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Global Water Partnership
Central Asia and Caucasus

CHALLENGES AND ACTIONS FOR INTEGRATED APPROACHES

Central Asia:
Position for the 4th World Water Forum

With support of the Japan Water Forum

Japan Water Forum
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Background

Central Asia covers territory of five countries: Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan and Uzbekistan. It is situated in the heart of the Eurasian continent with the total area of 3,882,000 square kilometres and the population of over 53 million (2004). It borders with Afghanistan and Iran in the south, with China in the east and with Russia in the west and in the north.

Central Asia is an unique region with a wide variety of ecosystems, including the highest ranges of the Pamirs, Tyan-Shan and Altai mountains, the vast deserts and steppes, large ancient rivers and a lot of lakes including the lake Issyl-Kul is one of the world's most beautiful and deepest lakes. The regional ecosystems play an important role in maintaining the global environmental equilibrium and hydrological cycle.

CHALLENGES AND ACTIONS FOR INTEGRATED APPROACHES

Central Asia: position for the 4th World Water Forum

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Available water resources have always principal impact to the economic activities in Central Asia as limiting factor for development which is competing with ecological requirements. The largest rivers over the region are mostly transboundary and they are the following: the Syr-Darya and Amurdarya (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan), Chu and Talas (Kyrgyzstan and Kazakhstan), Tarim (Kyrgyzstan, Tajikistan, China), Ili (China, Kazakhstan), Irtysh (China, Kazakhstan, Russia), Ural, Ishim, Tobol (Kazakhstan, Russia).

Social-economic development of the region has depended on water and land resources since immemorial time. Irrigated farming and livestock production formed the biggest part of welfare, but in the same time created vulnerable conditions and water limitations for ecosystems. The region started actively using irrigation in the 6-7th century B.C and still it is one of the biggest irrigation region in the world (with about 8.9 million hectares of irrigated crops). Population growth and economic development have significantly increased the demand for water in the region especially during the past 40 years. Actual surface and underground water withdrawal in Central Asian countries varies from 20% of available water resources (Kazakhstan, Kyrgyzstan, Tajikistan) to 80-90% (Uzbekistan, Turkmenistan).

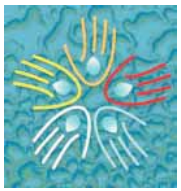
Water is the key factor for the well being of Central Asian countries. Availability of clean water will determine the quality of life and the future development in the region. These countries are united through the ecosystems of the water system. Any changes in water use of one country will inevitable affect the interests of the other countries. The need of a modern, but common system of management for the Central Asian is rooted in the nature itself and requires the working out and development of mechanism of cooperation towards integrated approaches.

Framework Directions towards the 4th World Water Forum

WATER & ECO 2005

The regional program towards the WWF-4 under a slogan: “Kyoto's Spirit on the Way to Mexico” was initiated by Scientific-Information Center of the Interstate Commission for Water Coordination (SIC ICWC) with facilitation from the GWP CACENA in November 2004. The program was officially approved at 41st ICWC meeting in Almaty on April 27-29 2005 during the International Conference «ICWC towards to the 4th World Water Forum: Local Efforts to Prevent Water Crisis». The Conference agreed the principal regional actions within this program with focus to the priorities existed at the different levels (transboundary, national, basin, local). The priority framework themes (compatible with themes of the WWF-4) are the following:

1. Integrated Water Resources Management



This theme aims at formulating and implementing practical actions to develop IWRM in the region.

IWRM is a system for management of water, land and other linked natural resources within a hydrographic basin or its part, based on accounting all types of water resources (surface, ground and return) and matching interests of different sectors and levels of hierarchy by involving all stakeholders for sustainable development and environmental stability.

The adoption of IWRM should mostly result in recognizing in practice its mechanisms for water management that includes not only organizational issues, but also managerial ones, along with a certain art to apply these rules in different conditions in the region. The states in the region are on the way to broadly implementing an IWRM concept. This concept has been recognized by Water Law in three of the five states, and some pilot projects have demonstrated success of practical approaches to IWRM innovations. The current actions are supported not only by governmental water agencies, but also by most stakeholders and NGOs. The major regional experience and lessons in implementing IWRM are to be submitted to the 4th WWF in form of a special brochure “IWRM in Central Asia: lessons and practical results”. Now it is being prepared under the direction of SIC ICWC in association with GWP CACENA, based on the results of numerous pilot projects (“IWRM in Fergana Valley”, “IWRM in Amudarya and Syrdarya Lowlands”, “National plan for IWRM and efficient water use in Kazakhstan” and others) and theoretical approaches developed by authors.

2. Water for Food and Environment

From time immemorial, water serves as a source of life, food and survival for population in Central Asia with its arid climate. In deserted region only irrigation makes it possible to form convenient living conditions, create a

planning and implementing such measures. During extremums, they should take the role of “conductors” in anti-risk actions in basin, system, and canal. Therefore, at the current stage of the IWRM-Fergana Project, a special activity direction was stipulated to develop such measures. We hope that these measures would contribute to elaboration of a model for similar actions.

The regional process of preparations for WWF-4 was organized in the form of open virtual dialogue around the above-listed themes and perspectives using regional information portal (www.forum.cawater-info.net). Also there are widely disseminated in the region a number of brochures and monthly published bulletins “Towards the 4th World Water Forum”.

regular snow observations in spring are absent, and free exchange of information is not maintained. Project of the Regional Hydrometservice is stuck in difficulties related with conciliation. Hydrometservices in a number of countries just boycott such exchange. ICWC's web-site includes hydrometeorological information and runoff data that are obtained only from Hydrometservice in Uzbekistan and two BWOs. Naturally, financial aspects of collaboration and exchange should be settled since damage caused by the extremums is much higher than these costs. Improved accuracy of long-term forecasts, particularly under drought conditions could allow farmers to plan, in advance, other crops or even leave some fields non-cropped so that to use maximum water for irrigation of the most profitable crops;

- Organization of a system for early warning. Here we have excellent example a USAID-equipped satellite transfer of information directly from loggers installed in two gauging stations in Syrdarya. Operator and BWO's leaders can take emergency measures in advance, i.e. within the limits of flow advance time, to re-regulate flow. If such equipment was installed in gauging stations located in transboundary rivers, the efficiency of control of extreme phenomena would be improved rapidly;

- Widespread formation of public opinion to understand such measures and phenomena. Here, awareness of both water-management organizations and water users should be raised. Both of them should improve accuracy of water distribution, organize control over reduction of losses and apply water rotation under shortage conditions. Active work of public water use organizations such as basin committees, Committees for Systems of Canals, WUA Boards, and groups for distributors established at WUAs is of great importance in this respect;

- Organization of training and education for both water-management organizations and particularly water users in adapting to drought conditions: stricter irrigation dating; transfer to limited, against optimal (to 20 %), water supply; alternated furrow irrigation, etc. The activities undertaken by SIC together with the McGill University within the framework of CIDA's project in Kazakhstan, Tajikistan, and Uzbekistan demonstrated that farmers may adapt to temperature and moisture changes as well as shorten, to some extent, growing season of one crop under general prolongation of vegetation conditions in region to spread cultivating double crops. However, for that farmers should be aware and prepared by training and in financial terms.

One must not forget that many water bodies are subjected to a risk of earthquakes and obstruction. The centuries-old history of rivers and water sources shows a lot of such examples (Usol landslide formation of Sarez lake; mentioned Ainy blocking; failure of rock-dammed lakes in Shakhimardan). It would be advisable to organize, within the Ministry of Emergencies, a special monitoring over the state of such risk-bearing places together with an early warning system.

Under the present conditions of global terrorism threat, one must not forget about a risk of deliberate deactivation of the key structures. In this context, it is necessary to improve guarding and security of large waterworks facilities and develop a strategy for probable inactivation of any elements of water-management systems and their switching over to other water-supply sources.

At present, the main and first-priority task is to organize at all water hierarchical levels development and preparation of coordinated measures in case of extreme events so that to avoid non-coordinated, fragmented actions of different water-related sectors. Here water-management organizations should play a leading role in

shady place where man could normally stand unbearable heat, and provide conditions for water supply to fields and gardens, vineyards and farmlands giving food to human beings for life and activity.

That is why irrigation, needed to satisfy growing population, caused a great irretrievable water withdrawal from rivers, groundwater and local sources, thus changing the initial character of environment. As early as 300-400 years ago, for these reasons a number of rivers and tributaries in the Aral Sea basin lost their ties with the main sources, and changed into disappearing closed water streams. Deltas of small rivers were lost: Tedjen, Murgab and Zarafshan broke away from Amudarya, and Chui, Talas and Kattasai from Syrdarya. Deterioration in water environment and the whole nature was especially sharp in the latter half of the 20th century when irrigation development reached a large scale up to 150,000 ha a year, as a result both irrigated area and water withdrawal from rivers in the region increased nearly twice.

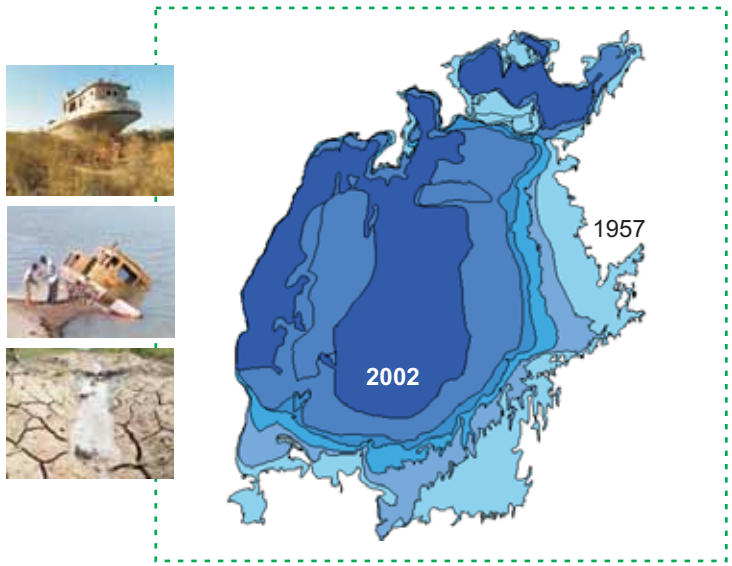
Table 1. Main indicators of water and land resources use in the Aral Sea basin

Indicators	Unit of measurement	1960	1970	1980	1990	2000
Population	million	14.1	20.0	26.8	33.6	41.4
Irrigated area	th. ha	4510	5150	6920	7600	7851
Irrigated area per capita	ha	0.32	0.27	0.26	0.23	0.18
Total water withdrawal	km^3 a year	60.61	94.56	120.69	116.27	105.0
including for irrigation	km^3 a year	56.15	86.84	106.79	106.4	94.66
Specific water withdrawal per hectare of irrigated area	m^3	12450	16860	15430	14000	11850
Specific water withdrawal per capita	m^3 a year	4270	4730	4500	3460	2530
GDP	USD billion	16.1	32.4	48.1	74.0	55.4
including agricultural production	USD billion	5.8	8.9	18.3	22.0	15.0

Since 1960 the Aral Sea has decreased in size and area, the former sea bottom desiccated, Priaralie undergone desertification, delta been lost. These processes are described in detail in studies done by SIC ICWC under two INTAS projects, which show that total damage from environmental degradation of the sea and deltas with socio-economic losses exceeded 260 million US dollars.*

The other environmental consequence of irrigation development was a sharp worsening of river water quality. The irrigation of saline and waterlogged lands with inadequate natural outflow caused a need for creating a drainage network, a system of collectors, which, as recipients, would correct river channels under the condition of intermountain depressions. Water for leaching and salt aeration of lands, passing through “saline groundwater reservoirs”, returns to rivers with salinity a few times higher than the initial. Water in mid- and downstream reaches of our rivers became saline containing 1.5 - 2.2 grams of salt per liter.

The present state of water supply to irrigated lands with their low efficiency and poor management while weakened control and attention by the government and water users does not facilitate improving the situation. Though in the period from 1992 to 2002 some steps were taken in reducing total water withdrawal for irrigation, first of all, owing to introducing water charge, by 2005 the situation in regard to water withdrawal amount has even worsened as a result of surplus water in the last three years, but as for quality it has slightly improved.



* INTAS - RFBR - 1733 “Assessment of socio-economic consequences of the Aral desiccation disaster” - 1998; INTAS 2001-0511 “Restoration of ecosystems and bio-productivity in the Aral Sea area with scarce water resources”

years 2002-2003 could not improve the situation. Only in 2004, agriculture in those areas achieved the level of 1999.

Consequences of the unbalanced pressure on the atmosphere, as known, refer to climate change on our planet as well. Humans, by disturbing the balance of relationship between the ground, atmosphere, oceans, forests, vegetation cover, particularly regarding pollution generation and dispersion, have generated a hazard of climate change. Under such conditions, we have already faced some effects: rise in temperature by 1 °C over the last 50 years; reduction of glaciers by 20 to 35% in different regions. However, an increase in extreme values over the past 15 years is probably the most dangerous in view of water professionals. 3 humid years and 2 extremely dry years were registered from 1990 to 2005, same as for the period 3 times longer - from 1950 to 1990. Hence, water sector and water users should be ready to prevent both water shortage and floods. The current year (2005) also gave notice about the need to struggle against floods in the Syrdarya basin, as well as regarding deighish (destruction of banks as a result of river water) and ice jams on the Amudarya river, and visually demonstrated a possibility to prevent floods through adequate management. At the same time, we can draw a lesson that if such situations occur, it is necessary to switch immediately to emergency regime of agreed water releases (not to increase already high flood load) and not to delay, at governmental level, transfer to critical regime, as was the case.

The adaptation of water-management system to increased floods and droughts, as well as to other extreme cases, requires developing and implementing integrated measures aimed at preventing and mitigating such events. Here, it is first necessary to draw attention to the following:

- Development and implementation of strategic actions of all basin and water-management organizations for coordination under flood and drought. Though floods are quite frequent and droughts are rare, nevertheless, every time flood management is an initiative of the downstream countries together with BWO. When increased flood in winter time, for example in 2004-2005, Kazakhstan undertook purely clear measures to be ready to releases to Syrdarya downstream in an amount of 800 m3/s, build up dams in Kzyl-Orda, and reconstruct Aklak waterworks facility. Nevertheless, under an approach of 1600 m3/sec of water to Chardara reservoir, several meetings of managers from water agencies for the Syrdarya river were organized to coordinate every step of actions. At the meetings, issues on degree of reduction of releases from Toktogul, amount of fuel to be compensated to Kyrgyzstan, on releases to be reduced from Kairakum, amount of water to be distributed in midstream irrigation canals, etc. were solved. Such actions could be scheduled within regular interactions of the states under various situations and various rates of natural runoff. Similar set of measures and schedule should be developed at regional and national levels for various degrees of drought (i.e. attraction of additional ground and collector-drainage waters, size of limitations, possibility to negotiate water limits, etc.);

- Abrupt intensification of activities aimed at improving water forecast accuracy and accounting. Undoubtedly, epy accuracy of forecasts is critical for extreme events. However, to improve the accuracy, we need coordinated actions of hydrometeorological services (hydrometservices) regarding estimation of snow stock, state of glaciers and weather conditions, as well as timely exchange of information. Unfortunately, except for rehabilitation of observation station for Fedchenko glacier, other stations at glaciers (Medvezhiy, Abramov) are inoperable,

The first-priority measure in this direction should be completion and approval of the regional and national water strategies that were left non-completed under the GEF project "Water resources and environment management improvement in the Aral Sea", adoption and signing by the states of the state of Agreements setting rules of development and interactions in the region as concerns transboundary water, and approval of the First-priority action plan.

4. Risk Management

Natural disasters always trapped humans and caused great damage, losses and led to a need for relevant protective and rehabilitation measures. It is obvious to all of us who live in sharp arid zone, where it is a routine phenomenon that during natural drought the temperature in a shady place exceeds 50 °C, and in winter it sometimes drops to minus 35 °C. Central Asia has a lot of zones, where storm winds of more than 40 m/sec are usual and local population consider them as something unpleasant but unavoidable and reinforce roofs of their houses and board up their windows during critical periods. Many of us remember drought in 1974-1975, catastrophic flood in 1969, earthquakes in Ashkhabad in 1948 and in Tashkent in 1966, landslide in Ainy in 1964 that blocked Zarafshan channel, and numerous snowdrifts and avalanching. However, humans just increase hazards and risk of disasters and contribute to their extended scope and frequencies.

From the point of water management, we should clearly understand consequences of our unwise actions and demonstrate that their effects are more complex and dangerous than natural disasters and changes. Typical example is origin and results of water scarcity in 2000-2001. Whereas Central Asian states and water-management organizations in the Syrdarya river basin (particularly due to the role of BWO "Syrdarya") managed to quite equitably allocate water among upstream, midstream, and downstream and, under water shortage level of 80%, ensured 75-85% of water supply to all systems, quite a different situation was observed in the Amudarya basin. Given average flow probability of 75-78% throughout the basin, upstream and part of downstream received more than 80%, while downstream was supplied within 50%! Northern Karakalpakstan received only 35% of water. Such damage to downstream was not observed even in the catastrophically dry years 1974-1975. The impossibility to control the river to a required extent and hydroegoistic actions (sometimes supported by the national governments with respect to downstream and, as thought, less effective water users) led to losses of national income in these areas that even the next two wet

The urgent problem is how to combine in the context of interstate management of the Aral Sea basin and other basins in Central Asia the growing need for products of irrigated agriculture with the need for sharply raising the environmental significance of water, find and release required water volumes for the deltas, for the rivers themselves as water use subjects. It is necessary to reach a compromise between irrigation and natural resources use, under the condition that it is practically impossible to reduce irrigated lands in view of their great socio-economic importance in arid zone.

The suggested way out can and should be based on change of thinking style and water use methods to improve relationship between society and nature.

In water use, user should be focused on achieving potential water productivity in irrigation, as well as in other water uses. Today, actual water productivity of, for example, farmers and grain producers varies between 1.3 and 2 m^3 per kilogram of grain with potential water productivity amounting to 0.8 m^3/kg. Right here reserves are laid at least 35-50% of water use for receiving the same crop yields. Add large water losses as a result of weak controllability, discrepancy in water supply at the turns of water hierarchy and so on. If all these reserves be involved, it is possible to confidently free at least 25-30% of water for nature. We don't need any more! If one would have managed to ensure nature at least 25-30 km^3 out of 118 km^3 available water resources, it would be enough our river become clean and productive rivers, not runoff ditches, and the deltas of our rivers would made us glad with fish, musk-rat, plenty of birds and green tugai woods. For that it is necessary:

- to transit from water management to water requirements management;
- develop Extension Service for farmers, which will enable to provide them with tools for economical and rational water use;
- confirm and strictly follow environmental requirements at national and regional levels in territories of the countries as well as interstate agreements;
- on this basis, restore the deltas and provide sustainable flow to the Aral Sea. Kazakhstan gives a good example in this respect, completing the Small Northern Sea Project, developing the project in regard to management and worsening of the Syrdarya river delta. Activities on the Amudarya delta are being implemented much worse;
- introduce everywhere principles "receiver pays" and "polluter pays";
- organize transboundary return flow management through BWOs, and internal return flow management and use through national basin authorities;
- attract stakeholders to protection of small rivers and water-protection zones;
- create a system for water and environmental monitoring, first of all, water quality recording;
- and support public awareness of water management on the way to transition to "hydro-ecological principle of management".

We call all stakeholders to discuss and suggest in these matters.

3. Water for Development

This theme aims at strategic planning of future development in Central Asia. Problems related to it are in the center of interests of all the countries in the region, and they concern the major strategic decisions of the countries. It is necessary to determine how the economy in the whole region will be developed, what role will be given to agriculture whole and irrigated agriculture in part in this future development, in what direction the irrigated agriculture will be developed, and what water policy will be pursued in Central Asian states in this connection, what position will each state take in strengthening interstate cooperation.

Development work done under the GEF and WARMAP (EU-TACIS) projects showed that each country has its views and hopes for irrigation development, which do not often agrees with capabilities of the region and come into conflict with interests of other countries in the basin. Kyrgyzstan and Tajikistan think their interests in previous water management, use and protection master plans for river basins were infringed, and in this connection in future they have right to increase irrigated area on a considerable scale, especially Tajikistan, where the area of irrigated lands per capita is less than 0.1 ha. Though the irrigated area per capita in Turkmenistan and Uzbekistan is higher, these countries are also planning to increase the area of irrigated lands. Hydropower development planned by upstream countries constitutes the second major direction of growth, very important for these countries because of shortage of carbonate raw material supplies. However, the transition of separate rivers with high-capacity reservoirs of long-term and seasonal regulation from the previous irrigation regime to energy regime has led to appearance of certain temporary water deficit in summer and water surplus in winter. In case of construction of additional hydropower units in the basin and export of energy generated by them beyond the region (China, Pakistan and others), it may raise cause a complicated situation with water supply to other sectors and countries in the basin.

Development work done under the joint project “Strategic planning of IWRM in Central Asian countries” (with the assistance of UN-ESCAP) revealed principal influence upon the strategy and direction of future development of definite destabilizing factors existing in the region:

- growth in population and majority of rural population (more than 60% in all the countries except for Kazakhstan, where this proportion is less than 30%);
- possible growth in water withdrawal from Amudarya in Afghanistan is several times larger than at present;
- change in possible water resources for use in the future, according to different forecasts, amounting to between 4 and 30% in the coming years under the influence of climate change. Reduction in volume of glaciers represents a special hazard in future, which after 2030 may sharply reduce glacier component of natural runoff;
- growing environmental needs of the basin of countries, especially in downstream areas owing to construction of complexes of water bodies there and adequate growth of ecological understanding of population.

Future economic development of the six countries (including Afghanistan) in the basin under these conditions will depend on respect of the countries in the region to mutual interests, aspiration of countries for jointly solving prospective problems through cooperation, political will and aspiration of the governments to develop a water saving concept for their development and implement their own water, economic and social policies. The components of this concept should include:

- Analysis of availability and actual use of different water sources, a special attention to use of return waters. For example, Israel derives 25% of its total water withdrawal from domestic sewage through treating and transporting them via special pip[lines to place of consumption. In our region, the volume of used return water does not exceed 15% of their amount. Meanwhile, step-by-step construction of water system represents large opportunities for such use directly as well as in combination with fresh water. The same reserves are available in use of weakly saline groundwater;

- Permanent reduction of specific water use in all water use sectors with focus on approaching to potential water productivity, which can be achieved by implementing a policy of water requirement management in addition to introduction of IWRM. Today, specific water use for production unit in Central Asia is larger by two times than in Jordan and Israel, and by 30-40% than even in India and Egypt. A good example is given in the region by Turkmen water organizations, which over the last 8 years increased the irrigated area by 20% not increasing total water withdrawal;

- Approval of major directions in development of regional water use, including joint construction of interstate hydraulic facilities, areas of planned irrigation development, measures to reduce unproductive losses of transboundary water. Joint management of both surface river water and return water is of particular importance since the management is important for maintenance of sustainable water supply in the region, both in terms of quality and quantity. By improving accuracy of water supply from transboundary sources through implementation of SCADA system in all transboundary structures and organizing satellite-based collection and transmission of information on transboundary gauging stations may reduce operational losses at basin level and ensure stable water supply at the upper level of water hierarchy, where the losses refer to cubic kilometers of water.