Republic of Kyrgyzstan - Country Report

NATIONAL REPORT ON THE REGIONAL WATER PARTNERSHIP (KYRGYZ REPUBLIC)

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Kyrgyz Republic has an area of 20 million ha, including 10,8 million ha (54%) used in agricultural production. Pastures (9,2 million ha or 46%) constitute major part of agricultural lands. Area of arable lands is 1,4 million ha (7%), of which 1,066 million ha (5,3%) are irrigated. Population is 4907,6 thousands. Kyrgyzstan has huge resources of ground and surface waters with substantial reserves in rivers, eternal ice and snow tracts.

There are 3500 rivers and rivulets related to main seven basins - Syrdarya, Amudarya, Chu, Talas, Hi, Tarim, and lake Issyk Kul. Water resources from these rivers flow all over Kyrgyz Republic to the Central Asian states: Kazakhstan, Tajikistan, Turkmenistan, and Uzbekistan, as well as to Sinczyan-Uygur autonomous region in China. There are no outside waters. Total average long-term natural river flow is 44,5 km^3 and 47,23 km^3 with return waters, of which: 35 km^3 (74%) in growing period and 12,23 km^3 in autumn-winter and early spring periods. Operational flow of surface sources includes waste and return waters flowing from irrigated lands to water sources both by surface and underground.

Mountains are natural accumulators of atmospheric water, which in turn is a source of rich river network. The main water source of rivers is melt waters of temporal and eternal snow, as well as glaciers. Some rivers have underground sources. Those rivers are fed in sub mountain area from alluvial cone of more or less large rivers.

Water consumption limit for Kyrgyz Republic is 11,9 km^3. Interstate water allocation, still being effective, was established during soviet period and based mainly on All-Union government interests with priority given to cotton-growing areas in Central Asian republics. Irrigation in these republics was developed according to past system of capital investments and resources planning.

Water was allocated in accordance with the development of irrigated lands, therefore Kyrgyz Republic used 24,7 % of water formed within its territory. This is a constraint in the development of irrigated lands in perspective. Comparison of actual specific water diversion over last years with average weighted irrigation norm planned under existing crop patterns shows that up to 40% of lands suffer from water deficit. Practically, water availability is much worse due to non-regulated flow of small rivers mainly feeding irrigation systems in the

republic. This became apparent in last and present dry years.

Amount of water flowing outside Kyrgyzstan is 31,34 km^3/year, of which 22,3 km^3 from the Syrdarya river basin. Total amount of water from Kyrgyz Republic is 17,572 km^3, including 6,591 km^3 - to Kazakhstan, 9,559 km^3 - to Uzbekistan, and 1,442 km^3 - to Tajikistan. In its turn Kyrgyzstan receives water from water objects of interstate use in the amount of 402 million m^3, including 325 million m^3 from Uzbekistan (7 objects) and 77 million m^3 from Tajikistan (Kairakkum reservoir). The tensest situation with the interstate water allocation is in the Syrdarya river basin. Water allocation in this basin is based on the Framework Agreement of 17 March 1998 between four states for the use of water and power resources from Naryn-Syrdarya reservoir system and the annually signed agreements.

There have not been serious problems on water allocation with neighboring states over past years. In 1992 water officials reached agreement on maintenance of before approved water shares. The Heads of State affirmed this decision in 20 September 1995 in Nukus and in 19 April 1996 in Kyzylorda.

Because of natural conditions (mainly relief) the main irrigation source in the republic is small mountain rivers. Irrigated area is 806 thousand ha or 76%, of which only 86 thousand ha are fed from regulated stream-flow and 720 thousand ha or 89% are irrigated by natural, non-regulated stream-flow. This causes irregular water availability for irrigated lands. Average monthly water availability factor is 0,9 in May and 0,54-0,58 in June-August. Irrigation in September is the worst provided with water. Water availability factor in this period is not more than 0,45.

262 thousand ha or 24% are fed from large rivers, of which 154 thousand ha from regulated irrigation source.

Thus, out of total 1 million 66 thousand ha of irrigated lands only 240 thousand ha (22,5%) are irrigated from reservoirs, while water availability of 826 thousand ha is not guaranteed.

Ground waters play an important role in water supply of urban areas, settlements, industry, etc. Within Kyrgyz Republic 34 fresh water aquifers were explored, which operational reserve is 112,2 m^3/s or 3,5 km^3/year. Operational potential of groundwater is 13,7 km^3/year, of which 2,5 km^3 are not connected with surface waters. It is possible to extract 4,0 km^3 of ground water, including 2,9 km^3 for irrigation needs. Present groundwater extraction ranges from 0,7 to 0,9 km^3/year.

Maximum diversion of water for all economic sectors in Kyrgyz Republic was registered in 1987-1989 and reached 13,93 km^3. It had decreased since 1990 and reached 8,85 km^3 in 1998. Actual average water diversion for irrigation from surface sources amounted 11 km^3/year over 1985-1992. At present time this amount has decreased by 36%. Decrease of water diversion both from surface and underground sources has the following causes:

- deteriorated technical state of inter- and on-farm water structures;
- partial use of irrigated lands in agricultural rotation;
- changes in cropping patterns on irrigated lands, replacement of hygrophilous crops (perennial grass) by less hygrophilous ones (grain);
- abrupt decline in industrial production;

- decreased canal capacity (to 20-40%) due to lack of funds for cleaning and repair works;
- low paying capacity of farms that could not use irrigated lands;
- worsened control of small intakes to private farms after breaking up of large land and water users.

Besides, introduction of water charges provided incentive to irrigation water saving.

Deterioration of the technical state of inter- and on-farm water structures, emergence of many land users with diverse cropping patterns on former crop rotation field, and general transfer to surface irrigation methods without mechanization and sprinkling technique lead to worse use of diverted water, reduced water use efficiency, increased water losses and erosion (about 60% of lands), deteriorated reclamation state of irrigated lands, and environmental damage.

Main water consumer is agriculture as usual, i.e. irrigation and agricultural water supply (90% of diverted water). Remained 10% is used in municipal water supply, industry, forestry, fishery, etc. Hydropower engineering uses water without its extraction from sources, however the former has its own water requirements to generate energy.

Irrigated agriculture is the main form of agricultural production in Kyrgyz Republic. Irrigated areas have specific natural conditions. Zonal differences in agricultural production, number and quality of lands usable for irrigated agriculture, natural moisture, and state of irrigation systems characterize irrigation in Kyrgyzstan.

Natural conditions in Kyrgyz Republic make it possible to keep irrigated agriculture only on the most area. Cultivation of maize, cotton, tobacco, vegetables, fruits and vineyards is impossible without irrigation.

Analysis of formal data shows that all indices of water and land use in the republic have taken a turn for the worse over last years, that did not promote raise of agricultural production and its efficiency. Over 5-6 years area of used arable lands has reduced approximately by 60 thousand ha and irrigated area has reduced by 125 thousand ha. Compared to 1990 cropped area reduced by 86 thousand ha with considerable decrease of the most crop yields and forage areas. Irrigated pastures reduced by 30,3 thousand ha or almost three-fold. As a whole, water diversion and supply decreased almost by 1,5 billion m^3/year.

Main causes of general decline in the use of water and land resources, decrease of their productivity, and decrease of agricultural production efficiency are:

- insufficient funds of agricultural producers (for maintenance of existing and purchase of new equipment, good seeds, fertilizers, herbicides, reclamation works) and of the government (for maintenance and operation of hydroreclamation network and for large-scale reclamation measures);
- abrupt rise of inputs prices;
- deterioration of existing and lack of new equipment and spare parts;
- reduction of livestock population;
- lack of agricultural product markets;
- shortages in the organization and implementation of land and agrarian reforms;
- lack of small-scale producers knowledge about high-effective agricultural practices.

Population growth and continuous changes in water use cause the increase of water requirements with consequent decrease of water availability per capita/year. If resource availability per capita shows country capacity, situation with its use shows the level of development and efficiency.

Use of **land resources** in agriculture is estimated by "Arable lands per capita" index of UN Commission for Sustainable Development. In Kyrgyzstan this index is 0,3 ha per capita. This value indicates that lands in Kyrgyzstan belong to the **zone of unsustainable land use.** Calculations show that while having population growth rate as 1,4% per year, arable lands will decrease to 0,2 ha/capita by 2025, and having 2,5-2,6 ton of grains per 1 ha, the country will loose food independence, i.e. enter a **zone of risk land use.** With the following decrease to 0,15 ha/capita the country would reach food catastrophe or famine. (Herein, average calorie content of daily ration for able-bodied citizens should be not less than 2600-2700 kilocalories/capita (by medical forecasts - 3000 kilocalories). Decrease of daily calorie content to 2000 kilocalories and lower means food catastrophe or famine). Taking into account rates of land degradation, the zone of risk land use will become closer by 5-7 years. If level of poverty remains at 51%, the zone of risk land use will become closer for Kyrgyzstan by another 3-5 years. Despite apparent high potential for the use of lands for agricultural needs (remaining 46,1%), one should note that these lands are located in mountains and a priori belong to the zone of risk agriculture.

Level of sustainable water use is estimated by another set of international indices. Those are "Annual diversion of surface and ground waters, % of available stock" (12-17% in Kyrgyzstan), "Share of irrigated arable lands" (60-67% in Kyrgyzstan), and "Domestic water consumption per capita". Sustainable water use in irrigation is estimated with those first two indices.

Kyrgyzstan uses a share of its surface freshwaters, viz 24,7% of surface flow according to interstate water allocation in Central Asia. Out of this share 80% has been already in use. Buffer stock at 20% would not cover Kyrgyzstan's needs in case of ordinary drought and particularly under tendency to 100% irrigation of arable lands. Consequently, current water use in Kyrgyzstan is unsustainable. Domestic water consumption in Kyrgyzstan 2-9 times exceeds essential minimum daily consumption per capita, determined in "Agenda for 21 century" at Summit of 190 countries in Rio de Janeiro in 1992. This value is 40 l/capita/day. However, according to expert estimations about 20% of population in Kyrgyzstan is not secured with such minimum. One of the indices of sustainable water use is access to high quality drinking water. Expert estimation shows that access of population to high quality drinking water does not exceed 75%. It follows that one fourth of Kyrgyzstan's population drinks poor quality water under richest high-quality drinking water resources in the country.

Because of canal capacity reduction, amount of water diversion decreases and irrigation water use becomes worse. As a result we have decreased irrigation efficiency. Besides, last years it has become difficult to operate water supply due to development of small farms and peasant households.

Deficit of government budget impedes the solution of many water-related issues influencing future yields and food provision. Operation of irrigation systems is not financed from the budget anymore. Many water objects are not repaired, structures work at full stretch, water losses from canals and structures increase, and reclamation state of lands deteriorates. 60% of

irrigation systems in the republic need to be repaired. Many pumping stations have been in operation for 20-25 years, their equipment is worn out, and in nearest future these pumping stations would be out of operation and stop water supply.

All above mentioned indicates the need to involve private sector and foreign investments in water-related activities, mainly in the field of water services, such as water supply and system maintenance. Territorial and basin organizations will play an important role in the establishment of such service market.

Further expansion of private sector in water sector in different forms (contract on operation, lease, concession, entirely private company) on a base of basin water development programs and its areas and implementation of water saving projects will require strengthened role of basin water management organizations. They will be responsible for control over water-related enterprises, irrespective of ownership patterns, in part of water supply and safe maintenance of water objects and structures.

Under development of the market relations and the appropriate organizational-economic framework current management system does not provide conservation and reproduction of water resources, optimal conditions of water use, and environmental sustainability within specific river basin. Economic mechanism of water use is based on compensation of users costs (agriculture, industry, etc.) for water supply services and of charges for water use.

Water management at national, provincial, and rayon levels is a prerogative of the Department for Water Resources by the Ministry of Agriculture, Water Management and Processing Industry of Kyrgyz Republic. Former separate Ministry of Water Management was amalgamated with the Ministry of Agriculture in 1996 in order to unite budget of these two organizations and to provide better coordination of activities both at general governance level and at local level. This ministry, through the Department for Water Resources, regulates water use and governs development, construction, and operation of the whole irrigation infrastructure. The following ministries are concerned, to a certain degree, with water (mainly its quality) management: Ministry of Environment and Emergency Situations; State Agency for Geology and Mineral Resources; Ministry of Health; Kyrgyzjilkommunsoyuz (Ministry of Municipal Works); and, Department of Rural Water Supply.

At present time we are carrying out preliminary work on the implementation of the President's Decree about separation of water management bodies.

Current legislation of Kyrgyz Republic on water use under market relations is insufficient, and laborious continual work on the making adequate changes and amendments to standard legal acts and on the development of new ones is needed.

The major legislative act regulating relations in water management is Water Law of Kyrgyz Republic adopted by Zjogorku Kenesh in 14 January 1994. This is a framework law regulating all the aspects of water use. A small change and amendment to this Law was made in 1995 in order to remove previous exemption of agriculture and forestry from water charges. The main feature of this Law is application of economic instruments to water use through water pricing.

The Law sets above-mentioned provisions, however their regulation is in the scope of special legislation of Kyrgyz Republic. At present time we have no such legislation, and these issues need to be solved.

Later adopted legislative acts have some contradictions with the Water Law.

Conducted agricultural reforms on the organization of private and collective farms, peasant households and joint-stock companies based on private land property, introduced by new Land Code of Kyrgyz Republic in 1999, need to be reflected in water rights, the secured rights.

The Law is enforced through appropriate government regulations setting the procedures and responsibilities of relevant executive authorities.

A number of laws and rules addressing water and land relations have been adopted and effective in Kyrgyz Republic. A range of rules establishes execution procedures, jurisdiction of government agencies, rights and obligations of executors, etc. in order to enforce legislative acts.

All above shortages in existing laws, analysis of current problems in water sector, and elaboration of prospective directions of further development with regard for reformation both water sector and water relations in the republic require appropriate changes and amendments in present legislation, as well as development and adoption of new legislative acts. In some cases it is difficult to abandon existing juridical traditions and practices and to adopt standard legal act in form of a law but not in form of a government decree.

Analysis of existing relations with regard for recent standard acts leads to a conclusion that there is necessity of changing and amending the existing acts and of developing new ones. Those are:

- Water Law. It should be adjusted in accordance with the reality and the requirements of adopted in 1995-2001 standard legal acts. The Law should exclude provisions that are subject of politics, and section addressing interstate relations needs to be completed. This can be done though radical revision of the Law, or even development of a new legislative act. Some specialists feel that insertion of the amendments and changes in current Water Law should be parallel to the development and adoption of Water Code. Draft Water Code is being prepared within the land reform project (USAID) and to be submitted for first discussion in Autumn 2001.
- Since functioning, operation and maintenance of irrigation systems located in former collective and state farms have not been solved, we need adoption of a bill about water users associations. It will be approved by the Parliament in the nearest future. Implementation of this law will require development and approval at a level of the Government of a range of standard acts.
- Approval of the bill of water users associations causes a need of amending and changing Tax Code, Civil Code, and a range of government rules.
- Water Law requires new special legislation, which include:
    - the law about procedures and terms of setting and collecting chargers for surface water use within established limits;
    - the law about procedures and terms of collecting chargers for over-limit and irrational water use;
    - the law about procedures and terms of collecting chargers for pollutants disposal into water bodies and structures;
    - the law about national irrigation fund;
    - elaboration of amendments to Tax Code on water charge relief;

- elaboration and approval by the Government of provisions essential for these laws implementation;
- elaboration of regulations within special legislation on relief and exemption from water charges.

Elaboration and approval of above listed standard acts will cause necessity in changes and amendments to a range of existing laws and acts regulating water-land relations in Kyrgyz Republic.

System of water charges in the republic has not been worked through so far, and therefore there are no adequate incentives to water saving. Currently Zjogorku Kenesh of Kyrgyz Republic is responsible for setting tariffs for irrigation water supply services. Setting of tariffs does not depend on economic factors, i.e. does not meet cost requirements, but often depends on political situation. It is essential that the right to set tariff rates is to be under jurisdiction of the Government and appropriate amendment is to be made to the Water Law. Prompt consideration and approval of a law on introduction of water charges, draft of which is under Zjogorku Kenesh's consideration, are needed. Practically, free and uncontrollable water supply often leads to salinization and water logging of fertile lands, that greatly damages agriculture.

At present time water sector is being financed from two sources, which are budget and collected charges for irrigation water supply. Department for Water Resources has still followed the Kyrgyz Law "About setting tariffs for irrigation water supply in 1999". Draft of similar law for 2000 and 2001 was prepared in time and submitted for consideration to the Legislative Assembly of Zjogorku Kenesh, however it has not been approved until now. Draft bill on differentiated tariffs of 2002 will be submitted to Zjogorku Kenesh in autumn.

Present tariffs are very low (1-3 tiyn/m^3) and cover only one third of operational costs, consequently hydrostructures fall out or function incompletely.

Current cost of water per 1 ha is 0,5-2,5% of gross crop production.

Unfortunately, over recent 10 years many main canals, dams and other structures have deteriorated due to lack of financing for maintenance of irrigation systems. These structures lost their design and operating reliability. As a whole, capacity of primary and secondary canals reduced 25%. Southern headworks are in emergency state because of floods in 1999. Problems with dam safety are being intensifying.

Taking into account importance of irrigation sub-sector and its problems, since 1996 the Government has taken intensive measures on the development of a program and the attraction of credits from the International Development Association to support irrigation sub-sector. As a result project "Rehabilitation of irrigation systems" has been implemented since October 1998, while project "Emergency measures in case of flood" has been implemented since July 1999. At present time we have launched project "On-farm irrigation". Total cost of above projects is 85 million USD, including 65 million USD - credits and 20 million USD - budget funds of the Government.

The aim of "Rehabilitation of irrigation systems" is to rehabilitate 48 irrigation systems having command area of 350 thousand ha and 12 dams, including such large dams as Orto-

Tokoy, Papan, Kirovka. It is also planned to complete construction of Kara-Buurin reservoir. Duration of this project is 6 years.

Project "Emergency measures in case of flood" carries out repair-and-renewal operations in check dams on Kugart, Kara-Darya, Sokh, Yassy, and Tar rivers. It is planned to construct about 9 km main dams and more than 15 spurs. The project includes rehabilitation of headworks in emergency state, such as Sokh, Shakhimardan, Zernovoy Kugart, Nayman, etc. Project duration is 2 years.

Project "Rehabilitation of irrigation systems" is a subsequent continuation of the first project and provides for rehabilitation works in on-farm irrigation systems and creation of viable water users associations in all provinces of the republic. Duration of the project is 6 years.

Successful, timely, and effective rehabilitation of above projects will ensure renewal of the most irrigation fund and will increase water availability of irrigated lands and their productivity.

The main strategic directions in the development of water sector and irrigated agriculture are rehabilitation and development of water management base through:

- reforming of organizational structures and decentralization of management systems, transfer of the most state irrigation systems and structures, excluding big reservoirs, structures, inter-farm main canals and pumping stations, to rural water consumers, associations;
- development, improvement, and application of economic measures contributing to rational water use through effective system of chargeable water use and consumption (both at national and interstate level) on a contractual basis and charges for water supply services, fully covering standard indices of operational costs and expenditures;
- rehabilitation of irrigation infrastructure at inter- and on- farm levels together with development of required capacity for further operation;
- involvement of local and foreign investments to ensure further operation and maintenance of irrigation fund and development of reforms being conducted;
- development and implementation of scientifically valid, technically perfect and economically accessible standard designs of irrigation devices, mainly for water use and consumption at a level of farm and association;
- complete development of available irrigated lands under appropriate technical state of water systems and ensured irrigation regimes;
- government subsidies with their gradual reduction as far as economic independence of water users associations increases;
- completion of the first line of all rehabilitation works in state irrigation network through investments and local financial sources;
- development and implementation of a plan for own industrial base development in coordination with irrigated agriculture development program;
- reduction of water consumption up to necessary level ensuring full requirements;
- improvement of legislative base in irrigated agriculture and water management sector, having in view:
  a) interstate economic relations on the use of water resources of Kyrgyz Republic on a contractual basis;
  b) completed creation of water users associations, their rayon and basin unions together with transfer of the most irrigation fund on a free basis;

c) transfer of all basin production authorities to self-supporting base;
d) revision of tariffs for water supply in order to fully cover operation and maintenance costs;
e) putting into operation objects of incompleted construction, such as Southern Chu Canal accumulating water on the Chu river tributaries, Kara-Buurin reservoir, Southern-Talass Canal, Lower Ala-Archin reservoir, etc. and increase of irrigated lands from available reclamation fund.

Integrated Framework for Development up to 2010 adopted at National Assembly in 29 May 2001 provides the following activities on the increase of water use efficiency and agricultural lands reclamation:

- to make changes and amendments to water legislation with regard for changed political, economic, and social situation;
- to finish formation of Water Cadastre of Kyrgyz Republic;
- to assess influence of return waters on basin water management balances;
- to adapt and introduce indices of UN Commission for Sustainable Development for sustainable water use estimation;
- to introduce modern systems for water fund management;
- to form common national database on state and use of Kyrgyz water fund;
- to create water users associations;
- to make step-by-step transition to advanced irrigation technologies;
- to introduce economic instruments for transition to effective water use, water saving and conservation technologies.

Essential condition for sustainable solution of problems is cooperation in all fields of international relations, particularly with Global Water Partnership on development and introduction of water management principles and on information and experience exchange. In this context CWP's program of regional actions could include the following activities in part of Kyrgyz Republic:

- creation of communication system and a framework of information exchange between the regional center and national center in Kyrgyzstan;
- public participation and capacity building in water management through national information network: National Center of Kyrgyz Republic in Bishkek (at the same time being the national site for northern areas of Kyrgyzstan) and national site in Osh city for southern areas of Kyrgyzstan;
- development of training network through establishment and development of ICWC Training Center's branch in Osh (Kyrgyz Republic) for 7 provinces of countries located in Fergana valley. Besides already existing and planned courses we propose additional courses: "Economic instruments of effective water use", "Problems in water formation and involvement of neighboring states", "Water pricing";
- creation of Public Councils for interaction and information exchange in water management first at a basin level and then at the national level. Reverse order of such Councils creation is not excluded. Kyrgyz Law about water users associations provides for establishment of Basin Water Councils involving public, water users, and local authorities;
- contribution to development of agreements, draft bills on interstate water use and conservation, on identification of transboundary influence, etc.

Taking into account natural conditions and priorities in economic development of arid Central Asian states, one can say with confidence that water will be the most important natural resource and a component of any supporting program. Involvement of the region in the network of Global Water Partnership will allow cooperation in the field and on a base of integrated water management to be developed.

Water-related publications:

1. Water is more expensive than gold. Water resources of Kyrgyzstan are national wealth. T.U. Usubaliyev, Bishkek, 1998.
2. Estimation of the parameters of average annual and within-year allocation of Kyrgyzstan's river flow and forecast of probable flows of the Naryn river in forebays of Toktogul and Uchkurgan reservoirs. 1996.
3. Human induced changes of annual river flow in Central Asia and Transcaucasia. Thesis for a Doctor's degree in geography. K.V.Zcycenko, Saint Petersburg, 1997.
4. Water resources in the rivers of soviet Tien-Shan and ways of their estimation. M.N.Bolshakov, Frunze, 1974.
5. National report on environmental state. Bishkek, 1997.
6. Kyrgyzstan in figures. Formal report, Bishkek, 1998, 2000.
7. National report on environmental state over 1995 and 1997.
8. State program for environment conservation and rational use of natural resources in Kyrgyz Republic up to 2005. Bishkek, 1998.