

WATER MANAGEMENT POLICIES OF CENTRAL ASIAN COUNTRIES: INTEGRATION OR DISINTEGRATION?

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Abstract

As stated in the “Earth Summit” in Johannesburg, at present time the main obstacle to the sustainable development of the planet is water resources management. Water is a natural resource- a product of nature; it has a great influence on society as well as on environmental conditions. The world’s poorest population are mainly living in the areas with water problems and generally facing problems on acquiring of water for everyday life. The analysis of the water management in the specific irrigation systems, states and regions should address the constraints and future development strategies on development, planning and using of the limited water resources.

The Central Asia is major arid region of the former Soviet Union. The Soviet era practice of water resources planning and management set restrictions on water consumption and made recommendations for resource development without any means for implementation. As a result water was misappropriated, leading to negative environmental effects. At present both regions experiencing water problems, such as extreme droughts in 1999 and 2000. The water resources problems of the Central Asia are seen as the poor technical conditions of water infrastructure. However, the major constraint of water resources management in the above mentioned regions is institutional weakness of the water management.

During the soviet era, in both regions water resources mainly played a great role on agricultural sector. Former Soviet times, in Central Asia and Caucasus had a unique water management policy and institutions. At independence, the Central Asian states put into place arrangements for regional cooperation in water management, however different states have a different approaches on water resources management. In this paper author tries to analyze and suggest the differences in the water management institutions among the Central Asian countries and its impact on the current water management problems of Central Asia.

Key Words: Water Resources, Central Asia, irrigation, institutions

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Background

The Former Soviet Republics of Central Asia sharing unique water resources, as arid zones, this 5 states: Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan needs water resources for its agricultural sector. The agriculture is still leading sector of each country's transition economy. During the soviet time republics of region had planned economy, if Kazakhstan was oriented to industrial development, Uzbekistan and Turkmenistan was main water users for agriculture. As unique system water management systems consist three main parts: regulating part, distributing part and transporting part. The regulating part of water system located in the territory of Tajikistan and Kyrgyzstan, where most water resources of region is origins. After collapse of Soviet Union countries of the region begin to integrate to the global world. It also impacted to the management of water resources of the Central Asia. This impact in both forms: negative (the problems of allocation of limited water resources, management of unique water systems) positive (integration into international law and documents on Transboundary water management, economically sound water use, etc.). In these article analysis present problems of Transboundary water use in Central Asia and different alternative variants of this problem.

The Central Asia is one of the largest irrigated areas of the globe. It has 8, 0 million hectares of developed and 32 million ha of utilizable irrigated area. Irrigated agriculture are biggest water user, it consumes from 85 to 95% of available water resources of the region. The five countries of the region: Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan have total 1.55 million km² of territory.

Physical Conditions of the Region

Diverse terrain and altitudes ranging from 0 to 7500 m above the sea level are responsible for the diversity of the microclimate. The average temperatures range from 0-4° C in January to 28-32° C in July (IWMI, 2000). However, summers in some parts of the area can be as hot as 52° C and winters ones can be as cold as -16° C, making the overall climate of the basin a continental, with hot summers and cold winters one. The two main rivers, the Amu-Darya and the Syr-Darya, together with some thirty primary tributaries, feed the basin. However, many of the tributaries now dry up before reaching the two main rivers. The sources of these two rivers have high surplus moisture (precipitation 800 to 1600 mm and potential evapo-transpiration of 100 to 500 mm) and result in permanent snowfields and glaciers, which are located in the Pamir and Tien Shan ranges. Annual precipitation in the basin lowland deserts ranges from 100 mm in the southwest to 200 mm in the foothills of southeastern mountains, and to 30 mm in the Hungry Steppe, southwest of Tashkent. Thermal conditions in the basin are favorable for crops such as cotton and cereals.

Brief History of Water Resources Management of Central Asia

Central Asia, particularly an area stretching between the rivers Amu-Darya and Syr-Darya, is considered to be ranked among the earliest seats of civilization, culture and irrigated farming. As early as the 6th-7th centuries A.D., the Arab conquerors named it "the garden of the caliph of the faithful," because nearly gardens and vineyards covered 50% of the region's area at the moment. Throughout their history, the peoples of Central Asia were engaged in grassland farming, gardening, etc. along with irrigated land cultivation. Such a practice would give 5-7 years of rest to irrigated lands. In those times it was no secret that the natural conditions of Central Asia were

unfavorable for lasting irrigation and that gradually the land lost fertility for lack of natural drainage in the greater part of the region's territory. More than 2 million hectares of what once was irrigated land have step by step degenerated into salt marsh.

The history of water management in Central Asia falls into the following four distinct periods:

- The development of the water management system prior to Central Asia being conquered by Russia -- through the mobilization of native manpower to carry out building and rebuilding operations;
- Engineering and rearrangement of water-management facilities and schemes. Development of an integral regional water-management network.
- Deterioration of water-management conditions and emergence of environmental problems due to extensive agricultural development in the period between the '50s and '80s;
- The disintegration of a single water-management system into a number of national systems -- a situation fraught with water-triggered conflicts.

The history of water management in the region is centuries of struggle waged by peasants over water use, the struggle closely related to the social, political, cultural and economic history of Central Asian nations. Years of observation in the earliest days of their history gave peasants the clue to the river flow conditions, flood rises and falls. There was an annual flood calendar for the rivers Amu-Darya, Syr-Darya and Zarafshan, indicating the signs, seasons and duration of river-flow changes.

A number of special structures would be built for water-management purposes. The ruins of small water reservoirs, canals and dams, which served to collect water in dry or low water years, have been found in Uzbekistan, southern Kazakhstan, Turkmenistan, Tajikistan and Kyrgyzstan. To tackle water shortages in the mid-stream Amu-Darya River, the great scientist A. Donish early in the 19th century advanced an idea of building an Amu-Darya-fed canal and even designed its scheme (Mukhamedjanov, 1985). He warned that cutting off waters of the Zarafshan River, thus creating water shortage -- which is what was really done by tsarist Russia later on, could easily conquer Turkistan. The past history of water management in Central Asia is in many ways instructive; especially what concerns water division and balanced water consumption.

Water Management Institutions and Policies in the in the Central Asia countries

In the Central Asian countries have more than 8 million ha of irrigated lands, most of which receives irrigation water from two main rivers (Amu Darya and Syrdarya). The more than 50% of all irrigated lands of the region situates in the middle and lower part of the above named rivers. The normal water resources of two main rivers are approximately 77 cubic km (according Basin Water Organizations of Amu Darya and Syrdarya), from which 96% is uses for irrigation. In the year 2000 all countries of region faced deficit of water supply for irrigated agriculture, because the water resources of the two rivers was 20 cubic km less, than in normal year. As result many analysts and journalists dealing with water resources in Central Asia, particularly with their political aspects, have of late started voicing concerns over possible regional conflicts related to the division of scanty water resources.

The region's water resources are distributed unevenly. There are no international accords so far regulating water resources division. Notwithstanding, all the countries have proclaimed water sources located on their territories to be their property. Besides, water division is done on the basis of Soviet-era quotas. Needless to say, such an approach can no longer meet the demands of the day. Water division like that stirs up discontent in the countries feeding the bulk of the region's water resources (Tajikistan, Kyrgyzstan). The general information on water consumption is given in tables 1,2 and 3.

Former Soviet times, region had a unique water management policy and institutions. At independence, the Central Asian states put into place arrangements for regional cooperation in water management. The same time during the last ten years the Water Management Institutions and policies of Central Asian countries changed a lot. Kazakhstan and Kyrgyzstan are reforming its institutions and policies faster, than other neighbors are, while Turkmenistan is slower. Uzbekistan and Tajikistan somewhere in between.

In the Soviet era, different ministries and institutions were responsible for water management. The Ministry of Melioration and Water Management of the FSU were in charge of Central Asian water resources management. The water resources of Central Asia were considered as water resources of the entire Soviet Union. The water management policy and water allocation between the Central Asian States were based on the maximum economic benefit to the Soviet Union as whole [Jochen Renger, 1998].

Under the FSU, the Central Asia region had a rather unique water management policy and institutions, based on interdependency of the republic. After independence, the Central Asian states put into place different arrangements for regional cooperation in water management, primarily with the establishment of the Inter-state Commission for Water Coordination (ICWC). During the ten years of independence the water management institutions and policies of Central Asian countries had changed and the countries are proceeding in different land and water reforms at their own pace. Kazakhstan and Kyrgyzstan are reforming its institutions and policies faster than the other neighbors are, while Turkmenistan may be the slowest, just now embarking on the road towards reforms. Uzbekistan and Tajikistan seem to be somewhere in between.

In all five states of Central Asia, agriculture is gradually changing from a sector composed of large-scale state farms to a mixture of agricultural cooperatives, joint stock companies, associations of peasant farms, and private independent farms. This transformation has created maintenance problems resulting in an institutional vacuum, posing additional financial burden on the governments. The O&M of canals, which, in the past were maintained by the large cooperative farms, has been gradually transferred under a system of land and water reforms either to the newly created WUAs (in Kazakhstan and Kyrgyzstan), or to shirkats (Uzbekistan) and joint stock companies (Tajikistan).

**Table 1 . Actual Water Resources Consumption in 2001 by the states of Central Asia
(By sectors, mil. km³)**

State	Underground waters						total	including	
	MTW ²	AW ³	ITW ⁴	FIW ⁵	IW ⁶	other		Underground water	Sewage-drainage water
Kazakhstan	143,2	133,0	197,4	158,3	9712,6	573,1	10917,6	423	126,1
Kyrgyzstan	30	81,2	53,7	-	4940	-	5104,9	514	67,9
Tajikistan	412	623	501	140	10338	17	12031	972	364
Turkmenistan	349	*)	139	37	2329,1	5	23821	474	48
Uzbekistan	2582	950	1103	530	534316	595,1	58581	6900	4500
Total for Central Asia	3373	1573	1994,1	865,3	101697,6	-	110455,5	9261	5158

Table 2. Shared participation of Central Asian and Caucasus countries in consumption of surface water

State	Consumption	%
Kazakhstan	10.5	10.4
Kyrgyzstan	4.59	4.5
Tajikistan	11.06	10.9
Turkmenistan	23.35	23.1
Uzbekistan	51,68	51.1
Total for Central Asia	101.18	100

Table 3. Specific supply of the Central Asian and Caucasus population of the surface water

State	Population million	Water consumption from surface sources, km ³	Specific water consumption thousands m ³ per capita	Irrigated square, thousands ha.	Specific supply ha. per capita
	2,6	10,5	4,0	786,2	0,3
Kazakhstan	2,53	4,59	1,8	429,5	0,17
Kyrgyzstan	5,62	11,06	1,97	719,2	0,13
Tajikistan	4,9	23,35	4,75	1744,1	0,36
Turkmenistan	22,0	51,68	2,34	4280,6	0,19
Uzbekistan	37,67	101,18		7959,6	

Despite the existing accords among and initiatives by the Central Asian countries targeting the creation of inter-government control, registration and distribution of water resources, these countries are not ready to settle the ongoing conflicts. After independence, conflicts were tackled by using business contacts that water workers have preserved since the days of the Soviet unified water management system. Regrettably, though, these ties are growing loose as a new generation

² Municipal – tap water supply

³ Agricultural water supply

⁴ Industrial – technical water supply

⁵ Fish industry water supply

⁶ Irrigated water supply

of water experts appears on the stage. Therefore, there is no cooperation to speak of among the countries' water-related agencies.

The break-up of what used to be an integral water-management system and poor financing of water-management organizations across the region have brought the largest hydraulic facilities - water reservoirs, canals and pumping stations - into disarray. The 39 water reservoirs (22 in the Syrdarya and 17 in the Amu Darya river basin) were operating in the water system of Central Asia. Observation, control and distribution equipment there experiences a chronic lack of maintenance.

Lack of concerted effort in the region's farming. Every country seeks to expand its own irrigated lands and appropriate free water resources. Area under irrigation throughout Central Asia has grown by 7% over the past five years. This is a very big figure, compared with the amount of free water resources.

Even in the Soviet days, cultivation of a personal plot would constitute the principal livelihood for an average household across Central Asia. Today, cultivation of these plots fetches a rural household as much as 90% of earnings. These plots feed a lot of impoverished households. Therefore, cuts in water supplies or water shortages hit the poor households the hardest. The countries' areas under irrigation largely border one another and thus may trigger conflicts as the neighbors share water draw from the same water system.

Water Related Environmental Problems of Central Asia-Aral Sea

The Aral Sea problem has now become world's most well-known, man-made ecological disaster. The world's fourth largest inland sea has shrunk by 60%, the no water now flows into the sea, and the salinity of the sea water increased from 1% into 11%. More than 27,000 square km of the dried bottom of sea is spreading an estimated 200,000 tons of windblown salts and chemicals to more than 500 km from the Sea. The land fertility in the Aral Sea basin, which includes more than 8 million ha of irrigated lands has declined from 1.8% (amount of organic matter/humus in soil) in 1965, to 0.60-0.70% in 1996. More than 60% of irrigated lands have salinity levels that are high or very high. Climatic changes in Aral Sea zone have also taken place, shortening the vegetation period (time for planting, growing and harvesting of agricultural crops) by 20-25 days. Large areas of irrigated lands are becoming deserts, or else, waterlogged and unproductive. In 1996, in the Bukhara region alone lost 13,000 ha of irrigated land. There have been many environmental changes, and most of riparian areas of lower Amydarya and Syrdarya are totally dead, and more than 80 types of plants and 50 types of animals have been lost forever.

The most damaged part of the environment is the region's water resources. Approximately 95% of Amydarya, and 100% Syrdarya Rivers, the main water sources for Aral Sea Basin, are regulated by more than 60 different water reservoirs, canals and dams. From a total 160-170 km³/year of water resources, more than 150 km³ is used by the 5 countries in the of basin. The quality of surface and ground water has changed dramatically. The Amydarya was the drinking water source for lower part of basin until 1970. Currently, both ground and surface water contains numerous chemicals, which are very hazardous for human health (pesticides, nitrogen etc.).

The human environment of the basin has also been totally changed. The Aral Sea region now is a completely artificial territory, governed by unnatural processes. The extent of these changes is so great that natural rehabilitation is impossible. But, at this stage of the process, the problems in Aral Sea region are more social, than technical, engineering, or environmental. More than 2.5 million people live in this disaster zone. Not only are they under severe ecological pressures, but they are also suffering from social and cultural degradation. The health of population has been degraded by exposure to polluted water, food, and air. More than 85% of women suffer from anemia, causing a great increase in health risks during pregnancy. Respiratory illnesses are found in more than 60% of population. Recently reported a type of disease, that causes individuals, mostly children, to lose their ability to taste food, and resulting in a complete loss of appetite.

Social degradation is related to the loss of jobs, most of which were related to the sea (fishing, and associated businesses), and the economic migration out of the area. The Aral Sea region today is both an environmental disaster zone and a humanitarian catastrophe zone.

The water resources, economy and political system of the Aral Sea basin, were united during the Soviet era. After the collapse of the Soviet Union, the region became five independent states and Afghanistan. Water distribution, and the use of the water engineering systems (water reservoirs, hydroelectric stations, etc.) became very controversial topics among the Aral Sea states. During last 8 years the water distribution principles have not changed, and the Soviet water allocation system remains. However, each country has now has its own economy, development programs etc., and this situation is not likely to last. This is a political problem.

THE MAIN CAUSE OF THE ARAL SEA DISASTER: LARGE SCALE IRRIGATION OR POLITICAL DECISIONS?

The main causes of Aral Sea Crisis are the increase in irrigated lands, the low-efficiency use of water resources, inappropriate agricultural practices, especially the dominance of cotton monoculture. During 15 years, 1965-1980 irrigated lands increased by more than 3 times. Most of the new lands were in the dry zone, an area with low soil fertility. In the past, these lands had once been irrigated, but had become a desert. There was no economic policy governing the effective use of water or land. Both the water and land were owned by the government; water was free, it is still free today. The water use efficiency was only 0.35-0.45. This means, if you are taking 100 liters of water from a river, only 35 liters are used to grow crops, and the other 65 liters are lost.

Cotton has been the main crop for most of Aral Sea region. In Uzbekistan in 1979, 85% of land planted in cotton. Even peoples' own small private plots had to be planted in cotton. During these years Moscow ordered the production of 6 million tons of cotton. All citizens were involved in cotton-growing activities. Secondary school and university students spent 3 months in the field helping to pick cotton. Everyone, plant workers, engineers, and housewives, were required to be in the fields during cotton-picking season. During this campaign, the whole region became one big farm. Also during this same period the practice of using defoliants to aid in the harvest of cotton was begun. Airplanes sprayed the defoliants onto the same fields where farmers, school students, and others worked.

So was the environmental disaster that occurred in the Aral Sea region the result of large-scale irrigation or faulty human management decisions?

We can improve irrigation management, introduce new technologies, use water conservation methods, and improve farm management. But without improved political decision making the problems will never be solved. One unavoidable conclusion of any assessment of the problems of the region is that, to a great degree, the Aral Sea disaster was caused by the behavior of the centralized Soviet system, where the cost of human life was very cheap. This should be acknowledged by all.

The newly independent countries themselves must acknowledge this as the principle cause of the disaster. Without changing the political/economic way of managing resources and society, we cannot solve the Aral Sea problem. The people, the citizens, in the Soviet time were forever forgotten during the planning and building of any great projects. Citizen participation was non-existent. People only found out about projects after they were built. This practice must cease. People need to know what their government are doing, especially if these projects are related to changes in their environment.

Water Resources Potential for Cooperation between Central Asian Countries

Potential Water Conflicts of Central Asia

The last three-two years water allocation and distribution in the Central Asia becoming very critical problem. Because of the limited water resources only in year 2000, agriculture, the main branch of regions economy lost some 30% of the production. Each year water allocation becoming central issue in the interstate relations between Kyrgyzstan, Uzbekistan and Kazakhstan, as result of unfair and irregular water allocation. The Turkmenistan and Uzbekistan are signing each year new documents, agreements on water allocation in the Amu Darya river basin. The Kazakhstan negotiated with Tajikistan to free water resources for its irrigated areas. The bilateral relations in the water allocations in the Central Asia are becoming more common, than multilateral agreements. But, the Amu Darya and Syr Darya basins are transboundary water systems for all 6 countries of the region: Afghanistan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan, where can be applicable only multilateral agreements or at least the common agreement on water allocation must be base for bilateral agreements.

What are main sources of problems of water allocation and management in the Central Asia? In our vision there technical, political, financial-economical and environmental-cultural sources (aspects) of problem are exist.

The above instances provide conclusive evidence of the fact that water-prompted conflicts are quite possible across the region. There are several so-called "hot spots" of the conflict, including:

1. Use of waters from the Naryn River and the Toktogul water reservoir for power generation and irrigation purposes. In Soviet times, the entire system of the Syr-Darya River was used to supply water to irrigated areas in Uzbekistan and Kazakhstan. Such a situation can no longer suit Kirgizia controlling 40% of water resources formed in the region. Besides, Kyrgyzstan is poor in mineral and energy resources. Since last year, it has begun to use water to produce

cheap electric energy. But the whole water-consumption pattern was irrigation-oriented with its peak falling on the vegetation period (spring-summer). The welfare of around 15 million people and irrigation of more than 1.5 million hectares of land rely completely on this water-management system. The energy-supply scheme, though, called for an overflow last winter. As a result, 120,000 hectares of Uzbekistan's land (pastures and irrigated areas) were flooded. Uzbekistan's and Kazakhstan's media gave a negative coverage of that measure. Repetition of situations like that may seriously damage the three countries' relations and even provoke conflicts.

2. Some 22 different size rivers, water systems are lies in the borders of the countries. Most of rivers are in small scale and with very little discharge (from 0.01 to 10-15 cubic m/sec), because of it not included into interstate status. In these river systems the local population trying to change historically settled water distribution. Upper located population wants to increase water intake, which will effect to water supply of lower situated areas.
3. Division of River Amu Darya waters between Uzbekistan and Turkmenistan. The division is done on a 40%-to-40% basis, although the river's basin is inhabited by 14 million people on Uzbekistan's side and by 4 million on Turkmenistan's. Besides, after independence, Turkmenistan built a bypassing canal from the Tuyamuyun water reservoir a circumstance that created serious problems for the water-management system in some of the regions in Khorazm province.
4. It remains very probable that Tajikistan may demand cuts in the consumption of water available from the Zarafshan River feeding waterless Samarqand province in Uzbekistan.

Roots of Water Related Conflicts

For analyzing the technical aspects of water allocation and management problems is very important to understand the structure of the unique water system of Central Asia, which formed during the Soviet era. Some 60 water reservoirs were built in the Central Asia, from which 39 in the Amu Darya and Syr Darya river basin. Syr Darya River equal to 0.98, in the Amu Darya River is 0.89, it means, that the 98% and 89% of annual discharges of river waters can be reserved in the system of reservoirs. The system of regulating water reservoirs permitted to save water resources for draughts and to safe areas from flooding in the high water discharges. According to Dr.A.M.Nikitin⁷, total volume of water reservoirs in the Central Asian Water System (CAWS) equal to 57 cubic km and useful volume is 39 cubic km. The water reservoirs can be classified into 5 groups:

1. Transit water reservoirs and hydropower stations with daily or weekly regulation;
2. Transit-accumulative , high velocity small water reservoirs;
3. Accumulative-transit 1st type, water reservoirs with seasonal regulations;
4. Accumulative-transit 2nd type, water reservoirs with seasonal regulations and slow water exchange;
5. Accumulative, water reservoirs with long period regulations and slow water exchange.

The most water reservoirs of Central Asia is seasonal regulated and 90% of it is irrigation oriented. This system was built for supplying sustainable water resources to the irrigation system of Central Asia. In the history of Central Asia have dozens of examples, when even in the ancient times people built the water reservoirs. At present time the chain of water reservoirs of CAWS is changes. The regime of water reservoir changes from accumulative to transit type, it means water will regulated daily or weekly. Even if the water regime of Syr Darya and Amu Darya rivers, after two-three year anomaly low discharges will return to normal regime, the change of water reservoirs regimes into transit type will seriously effect to the water supply for irrigated agriculture.

The riverbeds of Syr Darya and Amu Darya are not ready to receive high discharges regularly; especially in the winter, lower part of rivers can not effort high discharges in winter. If the regime of water reservoirs in the upper part of CAWS will change into transit type, than for collecting freed water from upper water reservoirs needs to be build chain of catching water reservoirs. This technically possible, but economically not feasible. The change of regime of the water reservoirs (especially regulating ones in the in the Amu Darya and Syr Darya river) will lead into ruining of the CAWS.

The low water use efficiency in the irrigation and other parts of the economy is one of the main technical sources of the water allocation and management problems of CAWS. If the water use efficiency (which is 35-50% in the different irrigates schemes and basins) will be not improved at least in the middle and lower part of CAWS, than after few years the severe water shortage will take place. An already idea of transformation of water resources from outside is rehabilitating. But, one must understand the ecological effects of such transformation and political results of this. Water donor will become a monster for Central Asia; it will dictate and decide the future development of the region. The low water use efficiency itself is source of the disagreements between upper part and lower part of CAWS.

Some 100 small rivers and its tributaries flowing from one country to another, discharge of which changes from 0.01 cubic m/sec to 600-800 cubic m/sec. The status of this small rivers and tributaries still not formulated with any documents. In most cases the local population tries to change water distribution quotas in this small rivers and tributaries. The number of water users is growing, and water use is increases in the basin of the small systems. The change of water use schemes of this small rivers and tributaries will lead into the disappearance of unique water system, because this small system finally builds up the CAWS.

The political (legal) source of the problem is the national documents, lows on water use and management of Central Asian countries, where each country declares the water resources as national good, such as oil, gas and other mineral resources. In each country the national lows and decrees prevailing from interregional agreements.

All countries of the region should include into the national legal system of water resources management the difference between state water resources and transboundary resources. ***The Transboundary water resources or water resources of basin – is the water systems, its tributaries, which geographically crosses boundaries of neighboring states and uses by the all states of the region. The water resources of the Basin (Transboundary) – in all phases of the hydrologic cycle (formation, evaporation, and precipitation) – constitute a single natural resource.***

According the Dr.Gregory Gleason (University of New Mexico, USA), the fundamental principle of the international law of the Transboundary resources is the doctrine of equitable apportionment. This doctrine holds that each co-riparian is entitled to an equitable share of the uses of water of river system. There a several principles of use of Transboundary (basin) water resources:

- No one party is entitled to all of the waters of a Transboundary river system ;
- A Transboundary river system must be equitably shared by all co-riparian;
- No one party can unilaterally determine its share;
- Mainstream waters are resources of common interest not subject to major unilateral appropriation by any riparian State without prior approval by the other Basin States;
- Any act or omission by a Basin State in the construction, operation or maintenance of a project which causes substantial damage within territory of another Basin State not excused by force major, shall be subject to appropriate compensation

These principles are not new or uncommon; it is the main bases of the all Transboundary regulations in the world. By these principles handled all known water conflicts in the earth. The Mekong, Jordan, Efrat, Nile, Colorado and other Transboundary river commissions and committees are managing their day to day activities on the basis of above given principles. The political isolation during the Soviet era and absence of the wish to accept internationally recognized principles may lead into conflicts and ruining of the CAWS.

In the Central Asian states, in most cases in the upper part of the CAWS the water resources takes into account as the mineral resources (gas, oil, etc.). It is main mistake; the water is the one of the conditions of human's normal (physical) life, such as air.

The one of the other political problems to appropriate allocation and management of water resources, the public opinion about the ownership of water resources. Mostly under pressure of state news media, the people think, that all waters, which forms in their territory is the national good of the country. The idea of Transboundary water use is hardly accepted by the public opinion.

In many cases the national media's of the CA countries is not always objective on conflict issues. It is very important to formulate and create the public opinion about the Transboundary water resources; it will help to solve water-related conflicts. Otherwise, even if in the government level the countries of CA will find out the ways to prevent water conflicts, the conflicts it self will exist between the bordering population on share of the small rivers and tributaries, if they will not understand Transboundary water use principles or ignore it.

The financial- economical aspects of the water allocation and management problems includes a several problems:

- Different type of reorganization and reformation of water and agricultural sector, the water management unit of the CA countries differences with each other it makes very difficult to build up common operational and technical policy on water management;
- The operation, maintained of the CAWS (regulation water reservoirs) is carries out by the national water management organizations and from national budgets. It is critical to create in the each CA country's budget the special state for operation and maintenance of Transboundary water systems.
- The absence of the market mechanism of the transferring of the unused quota (limit) from one country to another will lead into discussion, which used who's quota (limit). The appropriate negotiated and agreed mechanism of buying-selling the water quota's (limits) will stop the discussions on unfair water allocation.

The environmental-cultural aspect of water allocation and management includes the Aral Sea problem and the situation with local people around the sea. The CA countries must decide how

much water must be diverted into the sea, what are rights of the local people? At present time Aral Sea and environmental problems related with water management forgotten, because of the worsening of water supply in the CA.

All above-mentioned aspects of water allocation and management in the CA needs equal attention from government officials, water professionals, non-governmental organizations and international donors. The “Water Pact of Central Asia”- the appropriate and equitable water allocation principle will be developed, if it will include all this aspects.

Interstate Framework on Water Resources Management – Best Framework for Preventing Conflicts

The independence of the five Central Asian states in 1991 led not only to the truncation of the water infrastructure, but also to that of institutions. The Management frameworks became irrelevant soon after independence and needed re-integration. To-date, the water management institutions for the interstate, national, provincial, district and farm levels can be discerned. The complexities of the physical infrastructure for water delivery can be noticed in the institutional arrangements for water management.

Soon after the independence, as the conflicts over water sharing surfaced, the heads of the five recently independent states signed inter-state agreements on water sharing, use, conservation, financing and management. In 1992, first of these agreements established the Intestate Commission on Water Coordination (ICWC) with appointment of relevant deputy ministers for water as its members. ICWC was entrusted with the responsibilities of policy formulation and allocating water to the five states.

The ICWC comprises leaders of water management organizations of the CA states and is the highest decision making body concerned with the regional water supply. The ICWC annual planning meeting is scheduled towards the end of each calendar year, with high level government representatives (prime-ministers or deputy prime-ministers, plus relevant ministers) of the CA states present, to discuss preliminary plans and agreements for the following year's water supply⁸. Plans for water supply and mutual agreements regarding all commodities are confirmed in the ICWC meeting of the following year in March. Subsequently, the ICWC conducts working meetings approximately once in every three months to discuss monitoring of water deliveries and any problems with water supply, as well as compliance with agreements.

In addition, finding out and implementing solutions for the environmental problems of the Aral Sea were also seen as the ICWC tasks. Moreover, the research functions were also entrusted to the ICWC. The ICWC operated through 4 executive bodies, the Amu-Darya and the Syr-Darya BVOs, the Scientific Information Center (SIC), and the ICWC Secretariat. The ICWC Secretariat is responsible for facilitating the ICWC meetings, preparation of the programs and projects with other sister organizations and financial control of the BVOs. The BVOs are responsible for the technical aspects of water allocation, distribution, and management at the basin scale and among republics. The SIC with its 14 regional branches, is responsible for creating information base, analysis, and supporting and carrying out programs to enhance water conservation measures.

Latter, with the initiation of the Aral Sea Basin Program (ASBP) by the World bank, UNDP and UNEP, two special bodies were created, namely the International Fund to save the Aral Sea (IFAS) and the Interstate Council for Aral Sea (ICAS). These two entities subsequently merged into IFAS in 1997. IFAS is headed by one of the Presidents of the five states by rotation. The

⁸ To this meeting and in cases of urgently needed solution of problems also the water management staff from the South Kazakhstan oblast, Kzylorda and Shymkent - are invited.

executive committee of IFAS, comprising the Prime Ministers of the five states, carries out the functions.

In the present context, the institutional framework for water management is a hierarchy with five levels of authority/ responsibility (Bandaragoda, 1999). The levels of management responsibility are divided into interstate or regional, state, province, district, and farm.

The regional/interstate level organizations work under two different aspects. While one set of the organizations (IFAS, ICWC) deals with the macro-level water resources, environmental management, funding decisions and political decisions, the other set (BVOs) deal with technical aspects of water regulation among the states. However, most of the regional/interstate arrangements suffer from lack of financial commitment from the member states (IWMI, 2000) and, therefore can not perform optimally.

Ways to Prevent Water-Triggered Conflicts

Are there ways to impose sustainable water-consumption patterns across the Central Asian region? What's to be done first? An insight into potential causes of water-prompted conflicts gives the following answers.

Firstly, the region's powers should sign a Central Asian Water Pact to regulate the division of transborder water resources in keeping with universally accepted practices (the Mekong, Jordan, La Grande river basins, etc.) and with due regard given to the Central Asian nations' shared history. This pact should set forth division principles for water resources that remain in common use. There are four principles that may be applied to the division of water resources that are in shared use: historical, demographical, socio-economic and "robber-like". In our opinion, the historical and demographical approaches fit better Central Asian conditions and are closer to the mentality of the indigenous nations. In other words, each country's quota is to be determined by the number of the country's population and by the role nation plays in the formation of water resources. The above water pact should be the cornerstone for tackling the water issue, because lawlessness always leads to violence and arbitrary use of scanty water resources.

Secondly, creating maximum opportunities for water-management institutions to cooperate at the regional level rather than setting up new inter-state entities. If every country embarks on creating new national institutions just to highlight its own independence this will bring no practical results.

Thirdly, encouraging region-wide agricultural cooperation by dividing the region into a number of profile crop-growing areas. This kind of cooperation, in contrast to what used to be in Soviet times, should rely on market rather than on ideology. This measure would make it possible to reduce significantly water consumption.

Fourth, while founding the Central Asian Bank for Development special funds should be instituted to finance the maintenance and operation of the entire water-management system across the region. Contributions made to the Bank to these ends can be obtained through the phased-in introduction of charges for irrigation.

Fifth, encourage market regulation in water-management through the creation of a water-resources pool in the region. In accordance with the water pact, each country should have a quota to be assigned out of the total amount of water resources. A step like that would allow any

country to sell any part of its own water quota that remained unused, to other partners according to a special tariff.

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Annex 1.

