*Republic of Kazakhstan - Country Report*

# REPORT ON THE REGIONAL WATER PARTNERSHIP (REPUBLIC OF KAZAKHSTAN)

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## Introduction

About 90% of the Republic of Kazakhstan's territory relates to arid zone with low humidity and limited water resources. Water availability is 20th.$m^3$ /$km^2$ and is one of the lowest in Eurasia. Low water availability is limiting factor for natural and land resources development. Transfer of water resources from remote regions is the matter of future, because of that water issues should be resolved through water saving. This requires programs for water saving technologies, reduction water expenses per production unit, progressive norm introduction.During recent years water availability even became lower because of water deficit and water quality worsening.

## 1.

## Water resources status and use

Surface water resources of Kazakhstan for year of average humidity is 100.5$km^3$ from which 56.5 $km^3$ are formed within the country and rest is coming from China, Uzbekistan, Kyrgyzstan, Russia. Specific water availability is 37th.km /km. Surface water resources are located irregularly: eastern part-34.5%, northern part-4.2%, central part-2.6%, south-east part-24.1%, southern-21.2%, western part-13.4%.

Annual river flow has perennial fluctuations. Rivers on the plains are fed by melted snow. Mostly flow runs during spring (80-90%). Biggest discharge takes place in April-May. There are lot of temporal watercourses with very short living time. In summer precipitation does not play any role in river supply.

In the mountains main source is melted snow from the high mountains and glaciers. In spring-summer rainfalls contribute to this source. High flow on these rivers occur in the end of March- beginning of April and finishes in August-September. Maximum discharge here occurs in June-July. Peak flow constitutes 50-80% of annual flow. All rivers are located within the Caspian and Aral seas, Balhash and Alakol lakes and some small reservoirs.

There are about 80th. rivers and temporal watercourses from which 8th. rivers with length more than 10km. Only largest rivers reach central water bodies: SyrDarya river-Aral sea, Ural and Emba-Caspian sea, Hi, Karatal, Aksu-Balhash lake; Tobol, Ishim-Arctic Ocean.

## 2. Organization of water resources management: main principles and economic mechanism

Base of water legislation is Water Code adopted by Parliament in 1993 and governmental acts regulating water resources management. Multipurpose character of water resources use requires setting out priorities. First priority is basic human needs and ground water reservation for this purpose. Water limitation in dry years and water availability within a norm for other years are foreseen.

Water resources scarcity requires water fund preservation, water supply to industry and agriculture with water of correspondent quantity and quality, ecological issues solution. For this appropriate water management structure is needed.

River basins are considered as a base for water resources management setting out. This principles takes in account resources unity and character of utilization: economic, ecological, recreational. Basin principle of management allows to provide rational regulation and eliminate conflict situations at inter-branch level. There are 8 , basin water-related associations: Shu-Talas, Aral-Syrdarya, Balhash-Alacol, Ural-Caspian, Nura-Sarysus, Tobol-Turgai, Irtish and Ishim covering major river basins. They are responsible for water resources use management, plans preparation, water allocation, permitting, limiting water diversion, water reservoirs regime regulation, control and registration.

State enterprises are responsible for water structures operation including hydro-units, water-intakes, pumping stations, etc. Water resources management functions separation allows to take into account interests of water users within the basin as a whole, protect water resources from exhaustion.

Mentioned main principles of water management are based on common water fund regulation and are realized through basin-territorial structure.

At the national level main directions addressed are as follow: carrying out scientific-technical and investment policy providing water resources rational use< water fund preservation and sustainable water supply.

Primary element of management system is territorial board which subordinates to local authorities and, on the other hand to State Committee of Water Resources. It regulate manages water resources within its territory.

Basin water management body reflects interests of state and has functions of control and regulation. It works out basin programs, protects interests of state, on transboundary watercourses. It is important to involve public to planning and implementation of basin-wide projects.

Because scarcity of financing water projects and water structures wearing out it is necessary to involve private sector in water services on water delivery. Territorial and basin bodies play key role in privatization and legislative base preparation. Water resources allocation remains in hands of state and permitting is executed by basin water management body. Rational water use will be provided by water users associations creation in different economic branches, in first line, in irrigated farming. These associations should be established voluntarily through water users initiative from relatively small farms. As practice shows association should include all farms within irrigated system (10-15th.ha). Associations establishing will reduce load on state budget, save water and maintain water structures.

Private sector participation widening (contract, lease, concession, private company) based on prepared programs of water development, water saving project implementation will require strengthening basin water management bodies. They will be responsible for water resources management, water structures maintenance, etc.

In conditions of market relations and appropriate economic structures this management system provides optimal water resources use and protection, ecological sustainability maintenance within the basin.

Economic mechanism of water resources use is based on remuneration of cost by water users (agriculture, industry, etc.) for water delivery services and fees for water resources use. All this is foreseen by national legislation because under market conditions it is necessary to transit to paid water use for water resources use efficiency and ecological situation improvement.

Water for irrigation is charged, there are tariffs for surface and ground water and various economic branches, but it is imperfect and does not provide incentives for water saving by water users. In irrigated farming water price is 0.15-0.3c perlm$^3$ for southern regions. Tariff for water use does not exceed 0.04c per 1m$^3$. These tariffs should stimulate effective water resources and water structures use but they do not cover full operational costs.

Base for paid water use (water use, water consumption, waste water release) should be public necessary expenses for water development and water structures maintenance: flow regulation and transfer, water conservation in reservoirs, watercourses, lakes, etc., measures preventing waste releases (water rotation, treatment and re-use).

First group of measures is inter-sector one and executed by water bodies and is a base for water charging (water resources development and recharge, quality restoration, etc.).

Expenses for the second group of measures connected with technological process of production should be a base for waste releases fees. In this case this fee will be incentive for water saving and protection.

Special category is water diversion which should be paid as for water resources because it requires natural flow regime changes (river channel deepening for navigation, rafting, fish culture, level rising for energy generation, reclamation and recreation). Special payment is set for water pollution.

It worth to note, that paid water use itself can not change sources status. Principle reconstruction of economic base of water-related bodies functioning responsible for water use in the basin is needed.

### 3. River flow management, international collaboration on transboundary watercourses

Water use by various branches within one watercourse is always contradictive that requires to take it into account while regulating its regime.

For this purpose basin water organizations work out annually (autumn-winter, spring-summer season) water structures regime. On transboundary rivers regulation has interstate character. For example, on Irtysh river it is necessary to provide regime satisfying interests of Kazakhstan and Russia water users.

SyrDarya water regime is defined by Toktogul water reservoir operation regime as well as Andizhan, Kairakkum and Shardara water reservoirs.

Water resources of transboundary rivers are distributed between reparian states and each side should follow conditions established. There are certain international obligations on the Aral sea and AmuDarya and SyrDarya flow preservation.

All questions connected with river flow regulation are being solved together with water users that leads to optimal alternatives providing balance of interests of all branches-water consumers. International agreement between Uzbekistan, Tajikistan and Turkmenistan has been signed in February 1992 about collaboration in joint water management of water resources from interstate sources.
In accordance with this agreement ICWC has been established consisting of leaders of water sector and its executive bodies: BWO "Amudarya" and "Syrdarya".

International agreement between Kazakhstan and Russia has been signed in August 1992 about joint use of international water resources. This agreement regulates relations in sphere of transboundary water bodies use and protection. Kazakh-Russian commission is established which approves annually water reservoirs regime, allocated water resources and joint water structures maintenance.

On Transboundary watercourses reparian countries follow the next principles:

- Guaranteed water supply is provided, first of all for municipal needs, then industry, energy generation and fish production.
- No damage should be done to other side.
- All sides have equal rights on water use and country location in upper reaches does not give any advantages to it.

**4. Water-ecological issues of major river basins and priorities on sustainable environment restoration**

Practically over all territory of the country water situation is tense that is caused by lack and pollution of water resources. Imbalance between environment and anthropogenic load has led to ecological deterioration in all basins of the country. Syrdarya basin is characterized by complicated situation especially in lower reaches with irrigated lands expended in middle reaches and water diversion increase for this purpose. River flow reduction and pollution has led to ecological degradation and population living standard lowering. River delta has lost regulation meaning. Desertification process covered 2mln.ha and 6mln.t of salt annually is withdrawn on distance of 500km. Collector-drainage water release to SyrDarya pollutes sources of potable water.

Environmental changes reflected on fauna and flora, many bird species migrated to other regions.

Situation is aggravated by full available water resources exhaustion. Present water demand is 60 $km^3$ /year without taking into account ecological requirements that exceeds average annual flow on 22.8 $km^3$ or 50%. It is necessary to find additional water resources for ecologically stable situation and economic development.

This deficit can not be reduced only by water saving measures within existing management structure. Principal transformations are needed in basic branches of economy, mainly in irrigated agriculture, interregional cooperation and changes in share of ready production.

Water strategy in the Aral Sea basin is based on recognizing common interests in water resources development, use and protection of each state. It is important to determine within this strategy framework: common for the region principles of water resources use taking into account that: available resources are limited and water saving in industry is necessary. Saved rsources should be directed to the Aral Sea and Syrdarya delta support, ecological restoration and growing population water supply.

Aral Sea, Syrdarya delta ecosystems and natural complex of coastal zone should be considered as independent water consumers and their water demand should take into account regional ecological and social-economic interests:

- Irrigated area increase in the near future should not be foreseen, water and land conservation measures should be undertaken including water use economic mechanism;
- Population water supply, especially rural one, should be based on modern effective equipment and technologies in water preparation, treatment and delivery utilization. Control over water quality should be strengthen.

Ural river basin is also water scarce where industry development was based on natural resources availability and economic needs of the region without taking into account water factor. As a result, presently water demand significantly exceeds available resources particularly in dry years.

Western Kazakhstan water demand and necessity to develop oil and gas exploration require to find additional water resources. This issue should be solved, first of all, at expense of optimal use of fresh water available, saline ground and sea water desalinization and water intake limitation through losses reduction, water rotation and production technologies improvement. These measures will increase water availability up to norm but in the future it is necessary to consider jointly with Russia possibility of water transfer from Volga to Ural.

Central and Northern Kazakhstan river basins differ by relatively small flow and extreme irregularity within a year: 90% flow is running during 1-2 spring months. It makes this region the most water scarce.

Own water resources lack is constraint for economic development which is vary important for the country. 76% energy, 98% coal, 99% iron ore, significant share of copper are produced here. There are big supply of zinc-lead, wolfram, molibden, boxites, asbest, etc.

Rich natural resources require to attract water resources from adjacent regions: this sources is Irtysh river. Canal Irtysh-Kraganda has been constructed with length 458 km. Water is lifted by 22 pumping stations on 420. Annually about 1km$^3$ water is delivered to the Central region through this canal.

In the future more water will be conveyed by this canal by its capacity increase, brackish ground water desalinization, etc. Irtysh river has highest flow in Kazakhstan but its balance is also tense, besides it is polluted by industrial wastes. While solving Irtysh river issues it is necessary to take into account importance of three-sided long-term agreement including water pollution prevention, river flow quality maintenance, diversion volume.

Balkhash lake basin is now in unfavorable conditions due to diversion increase from Ily river and water pollution. Relations with Chinese on this river are still unregulated. Intensive water and land resources use lead to environment degradation and lake itself shrinking. Main direction of problem solution is water saving and flow quality restoration, releases from industry and agriculture stoppage. Water balance maintenance will depend on agreements with Chinese.

**5. Water resources management and water policy concept of sustainable water supply**

Taking into consideration experience of ecological sustainability restoration during short period of time, main task is to prevent wastes disposal to water bodies and watercourses. Introduction of water recycling and rotation should be considered as main technological element of production. River ability for self-cleaning facilitates river water quality restoration.

It is worth to underline that water resources protection efficiency as well as their rational use depend on water legislation improvement and its strict observance. It is necessary to provide rational use of water resources to keep our rivers and lakes clean. Economic development should not be executed at expense of environment. Water resources management means ecological protection of the basins. This policy should be based on legislation.

The most important prerequisite of management economic methods is perfection of the following directions: economically based tariffs establishing, extension of paid water use over all economic branches, territorial differentiation of water charges with regard for regional costs and water balance status, water fees distribution improvement.

- For water related measures undertaking different level of management should be defined. These levels should be interconnected without contradictions. Following levels exist: interstate, national, public and private.

At interstate level collaboration in joint transboundary water resources management should be achieved taking into account international approaches:

- Discussion and consultation in water resources management, preventing negative consequences;
- Prevention of losses due to reduction of evaporation from aquatic and earth surface;
- Collaboration in water quality maintenance.

At the national level of water management projects of national and regional meaning are implemented. Measures are as follow: dam and reservoir construction, ground water abstraction, pumping stations construction, river flow regulation, fresh water alternative sources development, maximum water losses reduction. Management plans at this level should take into consideration existing social and economic needs. Common plan and its stages should be in consistence with low level plans. Optimal compromise (in technical, economic and social aspects) is needed in water transportation distance.

At public level governmental water structures operation and maintenance is executed. Main goal is losses reduction while water is being conveyed and distributed, regular quality water delivery in time and space, close interaction between central and local organizations.

Water use efficiency improvement, WUA establishing, appropriate interrelations between water users and administration that provides equitable water distribution and its minimum losses. Water deficit problem requires new approaches both at national and interstate level.

Under existing water consumption and management methods permanent water deficit is expected, first of all in the regions with dense population.

Water consumption in industry and agriculture is growing, pollution and exhaustion deteriorate water quality and quantity that aggravates national socio-economic and regional problems. Growing role of water resources requires ecosystem approach to water related activity and better understanding of this problem at the national and regional level. One of key positions in water management policy and strategy is principle of water resources rational use and protection foreseeing water management jointly with other components of ecosystem.

Water related activity often touch only immediate consequences, while ecosystem transformation and its sustainability reduction are gradual process. Thus, ecological prediction should be considered as important part of this activity. It should be considered before project development and be based on data of systematic observations of ecosystem's components.

Water registration system should be further developed. Economic assessment should be promoted that allow to provide inter-branch and inter-sector cost-benefit analysis. National water legislation should reflect water functions as ecosystem support element. Main requirement of this legislation should be water ecosystem improvement and choice between ecosystem and economic water functions.

General plans should be considered as important tool of ecosystem approach to water related activity. Reparian countries should include ecosystem conditions both in basin plans and bilateral and multisided action plans covering all catchments areas. For water management and planning purposes river basin should be considered as a single ecosystem.

Ecosystem approach requires planning based on ecosystem boundaries and active intergovernmental collaboration at all levels because many ecosystems cross national boundaries.

Existing tools and means of water management should be revised and correct if necessary to take into account water bodies functions in ecosystem support. It is necessary to assess properly in-basin and intra-basin water transfer which can change flow regime and water quality.

It is necessary to define ecologically safe river flow based on concrete methods and approaches. For this goal schemes of ecologically weighted use of environment, which determine flow as share from flow in dry period. This flow should determine water volume for withdrawal, pollutants solution, environment protection, etc.

Transboundary rivers problems in Central Asia were formed in specific sphere of interstate relations and its perfection is important factor of regional security and sustainable development.

Water is dynamic renewable resource which volume can fluctuate causing dry and humid years. One component of water balance, namely diversion for irrigated agriculture, is permanently increasing. When water expenses exceed resources water deficit grows. Additional difficulties are created by uncontrolled water use in upper and middle reaches without taking into account lower reaches needs. Energy generation requirement often do not coincide with irrigation needs. Most energy is generated in winter and water dedicated for irrigation is spent; in summer irrigation needs are maximum, but releases from reservoirs are reduced. Main task is to find a balance between energy and irrigation needs, equal water use on Transboundary rivers.

Present water policy on one fifth consists of water resources management and the rest of people management. That is why goal achieving will depend on states commitment, gradual rapprochement of national and international legislation. Water right based on international experience< should take into account regional peculiarities. Regional collaboration should be strengthen on base of international practice for transboundary rivers. Principles and norms of international agreements and conventions will promote positive achievements.

International experience shows that regional stability can be provided only through common positions and mutual interests respect. Legislation development with regard for international experience in basin water management is a base for resolving many contradictions both at national and regional level. Sustainable economic development depends on effective interstate interactions and collaboration based on water right.

Interstate use of water resources in Central Asia should be based on, first of all, on commonly accepted conventions and framework agreements which do not limit parties by prohibited actions. Based on such conventions as "Convention on transboundary watercourses use and protection and international lakes", 1992 and "Convention about right of non-navigation types of international watercourses use", 1997 process of interstate relations should be developed. These norms of international water right set out common principles in joint water use.

It worth to note that Kazakhstan is single country which joined Convention on transboundary watercourses use and protection ratified 23.10.2000. Recognizing this convention by other Central-Asian states is important stage in interstate relations system regulating joint water resources use. In the future it will allow to work out common approach to participants of international agreements in joint water use but presently, unfortunately, it is not developed enough.

The fact that other states did not join this convention should not influence on interstate relations and agreements. But it is desirable that all states would follow the same rules. In Nukus Declaration of 20.09.1995 Heads of State stated their support to this Convention and proposed to create convention on sustainable development of the Aral sea basin. It worth to

note positive activity of IF AS and its bodies, in particular, ICWC, BWO "Amudarya" and "SyrDarya". Its approach is actual because it permits to create legal base for institutional provision of agreements achieved. Interstate institutions can be charged as a control bodies.

With regard for principles of international conventions in transboundary water sphere and taking into account specific economic and social conditions of the region regional institutes could support governments in common water use questions. The nearest objectives are the following: rational water use and its quality improvement, water and environment management perfection. For this goal special regional and national programs should be established. Success will depend on legal base creation, economic and social policy integration, public participation and international collaboration.

Program of concrete actions accepted by Heads of State in Nukus in 1994 is supposed to last 3-6 years and was finished in 2000. In this connection International Convention on the Aral sea basin should be accepted where regional development after 2000 priorities should be determined. There should be clear distinction between regional and national level in order to establish responsibility and obligations for decision making and implementation, water management and protection functions.

It worth to underline necessity of collaboration potential increase. Heads of State 24.07.1997 in Cholpon-Ata have decided to create international consortiums in energy generation, water resources< food production, communication and raw materials. But, unfortunately, this decision has not been fulfilled; nevertheless, there is need for appropriate legal base and effective administrative system of water resources management to provide interstate integration and regional collaboration.

Economic reforms in Central Asia have own peculiarities. For example, in Kazakhstan agricultural enterprises are fully privatized, power plants are transferred in long-term lease, preparation is done for distributive network privatization, water resources management is executed at lower administrative level. These factors influence on regional collaboration and should be analyzed to determine strategic directions.

It worth to mention that almost all conventions recognize the following:

- water resources are common property and a base of future development, they are limited;
- water resources do not depend on state borders;
- main goal of water resources management is common well-being of people and states;
- priority of basin-wide interests over private ones including separate states using water resources;
- obligatory observance of principle of equitable, reasonable water use without damage.

This is basic provision of international watercourses right and all states should follow it.

UN conventions are preventive and includes mechanisms on conflict prevention: sides obligations; consultation mechanisms; transboundary notification; technology and information exchange; public awareness and information; bilateral and multilateral collaboration; joint assessment and monitoring; bilateral and multilateral agreements/ All above mentioned provisions should be a base for water relations establishing and legal mechanism development for collaboration in this sphere and conflict prevention.