation and implementation of river basin agreements on restoration and protection of water bodies.
4) maintenance of public accounting, the State Water Cadastre and monitoring water basins;
5) the issuance, suspension and revocation of permits for special water use (e.g. for fire-fighting) in the manner prescribed by law;
6) determination of water use limits within the context of water users and the relevant basin;
7) participation in the organization and implementation of the competition for the provision of water bodies to individual or groups of uses;
8) participation with the Committee for Geology in the approval of underground water resources use?
9) harmonizing the complex water use and protection of the water sources of the relevant basin; harmonizing the rules of water bodies and operation of water facilities

10) formation of the Basin Council, consultations with the members of the Basin Council on the use and protection of water resources in the basin, the analysis of the recommendations prepared by the Basin Council, ensuring their implementation, forwarding recommendations of the Basin Council to concerned government agencies and water users.

The plans of complex use and protection of water resources in the basins (SCUPWR) are the basis of the implementation of IWRM in water basins.

The plans of complex use and protection of water resources in the basins (SCUPWR)

SCUPWR are data bases to support selection of optimal solutions for the design, planning and implementation of state, basin and regional programs aimed at sustainable use, restoration and protection of water bodies, including introduction of limits on water consumption and wastewater. The SCUPWR are specifically developed to support decision-making and the implementation of integrated water resources management approaches.

Table 6.2.1 Development of SCUPWR for water basins in the Republic of Kazakhstan since 2003

Number	Year of publication - Basin
1	2003 Ulken and Kishi Uzen
2	2004 – 2005 Ertish River
3	2006 - 2007 Yesil River
4	2006 – 2007 Nura River
5	2006 – 2007 Sarysu River
6	2006 – 2007 Tobyl River
7	2006 – 2007 Torgau-Irgiz River
8	2006 – 2007 Zhaik River
9	2007 – 2008 Shu River
10	2007 – 2008 Talas River
11	2008 – 2009 Syrdarya River
12	2008 – 2009 Ile River
13	2012 The General SCUPWR (16 volumes)

For the full-fledged implementation of IWRM The Republic of Kazakhstan will have to revise the established structure of the water management system and to shift to a new one, which is characterized by flexibility, dynamism and openness to continuous improvement, as well as based on the basin principle. These assumptions have been taken into account in the development and adoption of a new Water Code in Kazakhstan in 2003, and have been described in a number of new regulations governing the state water resources management. Thus, the key provisions of it are those which are devoted to basin agreements on rational use and protection of water bodies, as well as the creation of basin councils (Petrakov I. et al. (2007), Anomymous, (2005a), Anomymous, (2007)).

Basin Agreements

The basin agreements on restoration and protection of water bodies have been reached are between the river basin organizations, local executive bodies within each region (e.g. cities of republican status, capitals etc) and other entities located within the territory of water basins. Their aim is to integrate and coordinate water management activities, including the implementation of measures of restoration and protection of water bodies. The basin agreements identify each party's obligations, including specific protection measures to be taken in relation to agreed timelines. To achieve goals and objectives of the river basin agreements, individuals and legal entities (organizations) have to ensure funds availability based on the terms and forms established in the legislation of the Republic of Kazakhstan. These funds are intended solely for the activities related to the restoration and protection of water bodies.

Table 6.2.2 Overview of basin agreements for Basin Water Management in Kazakhstan

Number	Basin Water Management	Number of basin agreements
1.	Aral-Syrdarya	2
2.	Balkash-Alakol	absent
3.	Ertish	2
4.	Yesil	4
5.	Nura-Sarysu	2
6.	Tobyl-Turgai	1
7.	Shu-Talas	4
8.	Zhaik-Caspian	absent

Basin Agreements may be international (if they involve two or more countries) and/or domestic in nature (participating entities are representatives of the various structures of administrative units within Kazahkstan). These Basin Agreements are domestic (interstate) legal documents containing

mutual obligations of the parties to work towards water protection and water management. The agreements between the parties are currently voluntary and are based of equal terms. A prerequisite for signing agreements is a mutually beneficial cooperation between the parties.

Approaches to address the following issues are provided in the framework of the Basin Agreements and are including:

- protection of water resources from pollution, prevention of pollution transmission by water and restoration of water bodies to the best attainable status (chemical, environmental, etc.);
- prevention of the harm to the environment, economic facilities, property, life and health of the people from environmental excesses on water bodies;
- joint development and implementation of targeted programs of measures to ensure protection of water bodies and water resources;
- formation and maintenance of a monitoring system of water bodies; monitoring water quantity and quality in transboundary water bodies and regulated exchange of monitoring data.

Basin Councils

Formation of the Basin Councils is regarded as an essential component of an integrated approach to water resources management. They can provide necessary institutional framework for coordination of efforts of various categories of water users, public organizations dealing with water quality and other issues in management of water resources, land resources, environmental protection, and in ensuring drinking water quality,. It should be noted that practical and legal status of these basin councils are quite different in different countries (i.e. each of the transboundary countries sharing basins with Kazakhstan). In the European Union, the significance of the river basin management councils has increased following adoption of the EU Water Framework Directive in 2000 (2000/60 EC), given their significant role in coordinating the involvement of a wide range of stakeholders in the development, implementation, review and regular updates of basin water management plans on.

According to the Water Code of the Republic of Kazakhstan, the Basin Council is an advisory body established under the Basin Agreement. This means that it does not possess any regulatory powers, for example, it can approve neither legal documents nor generally binding regulations, also it cannot issue any permits (license) or carry out inspection activities or control state property. This agency is primarily intended to develop and make recommendations to the signatories of the Basin Agreement. The Basin Council in Kazakhstan, led by the head of the relevant basin authority includes the heads of local executive bodies (cities of republican status and Astana capital), heads of territorial bodies and representatives of water users. Basin Councils may also include representatives of public associations. The activity of a Basin Council is organized by the Basin Authority (Anonymous, 2005b). Currently, there are eight basin councils in the Republic of Kazakhstan, operating in the framework of the IWRM implementation of. In other words, there is a basin council in each of the water basins.

Basin plans for the IWRM implementation in Kazakhstan

The first IWRM planning program at a basin level in the Republic of Kazakhstan was developed and adopted between 2007 and 2009 by the Regional Environmental Centre for the Central Asia for the Balkash-Alakol Basin. Entitled "Integrated Water Resources and Water Conservation Basin Plan of Balkash-Alakol Basin", this plan has been developed jointly with China within the project of "Cross-border Dialogue and Cooperation in the Ile-Balkhash Basin". This project was a national component of the Program "Promotion of Integrated Water Resources Management and Fostering Transboundary Dialogue in the Central Asia" funded by a number of parties, including the European Union, the Government of Finland, and the United Nations Development Programme.

A brief overview of the Program is presented in "Sustainable Development of the Balkash-Alakol basin between 2007-2009 years" (Anonymous, 2013b). In summary the Program includes analysis of current trends in environmental and ecological status of water bodies in the Balkash-Alakol basin alongside with the measures for the rational use of water resources, ecosystem conservation, environmental improvement and social and economical development of the region. The paper uses scientific data to rationalize its proposals as to conservation of ecosystems of the Balkash-Alakol basin; stabilization of hydrological regimes and water levels of Lake Balkash; more efficient use of water resources; improvement of the social and demographic situation in the region; and creation of ecosystem

zones according to basin principles. In total the plan recommends the implementation of 39 activities, all of which have been implemented, including 9 scientific-research projects. Specific activities include assessment of the space-time redistribution of water resources in the basin taking into account environmental and social indicators. Further recommendations to improve basin systems of river runoff regulation and distribution have been proposed.

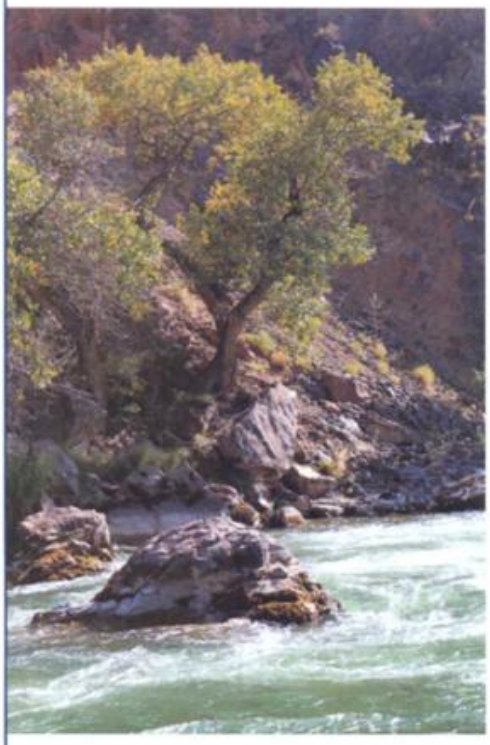
Review of the basin industrial companies has also been carried out in Alakol district. These involved identifications of the major sources of pollution and quantity assessment of the quality of air, water and soil. Assessment of the influence of anthropogenic factors on the health of the population in Balkhash-Alakol basin has also been carried out based on the development of database of the main demographic indicators (e.g. basic sanitation and environmental indicators) and overall morbidity of the population residing in the Balkhash-Alakol water basin region for the last 10-15 years. This database was used for the of the health status in the region contributing to a subsequent assessment of the role of production and economic activities. Mappings and hydrological information bases related to modern hydrographic networks were established. Patterns of relationships between ecosystem components and current states of biogeocenosis were analyzed, and the influence of anthropogenic factors on basin areas of Lake Balkhash and Alakol-Sasykkol was evaluated. Geographic Information System (GIS) data concerning the inflowing rivers with the contours of the watershed has been collected by the types of sources of incoming waters in the rivers.

The forecast of changes in water resources of Alakol basin is carried out and used as the basis of planning sustainable development of natural and economic systems of the region. Geobotanic maps of the basin environmental status were developed.

Extensive field work was undertaken to study the dynamics of ecosystems in the region. Analysis of the current status of ecosystems was provided based on the cadastral characteristics and cartographic materials developed using data collected during field expeditions and research, as well as satellite imagery data. Analysis of the economic use of water resources was conducted in the basins of the River Ile, Lake Balkhash and Lake Alakol. A map describing hydroecological situation in the Lake Alakol basin was developed based on the research data. A probabilistic forecast of changes in water resources of Balkhash-Alakol basin was developed. Data pertaining to hydrological regime and use of water resources in the Balkhash-Alakol basin was collected including the analysis of the water demands of various industries. Assessment of irrecoverable loss of water as well as water transportation losses was carried out. Assessment of the status of the irrigation systems in the region became possible due to creation of a scientific basis for mapping natural resource potentials and environmental conditions within the territories of the Balkhash-Alakol basin. Complete set of results of all the above studies is available in the Reports (Anonymous, 2013b). The programme implementation of the "Sustainable Development of the Balkash-Alakol Basin" was finalised in 2010. It's cost made up 58,6 million Tenge (that is about 400.000 U.S. dollars).

Conclusion

The use of basin principles approach is now the basis of water resources management in the Republic of Kazakhstan. As required under an IWRM approach, BWM organizations (territorial bodies that carry out strategic water management and coordination between the stakeholders.) have been established within each of the 8 water basins in Kazakhstan, and each BWM is going through the process of signing basin-specific agreements.



The 'Integrated Water Cycle Management (IWCM) in Kazakhstan' book is specifically designed to support Kazakh students and teachers to develop the broad knowledge base required to underpin a critical understanding of international best practice in water resource management. It innovatively integrates knowledge developed in international, European and Kazakh science and engineering about how to sustainably manage this finite resource with a clear focus on understanding and addressing the human challenges currently facing Kazakhstan and the Central Asian region through stakeholder engagement, risk communication and policy development.

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