

INTEGRATED WATER RESOURCES MANAGEMENT (The case of Central Asia)

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ABSTRACT

The Soviet period of the command system left for the Central Asian countries a legacy of under-funded multilevel bureaucratic structure of water administration and planning. A final water users, whose well being depended on (established by the government) unified water supply quotas and regulation of agricultural production (which consumption is above 90 % of total water withdrawal). Water management bodies were not accustomed, until recently, to acknowledge the initiative and participation of the public and rural community in solving water management issues. As a rule, water resources management bodies are functioning not taking into account the hydrographic boundaries, but administrative that affecting negatively the economy and environment. Therefore, this situation calls for principles of integrated water resources management (IWRM) in the region. The paper is discussing the ways for implementation these principles into practice.

Keywords: Water management, Governance, Institutional reforms, Efficiency, Productivity.

1. SITUATION ANALYSIS (WHY WE NEED IWRM?)

Unfortunately, until now in Central Asia, priority has been given to the basic needs of human beings for water and satisfaction of economic needs. As a result we can see the disaster of the Aral Sea and its coast: the lake has lost about 70 percent of its volume and 60 percent of its surface area, while water salinity has risen from 8 percent to 60 percent since 1960. There are huge processes of desertification (over an area of 1.6 million hectares). There have been heavy losses of biodiversity occurred: more than eighty common species have disappeared from the water fauna and flora.

Another problem is salinization and waterlogging on the irrigated area (approximately 5 million hectares require artificial drainage). Irrigation creates a return flow, which is a source of environment threats. This polluted water constitutes more then 30 percent of totally available water resources in the region. As a result there is growth of river water salinization, sometimes up to 1.5–2.5 g/L. A worsening of ground water quality, especially through the actions of the chemical industry, has also occurred in the region. All these factors have resulted in the proliferation of various diseases and an increased mortality rate in downstream reaches of the Syrdarya and Amudarya rivers, along with losses of natural productivity.

Water is already a limiting factor (not only in terms of volume, but also in terms of quality) for some zones in the Aral Sea Basin today. Competition for limited water resources occurs between agricultural, rural, urban, industrial, and environmental users in the region. On the one hand, irrigated agriculture is a major source for food security and simultaneously the biggest water consumer (about 90 percent of total water resources used for irrigation). On the

other hand, there are growing ecological, industrial, and municipal needs. This means that future sustainable development is under some stress. Also there is uncertainty about the possible impact of global climate change on water resources in the region. Over the last thirty-five years, the average temperature has increased by 1 °C and the size of glaciers in the Pamiro-Alay system has been reduced by 22 percent. Different scenarios predict a greater water deficit by the year 2020 as result of evaporation increase and a decrease of water resources of between 6 and 20 km³ annually (or 5–15 percent of total water resources). In this context, conflicts in water management could arise as the result of different national approaches to the planning of national development scenarios. It is desirable to establish proper interstate cooperation to promote unanimity in the conduct of the planning process for IWRM.

Water allocation approaches inherited from the Soviet Era do not take into account possible changes in the priorities of the former republics, which are now independent states. They all have distinctive water and land reserves and demands, sharply differentiated due to current – and especially future – issues related to securing per capita indices. The view of the Kyrgyz Republic and Tajikistan is that they were held back in Soviet times in developing irrigation, and that they need to reassess their future water share. Downstream countries wish to take into account environmental constraints, particularly water quality in the middle and lower reaches. In addition to this there is the possibility that growing water demands from Afghanistan (after stabilization of the situation in that country) could cause new requests for reallocation.

From the above-mentioned it is clear that there are a number of fields of potential conflict over water management in the region. Among countries and within countries these relate to water sharing issues: quantity, delivery schedules, and shares of expenses to cover water management costs within the basin, including upstream and downstream relations. Among sectors (irrigation, power generation and environment) there are concerns over water allocation, use of water reservoirs, and water sharing for the Aral Sea coastal zone and the rivers themselves (sanitary and ecological flows).

In order to avoid these conflicts, it is necessary to create an efficient framework for IWRM, including a legal and institutional basis for the fair and equitable sharing of the beneficial water, with equally strict regulations for all levels of organizations responsible for water governance in their activity on operation, management, and maintenance.

It should be noted that there are factors that obstruct IWRM implementation in the region. Among them are the lack of information transparency and lack of public participation in decision-making and proper communication systems among different levels of water related players:

- on the inter-sector level in each country and in region
- on the interstate level between water specialists and water users
- between water organizations and NGOs.

To establish proper mechanisms for IWRM it is necessary to concentrate activities on the following areas: (a) institutional straightening at the national and regional levels; (b) creation of a legal framework; (c) establishment of the proper financial mechanisms; (d) technical perfection and capacity building.

2. OBJECTIVES AND TARGETS OF THE IWRM

Based on the IWRM definition given by GWP (GWP TEC Background Paper No 4) it could be proposed the following practical understanding of the IWRM:

“IWRM is a system that bases on accounting of all available water sources (surface and underground) within hydrographic boundaries, coordinating inter-sector interests and all levels of water use hierarchy, involving all water users/stakeholders into decision-making, and rational water use to ensure sustainable water supply to the society and ecological security”.

Thus, from practical viewpoint the main tasks of the IWRM implementation in the region could be formulated as following:

- To restructure water governance bodies based on hydrographic principles within sub-basins or systems with linkage of water supply process in top-down direction and water planning process in bottom-up manner irrespective to administrative boundaries.
- To minimize hierarchic levels of management – that will led to minimization of unproductive operational water losses.
- To establish proper interconnections between national, provincial and district levels of administrative management to meet inter-sectoral interests in water at corresponding levels of hierarchy.
- To provide equal representation of all concerned parties/stakeholders in the processes of policy making, water allocation, water uses analysis and assessment, fundraising and O&M as well as public awareness – that will led to refuse from administrative pressure.
- To provide free access to information.
- To put environmental issues as a priority area of the water governance bodies concerns.

3. ACTIONS TO DATE

3.1 Status

Unfortunately, until 2001 there was not in the region any project addressed to the practical implementation of the IWRM approaches. The pioneer in this sphere is the interstate project titled "Integrated Water Resources Management in Fergana Valley". This pilot project was initiated in September 2001 aiming to achieve the following main goals:

- To propose different aspects of water management improvement and to demonstrate the ways towards integrated water resources management by evaluating elements of this concept on pilot sites, with participation of water sector specialists and water users. In other words, the objectives are to demonstrate usefulness of possible measures for reforming the water sector in Central Asian countries and show how the principles for IWRM can be applied.
- To demonstrate real opportunities for water and land productivity increase.

As a pilot area for the project it was selected the Fergana Valley, which is an ancient oasis where the age of irrigated agriculture and civilization, similarly like in India, Egypt, China, and the Middle East, is estimated at several millennia. The project activities organized in three provinces within the valley: Fergana (Uzbekistan), Osh (Kyrgyz Republic), and Sogd (Tajikistan). The project is mainly working along three main pilot canals and three pilot

WUAs - one in each country. For activities concerned with water and land productivity improvement the key project partners are 10 pilot farms located along the mentioned pilot canals.

The principal project executor is association of the International Water Management Institute (IWMI) and Scientific Information Centre of the Interstate Commission for Water Coordination (SIC ICWC). Donor of the project is the Swiss Agency for Development and Cooperation (SDC).

The following main outputs are expected after three years (before April 2005) of the project activities:

- The agreed-on concept of water management improvement in Fergana Valley applying the principles of integrated water resources management.
- New institutional framework for water management with participation of all stakeholders.
- Development of Water User Associations - as a form of self-managed organizations of water users, responsible for lowest level of the system, enabling development of new relationship between water users and water managing entities.
- Capacity building: (i) for water management staff of different entities; (ii) for WUAs professional staff; (iii) for creating a communication network for all participants; (iv) developing an information system and a set of models.
- 'A prototype' of a flexible legal base, regulating the implementation of water management improvements concept through pilot objects.
- Measurement system, ensuring sustainable and equitable water supply (tools - models and recommendations for water use plan design and their adjustment).
- Demonstrating all opportunities for water conservation and water and land productivity increases.
- Concrete proposals and recommendations to decision-makers for replication and up-scaling, based on project results.

3.2. Lessons Learned

The following is a summary of findings from the "IWRM-Fergana" Project Inception Report:

- Successful IWRM in the region could be achieved through a gradual *process of dialogue and development*.
- IWRM requires that *government* provides an adequate legal framework and acts as coordinator and regulator. It does not require that all water services should be provided by the government. Many water services can more efficiently be provided by user associations or the private sector. But coordinating bodies at the river basin level should be established by high levels of government.
- *Water rights* are weak, unclear, or poorly recognized.
- There is a shortage of pertinent *data* and data that is available is not shared or utilized optimally for making management decisions.
- There is already clear understanding that systematic *stakeholder participation* in planning, development, and management of water resources will lead to more successful outcomes.
- *Consultative committees and networks* may be sufficient to enable well-coordinated IWRM, even in the context of fragmented sectoral agencies. But this is true only if there will be a clear policy, legal and regulatory framework that is applied at the different levels

of management hierarchy. Also, a strong and stable government entity (such as a water ministry) can help ensure continuity and allegiance of parties concerned.

- There should be clear and effective arrangements to ensure fair and expeditious resolution of *water-related disputes*.
- Full cost pricing, the polluter pays principle, cost sharing requirements, and other *economic instruments* can be effective means for achieving social objectives in IWRM (compared with attempts to impose direct control through regulation).
- Compliance of organizations with agreed rules and regulations under IWRM requires that the roles of policy-making and regulation, water governance, management (i.e., provision of water services), and financing water services should be performed by different entities that are *mutually accountable* to each other.

4. FOCUS AREAS CONSIDERED AS THE PRIORITY AREAS

4.1 Legal Basis for IWRM

Legislation creates a basis for competent definition of responsibilities and rights required for proper institutions and mechanisms establishment. Juridical provisions like “Water Law” or “Water Code”, “Land Law” and other similar documents should promote effective state policy in water resources management. The priority should be done for:

- Definition of roles and responsibilities of the government, water authorities and other concerned parties in water resources distribution, management, use, development, conservation and protection;
- Clear definition of social, economic and ecological values of water;
- Definition of local communities roles and water users participation in restructuring and strengthening of water sector, etc.

Water legislation defines who is water owner, what are status and terms of water rights as well as a basis for their distribution. It establishes mechanism of dispute resolution and imposes obligations on society for water resources conservation and protection as well as IWRM financing. Legislation regulates monitoring, management and information exchange.

4.2. Support to Institutional Capacity Building

Existing shortcomings in water management can be eliminated and effective water use can be achieved via real regional and national water partnerships and integration of efforts in the following six directions:

- Integration of the countries’ efforts in water basin management and conservation through partnership at interstate (regional) level.
- Integration of economic and environmental interests through inter-sector partnerships in each state that take account of environmental requirements.
- Integration of water management system hierarchic levels through vertical partnership in the chain: “state – basin/system water bodies - water users.”
- Integration of water users and water management organizations through the involvement of water users at all levels of the water management hierarchy, as well as partnerships between governmental and non-governmental bodies.
- Integration of knowledge and practice through partnership of science with water users and water organizations (using such tools as base of knowledge, training, consultation, and extension services).

- Integration of international donors and regional/national bodies through coordination and partnership of international financial organizations and the countries.

4.3 Financial Aspects during Transition to IWRM

Presently, in the newly independent states there are different systems of national financial system of water sector:

- In some countries (like Uzbekistan and Turkmenistan) water management organizations of all hierarchic levels are funded from state budget;
- In some countries (like Kazakhstan, Kyrgyz Republic and Tajikistan) there is payment for water services and water management organizations are funded partially from the state budget and partially by water charges.

There is hope that in future under economy liberalization, open access to market, water users will cover full O&M costs. The most realistic approach is if costs of water services at all hierarchic levels will be based on assessment of actual expenses and distribution of costs between water users (WUA) and the government using effective institutional measures and incentives.

Common tasks for economic mechanisms development in water sector and for implementing them into practice are as follows:

- to provide sustainable mechanisms for financing and maintaining water management infrastructure and water governance bodies;
- to create incentives for government and water users to conserve water and to ensure meeting of environmental needs;
- to apply the “polluter pays” principle into practice;
- to create a mechanism of objective expenses and effects distribution at all levels of water distribution and use.

4.4 Public Participation in Water Management

Public opinion involvement into water management should starting from stage of strategic plans and projects, water allocation technology and ending by stage of licensing, disputes resolution both between water management organizations of different levels and between them and water users. It should be envisaged participation of the international public organizations (like GWP) and various local NGOs and mass-media representatives for maximum transparency. Communication system between water management organizations, WUAs and NGOs should be developed. Water users themselves should take active part in public awareness campaign.

4.5 Improve Access to Information

Extensive work done during 1996-2000 under the supervision of the EU in the TACIS-WARMAP Program made it possible to create an information system, though only at the regional level. At the moment, the major task is information service creation and development at the province, irrigation system, and WUA level on principles similar to the regional system, which will form a common database based on the pyramid principle with “information grids.” Such development has now started for the Fergana valley, with financial support from the SDC. We expect the participation of other donors in this direction, which should increase regional collaboration.

4.6 Training System

Following to the ICWC decision, and supported financially by CIDA, a regional Training Center was established in Tashkent in 2000 in collaboration with McGill University (Montreal, Canada). The main task of this center is to improve skills and, simultaneously, to bring together the positions of specialists from different countries. Monthly courses are organized as round table discussions. Last 2 years more than 700 specialists from five states attended three main courses on:

- problems of integrated water resources management based on hydrographic principles;
- regional collaboration on transboundary watercourses;
- Innovative practice in irrigated agriculture;
- International water law.

In future it is planned to prepare a set of new courses covering:

- environment protection issues
- problems of drinking water supply and sanitation
- problems of sustainable development of the power sector in the region
- modeling in water management and irrigation.

To improve integration and involve more participants, there are plans to organize training activities in four sub-regional centers: Dushanbe (Tajikistan) on the problem of intermountain plains and upper watersheds (supported by the World Bank); Osh (Kyrgyz Republic) on water problems in the densely populated Fergana valley (supported by SDC and IWMI); Kyzyl-Orda (Kazakhstan) on the problems of downstream waters and rice cultivation; Tashauz (Turkmenistan) on the problems of downstream waters and Priaralie (the Aral Sea coastal zone). It is planned to use these centers in combination with demonstrations in the field in water conservation and WUA development.

4.7. Consultative Services for Water Users/Farmers

The main goal of effective water management system is providing water to all water consumers and, in the first line to increase agricultural production. Main indicator of effective water management is equal water allocation among water consumers and timely water supply according to water demands. Water productivity in irrigated agriculture is main criterion of effective water resources management in arid climate. To achieve high irrigation water productivity it is necessary to create water account (measurement) system at all levels of water use, to define crop water consumption rates. Extension services should be established to assist water users/farmers to implement new technologies and innovative methods of production on the basis of water use. These services should solve not only water, but also agro-technical issues.

5. CONCLUDING REMARKS

Water management is effective when water used produces a maximum benefit and water is equitably distributed within the hydrographic boundary amongst various needs and levels of society, while maintaining the vital ecosystems. Key goal of the new incentives in Central Asia - creation of new institutional and technical structure in water sector, which will enable different groups of people with different interests to peacefully agree and coordinate actions

on water use regardless of administrative boundaries and bureaucratic interests. It can be expected that needed improvements will be reflecting on:

- Legislative base that regulates water resources management system;
- Economic tools and financial regime (market relations, prices, credits, investments);
- Capacity building and strengthening of potential of new management system (communications, information exchange, model planning and analysis tools, training);
- Improvements in the organizational set-up, jointly with Water User Associations (removing bureaucratic barriers, mutual responsibility);
- Technical development (SCADA, water allocation automation along main canal that will lead to reduction of water losses and water supply equity, further enhancement of water conservation and water productivity at various levels);
- Distributing the experience from the pilot objects over the whole Central Asia.

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