

Interstate Commission for Water Coordination of Central Asia

Global Water Partnership Caucasus and Central Asia

Towards to 5th World Water Forum

“Bridging Divides for Water”

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INTRODUCTION

It is necessary to give credit for strategic wisdom of the political leaders of Central Asian countries who, already in September 1991 - one month after disintegration of the USSR, have initiated the meeting of national ministers of water resources. In Almaty, on February 18, 1992, after discussing the issues related to establishing the Interstate Commission for Water Coordination (ICWC) and preparation of the agreement between the Republic of Kazakhstan, the Kyrgyz Republic, the Republic of Tajikistan, Turkmenistan and the Republic of Uzbekistan on collaboration in the area of joint management, use and conservation of inter-state water resources, they have signed this agreement. Approval of the agreement by Heads of five states on March 23, 1993 at their summit in Kyzyl-Orda has demonstrated to the whole world their political will to collaboration. In January 1994, Heads of the States have approved the Aral Sea Basin Program (ASBP-1), which envisages the major directions of works for strengthening collaboration in the region, and the concept to tackle basin socio-economic and environmental challenges. Both documents created the platform for activity not only the ICWC but also for other regional organizations that were established in the frame of IFAS (International Fund for Saving the Aral Sea): the Executive Committee and National Branch Offices, Interstate Commission on Sustainable Development (ICSD), and Regional Hydro-Meteorological Centre. Declarations adopted in Nukus, Dashoguz, and Dushanbe and follow-up inter-state agreements (1997, 1999, and 2002) allowed developing the inter-state collaboration in the area of transboundary water resources management. The agreement on water-energetic resources management in the Syrdarya River basin, signed by Kazakhstan, Uzbekistan, and Kyrgyz Republic in 1998 and later by Tajikistan, played a central role in developing the cooperation of water management and hydropower organizations.

International financial institutions and agencies for international development of many countries such as the World Bank, Asian Development Bank, UNDP, UNECE, GEF, ESCAP, OSCE, USAID, CIDA, Swiss International Development, GTZ and many others, as well as many target projects financed by the EC (TACIS, EuroAid, Regional Programs), NATO, INTAS made a valuable contribution to strengthening the co-operation of our countries. It should be also noted the active participation of international non-governmental organizations such as the World Water Council, Global Water Partnership, Asia-Pacific Water Forum, International Network of Basin Organizations and many others in strengthening the regional collaboration and relations.

Main Challenges and Actions towards the Fifth World Water Forum

Water issues and actions to address them

There are a number of challenges for sustainable water resources management in Central Asia, which are predetermined by the following destabilizing factors:

- *Population growth*, although its rates have reduced in comparing with the last quarter of 20th century, makes up not less than 1.5% per year resulting in annual population increase in the amount of half a million people, that even at a minimum water supply rate that equals to 1200 m³/year/person require about 700 million m³ of additional water resources annually;
- *Urban population growth* and expanding urbanized areas at the expense of irrigated lands causes the additional need in water resources and, at the same time, necessitates replacing them with new irrigated areas;
- *Changes in crop pattern* due to restructuring of large farms and tendency to receive second crop yields and produce high-valuable crops;
- *Raising environmental awareness* promotes fulfilling the requirements to maintain ecological flows through rivers into their deltaic areas;
- *Climate changes* that are exhibiting increasing crop water requirements and more often recurrence of extreme flood and drought events;
- *Progressing variations of world prices on agricultural produce* against increase in prices on agricultural inputs makes the irrigated farming quite low cost-effective, but under the need of developing irrigation due to its high social significance in the region (about 60% of rural population).
- *Increase in use of hydropower potential* through construction of hydropower stations on upstream river reaches, strengthening the competition for water resources mainly due to shifting the water use regime towards the interests of maximum hydropower production, especially in winter time, for satisfying own consumption and export of electric power with the purpose of receiving extra revenues.
- *Possible increase in water withdrawals from the Amudarya River by Afghanistan* after the stabilization of political situation in this country.

A number of *internal challenges*, which characterize consumption factors and can be controllable, first of all, due to the introduction of IWRM in the region, should be added to the above:

- *Ignoring proper managing of water*, as extremely scarce resource, at the level of state governance;
- *Lowering an accuracy of flow rates measurement*, resulting in water losses in river channels, which have risen almost two times!!!

- *Aging and obsolescence of water infrastructure* at all levels of water management hierarchy leading to unproductive water losses and deteriorating the controllability;
- *Low level of capital investments to rehabilitating and upgrading water infrastructure;*
- *Increase in the amount of water users; and*
- *Insufficient financing O&M organizations resulting in loss of skilled personnel.*

With the aim to find proper way to overcome the most of the above-mentioned destabilizing factors the Central Asian countries organized the Regional Preparatory Meeting of the Fifth World Water Forum, which took place in Bishkek on 28-29 May 2008. The meeting was hosted by the Ministry of Agriculture, Water Management and Processing Industry of Kyrgyz Republic, the Ministry of Environment and Forestry of Turkey, the Interstate Commission for Water Coordination in Central Asia and the Global Water Partnership Central Asia and Caucasus. Ministers from Kyrgyz Republic, Turkey, Tajikistan and Turkmenistan attended to the meeting. Presentations were made by Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan and Turkey, as well as by the representatives of the ICWC, EC IFAS, and regional offices of SDC, IWMI and ADB. Roundtable meetings followed by about 200 experts from the 13 countries sharing similar problems were fruitful and provided guidance for managing and protection of water resources to meet human and environmental needs.

Finally, the four major topics were formulated as main outcomes of the Bishkek meeting, for which follow-up activities towards WWF-5 were agreed. These are the following:

Topic 1: Climate change impact to water resources in Central Asia

Climate change, population growth, industrialization, urbanization and deforestation create huge stress on the water resources of the region. Understanding the effects of the climate change is central for developing regional and national adaptation strategies. Water storage and integrated water management are important elements in that respect. CO₂ emissions should be decreased by using renewable energies, hydro-energy in particular. Re-use of the waste water and utilization of the modern irrigation techniques are essential for water saving. Furthermore, public awareness should be created on the adaptation strategies. Hydro-meteorological data and information should be collected regularly. Observation, measurement and monitoring networks should be improved. The scale of tasks and problems on mitigation of influence of the climate change is rather great and covers almost all spheres of the human life. This problem in aggregate with the drying Aral Sea should be given the priority attention in the region. Mitigation and overcoming of these crises require mobilization of the efforts of all stakeholders and more harmonious cooperation of the Central Asian countries.

Topic 2: Basin management and transboundary cooperation

The region is relatively rich in water resources, but there are many transboundary rivers. Trans-boundary dialogue and cooperation in the region for the last 16 years has permitted to avoid any serious conflict for water delivery to different states and zones, even in previous water scarce and flooding years. Nevertheless, the existing cooperation among the countries of the region is not sufficient and must be improved. Although political will generally exists, the lack of understanding and confidence at the technical level is the main barrier to enhance cooperation. Regional program of consensus building dialogues at different levels could be developed so as to merge different views and positions. Exchange of reliable data and information is crucial. Furthermore, international mechanisms should work coherently to strengthen and advance trans-boundary cooperation. Cross-sectoral interests of hydropower, irrigation and environment requires strengthening of legal and institutional framework of cooperation, same as use of financial tools that would account of sharing benefit, expenses and compensation of damage. This calls for comprehensive basin development plans, which need to be developed with stronger participation of all riparian countries and should be based on IWRM principles. Promotion of regional and sector dialogues oriented specifically towards long-term development of the region as a whole and stronger adherence to agreements by member countries is a must in order to merge different sectoral and country priorities on water use with the interest of society and nature. The Chu-Talas experience can be taken into account particularly in small trans-boundary rivers. Inter-national Commissions should be established by the riparian states in order to manage trans-boundary water resources in an equitable and sustainable manner. Integrated water management plans could be developed at the basin level. However, good management of water resources at the national level is central at first. All stakeholders should be included in this process and bottom-up approach need to be followed.

Topic 3: Water resources governance (organizational aspects of efficient water management)

Water resources management and governance should be reformed in the region. Content and phases of the reform, from the decentralization point of view in particular, is as follows:

- Transboundary level (Aral Sea basin, agreements, strengthening of organizations on regional/basin level, ecosystem demands, economical tools – cost and benefits sharing, information exchange, water demand and limitation)
- National level
- Basin level
- System level
- Water users association level

Decentralization of water resources management in line with the economic reforms, mostly in agriculture sector, requires the tools and instruments for all inclusive (states, sectors and stakeholders) and good governance such as:

- Institutions
- Legal and regulatory framework (development and harmonization)
- Economic tools (what is state share and what are the boundaries of responsibility, financial mechanisms – tariffs, subsidies, privilege loans, incentives for water saving and resources protection)
- Technical and technological aspects (hydrometrics, automation, water allocation tools)
- Environmental needs (pollution control, ecological releases, water protection zones)
- Capacity building (equipment, training, including study tours).

Integrated water resources management is an important concept for bridging water users (sectors, states, downstream-upstream), water providers (states, decision makers, sectors) and stakeholders.

Topic 4: Capacity building and education

Training of the trainers is crucial in the region. Furthermore, education of the technical people as well as the women and children is central. Integrated training programs could be developed at the regional level. Joint and reliable hydraulic and hydrological data bases should be established. Information exchange on the standards ought to be ensured. Technological innovations should be followed regularly. Partnerships can be developed for capacity building. New models and techniques should be applied in order to utilize water resources in an equitable way. Strengthening regional cooperation, particularly in the Aral Sea Basin, could include the following:

- Institutional and legal aspects
- Training activities
- Information systems and data base
- Integrated water resources management
- Introduction of the automation systems
- Modelling tools for decision support systems.

Furthermore, public awareness and concern on water issues should be created. NGOs involvement and media attraction are essential to this end.

Progress on political commitments

On 10 October 2008 in Bishkek Heads of Central Asian countries using opportunity to meet within framework of the Commonwealth of Independent States had a discussion addressing regional cooperation on water-energy issues. There was confirmed one more time willingness for regional cooperation in this sphere. Also, there were achieved certain agreements and given orders to relevant national authorities to develop and sign within two weeks period inter-governmental documents to regulate among all five countries water-energy issues during winter season 2008-2009. There are preparations for launching the new EC IFAS arrangements during special regional meeting, which will be held on 17-18 November 2008 in Almaty. All these events show promises for new positive impulse to regional water cooperation.

Way Forward

The GWP CACENA, as one of the recognized regional driving forces on the way forward to the WWF-5, is trying to conduct sub-regional preparations in line with policy and activities of the ICWC – leading regional body responsible for real-time water management. Using outcomes of the Bishkek Conference (May 2008) as a basis – GWP CACENA supported preparation of the National position papers for WWF-5, which were drafted by members of ICWC and passed governmental expertise in all five countries. These papers are presented in this book.

On agreement with ICWC the GWP CACENA submitted proposal for Central Asian session to the Virtual space of the WWF5, which was adopted by Organizing Committee of the Water Forum. The GWP CACENA achieved agreement with Ministry of Foreign Affairs of Finland about proper financial support in 2009, which will be allocated via GWP CACENA Secretariat to cover part of costs for Central Asian delegation to World Water Forum in Istanbul in March 2009 and to support follow-up activities after forum during 2009.

REPORT OF THE REPUBLIC OF KAZAKHSTAN

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Water and Millennium Development Goals

In terms of water availability, Kazakhstan is one of the most water scarce countries on the Eurasian continent.

Due to climate characteristics of the republic, up to 90% of the annual runoff in steppe rivers refers to spring, while 70% of the annual runoff in the mountainous rivers – to summer.

In normal year, water quantity of the republic is estimated to be 100,5 km³, whereas water available for economic uses amounts to only 43 km³ out of the total quantity, and about half of this quantity (44,0 km³) is formed outside the country.

The unit water availability is 37 thousand m³ per 1 km² and 6,0 thousand m³ per capita a year in Kazakhstan. Moreover, water situation is not uniform throughout the republic. There are both water abundant regions, for example, the Irtys River basin (East Kazakhstan province) and water scarce regions (Mangistau province).

The state of water use

Currently, the mean annual water consumption by national economic sectors is about 20-24,8 km³. In early 90-s of the last century, this value was about 36,1 km³. The decrease is related to unfavorable flow probability conditions, as well as to on-going structural reforms in economy.

The main water users in Kazakhstan are agriculture, industry, and domestic sector.

Use of water for domestic and drinking needs. Satisfying drinking and domestic needs of population are of first-priority in water use. In the last decade, water withdrawals were more or less stabilized and amounted to 800-900 Mm³.

Actual unit domestic and drinking water consumption averages 167 l/day per urban resident and 68 l/day per rural resident.

There are problems of good-quality drinking water supply almost in all provinces and urban centers of the country. On average, 70-75% of urban population is provided with tap water and 15-18%, with water from decentralized sources. The centralized water supply of rural settlements was ensured previously through construction of local (for one settlement) and group (for a few settlements) water pipes. All large water pipes in rural area were operated and subsidized by the government for their maintenance.

At present, many rural settlements have refused from the services of group water pipes due to technical problems with their operation. Moreover, numerous settlements were disconnected from water-supply by operating organizations due to regular non-payments. The coverage of population with centralized tap water is 75.2%; decentralized sources, 21.0%; open reservoirs, 1.6%; and, water imported from outside sources, 2.2%.

In the Strategic Development Plan of the Republic of Kazakhstan by 2010, the reduction of water shortage and the improvement of water supply are strategic objectives of the government for given period of time.

To this end, a number of program documents are envisaged. One basic document, which regulates activity in drinking water supply, is a sectoral program “Drinking Waters” for 2002-2010. Besides, financing of measures for provision of settlements with drinking water is realized within the framework of the State Agricultural Land Development Program for 2004-2010 and the Small City Development Program for 2004-2006.

Initially, 115 billion tenghe were planned to allocate to the Program. However, changes occurred during the first stage of implementation necessitated to revise its major points. Given Program underwent an independent expertise, including of foreign experts, who assessed positively the first stage and recommended to revise the Program towards increase in financing and wider coverage of settlements to be provided with improved water-supply systems.

According to the Decision of the Government No.956 of 16 October 2007, the sectoral program “Drinking Water” was modified and amended and its updated version was approved, with financing in an amount of 300 billion tenghe, of which 168.8 billion tenghe to come from the republican budget.

The program will ensure that all settlements, where reconstruction and repair of water-supply systems is needed, be embraced and imported water use and unsafe water consumption from open sources be excluded. This will allow meeting the challenge of guaranteed provision of population with safe drinking water.

Use of water for industrial needs

Industrial water consumption is about 5 km³/year on average at the withdrawals of 5.8-7.8 km³/year. Heat-and-power engineering, non-ferrous metallurgy, and oil industry account for larger portion in water withdrawal. Recently, according to the UN

Review “Water Resources of Kazakhstan in New Millennium”, industrial water use has also tended to rise by 0.8-1% per year on average.

The use of fresh water per unit production stays high due to poor application of water recycling and water reuse, unsatisfactory conditions of water-distributing system, and low coefficient of efficiency. Currently, up to 40% of water purified for drinking needs is used in industry.

The prospective industrial development is seen in the reduction of water inputs per unit production through wider application of water recycling and reuse.

Use of water for agricultural needs

The major water user is agriculture, the total use of which is about 13.8 km³.

Irrigated agriculture and then liman irrigation have heavier weight in water consumption. Regular irrigation is based mainly on surface runoff and developed widely in the south and south-east areas of the republic.

The analysis of water use shows that irrigation norms and losses in the networks have increased in some zones. The main reasons of ineffective water use are weak application of modern farming technique, bad technical conditions of irrigation and water-distributing systems, deterioration of equipment, lack of water-conservation technologies and water monitoring. Those reasons contributed to deterioration of water quality in sources, salinization of irrigated land, and intensification of desertification.

Use of hydropower resources

In contrast to water consumers (irrigated agriculture, industrial-domestic and agricultural water-supply), hydropower is a water user, which utilizes water energy through creation of water head by constructing diversion (storage) dams. At the same time, hydroelectric power stations (HEPS) use river water and do not pollute them.

Hydropotential of the republic is about 170 billion kWh/year, including: technologically usable - 62 billion kWh; economically usable - 27 billion kWh, of which more than 8.8 billion kWh/yr is used currently.

In order to transfer to more sustainable methods of water resources development and management, the World Summit for Sustainable Development in Johannesburg (2002) called the countries to develop Plans of integrated water resources development and of water efficiency in order to promote achievement of development goals such as poverty reduction, food security, intensive economic growth and ecosystem preservation. This also implies a number of other challenges to be addressed, including preventing of negative water impact, mitigation of drought, improvement of access to safe water and sanitation, as well as problems of growing competition among users and water scarcity.

In this context, within the framework of United Nations Development Program (UNDP) under support of the Norwegian Government, Department for International Development (DFID) and Global Water Partnership (GWP), the Program of Integrated Water Resources Development and Water Efficiency is developed (hereinafter - Program).

Given Program will be a fundamental document containing specific plan of priority actions for the improvement of water sector management.

Basin Councils have been established in all river basins, and specific work has been started on signing of basin agreements on restoration and protection of water objects in order to integrate and coordinate activities of different water users - governmental and non-governmental entities.

Kazakhstan started to develop Master Plan of Integrated Water Resources Use and Protection in River Basins that are the basic strategy of sustainable water use. The Master Plan considers basin as an indivisible ecosystem with population, productive forces, water, energy, mineral, biological and other resources. The Master Plan is planned to be finished for the whole republic by 2010.

The key word in the integrated water resources management (IWRM) is “integration”.

One of the forms or types of integration is the integration of water managers, water users, and NGO. Basin Councils should unite efforts of the latter in order to achieve efficient use and protection of water resources. Water management is easier to accomplish if staff of Basin Water Administrations (BWA) understands the needs of their “clients”, i.e. water consumers and the community.

Since the Basin Council is established at BWA for the development of recommendations for BWA, and activity of the former is planned by BWA, the staff of the latter should play the key role in activity of Basin Councils. In order to sustain good environment, they should enable water users, community and water managers to negotiate together and discuss in detail water use issues and probable negative effects for aquatic ecosystems and for the nature in general.

Another form of integration is the integration of economy, community and environment or ecology. So far, decision making on water management was based only on economic interests. However, now we understand well that the long-term sustainable economic and social development is impossible without conservation of good environment for human. Subsequently environmental degradation will lead to decreased economic and social activity of population as was the case in Prearalie. The Department for Nature Conservation, non-governmental environmental organizations that support poor and vulnerable population and others will be represented in Basin Councils. This will allow the balancing of economic, environmental, and social needs in making water-related decisions.

Another important aspect is the integration of water and health. All rivers, aquifers and other water objects became more polluted or vulnerable to inadequate decision making regarding water quality. This affects the health of the population. Kazakhstan’s Sanitary and Epidemiological Service and other agencies responsible for water

monitoring in relation to water safety for the health are aware about the problems of polluted water sources. Those problems are caused mainly by industrial plants and utility companies that discharge wastes partially or not treated at all. Now, the representatives of industrial plants, municipal services and health-care services in Basin Councils will have a possibility to address the problems, come to an agreement at managerial level and put the public health needs into the agenda of round-table discussions.

The industry plays an important role in water resources management, therefore the integration of water and industry in Basin Councils is critical. The industry plays a dual role: it is a water consumer, on the one hand, and a potential polluter, on the other hand. As a driver of the economy, the industrial sector is significant for well-being of the community. However, as a polluter, this sector creates bad environmental conditions for the health. Basin Councils will enable the industrial sector and other basin stakeholders to discuss together ways to solve the pollution problem. In international practice, raising of public awareness about major polluters of water sources and of environment through Basin Councils leads to the information pressure on polluters and forces them to reduce waste discharge and apply best technologies.

It should be noted that agriculture, same as industry, is a major water consumer. Agricultural effluents polluting water create environmental problems as well.

All those issues can be solved at meeting of Basin Councils.

Information is a critical area for integration. Reliable information is needed for good water management. Basin Councils will be comprised of people from provincial organizations who have information and are kept informed in area of water management. Basin Council will decide which kind of information should be accessible for other stakeholders. The Councils themselves will start to identify areas, where information is scarce or unreliable and inadequate, and make decisions on the improvement or expansion of an information system. Moreover, relevant organizations should take measures to implement decisions made by Basin Councils.

Integration of water quantity and water quality is another key component. Until now, these two elements have not been considered in an integral way. Meanwhile, the only effective way to keep river or any other water object healthy is an integration of those two elements in water management. The Basin Council will exactly be an institution, which serves for discussion of such issues and search for a balanced solution.

Integration of surface and ground waters is seen as a priority component of the integrated water resources management as well. There is no a formal space where BWA and Geological Department can meet together and participate in the development of water management plans. In most basins, these two organizations communicate with each other and share information; however, there is no essential component such as “joint use of surface and ground waters”. In this context, Basin Council will be a formal place, where the organizations can work on the improvement of equilibrium between these two water sources.

There are also areas of water and land interaction, therefore the integration of these two elements of water and land is also a substantial aspect. The integration in this case indicates that watershed area should be protected in order to conserve water

resources. Land management here implies regime of the use of water-protection zones and belts for economic activities.

In the same line we should address the pollution of surface and ground waters due to inadequate control of solid wastes (garbage) and, particularly, the harmful practice of sewage tanks (ponds, fields), which receive contaminated effluents from urban areas.

In order to address water conservation challenges, the Water Code was supplemented by a rule, which obliges users diverting water from natural sources to equip intake structures with water meters since 2009. For enforcement of this rule, in 2008 it is planned to develop a feasibility study of creating the information system of on-line water control. Given system will receive water meter readings transmitted through up-to-date communication channels. This will allow the flexible and efficient water distribution and bring the state water control to higher technological level.

In order to implement water saving technologies of irrigation, the subsidizing of irrigation water cost is increased from 25 to 80% for those agricultural producers who apply mechanical watering, including drip irrigation.

Legal and regulatory mechanisms of water supply in the Republic of Kazakhstan

The economic and social development of Kazakhstan largely depends on sustainable functioning of the water sector. In turn, the efficient protection of water resources and their rational use to a great extent depend on legal regulation of water relations.

The main directions of national development in area of water resources are set out in the Development Strategy of Kazakhstan up to 2030 and the Strategic Development Plan of Kazakhstan up to 2010 approved by the President's Decree No.735 of December 4, 2001.

Within the framework of the Strategy-2030, for the mid-term future the Government approved the "Conception of water sector development and water policy in the Republic of Kazakhstan by 2010." The main tasks under the public water policy as set in the Conception include the development and implementation of programs in the following lines:

- efficient use and protection of water resources in large river basins;
- water supply, control of level and salt regimes in internal and marginal water bodies (Balkhash, Aral, Caspian Sea);
- implementation of water conservation technologies, recycling and closed water use in industry and agriculture, reduction of operational water losses, equipping of water system with modern metering and regulation devices;
- national strategy in area of international cooperation in joint transboundary water use.

In 2003, a new Water Code was adopted and replaced that of 1993. The Code is intended to settle the issues related to:

- public policy in area of water fund use and protection;
- regulation of water relations;
- ensuring of legal framework for support and development of sustainable water use and protection, including from natural and man-caused pollution by harmful chemical and types of pollution;
- definition of basic principles and directions of water fund use and protection;
- regulation of relations in area of investigation, exploration, rational and integrated use and protection of water resources and hydraulic structures;
- responsibility of state agencies, physical and legal entities for implementation of measures to prevent and liquidate negative water effects from floods, water-logging, destruction of banks, protection dams and other structures, that refer to emergencies of natural and anthropogenic nature.

As to quality of water objects, the Water Code stipulates new approaches to regulation, based on target indicators of water and criteria of water quality, as well as on gross standardization of all water-related activities within the boundaries of given basin, waterway or site. At the same time, implementation of these new requirements concerning regulation of water quality will take a lot of time and huge efforts for the development of appropriate standards and their enforcement.

The Law about Environmental Conservation sets out the issues of conservation of water resources as an environmental object.

A number of provisions and regulations dealing with water relations are included into the Land and Forest Codes. In particular, the Land Code contains specific chapter on lands of water fund, which includes lands under water bodies, hydraulic and other water-related structures and facilities, as well as water-protection zones, belts and sanitary protection zones of intake structures for drinking water-supply. The provisions of Land Code regulate specific issues related to ownership of these lands, the procedure of their allocation and use, restrictions for their withdrawal, etc.

The Law about Rural Consumers' Cooperative of Water Users contains provisions regulating relations during the process of water supply and consumption between physical and/or legal persons - the members of rural consumers' cooperative of water users and state agencies and the non-members of given cooperative.

The Code of Administrative Offences and the Criminal Code establish liability for offences, violations in area of environmental protection and natural resources (including water) use.

Legislative acts regulating relations in area of prevention and elimination of water-related emergencies include also such laws of Kazakhstan as on "Natural and Anthropogenic Emergencies", "Civil Defense", "Rescue Services and Status of Rescuers", "Fire Safety", "Industrial Safety of Hazardous Facilities", "Mineral Resources

and Their Management”, and “Sanitary and Epidemiologic Well-Being of the Population.”

Many issues connected with public management, use and protection of water resources are regulated by subordinate acts also. In particular, the following issues are regulated through Government Regulations:

- public planning of water fund use and protection;
- state water monitoring and control and water inventory;
- regulation of water relations between provinces;
- issue of permissions and licenses for specific water use;
- water use charges;
- drinking water supply;
- protection of water resources from the adverse effect of and the regulation of economic activity impacting conditions of water objects;
- legal status of some water objects, with specific use and protection regime;
- subsidizing of some water-supply systems, etc.

One topical issue of water law in Kazakhstan is the legal regulation of drinking water supply. For sustainable provision of people with drinking water in adequate quality and quantity, the Government of Kazakhstan approved the sectoral program “Drinking Waters”. The program activities cover about 4 million people, including urban population of more than 3 millions. Based on the program, provincial akimats (local governments) developed regional (provincial) programs “Drinking Waters”, “Taza Suu”, and “Sapaly suu”.

Besides, a draft of the Law on Drinking Water is developed currently. Given draft should set basic provisions in legislation regarding people’s access to drinking water. Yet those matters are regulated mainly by normative acts (State Standards, sanitary regulations and standards).

Practically all normative documents regulating water quality are of departmental nature. The norms of maximum allowable discharge and of maximum permissible concentration of pollutants in water sources are set by sanitary and epidemiological services of the Ministry of Health upon agreement with the Ministry of Environmental Conservation.

The parliamentarians of Kazakhstan developed draft laws, such as on Water Supply and Discharge, on Amending and Supplementing the Water Code of the Republic of Kazakhstan.

The draft law on water supply and discharge establishes legal, economic, and institutional frameworks of the public policy on water supply and discharge in the republic.

The draft law on amending and supplementing the Water Code establishes legal, financial and other grounds for the development of normative legal and normative-technical acts in area of water supply and discharge. It also gives more detailed defini-

tion of concepts used in the Code and of jurisdiction of an authorized body in area of water fund use and protection.

In area of water supply the following international agreements were signed within the framework of the Central Asian Economic Community:

The Agreement between the Government of Kazakhstan and the Government of Kyrgyzstan on the use of interstate water structures along the rivers Chu and Talas, which is ratified by the law No.301 of Kazakhstan on March 7, 2002;

The Agreement between the Governments of Kazakhstan, Kyrgyzstan, and Uzbekistan on the use of water and energy resources in the Syrdarya River basin, of 17 March 1998;

The Agreement between the Governments of Kazakhstan, Kyrgyzstan, and Uzbekistan on the shared and integrated use of water and energy resources of Naryn-Syrdarya reservoir cascade, of 17 March 1998;

The Agreement between the Governments of Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan on the parallel operation of water and energy systems in Central Asian states, of 17 June 1999;

Protocol of amendments and supplements to the Agreement between the Governments of Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan on the use of water and energy resources in the Syrdarya River basin of 17 March 1998.

Measures to enhance international cooperation

Kazakhstan is located in the tail part of all large transboundary waterways. Thus, the water availability of the republic, to a great extent, depends on water policies and water allocation principles of neighboring upstream states. Therefore, sustainable economic development in the region is subject to efficient interstate cooperation.

Kazakhstan-Russia

Quite constructive cooperation is observed in relations with Russia. In 1992, an Agreement was signed on the shared use and protection of transboundary water objects and later prolonged till 2007. Besides, a Kazakhstan-Russian Commission was established and holds regular meetings.

At the same time, the Agreement does not provide for regulation of parties' liabilities for quality of water flown to Kazakhstan and to Russia. In this context, transboundary waterways are subjected to heavy industrial and domestic pollution. Currently, water agencies of the both countries are negotiating to amend given agreement.

Kazakhstan-CA countries

Relations of Kazakhstan with a number of Central Asian republics in area of shared water use are more complex. Contrasting interests of the republics have not yet

allowed finding absolute trade-off for solution of interstate water problems. The following stubborn problems occur in the transboundary Syrdarya river basin every year:

- a need to pass excessive winter flows that are comparable with spring floods in humid years. Such high flows during this season are the result of energy-generation operation, firstly, of Toktogul HEPS cascade bound to generate electricity for internal demand of the Kyrgyz Republic. Under conditions of freezing-over of downstream river, this threatens to flood settlements along the river banks, as well as agricultural and other valuable lands.
- water shortage for crop irrigation, especially in Dostyk canal for Makhtaara region in South Kazakhstan province.
- construction of a dam in Arnasay depression without agreement with Kazakhstan. This creates backwater conditions in the downstream pool of spillway and prevents from emergency spills, thus posing a risk of overflow of Sharda reservoir and its breakage.

Moreover, at present, Uzbekistan, without prior agreement with other states, is constructing several reservoirs, with the total capacity of more than 2 billion m³ in the Syrdarya basin. The matter concerns the interception of water limit of downstream water users and the demand of the Aral Sea and Prearalie.

In order to increase flow capacity in the Syrdarya river in winter period, as well as to improve withdrawals for irrigated schemes in South Kazakhstan and Kyzyl Orda provinces, rehabilitate aquatic ecosystems in the lower reaches and restore North Aral Sea, Kazakhstan implements the project “Regulation of the Syrdarya river channel and of North Aral Sea”. Currently, its 1st phase is close to completion and 2nd phase will start.

Despite all this, the Central Asian countries achieved certain progress in cooperation development: regulatory framework in process of formation; created institutional mechanism of interaction; on-going international programs for environmental and socio-economic improvement in the region (the projects of the International Fund for Aral Sea Saving). However, there are a number of problems constraining cooperation in this area:

1. Lack of coordination of actions among Central Asian countries. It should be noted that most achieved agreements establish only general approaches to the solution of topical water problems and do not contain detail procedures for implementation of such approaches.
2. Non-coordination of national positions in the establishment of water and energy consortium.
3. Poor harmonization of the existing legal and regulatory framework with the international law system.
4. Absence of a common data bank containing information on regime and conditions of water objects in Central Asia.

5. Interstate water allocation problem. This will aggravate as political situation changes in the region and in view of Afghanistan's claims to their share of water resources.

Kazakhstan-China

Efficient use and protection of waterways shared with China pose similar potential threat. Since independence of Kazakhstan, the country has brought up repeatedly a need to formalize legally bilateral relations in this area before China. However, such initiatives were not always understood by the Chinese side.

In September 2001, the Agreement was signed between the Government of Kazakhstan and the People's Republic of China about cooperation in area of transboundary water use and protection.

The Agreement between the Ministry of Agriculture of Kazakhstan and the Ministry of Water Resources of China was signed in 2005 on the urgent notification of the parties about disasters on transboundary rivers. The Kazakhstan-Chinese Commission was established for use and protection of transboundary rivers. The parties started to design a joint waterworks facility on the Khorgos river.

By present, the following drafts of Agreements have been approved:

1. Agreement between the Ministry of Environmental Conservation of Kazakhstan and the Ministry of Water Resources of China about exchange of hydrological and hydrochemical information (data) from boundary gauging stations along the main transboundary rivers.
2. Agreement the Ministry of Agriculture of Kazakhstan and the Ministry of Water Resources of China about the research cooperation development on transboundary rivers.

Thus, recently some progress is achieved in relations between Kazakhstan and China, however an understanding on the main interstate Agreement for water allocation along transboundary river has not been reached.

At present, China has 52.5 Mha of irrigated land. In order to ensure food security of fast growing population, the country plans to extend the irrigated area up to 60 Mha, mainly in its western part, within the next few years. This will worsen greatly water-related and environmental conditions in eastern and south-eastern parts of China. Evidently, China will keep showing growing demand for water in transboundary rivers (not only Irtysh and Ily) since this issue is of strategic importance for this country. New, very prospective industrial zones will be developed in Chinese western regions that border Kazakhstan. In general, it is estimated that the increase of water withdrawals by China may achieve 15-20% of the total river runoff.

In this context, Kazakhstan may face a real threat of water deficit in a number of their regions, including Almata, East-Kazakhstan, Pavlodar, Karaganda, and even Akmola province in the future.

As to water withdrawals from Ily River, this will cause a serious damage to metallurgy and energy industries, agriculture, as well as fisheries. In environmental terms, shallowing and salinization of Balkhash may bring to consequences comparable with the Aral disaster.

Practical proposals making provision for measures and mechanisms on sustainable water supply in the Republic of Kazakhstan given the transboundary character of surface water resources

Given the transboundary character of surface water resources, in the nearest future Kazakhstan may face a critical challenge of water supply. This is related to the problem of low water availability and consumed water quality in the region and the increase in water demand in Kazakhstan and neighboring countries.

Evidently, solution of this challenge should be comprehensive and full-scale. We should address the issue as a whole, rather than solve isolated tasks and combine actions at intra-state and international level. In this context, in our view, a set of measures should address the following directions:

1. Facilitating development of partnership between concerned parties of the public sector, civil society, and private sector, ensuring that such partnerships are equitable and transparent, protect interests of the consumers and the investors, and enforce strict environmental requirements.
2. Securing enlargement of an information base to support efficient planning and decision making, as well as management capacity development. To this end, at present, it is advisable to develop a unified Information System (database) on the state and management of water resources.
3. Securing usage of scientific potential. To this end, it is advisable to develop a network of research organizations in charge of scientific support for current and future activities of the state agencies. At the state level, it is necessary to coordinate fragmented and partially duplicated research and development efforts.
4. Drawing up a draft of new long-term Agreement on the use of water and energy resources, which makes provision for elaboration of effective water allocation pattern.
5. Making inventory of agreements on shared water management in the Aral Sea basin for further discussion with representatives of CAR.
6. Studying experience in implementing the European Water Directive, particularly, management system, based on the conception of combined use of ecosystem quality standards, target catchment quality indicators, and best available technologies.
7. Exploring appropriateness and possibility of creating new, more effective regional agency.

This organization can be based on principles and mechanisms as developed within the framework of well-known conceptions “Global Deal” and “Regional Deal”. In particular, the “Regional Deal” of Kazakhstan implies the process of consolidation (integration) of the agreements among all the states in the region with other countries and interstate unions, world institutions and donors in order to define contribution to and obligations of all these parties in area of sustainable development (SD) and security.

In this context, the key elements of the “Regional Deal” for Central Asia will allow implementation of existing recommendation basis - for solution of a number of regional problems - developed within the framework of such agencies as UN, SPECA, IFAS, ESCAP, ICWC, and others.

The proposed institution, established on the basis of “Regional contract” principles, should become a political tool for balancing interests of the parties and will act as a real effective mechanism aimed at creating appropriate conditions for sustainable development and security in Central Asia.

For a number of reasons and grounds, the United Nations Organization (UN) can be a real basis for such institution. The local initiative for the establishment of a specialized institution dedicated to solve regional problems in Central Asia will be understood clearly in UN and find political and financial support. Thus, a specific Commission for Sustainable Development in the Central Asian Region (CSDCAR) may be established at the UN.

Within such agency, it would be logical to continue more detailed and thematic development of solution lines for existing water use problems in the region, as proposed by UN, ECE, and ESCAP in their Diagnostic Report for the preparation of the regional strategy for rational and efficient use of water resources in Central Asia.

Another alternative of a back-up organization to focus on is the Asia Mutual Trust Meeting (AMTM). The below arguments can be cited for this organization:

- first, AMTM has serious and wide representation of different countries (as members or observers);
- second, the basic conceptual objectives and principles of AMTM, which were supported by all states, corresponded to challenges facing by the Central Asia. These are security and conditions for sustainable development;
- third, establishment of a regional organization under umbrella of AMTM will be a trade-off for external actors presented here and who can have both similar and differing geopolitical interests but in general who are interested in stability in the region and its sustainable development in economic, environmental or humanitarian terms;
- fourth, AMTM already has great accumulated experience in organization-structural issues and negotiations. This is important since the process of consensus-building and self-organization will be one of key points in establishing such agency.

Moreover, AMTM was established as an analogue of Organization for Security and Cooperation in Europe (OSCE). In one's time the latter started to work as "meeting" and there was much skepticism regarding its future as now it is the case with AMTM. Now, OSCE is a powerful organization and the region can figure on its support of "Central Asian Project".

Thus, clarifying the basic structure, which can be AMTM, we consider it expedient to establish under its umbrella an organization called conditionally a Central Asian development organization or briefly CADO.

Exactly CADO will be intended to secure regular execution of established requirements and tasks of the new-level partnership, among which the basic ones are the following:

- first, achieving the region-wide integrity and coordination of actions within ongoing and future planned specific and specialized programs (SPECA, IFAS, poverty eradication, etc.);
- second, organizing harmonized activities of the regional agencies and programs through the development and implementation of "ecosystem" approach, which takes into account primarily the natural limitations of region's ecosystems;
- third, wider attraction of material and financial resources within (fixed allocations from national budgets, receipts from private and legal persons, etc.) and outside the region (target subsidies, international grants, loans, etc.);
- fourth, assisting in getting full access of the region's countries to scientific-analytical, technical, methodological developments and technologies.

Evidently, CADO should have administrative bodies:

- governing center, where strategic matters (development and making of policy and economic decisions, prevention and settlement of conflicts and disputes, setting of priority areas for financing, etc.) would be dealt with;
- executive and specialized committees and commissions (environmental, water-energy, food, social-humanitarian, gender, etc.);
- secretariat and other administrative-technical divisions;
- personal bank (CADO's bank);
- scientific-analytical center, etc.

Conclusions

Water crisis is, in essence, a crisis of management for most countries, including Kazakhstan. Particularly, the main cause of negative environmental and social consequences is the resource-based approach to the use of natural resources, mainly, of water, where the state of ecosystems is often ignored. Such approach to water use has been prevailing still. No integration of environmental, social, and economic concerns is maintained in decision making. Decisions are usually made by the state agencies re-

sponsible for environmental conservation, thus not ensuring balanced consideration of socio-economic benefits and losses of given project. And, vice versa, the transfer of decision making mandate to “non-environmental” agencies causes that environmental considerations are fully neglected.

Such situation calls for the elaboration of reliable mechanisms for management of economic and natural system interactions, the improvement of mechanisms of ecosystem approach to water-related activity and higher level of understating of given problem at the national and regional levels.

Besides, current tendencies show that water challenges become more complex and interrelated with other economic sectors, including agriculture, energy, industry, transport and communication, as well as with social sectors such as education, environment, health, rural and regional development.

Therefore, the water policy and challenges should be assessed, analyzed and addressed in integrated general context of development; otherwise, the main goals of water management such as improvement of people’s life, eradication of poverty, efficient and equitable allocation of benefits, and conservation of the nature cannot be achieved. The main challenge is the socially acceptable and economically effective achievement of those goals.

The national water management policy, especially under conditions of transboundary water resources, should ensure achieving the long-term objective of rational water use and water conservation in order to improve health and living conditions of the republic’s population. Experience of many developed countries demonstrates that the efficient and integrated participatory water management together in knowledge and information exchange contributes to economic development, institutional stability, and conflict avoidance.

Activity of national water agencies, in many respects, depends on good information provision and adequate organization of information flows for supporting efficiently decision making.

As a whole, the strategic goal of the national water policy should be the implementation of long-term comprehensive measures aimed at eliminating the negative consequences of water scantiness and creating conditions for economic growth, overcoming of social and economic problems, and settlement of interstate water relations. Moreover, we should proceed from an understanding that water is a resource, which has a certain economic value and determines sustainability of national development and that water quality in internal and transboundary rivers should not be addressed separately from water quantity. Thus, the main principles of water policy should be the integrated approach to water resources management, the reduction of discharged pollutants into and of water withdrawals from the natural sources, and the economic regulation of use on the basis of balanced tariff system.

REPORT OF THE KYRGYZ REPUBLIC

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Dear Ladies and Gentlemen!

Dear Mr. Chairman!

Let me express gratitude to the Government of Turkey for the support in organization and holding of given Forum at high level!

This Forum enables to all whose business is water, to exchange information on the state-of-affairs in water sector and address challenges to be met in order to achieve the Millennium Development Goals.

Our small mountainous republic is located within an area, where such rivers as Syrdarya, Amudarya, Chu, Talas, Tarim, and Karkyra are formed. The runoff of these rivers is intensively used by both Kyrgyzstan and its neighboring states – Kazakhstan, China, Tajikistan, Turkmenistan, and Uzbekistan – for drinking needs, irrigation, energy generation, and industrial production.

In early 90s, with the collapse of the Soviet Union, like all former Soviet republics, Kyrgyzstan faced a number of problems and, particularly, those related with under-financing of water sector. This has led to rapid deterioration of the state of water infrastructure, lack of possibility to secure stable water supply from hydrostructures at both national and interstate level. A security threat arose for population living in large reservoir and dam areas.

Besides, as already mentioned, the republic is located within a zone of flow formation in the Aral Sea basin. Therefore, there arises a need for measures on conservation of flow formation zone, with consequent afforestation, rehabilitation, development of monitoring over river water quantity and quality, hydrometeorological parameters, including the state of glaciers. Obviously, efforts undertaken by our republic are not enough.

Moreover, recently, we have observed deterioration of irrigated lands and water-logging of settlements due to rise in groundwater level. This is a direct consequence of unsatisfactory conditions of collector-drainage network, and this is also a problem, for which solution the republic has to search for additional funds.

In this context, our Government undertook certain measures to increase budget financing, attract loan proceeds. Here, it is necessary to note cooperation with such financial organizations, such as the UN, World Bank, Asian Development Bank, European Union, USAID, JAIKA, Swiss Agency for Development and Cooperation (SDC), and the Government of Japan.

¹ At the moment of report preparation

However, despite the efforts made, the following problems remain unsolved: underfinancing of the sector; unsatisfactory state of hydrostructures; lack of inflow of young specialists; reduction in research efforts in area of water use, irrigation, land reclamation, etc.

Kyrgyzstan, like other countries in the region, is devoted to the principles of integrated water resources use. In this context, we are planning to reform the water sector on the basis of developed countries' experience.

To this end, we need a help and support from international institutions and organizations, as well as from neighboring countries.

Central Asia's downstream countries receiving water from the upper reaches, cause severe damage to our economy, agriculture, water sector, and forestry. At present, their co-financing of conservation and improvement of flow formation zone is required.

I think that Kyrgyzstan is interested in rational water use in CA region and in sustainable development of cooperation among the Central Asian countries. However, downstream, neighboring countries should be concerned as well since we live in one country, and even more, in one basin of the Aral Sea!

I want to draw your attention on one good result of cooperation between the upstream and downstream countries, that is signing and implementation of Agreement between the Governments of Kazakhstan and Kyrgyz Republic on the use of interstate water objects on the rivers Chu and Talas. On the basis of this agreement, the bilateral Parity Commission was established and Kazakhstan shares the maintenance costs of hydrostructures located within the Kyrgyz Republic.

The Millennium Development Goals at global level

During the Millennium Summit, which was held in September 2000, the heads of 189 countries and governments reached a historical agreement on the Millennium Declaration, voicing the common goals and commitment to reduce poverty all over the world by 2015. Eradication of poverty, with all its indications such as lack of livelihoods, feminine, diseases, lack of adequate housing and isolation is the main task of Millennium Development Goals. While achieving these goals, gender equality, education, sustainable environmental development (rational natural resources use), and protection of basic human rights for free medical care, education, housing, and security are promoted as well.

Millennium Development Goals in Kyrgyzstan

The progress in achieving MDGs in Kyrgyzstan is variable. It is evident that probably Kyrgyzstan will be able to reduce poverty and infant mortality and to secure access to safe drinking water and environmental stability.

The public health reform in the Kyrgyz Republic has been carried out for 10 years (1996 - 2005) within the framework of National Public Health Reform Project "Manas". The result of project Manas I was the development of healthcare model acknowledged all over the world and comprised of: basic health care and family medicine; restructurization of service standards; and new public health financing model. Nevertheless, general access to quality services of obstetrics and gynecology causes concern, especially in rural area. Despite the existing integrated system for controlling HIV/AIDS, tuberculosis and malaria, yet the country have to succeed in effective regulation and control of these diseases. Transparent boundaries were among the reasons of increased drug traffic, while uncontrolled labor migration, in turn, caused more vulnerability of the country to HIV/AIDS, tuberculosis and other infectious diseases.

In 2003, UNDP in Kyrgyzstan in partnership with the Government prepared a first National Report on MDGs. The second progress report is under completion and will contain analysis of achievement of tasks set by MDGs, based on gender disaggregation methodology.

At present, major water consumers in the Kyrgyz Republic are agriculture, industry and domestic sector. In 2005, the number of water consumers was 906, whereas in 2006 it was 789. Hence, the number of water consumers decreased by 117 due to economic reforms in the country.

In 2005, the total water consumption amounted to 7.89 km³, while in 2006 this indicator equaled 8.006 km³.

The comparative analysis of water use over 2005 – 2006 shows the following:

As to the state of drinking water supply, here one can say that the higher risk for people's health is posed in many villages by irregular water supplies (hourly supply). This keeps from taking effective measures to arrange alternative supply in case of damage. According to the Millennium Development Goals, the system of monitoring over water-borne diseases in order to prevent and eradicate their episodes should facilitate to direct investments in highest risk zones and reduce two-fold by 2015 (as compared to 2002) the number of people lacking access to safe drinking water. However, actual allocation of ADB's loans did not contributed to considerable improvement of water supply in most problematic regions of the republic, first of all, in Batkent, Djalalabad, and Osh provinces.

To change current situation, the Asian Development Bank (ADB) gave a loan in an amount of 36 M\$ for 2002-2007 under the project "Infrastructural services for settlements" for rehabilitation and construction of water pipes in 730 villages and 7 towns

of Chui, Osh, Djalalabad, and Batkent provinces. The co-financing by the Government of the Kyrgyz Republic is 9 M\$.

Similar project “Rural water supply and sanitation”, with the total cost of 24.5 M\$ from the WB’s loan and the total duration from 2002 to 2007, also is aimed at rehabilitation and construction of rural water pipes in 270 villages of Issyk-Kul, Naryn, and Talas provinces. In total, taking into account the republic’s contribution, about 70 M\$ are directed to the improvement of people’s access to safe drinking water. During six years, repair and rehabilitation work and construction of new water-supply projects were planned in 1000 villages and 7 towns. The general aim of the mentioned projects is also to improve rural water-supply infrastructure so that to achieve sustainable delivery of good-quality water to population at minimum costs and to reduce episodes of acute enteric infections among village residents.

As a result of increase in the cost of rural water supply component from 20 to 80\$ per capita and after adjustment of ADB and WB projects, it is planned to embrace 300 villages in Osh, Djalalabat, Batkent, and Chui provinces and 200 villages in Naryn, Issyk-Kul and Talass provinces.

Role of irrigated agriculture

Agriculture remains a core driver in economic growth in Kyrgyzstan. Agricultural sector forms 40% of GDP, half of the whole employment and 17% of export.

1.1 million ha of the Kyrgyz lands are arable and account for only 7% of total area in the republic. Productivity of more than 70 % of arable lands depends on irrigation. Irrigated lands provide more than 90 % of agricultural production and are a strategic natural resource of Kyrgyzstan.

As for 1 January 2007 the territory of the Kyrgyz Republic is 19995,1 thousand ha.

As for 1 January 2007 in the Kyrgyz Republic 1232,3 thousand ha of available lands are of private property, 58,2 thousand ha are of municipal property and 18704,4 thousand ha of land belong to the Government.

At the present time use of agricultural lands is an acute issue. Unfavorable lands are increased everywhere due to lack of investments and maintenance of irrigation and drainage systems. In 2006 in the Kyrgyz Republic 141,1 thousand ha of arable lands or 11,0% of total arable area were not used as a result of various reasons (salinization, waterlogging, water shortage, lack of funds to purchase seed and combustive-lubricating materials, remoteness, economic irrationality).

In the republic total agricultural lands are 10766,4 thousand ha, 9176,1 thousand ha of which are rangelands, 1283,7 thousand ha are arable lands and remaining lands are used for other purposes.

Total irrigated area is 1020,6 thousand ha, 866,3 thousand ha of which is irrigated arable lands.

Climatic peculiarities of Kyrgyzstan cause mainly development of irrigated agriculture, which is the most productive one under the Kyrgyz conditions. Crop yields within rainfed lands are lower than on irrigated ones. For example, it averages 35 centner/ha for cereals within irrigated lands and 15 centner/ha within rainfed lands. Profit is also significantly different and averages 28% of profit from irrigated lands.

Land degradation and vulnerability of poor people

More than 60 % of people live in rural area and directly depend on quality of land and water resources. Thus, land degradation is a serious economic and social challenge related to environment and faced by the Kyrgyz Republic. Such challenge impacts directly on life of rural population by reducing productivity of agricultural lands as well as brings a baneful influence on sustainability, functionality and quality of resources being generated by natural ecosystem.

Land and water resources are natural resources required for survival as well as for well-being of rural population, in particular the poorest rural one. Land degradation challenge and its consequences such as salinization, waterlogging and irrigation erosion result from irrational use and distribution of irrigation water. Dependence of poor people on land resources makes them especially vulnerable to land degradation and its negative impacts. Land reserves have limits. Increased pressure on little amount of arable lands of Kyrgyzstan results in reduction of productivity and yield. Poor people are majority of informal manpower gaining livelihood directly or indirectly from land resources.

Therefore, ineffective use of land and water resources and severe degradation restrain agricultural development and alleviation of poverty rate.

There is need in government program to address this challenge and financial resources should be searched in form of grants for development and strengthening of Water Users Associations, peasant and individual farms, as since 90s latter ones have become ownerless and the government has no provided any support.

Water conservation

As a whole for the republic the lands potentially prone to erosion account for more than 85%. Stony and pebble area is about 450 thousand ha and rainfed lands come to 440 thousand ha.

In the republic irrigated area in submountain region prone to irrigation and wind erosions is more than 700 thousand ha. As for plain region 200 thousand ha are saline and 30 thousand ha are water-logged.

The Kyrgyz Research Irrigation Institute carried out research activities on water conservation within pilot sites in hillside lands of Chu Valley. This will allow not only saving water but facilitate improving land productivity and preventing erosion.

At the present time there is an urgent need to develop water conserving methods for irrigation technology for main regions in the republic.

Water as energy resource. Water conservation is a main way to survive

Wide-scale rehabilitation of water system in the Kyrgyz Republic is a crucial factor for further agricultural growth and sustainable building of production fund.

In the nearest time it is planned to improve technical condition of functioning irrigation systems, to develop and implement arrangements for forcing transition to water conserving methods for irrigation and rational water resources use. At the same time application of automation and water accounting in irrigation systems becomes of special importance. It allows saving irrigation water up to 40% and at the same time improving irrigation capacity of irrigation sources and thus increasing coefficient of land use and assuring labor productivity increase.

Agriculture intensification requires a comprehensive approach to design and construction of new objects and systems and to reconstruction of existing ones by using energy and resources conserving technologies. Water systems and objects have considerable reserves of renewable hydraulic power, which can be used also for other purposes.

The most important condition for effective operation of land reclamation system is an objective and operational water accounting. Based on it dispatching management of water withdrawal and water distribution is made, water regime is regulated in fields, operation and maintenance of certain structures and systems are performed. Water accounting is needed for studying land state and modernizing irrigation systems.

All irrigation systems in the Kyrgyz Republic regardless of construction, purpose, dimensions, operation have a number of specific characteristics. Hence, they can be deemed as one-type water accounting and automation systems.

Objective and operational water accounting with required accuracy of measurements is possible only by applying modern software facilities.

Today many technical facilities are proposed to be installed within water systems for water accounting and automation. Such facilities have been developed in the Kyrgyz Republic and meet state-of-the-art measuring technologies that will enable improving efficiency of operating entities.

Energy and environment

The Kyrgyz Republic created hydropower capacities - mainly on Naryn cascade - in form of national assets as compared to previous perception of these capacities as a by-product of water releases for irrigation. Energy consumption efficiency is very low in the republic, even under Central Asian criteria. This is attributed to inefficiency of energy transportation and lack of incentives to save energy in the private sector and by

enterprises, as well as elementary stealing of electricity. Solution of those problems could contribute to sustainable land and water management.

For stable provision of population with energy resources, especially in winter time, currently the state focuses on the development of hydroenergy. It is planned to finish construction of Nijnenaryn reservoir cascade, first of all, of Kambarate HEPS 1 and 2. In this case, national electricity demand will be met in full and Toktogul water-works facility could operation in irrigation regime, which downstream countries such as Kazakhstan and Uzbekistan are interested in. And we hope on understanding on this matter.

In order to raise national economy, it is also necessary to pay attention to construction of medium and small HEPS in all the rivers in Kyrgyzstan.

Water management and basin approach

1. Water management is a comprehensive system of measures, standards and rules according to the Water Code and other standard legal acts regulating the development, use, and conservation of water resources and environment, the community health care, as well as protection of settlements, industrial sites and all ownership forms from hazardous water impact.

2. Basin approach implies that management of water use and protection is undertaken within the boundaries of main basin according to hydrographic principles. On the basis of proposals of National Council for Water, the Government of Kyrgyz Republic fixes jurisdiction of each basin water administration and basin council. Adopted decision is published in official press.

3. In each main basin, the basin water administration and basin council are responsible for certain aspects of water management, according to regulations of the Water Code.

4. Decisions of local authorities and territorial bodies of ministries and administrative departments are made according to the Article 5 of the Water Code and the basin approach to water management.

Water management principles

Water management is based on the following principles:

- participatory principle: all stakeholders (should be involved in planning and decision making);
- water demand consideration principle (demands of present and future generations should be considered in making decisions on the use and protection of water resources);

- principle of economic water value (the economic value of water resources should be considered in planning, decision making and handling water use and protection);
- precautionary principle in decision making (lack of complete scientific information should not be the reason for delaying or refusing from effective measures to be taken where a risk exists of serious hazard to water resources, environment, and people's lives);
- specific guarantee principle (provide water users with specific guarantees of their rights and legal defense);
- accessibility principle (information on the state and use of water objects and resources should be accessible to the public).

Aim and objectives of the Water Code

1. The Water Code regulates water relations in area of water use, conservation and development for guaranteed, adequate and safe water supply to population of the republic, as well as in area of environmental conservation and efficient development of national water fund.

2. The Water Code establishes:

- basic principles of water management;
- basics of public water policy;
- jurisdiction of public agencies responsible for management of water resources and objects;
- system of measures for the development of National water strategy and water use plans;
- regulation of use of surface and ground waters and charges for their use;
- measures for protection of water resources from pollution and depletion;
- provisions on water-related emergencies and dam safety;
- provisions on the use and ownership of lands referred to the water fund, on creation of state water inspections, including powers and responsibilities of inspectors;
- water use violations;
- relation of given Water Code to commitments of the republic under the international law.

Water rights of users

Water right of users is regulated by the Water Code.

Water is used on the basis of water delivery contracts signed between water user associations, industrial enterprises or municipal bodies and water suppliers.

According to established order in Kyrgyzstan (like in many countries of the world), irrigation water delivery services are not free, and fees collected are used for maintenance of irrigation and drainage systems under public ownership.

The right to use in general, and, in this case, resources of ground or surface, river or lake, fresh or saline water, with or without their diversion is permitted (licensed) only by the Government, based on the established law order, and given for 15 years. Special permission for water use is given up to 50 years if claimant makes substantial investments in construction, modernization or rehabilitation.

State and its subsidies for water supply services

The state compensates fully or partially water use costs in form of budget allocations, loans, grants, as well as by attracting foreign investments, according to national laws.

Every year, the Government of Kyrgyz Republic sets subsidies for irrigation and drainage from the state budget.

In 1999, a law was adopted on tariffs for irrigation water delivery services, where 1 m³ of water costs 3 tiyin, and the total cost coverage is about 30% of operational costs.

Besides, the Government of Kyrgyz Republic rehabilitates the public irrigation and drainage systems at expense of investments of international financial organizations (World Bank, Asian Development Bank, etc.).

Shift to public participation

Regulations of the Water Code make provision for consequent enlargement of access of water users, the community and other stakeholders to planning, making and controlling of management decisions.

Involvement of water users in water resources management is a first stage of institutional reformation of water sector.

Efficient water use is a basis of national agricultural development.

Now we are at transition stage of water sector reformation. The objective is to improve efficiency of water use and create strong basis for irrigated agriculture development in our republic. Adoption of the Water Code was a result of long accumulation of problems and experience in water use.

Hydrographic participatory water management was successfully implemented in Aravan-Akbura Canal Management Organization, which was established according to the Water Resources Department's (Kyrgyz Republic) order No. 140 of 24.03.2003, irrespective of territorial dependence of land in Kara-Suv, Aravan districts and Osh. The Canal Water Users' Union (CWUU) integrating 6 WUAs of the above-mentioned two districts was established at the pilot canal.

The Board of Aravan-Akbura canal's Water Committee was organized on the basis of trilateral Agreement about joint governance of Aravan-Akbura canal (AAC), which was under responsibility of Osh Basin Water Authority, between the Water Resources Department, the Osh Basin Water Authority, and the CWUU.

For the purposes of joint governance, the parties agreed to create a joint management body - Canal Water Committee (CWC) - consisting of 7 people, based on financing shares (55% state budget, 45% water users), i.e. 4 representatives of Basin Water Authority and 3 representatives of AAC water users. Work plan was drawn up and approved for joint governance (hereinafter CWC) and all activities followed this plan.

Since 2004, the management information system "MIS IWRM-Fergana" has been operating in Aravan-Akbura Canal Management Organization. All the data on water allocation (withdrawals, delivery, efficiency) for each outlet and water user are inputted into the database. Water availability, equitability, stability and efficiency of water supply in balancing sites are analyzed using this system.

Transparency and awareness

Access of all stakeholders to official information on the state and use of water resources, hydrostructures and water-protection infrastructure is a prerequisite of efficient management of the national water fund.

Transparency of management by state agencies should be ensured, first, through the involvement of water users and local communities in activities of community-based organizations, such as basin water councils, water user associations, etc.

Wider involvement in activities of those organizations of NGOs, local government bodies, and environmental movements is to be secured.

Results of gender analysis in national water sector

Below we will try to analyze actual state-of-affairs in status of women and men generally in the republic and particularly in water sector.

By present, the republic has ratified more than 40 different international documents that set a common idea of protecting rights and liquidating all forms of discrimination against women. In 2001, by the President's Decree, a National Council for Women's Affairs was established to deal with women, family and gender equality issues. Mandate of the Council includes coordination of actions on implementation of gender equality policy and strategy and monitoring of meeting republic's international commitments in area of gender development, including UN Convention on Liquidation of All Forms of Discrimination against Women. By the President's Decree of March 2002, the first National plan of actions aimed at achieving gender equality in the Kyrgyz Republic was approved for 2002-2006, and in August the second National plan of actions was approved for 2007-2010. There exists gender statistics, and for already nine years a statistical collection dedicated to status of women and men in our republic has been published.

Level of extreme poverty or percentage of population consuming below food poverty line lowered by 2.3% in 2005 as compared to previous year and reached 11.1%, while the share of extremely poor was 6.5% in urban area and 13.8% in rural area.

Let consider the state-of-affairs regarding gender equality in the water sector. According to the data of 2006, only 18% of employees are women out of 4175 people working in the sector. In 436 water user associations women occupy the following posts: director - 6 women; accountant - 160; Chairman of WUA Council - 2; and, Deputy Chairman of WUA - 9.

Measures to enhance international cooperation

Since independence in 1991-1992, the Central Asian countries have been collaborating in area of water resources management for already 17 years within the framework of ICWC. The accumulated experience made it possible to formulate certain methods, style and order of cooperation in water management and use in the two major river basins of the Aral Sea - Amudarya and Syrdarya.

The political platform and whole system of interstate cooperation were established: within the framework of the Interstate Fund for Aral Sea Saving (IFAS) and its commissions - ICWC and ICSD. Recently, some efforts are made under EurAsEC and SCO, where establishment of certain institutions is envisaged as well.

Joint actions were and are undertaken to implement regional, bi- and multilateral projects. For example, GEF project, SPECA, IWRM-Fergana, Bilateral Commissions for rivers Chu and Talas.

Implementation of regional projects demonstrated a need for joint activities and their important role in enhancing cooperation. However, the pledge of successful cooperation and positive results of joint projects is a willingness of the states to reach the shared vision and consider interests of each other. The above mentioned regional projects indicated to such willingness and degree of readiness of the states to a reasonable compromise.

Over the last period, a certain framework of regional water management organizations was formed. Some of them were newly created (such as ICWC, IFAS), while others were reorganized (BWO).

Recent period showed that without certain reformation such institutions turned to be rather old-style and their work was conservative and low efficient, as well as involvement of the states in their work. This is visually demonstrated by IFAS operation:

- it was identified next state-host of EC IFAS with delaying in two years;
- level of IFAS Board members decreased from vice-premiers to water resources ministers, etc.

ICWC carried out some work on the development of legal framework. Several Agreements were signed, part of draft agreements were approved by ICWC members and submitted to EC IFAS for further submission to the countries for consideration, while another part of drafts is in stagnation. A lot of draft Agreement development within the framework of ADB project is also uncertain. All this indicate to some difficulties in work process and that a possibility to reach reasonable compromise between all the countries was not explored to the end. However, this does not mean that work on the draft agreements should be stopped. It is necessary to continue working within thematic work groups of ICWC. Government of Turkmenistan Shared financing of hydrotechnical and hydro-environmental measures is, in our opinion, a goal of one thematic work group of ICWC. Activity of this group should help to determine frames, work scope and legal basis for those measures. It seems necessary to plan such thematic work group. Government of Turkmenistan However, work of this group will be effective only if financial matters are settled. Due to irregular financing, attempts to establish and organize work of such group usually fail. Government of Turkmenistan There is some experience in shared financing of hydrotechnical measures by Kyrgyzstan and Kazakhstan on the rivers Chu and Talas. As activities of the Commission strengthen, it will take the leading role in implementation of hydro-environmental measures as well. Moreover, this work will be carried out by sub-contractors of the both countries under shared financing. Government of Turkmenistan The European Parliament supported an initiative of the President of Kyrgyzstan Kurmanbek Bakiev on the establishment of an International Water-Energy Academy in the Republic. This is stated in a resolution to the EU Strategy for Central Asia as adopted on February 20, 2008: “The European Parliament supports the proposal on the establishment in Bishkek of the so-called water-energy academy for all the countries in Central Asia in order to achieve adequate water use and hydropower generation, enhance technology transfer, protect biodiversity and improve agricultural and irrigation technologies”. Government of Turkmenistan The European Parliament “calls for active energy cooperation between EU and the region, especially Kyrgyzstan, Tajikistan and, as far as possible, Uzbekistan in order to tackle energy problems”.

REPORT OF THE REPUBLIC OF TAJIKISTAN

Saidi Yukubzod
Minister of Land Reclamation and Water Resources
of the Republic of Tajikistan

The role of water is rising at a very fast pace, as the world population grows and living space reduces. Over the past decades the humanity has come to understand more that at existing rates of consumer growth and level of technologies, water deficiency will restrain sustainable development of many countries in the near term.

Tajikistan and Kyrgyzstan are the main flow formation zones in Central Asia. More than a half of water resources of the region are formed in Tajikistan. Fresh water resources in this country are enough to provide hundreds of millions of people with drinking water. Having sufficient water resources of drinking quality, we continue to develop water supply networks. At present, in large cities 93% of the population uses centralized water supply, while in rural areas this figure is no more than 49%. In the republic, about 2.9 millions don't have permanent access to improved water sources, of which 2.8 millions live in rural areas. The whole infrastructure including in urban areas is more than 70% used up and requires serious rehabilitation and reconstruction. One of the major objectives of the Program for Achievement of the Millennium Development Goals in Tajikistan is to halve the proportion of people without sustainable access to safe drinking water and sanitation by 2015.

To achieve this goal, the President of the country Emomali Rakhmon and the Tajik Government continually give attention to the improvement of drinking water supply to population, allocating funds from the state budget to these purposes. Capital investments are being made, using loans from the World Bank and Asian Development Bank, and technical assistance from international governmental and non-governmental organizations. The population takes an active part in implementation of water supply improvement projects, making its contribution.

In our country, irrigated agriculture is the major activity for the rural population. Accounting for only 15% of GDP, the irrigated agriculture provides more than 95% of agricultural production. At the same time, about 2.5-3 millions of people are provided with job. Developing and improving the efficiency of irrigated agriculture directly influences the reduction of poverty in rural areas. Over the past 10 years, activities to rehabilitate and enhance the performance of irrigation systems, a basis for irrigated agriculture, were carried out intensively in Tajikistan. For these years, the Tajik Government have attracted about 200 million US dollars for rehabilitation of irrigation systems, using loans of international financial organizations, budgetary and other funds of governmental and non-governmental international organizations.

The process of agricultural management reformation and improvement of market mechanisms, in particular in irrigated agriculture, is going on. Within the next few years, it will enable to improve the efficiency of agricultural production and create an appropriate economic mechanism that ensures satisfactory financing for operation and maintenance of irrigation and drainage systems, thus ensuring steady functioning of irrigation systems. This, in turn, should favor sustainability and efficiency of irrigated agriculture.

However, the pace of fulfilling these tasks leaves much to be desired, and we are searching for opportunities to attract larger financial and material resources for irrigation and drainage systems rehabilitation, institutional development, and water management improvement. In this context, we hope for cooperation with international financial institutions, grants of donor countries and, of course, for own internal funds.

The efficiency of water resources management determines the efficiency of hydrological system operation. It is especially important in arid Central Asia, which faces water scarcity. As consumers grow and consumption rates decrease proportionally, the process of water resources management requires applying more effective approaches and technologies. Although our financial and technical capabilities are limited now, for example, on pilot basis, water distribution automation elements are implemented in the Khojabakirgan canal in Sogd province, with the technical assistance from the Swiss Agency for Development and Cooperation, and should considerably improve water distribution and reduce water losses.

Under the overall economic reform and land reform in the country, the Tajik Government undertakes institutional development in water management. At on-farm level, Water Users Associations (WUA) are being established, projects and measures for management transition to basin principle are being developed. Therein, we are supported by donor countries, for which our country provides favorable conditions to implement their activities.

Hydropower resources of Tajikistan are widely known in the world. The potential cost-effective stock of hydropower resources in Tajikistan is more than 300 billion kWh per year. This is a clean and renewable energy. The construction of cascades of hydroelectric stations in the Amudarya and Syrdarya upstream will enable not only to obtain electricity, which is in deficit in Central Asian republics, but also irrigate additional thousands of hectares, improve water availability for thousands of hectares in the Aral Sea basin countries. At present, Sangtuda-1 and Sangtuda-2 hydroelectric stations are being constructed in our country in cooperation with the Russian Federation and Islamic Republic of Iran.

The first generating unit of the Sangtuda-1 hydroelectric station was put into operation in January 2008. Intensive negotiations are being conducted with interested investors and countries on the construction of largest Rogun hydroelectric station with a capacity of 3600 MW and average annual power generation of 13 billion kWh in Central Asia. Regional cooperation on the construction of cascades of hydroelectric stations, with due consideration of the interests of all the parties, will benefit our countries. We are sure that joint development of hydropower resources of Tajikistan should

bring together our peoples and give a serious impulse to economic and political integration of the countries in the region.

In the post-Soviet period, the national legal framework, Water Code, was updated twice, in 2000 and 2007. A Law on WUA was adopted in 2006. The draft Law on Water Supply to Population is being considered. The Tajik Government issues decrees and instructions for efficient regulation of water relations in the country, continuously drawing attention to improvement of water regulatory framework. In the National Constitution, water resources like other natural resources are proclaimed as the public property and are provided for rational and efficient use. All legal improvements are aimed at better conditions for water use and at water resources protection, while keeping fundamental principles of the legislation:

- public ownership of water resources;
- priority use for drinking water supply needs;
- paid services for water delivery from intake point to user;
- governmental support in water resources management, in operation and maintenance of irrigation and drainage systems;
- state control over water use and protection.

It is well known that water is used in all spheres of human life, and this requires an integrated approach to water management. The principles of integrated water resources management (IWRM) were partially applied at Soviet times as well. Today, the IWRM-Fergana Project is implemented, particularly in the north of Tajikistan. We will apply the IWRM experience from Sogd province in other parts of the country during the transition to basin water management. Public participation in basin management through Basin Committees will enable to raise responsibility of water users for rational and efficient water use, involve them in water and land protection measures.

Under market economy and democratization of social relations, well-timed public awareness raising is an important factor in making proper decisions. Information on activities of water management organizations is disseminated through the mass media (press, radio and television), round tables, meetings, and press-conferences. Workshops and trainings, awareness raising campaigns for farmer-water users, engineers and technicians of water management organizations at local level also play a big role in dissemination and application of new knowledge.

Participation of women in water resources management at all levels should have a positive impact on rational and efficient water use, and enhance her status as an equal member of society. In water management system of the country, women hold high positions like chiefs of province water management organizations and many woman-professionals work in this system, in particular at the Ministry of Land Reclamation and Water Resources. Women are included necessarily in the membership of the Boards of newly established Water Users Associations (WUA), most of them are headed by women. The projects for rehabilitation of drinking water supply systems provide for the establishment of community Councils for Water and Sanitation or Water Committees, which should be headed by women. The Tajik Government gives big

attention to women participation in management of economic sectors and provides all-round support for this.

It is evident that there is no alternative to water conservation for us. In the near term, the nature will not give us more water than we have, and annual water quantity fluctuations are within forecasts. However, the far future can be predicted hardly. The important way of water conservation is to reduce water losses and improve coefficient of irrigation system efficiency. At present, the coefficient of efficiency of inter-farm irrigation systems in Tajikistan, depending on technical conditions of the network and structures, is within 0.5-0.7. If one takes into account the coefficient of efficiency of on-farm irrigation network and field water losses, then water use efficiency in irrigation will be no more than 35%.

It is very easy and, at the same time, very expensive to save water by 10% in Central Asia countries and reduce water withdrawals, for example, by 10 billion m³. For that, it is necessary to use drip irrigation and other water-saving technologies in an area of around 2 million ha, and make investments of about US\$8 billion. Today, this is large money for us, but we have no alternative. At present or in the future we will have to solve this problem. In Tajikistan, only research for assessment of water-saving technologies efficiency is carried out as yet. Currently, our country needs investments for rehabilitation of deteriorated hydraulic structures, pumping plants, and application of water-saving technologies for crop irrigation. Therein, we only rely on the assistance from donor countries, international financial institutions, and international governmental and non-governmental organizations. But there is a hope that as market principles in agricultural production improve, farmer-water user will also show interest in application of such technologies.

The training of highly qualified specialists in water management is a strategic issue. Over the past period, we failed to restore completely the system of personnel training, with due consideration of conditions of the present market period. Partly, it is connected with costs for passing of real long-term work practice by students. The only theoretical skills tend to be insufficient for effective water management. Owing to technical assistance of international organizations, a limited number of specialists pass short-term familiarization trainings in countries with developed irrigated agriculture. Assistance is provided by ICWC Training Center located in Tashkent. However, it is obvious that without own training center and systematic qualification improvement of water specialists, it will be hard for us to change radically the quality of our specialists.

The Interstate Commission for Water Coordination and the International Fund for the Aral Saving (IFAS) has been serving still as a basic platform for regional cooperation in water and power management in Central Asia. Tajikistan active works in these organizations. Although the financial support provided by donor countries for measures within the framework of IFAS reduced when its head office was located in Tajikistan, our country diligently carried out activities aimed at the implementation of adopted long-term plans for water use efficiency improvement and environmental protection in the Aral Sea basin. The speech of the President of Tajikistan and President of IFAS Mr. Emomali Rakhmon at the 3rd World Water Forum in Japan can serve as an example for that. He put forward a number of proposals for institutional and legal improvement of water use and protection on a global and regional scale. They are

aimed at improvement of trust and cooperation between countries, prevention of water-related disasters, improvement of well-being and living conditions of population. Based on these proposals, in Central Asia, we could enhance our cooperation by implementing the following proposals:

1. Development and adoption of an international universal water convention. The existing Conventions have been developed by countries, where the problem is not water resources deficiency; they are aimed at regulation of interstate water relations in large. For example, in arid Central Asia the main question is whether the potential water shortage is real. There are a lot of such regions as well as conflicts caused by water problems in the world. The development and adoption of such universal convention would support joint sustainable development of countries in similar regions.

2. Giving the IFAS a status of UN organization to coordinate activities of international organizations and donors, and proclamation of the Aral Sea basin a priority pilot region for achievement of the Millennium Development Goals.

3. Establishment of a Central Asian Sub-regional Center for Asia-Pacific Water Forum in Dushanbe.

4. Development of a Central Asian sub-regional water doctrine.

In Tajikistan we firmly believe that transboundary basin countries should cooperate and direct their efforts to providing favorable conditions for such cooperation. The cooperation should cover not only water problems, but also other economic sectors, above all, transport and trade. People living in one river basin are doomed to cooperation and peaceful development anyway.

The doors of Tajikistan for cooperation are open to all near- and far-abroad countries.

REPORT OF TURKMENISTAN

Myratgeldy Akmammedov²
Minister of Water Management of Turkmenistan

Currently Turkmenistan is implementing a large-scale program for the development of central water-supply and sanitation systems in cities and settlements, including rural. For central supply of drinking water to population, about 2% of country's water resource out of the total water consumption is used. As population grows, individual house-building develops and settlements are improved (creation of green zones, fountain development), a need for central water-supply becomes higher. In the total volume of central water supply, the share of groundwater is more than 55% and this figure tends to increase since currently all velayats (national provinces) have enough fresh groundwater reserves to meet largely household and drinking needs of population.

Complete meeting of people's demand for safe drinking water and adequate sanitation is a priority task of the Government of Turkmenistan at present and in the next decades. In order to fulfill this important task, a specialized drinking water-supply and sanitation enterprises function in urban area. Besides, special water-supply enterprises for rural settlements function within velayat administrations. Currently, these services operate the whole water main and sewerage network, treatment structures. Drinking water supply services operate wells and huge infrastructure.

In the recent 9 years, under the sectoral program of central water-supply and sanitation development, 4 large water-supply enterprises have been constructed in Turkmenistan. These enterprises were designed for future needs of growing population. The total capacity of the constructed clear drinking water plants is 610 thousand m³/day.

A huge program is undertaken to construct large desalination plants in the areas that lack sources of domestic and drinking water, meeting operating standards.

Particularly, in 2007, by order of the President of Turkmenistan, construction of a large desalination plant was started in the very west rayon center Esengula on the Caspian coast. The plant is to provide desalinated sea-water of drinking quality not only to the rayon center but also to near rural settlements.

For a long time, it was a common practice for Turkmenistan to construct local small-capacity desalination plants based on membrane technology and back osmosis method for schools, kindergartens and food enterprises, especially in Dashoguz velayat in the zone of environmental disaster of Aral.

Regulation of supply from the central water-supply systems plays an important role in the improvement of access to water and sanitation in urban and rural areas. In

² At the moment of report preparation

particular, construction of vertical drainage and use of pumped water for irrigation of green plantations, fountains, fire basins, car washing and industrial equipment allows release of a share of drinking-quality water used previously for these needs. Moreover, pumped water contributes to lowering of water tables and to improvement of sanitary conditions in cities and settlements.

In the nearest future, it is planned to build hundreds kilometers of water mains, reconstruct the existing network, drill new water wells, and construct large sewerage stations with biological treatment under a new huge program. The biologically treated sewages from industrial plants will be used for irrigation of forage and technical crops. Design estimates have been made for the development of irrigation schemes for combined utilization of household effluents and collector-drainage water from the settlements surrounding the city of Ashgabad. A special research program was developed to explore an impact of sewages on soils, groundwater, and agricultural crops.

The total agricultural area amounts to 40.2 Mha, of which about 2 Mha are arable lands and almost fully irrigated, and 95% of Turkmenistan is desert and semi-desert pastures. The irrigated area per capita is 0.32 ha.

The population of Turkmenistan is about 7 millions, of which 54% is rural people. Agriculture is still the largest employment sector since it accounts for nearly 49% of labor force.

The available water resources are comprised mainly of contracted share of four transboundary rivers flowing through several states. Those rivers are Amudarya, Murghab, Tejen, and Atrek. The Amudarya River accounts for about 90% of the national water supply. Water resources from this river are distributed among main canals, including the Karakum-river, which stretches to 1300 km and almost reaches the Caspian Sea.

According to existing agreements, water withdrawal is 25-26 billion m³/year under normal and high flow probabilities in the above-mentioned rivers, while it decreases substantially in low-water years. Water consumption per capita decreased from 4511 m³ in 1995 to 3571 m³ in 2005. As population grows, by 2010, consumption may come down to 2134 m³/person.

The main water consumer is irrigated agriculture in Turkmenistan. Annually, nearly 90% of water or 9500 m³/ha is used in agricultural production. The share of water used in drinking water-supply and other economic sectors is minor.

The current Law establishes the first-priority meeting of drinking and domestic needs. In particular, the use of fresh groundwater for needs different from drinking and domestic ones generally is not allowable. Only for the zones, where surface sources are absent and enough groundwater reserves are available, the use of this water for purposes other than drinking and domestic needs can be permitted on temporal basis.

Currently, minor needs of domestic sector, industry, energy, and fisheries are met in full, and there is no competition (and particularly contradictions) among water users in Turkmenistan.

Nevertheless, last decades, the national water resources are used in their full volume, and therefore, current water use is based on annually set limits for velayats,

etrap (local districts), and specific users. The development of water-using production sectors, including expansion of irrigated area, is possible only through the improvement of water use efficiency and of water management, the use of return water and non-conventional sources.

According to the new Water Law approved and enforced since November 1, 2004, the public management in area of water use and protection is undertaken by the Cabinet of Ministers of Turkmenistan, as well as by duly authorized public agencies responsible for water use regulation and other bodies.

Current water resources management in Turkmenistan is based on three-staged hierarchical system. The authorized public agencies responsible for regulation of water use and protection are the Ministry of Water Resources and the Ministry of Environmental Conservation, respectively. The Ministry of Water Resources includes water management organizations “Suvhojalyk” of 5 velayats and basin water organization “Karakumderyasuvhojalyk”, which is responsible for management of water in inter-velayat waterway Karakumderya. The velayat organizations have their subordinate etrap water management organizations that functions within administrative boundaries of their respective etrap. The Ministry of Environmental Conservation also includes 5 environmental organizations in velayats. It should be noted that the administrative-territorial water management system does not secure efficient management and balanced supply along the hydrographic network. During intensive water use and in low-water years, usually there are cases of frustration of the established water delivery schedules at tails of canals.

At on-farm level, community organizations for water management, such as water user associations or unions have not been established yet. And water management at this level is performed by staff of etrap water management organizations on a basis of contracts signed with farmer-producers. Water discharge and productivity are estimated in general by etrap and daikhan organizations and by average indicators.

The body of all water objects and lands under them, including water-protection zones and belts forms the Public Water Fund of Turkmenistan.

This Water Fund is an exclusive public property. The ownership of interstate (transboundary) waters is determined by agreements between the riparian states.

Hydraulic structures built on the basis of established order for water use and protection can be the property of legal and physical persons.

Water use is free in Turkmenistan.

The water sector of Turkmenistan supports not only irrigated agriculture. Irrigation canals and reservoirs are the sources of domestic, drinking, cultural and household water supply and used for watering livestock and pastures, for fisheries, industries, energy and transport, as well as for recreation, navigation, sports, urban greening, environmental needs and other multiple economic purposes. A branched collector-drainage network, the main function of which is diversion of drainage water and land reclamation, also serves for watering of desert pastures and for fisheries. Main collectors and lakes formed on the basis of CDW are habitats of swimming and waterside birds.

Water sector is a large employer as well; many able-bodied citizens are occupied in this sector in all velayats.

Lack of competition among water-consuming sectors, social needs and environment does not mean that there is no need for the integrated water resources management (IWRM). The legal framework of water relations does not meet present-day requirements and needs to be improved. The administrative-territorial water management system leads to inconsistency of managerial decision within a single basin. There is lack of harmony in use and protection of water resources among different economic sectors, fragmentation in management of interrelated water types (surface, ground, return), gap and insufficient coordination between some chains and levels of water management. Moreover, there is lack of commitment among water management organizations and water users for water productivity improvement. All this calls for a need to implement IWRM gradually and successively.

In order to elaborate and adopt legislative instruments regulating the implementation of IWRM in Turkmenistan, it is necessary to continue raising awareness of different water users about characteristics and advantages of IWRM principles and arrange policy dialogue between economic sectors in form of seminars and round-tables.

One main principle of IWRM is the establishment of community-based water management at on-farm level. Currently, in Turkmenistan water management at the on-farm level is undertaken by farm-users themselves under contract and with technical service of the state water management organizations. The XXth meeting of the public assembly of Turkmenistan in March 2007 adopted the Law on Daikhan Farm and the Law on Daikhan organizations that make provision for the establishment of larger organizations of peasants instead of individual small farmers and tenants. Thus, it would be possible to put in order and improve water management at on-farm level on the basis of such organizations.

At present, Turkmenistan has huge water sector securing water for all economic sectors, including agriculture on the area of more than 2 Mha. The total length of irrigation network is 42.7 thousand km, and collector-drainage network stretches to 35.7 thousand km. There are flood-control dams, with the length of more than 1200 km. There are more than 16 000 hydrostructures on irrigation and drainage network. 16 irrigation reservoirs were constructed, with the total capacity of about 3.2 billion m³. More than 2760 pumping stations, nearly 650 km of service roads and about 700 km of communication lines are operated.

Large investments are allocated for water infrastructure development: fund of the Ministry of Water Resources; state budget; state currency reserves; state development fund for oil and gas industry and mineral resources; and other investors. Investments in water-management construction increased 17 times in 2000 as compared to the year 1995 and almost 11 times in 2007 against 2000. Investment limit allocated for water construction in 2008 exceeds by 43% that of 2007. Besides, more state budget money is allocated for operational needs of water management organizations. For example, money allocations for operational needs increased 38 times in 2000 as compared to 1995 and accounted for more than 140% in 2007 against 2000. In 2008, it is planned to invest in such needs funds that make up 106% of that in the last year. Considerable in-

crease of investments for water infrastructure development and operational needs of water-management organizations is planned in future economic and social development plans.

Water resource is the key factor of economic activity in Turkmenistan. The surface water sources are mainly transboundary. Countries located in transboundary basins are linked through aquatic ecosystems. Any change in water use of one country inevitably will affect interests of other countries. A need for present interlinked and coordinated system of transboundary water management provoked by the nature itself and calls for the establishment and development of cooperation through integrated approaches.

The hydrological characteristics of transboundary river is the division of its basin into three separate zones:

- flow formation zone;
- zone of intensive flow use and dispersion;
- delta zones.

The tensest situation in transboundary water management is observed in the basins of Amudarya and Syrdarya and caused by intensive drying of the Aral Sea, environmental degradation in Prearalie and water shortage in dry years.

The Central Asian countries have enough large experience in settling the interstate water relations and its positive results are acknowledged all over the world. On February 18, 1992, the leaders of Central Asian water agencies signed the Agreement between the states of Central Asia on cooperation in joint management of water use and protection within the interstate sources. Later, in March 1993 this Agreement was approved by the Head of States in Kzyl-Orda. According to the Agreement, the parties established the Interstate Commission for Water Coordination (ICWC) and its executive bodies – BWO “Amudarya” and BWO “Syrdarya”.

Bi- and multilateral agreements were signed on water and energy management and use in the basins of Amudarya, Syrdarya, Chu and Talas.

Over the last 17 years, collaboration of Central Asian countries within ICWC enabled the development of certain methods, style, and order of cooperation in management and use of water resources in the Amudarya River and the Syrdarya River. Such approaches are unique since agreement and planning of actions, correction and allocation of water resources are performed on regular basis within the framework of this cooperation.

However, the course of joint activities and analytical assessments in water-management area indicate to a certain passivity and stagnation of ICWC activity, especially in improvement of the regional water policy and enhancement of legislative basis.

It is well-known that the efficient transboundary basin management requires a new system of national and interstate rules and regulations on the use and protection of water resources, with clear procedures, economic mechanism and criteria. However, at

present, there is no systematic work for addressing the above-mentioned problems in the region, while draft agreements drawn up under on-going international programs progress slowly and it is difficult to forecast the date of their signing if so. Because of highly regulated flow in the Syrdarya River, a conflict arose between energy and irrigation use of this flow. However, due to imperfect legal framework for water management and lack of mutually beneficial and efficient mechanism of water-energy exchange, as well as economic problems of the countries, this conflict has not been resolved and the earlier adopted framework agreement has not been amended or improved. Analysis of water use in the region puts in the forefront the issue of saving and efficient use of the resource since the only perspective of regional development is water conservation. The ever increasing demand of growing population, agriculture, and industry can be met only through water saving, demand-based management, and the general line towards water conservation. A certain tendency is observed in this respect but it is not permanent and wide-spread.

The most critical priority tasks are meeting demands of ecosystems and keeping quality of transboundary sources. In this context, it is necessary to elaborate common criteria of water quality assessment in riparian countries. If such criteria differ among the countries, then, for example, water in upstream country may be considered as acceptable in sanitary and hygienic terms, while the same water can be treated as quite polluted in downstream country. Such situation can cause conflicts. Thus, first, at expert level, we need to agree on a procedure and criteria of assessment of surface and ground water quality and identify anthropogenic and natural elements of water pollution. Then, internal standard acts should be brought to agreed by the parties, not necessarily similar indicators.

A very important line of cooperation in transboundary water management and use is creating of environmentally friendly people's perception. The point is that engineering and organizational solutions often are not effective exactly due to human element. People's perceptions fall behind rapidly developed technologies. Thus, to secure good living conditions for future generation and sustainable development, we need to fill this gap.

Over the last time, attention of international organizations and donors was focused on problems of the Syrdarya river basin. Indeed, highly-regulated flow, cascade of hydropower stations, relatively smaller quantity of flow and larger development of command areas for irrigated agriculture have led to conflict of interests between energy and irrigation uses and to aggravation of environmental conditions in the river basin. Meanwhile, the critical matters are impending in the Amudarya river basin as well. If efficient preventive measures are not undertaken timely, such matters may develop into intractable problems.

The conservation of ecosystems in the flow formation zone and implementation of erosion-preventive measures are issues of the day. However, huge efforts are made in mid- and downstream zones to secure water by-pass through channel regulation and keep head inflow to main canals. As a result of bank erosion events, every year there is a risk of destruction of crops, settlements and other economic objects located in water strip, and large material and financial resources are spent to avoid and mitigate the consequences. Situation formed on the Amudarya River in January 2008 can be given

as an example. Abrupt fall of temperature and prolonged hard frosts caused ice phenomena, such as formation of ice-field in river's downstream. Firm freezing in the downstream was accompanied by intensive ice movement and frazil ice drift in the midstream. Consequently, first, in area of Birata gauging station and then in many upstream sections ice jams occurred, threatening by rise in water in the river up to catastrophic levels. Many river sections faced a real threat of overflow from the river valley and flooding of settlements and economic entities. Only because of timely and effective measures undertaken by the Government of Turkmenistan, we managed to avoid negative developments. Construction and reclamation facilities from all areas of the country, emergency services, numerous volunteers from coastal settlements of Lebap velayat were enabled to consolidate river banks, repair flood dams, break ice monoliths, and destruct ice jams. Twenty-four-hour watching in all risk river reaches and monitoring over the state of ice, water, banks, and protecting structures were organized. Combating of this disaster continues. The cost of organization and implementation of relevant measures against those dangerous ice phenomena is estimated at millions dollars.

These costs should be considered in the interstate agreements on management of shared transboundary water objects.

The joint and coordinated management of transboundary river basins is one of topical challenges of the present day and a prerequisite of sustainable development in our countries and dignified lives of our nations.

REPORT OF THE REPUBLIC OF UZBEKISTAN

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Head of Central Water Resources Administration,
Republic of Uzbekistan

On behalf of the delegation of Uzbekistan, let me salute the participant of the 5th World Water Forum and express deep gratitude to the Government of Turkey for hospitality and organization of this event.

The title of the Forum - Bridging Divides for Water - is of direct importance for the future of Uzbekistan. For the country situated in the mid- and downstream of the major rivers within the Aral Sea basin and which suffers from ever growing water shortage, the challenges related to changes in water resources are of key concern for economic development and population needs provision.

1. Status of water resources in Uzbekistan and situation in Prearalie

The common weal in the republic depends on a possibility to ensure water supply for almost 29 millions of people, for irrigation of 4.3 million ha, for industry and for the environment.

At present, the total annual water use in the republic is 55.1 km³, of which irrigated agriculture - 49.7 km³, domestic and drinking water supply for urban and rural population – 3.4 km³.

In terms of orography, Uzbekistan is located within the two Central Asian river basins, that are Amudarya and Syrdarya, occupying their western and north-western areas, where Pamiro-Alay and Tien-Shan mountain systems change by plains. This explains the relatively low water availability in the Uzbekistan's rivers as compared to Tajikistan and Kyrgyzstan and dependence on neighbors for guaranteed provision with surface water since only 11-12% originates in the country out of the total usable water resources in the country.

Shortage of water and deterioration of water and land resources are observed throughout the country. Most irrigated area is subjected to salinization, water-logging, water erosion, agro-biodiversity losses and other very hazardous processes. This hampers the development of agriculture and other economic sectors and increases the problems of low-income rural population. There is close relationship between water quality, health, and low-incomes of population. Almost one fourth of people in the republic (more than 6 millions) suffer from negative effect of polluted water. Various surveys undertaken in the rural area (WB, 2002; ADB, 2005) showed that undoubtedly low-

incomes of rural population were linked with the irregular supplies of irrigation water and the deterioration of land (salinization and water-logging).

Undoubtedly, level lowering in the Aral Sea affected the wind regime in Prearalie, that is reduction of breeze circulation.

Drying-out of huge areas of 4.5 Mha and enough stirring wind activity in 1970-1980 have caused sudden increase in dust storms in and outside Prearalie.

The exposed seabed has formed a salt desert called Aralkum, from which annually 15 to 75 Mt of salt and dust are spread with the wind. The intensive salt and dust transfer increases salinization of arable land and pastures.

In the last decades, many natural freshwater lakes disappeared, tugay areas halved, and reed area decreased 6 times.

2. Available water tendencies and forecasts, including in light of climate change

Future changes in water resources depend on two major factors, such as climate change and economic activity.

Intensive climate warming is observed throughout the Central Asia. This phenomenon is occurring in both cold and warm seasons. For Uzbekistan, records also show steady trend towards warming. The mean warming rates are 0.29°C for every decade since 1950-ties. This is twice as high as the mean warming rates in the world. The Fourth Report of IPCC (2007) indicates that since early 1950-ties the global warming rate has reached 0.13°C per decade.

A visual regional indicator of climate change is the change in frequencies of high and low air temperatures. For example, in Prearalie, the days with the temperature higher than 40°C increased twofold, while for the rest territory of Uzbekistan this is increased on average half as much again.

Number of days with low temperatures also decreases throughout the republic.

Water resources in the Aral Sea basin's rivers and their sources of feeding are very sensitive to climatic changes. The major factors influencing river runoff under conditions of warming are as follows:

- reduction of snow cover;
- glacial degradation at 0.2% - 1% a year;
- increase of evaporation from river basins.

The Uzbekistan's rivers respond differently to climate warming due to differences in types of their feeding. Runoff in the rivers with snow feeding decreases faster as temperature rises. This fits simulation results that indicate to continuous reduction of snow cover in mountain river basins.

Rivers with substantial glacier feeding are more "inert" since the temperature rise makes melting of high-altitude snow and glaciers more intensive, thus creating certain compensating conditions for runoff generation. Due to continued glacial degra-

dition, which will be ever increasing with temperature growth, runoff will decrease, maybe more intensively here as well.

Assessment of water resources in light of climate change for the future, as made under preparation of the Second National Message of the Republic of Uzbekistan on climate change, as well as by modeling of mountain river runoff formation showed the following:

- By 2030, flow rates will remain practically the same as at present.
- As air temperature will increase further, river runoff will decrease.
- Amudarya basin's rivers and small watercourses are more sensitive to climate warming.
- Flow variability is expected to increase in all basins.

The assessments indicate that changes in air temperature and precipitation in the long-term, by 2050, probably, will result in runoff reduction in the rivers Syrdarya and Amudarya. For this period, the expected runoff changes will be within 2-5 % for Syrdarya and 10-15% for Amudarya.

However, given the current situation in irrigated agriculture, climate change will cause sharper water deficit and additional risks for agriculture. Mid- and downstream of Amudarya are more vulnerable to climate change and this raises particular concerns.

It is expected that anthropogenic climate changes will lead to more frequent and severe droughts.

During dry years, when hydrological drought occurs, water-related situation is particularly critical.

Analysis of minimally low-water level conditions through extreme climatic scenarios shows that runoff in the Amudarya and Syrdarya river basins may decrease by 25-40% during growing season.

The Aral Sea basin (Amudarya and Syrdarya rivers) is expected to face the following:

- More severe Aral crisis as a whole.
- More severe water shortage and water quality deterioration.
- Continued degradation of glaciation and reduction of snow cover in mountains.
- Increased risk of drought.
- Increased water demands of growing population and all economic sectors.
- Reduced water resources, more frequent droughts, deteriorated water quality that would cause irrigated land degradation (salinization, soil erosion, fertility losses).

3. National and regional measures for adaptation of water management to climate change

Though reduction of water resources is expected in the middle of XXI century, *adaptation to consequences of climate change is one of primary objectives as early as now.*

Moreover, in this context, “The improvement of water and land resources planning and management” is very important, and the basic adaptation measures are as follows:

- Improvement of water quality control and management system.
- Improvement of hydro-ecological monitoring.
- Institutional development in area of water use and consumption.
- Water conservation through the improvement of existing irrigation infrastructure, the development and implementation of measures contributing to faster transfer to water-saving irrigation technologies, and rational water use.
- Support of agricultural reforms and strengthening of the role of Water User Associations and Farmer Associations.
- Extension of knowledge and skills for sustainable water and land management.
- Regular improvement of consciousness and awareness about resource saving and climate change.

Successful implementation of the national adaptation strategy is only possible in case of bridging the countries in area of water management and use.

4. The impact of artificial change in transboundary river regimes on water resources, and the efforts of upstream countries to expand hydropower capacities unilaterally

A negative consequence of water and environmental problems is the breach of natural river regime, which occurred as a result of increased use of Amudarya and particularly Syrdarya (due to the change in operation mode of Toktogul reservoir) for hydropower generation purposes. Instead of summer water abundance in the rivers and dry winter, winter floods with heavy ice regime in mid- and downstream and low water conditions in summer, up to complete drying of channel, occurred along the Syrdarya river. This complicates diversion for water supply in the scarcest summer time and contributes to morbidity. Water salinity exceeded 1.5-1.8 g/l in lower reaches.

The rational use and development of water and energy resources in Amudarya and Syrdarya basins have been and still are the most complex regional challenges before Central Asia.

At present, new large-scale hydropower projects are developed along transboundary rivers in Kyrgyzstan and Tajikistan: in the upper reaches of Amudarya,

Syrdarya, and Zerafshan, such as Kambarata HEPS in Kyrgyzstan and Roghun and Yavan HEPS in Tajikistan.

However, implementation of those projects can change significantly regimes of Syrdarya and Amudarya and can have negative effect on water availability for population, major economic sectors and, especially, irrigated agriculture. Putting of Roghun waterworks facility into operation could critically complicate situation in mid- and downstream of Amudarya under operation of Roghun and Nurek in power-generation regime. The change in river regime would infringe on interests of the downstream countries. Besides, it is necessary to bear in mind that the proposed construction is located in the higher seismicity zone, where Richter magnitude 8-9 earthquakes are registered. What catastrophic consequences may bring this for hundred thousand people.

Investments in the construction of hydropower stations in any water basins, including transboundary rivers, should be based on international law and take into account interests of all riparian countries. The investments should only be made after an independent international project expertise, which identifies an impact of such projects on water, environmental and socio-economic conditions in downstream countries.

The optimal development of water and energy potential, based on consideration of interests of each country, could and should be achieved through IWRM and interstate cooperation. This, in turn, would improve food and energy independence, expand export capacities, and save investment resources.

Water and energy management at transboundary level should be undertaken jointly by the countries and meet international norms. Moreover, it should be aimed at both generation of economic benefit and avoidance of potential conflicts. In this context, it is necessary to develop a strategic plan and set clearly objectives of transboundary river water use that must contribute to safety in and sustainability of the region.

Uzbekistan cooperates closely with a number of international organizations, including United Nations Development Program, the World Bank, the Asian Development Bank, Swiss Development and Cooperation Agency, Global Environmental Facility and others.

The issues of transboundary river water sharing in the region were addressed at the 13th World Water Congress “Global changes and water resources: confronting the expanding and diversifying pressures” (September 2008, Montpellier, France), where the Special session “Future trends of water and food security in Central Asia, implications for reaching the Millennium Development Goals” adopted a resolution, which stressed a need for elaboration of the common transboundary water sharing strategy by the six countries in the region in order to achieve stability in Central Asia.

The EU-CA Ministerial Conference (December 2008, Ashkhabad) placed emphasis on a need to solve water problems on the basis of the effective international water law and the agreement and expertise of all new projects on transboundary water sources in order to avoid damage to downstream riparian countries. Representatives of the European Union advocated a proposal to incorporate the item that discussions of environmental and water issues, including transboundary waters, should be based on relevant international legal framework into the final document of the Conference.

The International conference “Problems of the Aral Sea, their impact on population gene pool, flora and fauna and international mitigation measures” (March 2008, Tashkent, Uzbekistan) adopted its final document - Tashkent Declaration - which stated the following: promote sustainable management of transboundary rivers and exclude artificial reduction of volume and regime of their runoffs.

Today, Central Asia is a region, which needs stronger international cooperation and coordination of efforts in searching ways for mitigation of the Aral crisis consequences and development of effective tools for shared water use.

The international cooperation in water-related area in the region should be based on such regional strategy and concept, which provide for: 1) the development of national strategies; 2) the mechanisms of dispute resolution and consensus-building among the countries; 3) the availability of common territory, security, and mutual cooperation.

5. Position of the Republic of Uzbekistan regarding transboundary river water sharing

It is particularly important to strengthen mutual understanding and cooperation as concerns the development of water and energy potential of transboundary rivers in the region. Taking into account extra importance of water resources for Central Asia, Uzbekistan has been supporting always a wise approach to water use.

The President of Uzbekistan Islam Karimov in his speech at the Summit of the Heads of Member States of Shanghai Cooperation Organization in Bishkek on 16th August 2007 stated the following Uzbekistan’s approaches:

- issues related to use of transboundary river water in Central Asia should be solved by considering interests of more than 50 million people living in the region’s countries;
- any actions as undertaken at transboundary rivers must not make harmful effect on existing environmental and water balance in the region;
- current international-legal framework in area of water use and environment, in particular the UN Convention 1992 on protection and use of transboundary waterways and international lakes and the UN Convention 1997 on non-navigational uses of international waterways should become a basis for building of an efficient system of joint resource use in Central Asian transboundary rivers;
- there must be guarantees that construction of structures will not cause irreparable environmental effects and will not disturb the existing balance of waterway use by all riparian countries;
- in case of causing damage, all measures should be made to undo or mitigate such damage and, if necessary, a question of compensation should be raised;
- implementation of projects on transboundary river water use, including hydraulic structure construction, should be subject to their preliminary independent,

comprehensive expertise, based on principles of transparency and total awareness of stakeholders;

- the projects should be implemented on the basis of affirmative approach and compromise, where the interests of other concerned states are not infringed upon and the two extra important provisions are guaranteed:
 - **first** - no reduction of run-off flow for downstream countries;
 - **second** - no disturbance of the region's environmental security.

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