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WATER PROBLEMS OF CENTRAL ASIA

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Sketches by E. Shukurov

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This publication presents a review of the history of the emergence and development of water-related issues in Central Asia, along with a description of the current political, economic, legal, technical and ecological problems related to the use of the water resources in the region.

The publication includes the findings of a survey involving the leading experts of the region and reflecting a broad spectrum of views as to the key water problems.

The publication targets professionals in the area of water resources management and regional use of water resources, as well as a broad audience of readers interested in the water problems of Central Asia.

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Preface

Resources for life have always been the moving force that defines the world order. This simple but universal rule has been the basis for both geo-economics as well as geo-politics. Ideologies, laws and public morals have been loyal servants to this rule.

The struggle over resources has dictated the logic in choosing humans' habitations, led pioneers overseas and caused nations to fight against one another.

As people learned to use new and diverse resources as the means of living, they created the artifacts of civilization that identify the essence and basic nature of dealings between nations in certain historic eras. Thus began the era of the great geographic discoveries which provided European civilization with the huge new resource potential which determined the world order which is preserved to a significant extent until this day. That was also how the Great Silk Road evolved as the platform of the modern process of globalization, underpinning the exchange between the West and the East. This is also how the modern world exists, with its forms of neo-colonization under the cover of technological, information and democratic upgrading.

There is a war over resources. At different times various resources have become the most desired trophy of humanity's expansionist instinct. Arable land, gold, lucrative pastures, forests... Most recently, it has been energy - oil and gas, over which nations have fought.

One peculiarity of such resources is that they get depleted at some point, being either limited or non-renewable, while others are renewed through too lengthy a cycle, going beyond the scale of life of humankind , not to mention the scale of technology. Whereas previously some resources could last for many centuries, the situation is different today. The era of oil, which has been the most important resource for a little over a century, is now about to come to an end. The whole drama of modern political history is determined by the aspiration of certain countries and nations to prolong their ability to possess this resource for as long as possible. Actually they fight not to own as much oil as possible today, but to have it last for as long as possible.

However, it is already possible, though difficult, to imagine the existence of humankind without oil or forests as the source of technological timber, and even without metals.

There are just two global natural resources -- air and water -- without which it is impossible to think about the existence of human beings.

Until very recently, air and water have been in abundance. There was no need to fight over either of them. But as the population of the planet and

the degree of environmental pollution have grown, air and water have grown scarce. In certain regions, cities, areas, countries and even continents are running out of air and water.

We are not talking just about the shortage of water for agriculture. This problem has existed forever, mostly as an engineering puzzle: how to deliver water where it is needed? One may say that the history of water relations until recently has been the history of irrigation.

As the use of water intensifies, this becomes an increasingly ecological problem. Initially the problem was limited to the pollution of drinking water, large water basins, and seas, but it has led to the threat of total disappearance of some rivers and lakes. Perhaps, it was environmental concern that for the first time raised the water issue on the agenda of the highest international tensions and turned water into the subject of international relations. For this region, the Aral Sea problem has become the symbol of this development.

Since the last quarter of the 20th century the essence and nature of water relations has started to change in the most radical way. The main subject of these relations is the issue of ownership.

In this world, rivers originate in places not very suitable for living. As a rule, rivers emerge from mountains, or swamps if in lowlands. People living in highlands find themselves in harder conditions and have less opportunities for economic prosperity. Mountainous regions and countries are forced to pay a kind of natural rent, obviously making more efforts to obtain the same quantity of resources for life than downstream nations.

Clearly, this kind of injustice was created by God or by History, but the Almighty has also provided us with the opportunity and instructions to fix this injustice. This opportunity is the right of people to own their land where they live and everything originating from this land. This includes also the natural systems of water-creation: glaciers and water springs.

As a rule, mountainous countries are not among the wealthy nations, for well-understood reasons. With scarce agricultural resources and expensive communications, countries in the mountains tend to desperately struggle for their survival rather than prosper. For any mountainous country, water serves, essentially, as a natural historic source of and chance for development. The international community must recognize and support this principle.

Unfortunately, this recognition finds its way extremely slowly. Partly, because it damages the interests of the water-using countries. It entails the obligation to pay for the water they have taken practically for granted for many centuries. They resist it so hard that they even use the authority of God as an argument for their position. Partly, the solution of the problem is hindered due to the absence of any previous practice or legislative framework for issues related to water ownership. Another very important factor is the understanding that water is growing into a strategic resource of the not-so-distant future. And

those who possess it are already entering the circle of global power centers in this century.

Due to its natural peculiarities and geographic position Central Asia is one of the largest regions that possess water resources. We emphasize the highest quality of such water resources, which provide environmentally impeccable drinking water. It was not a coincidence that all activities as part of the Global Year of Fresh Water declared by the United Nation focused on this region, particularly Tajikistan.

At the same time, Central Asia is a set of nations with a huge density of population, which is growing rapidly, combined with critical poverty levels and a desperate need for development resources.

All of this establishes the framework and define the highest degree of complexity for water issues in the region.

The study of the problem undertaken by the authors of this publication through the active support and involvement of the Friedrich-Ebert-Stiftung quite completely reflects the situation in the Central Asian region and presents the whole spectrum of problems associated with water relations. The good quality of the factual material and the solid research on the history of the problem serve the purpose of not only providing readers with an idea of the problem but also of explaining the reasons that necessitate thoroughly well-thought-out and weighed approaches for the practical resolution of the controversies and issues arising today and tomorrow before the countries of the region, as well as for international organizations dealing with water-related problems.

In fact, this is a practical guide for politicians and public figures, as it reveals the current status of the problem and analyzes possible solutions.

The assessment of the situation as made by the authors and described in the second part of this publication, which involves the most advanced experts from the countries of the region, presents the very complex picture existing in today's world about the approaches to water issues taken in the Central Asian states. This is the most important recognition, since any problem is a result and a manifestation of the approaches and assessments of various phenomena made by different people.

Obviously, the formulation of shared approaches and the assimilation of positions are the most important goals for practical immediate actions by representatives of the countries of the region within both international structures as well as communities of experts and NGOs. Indeed, we are hopeful this presentation will effectively serve this goal.

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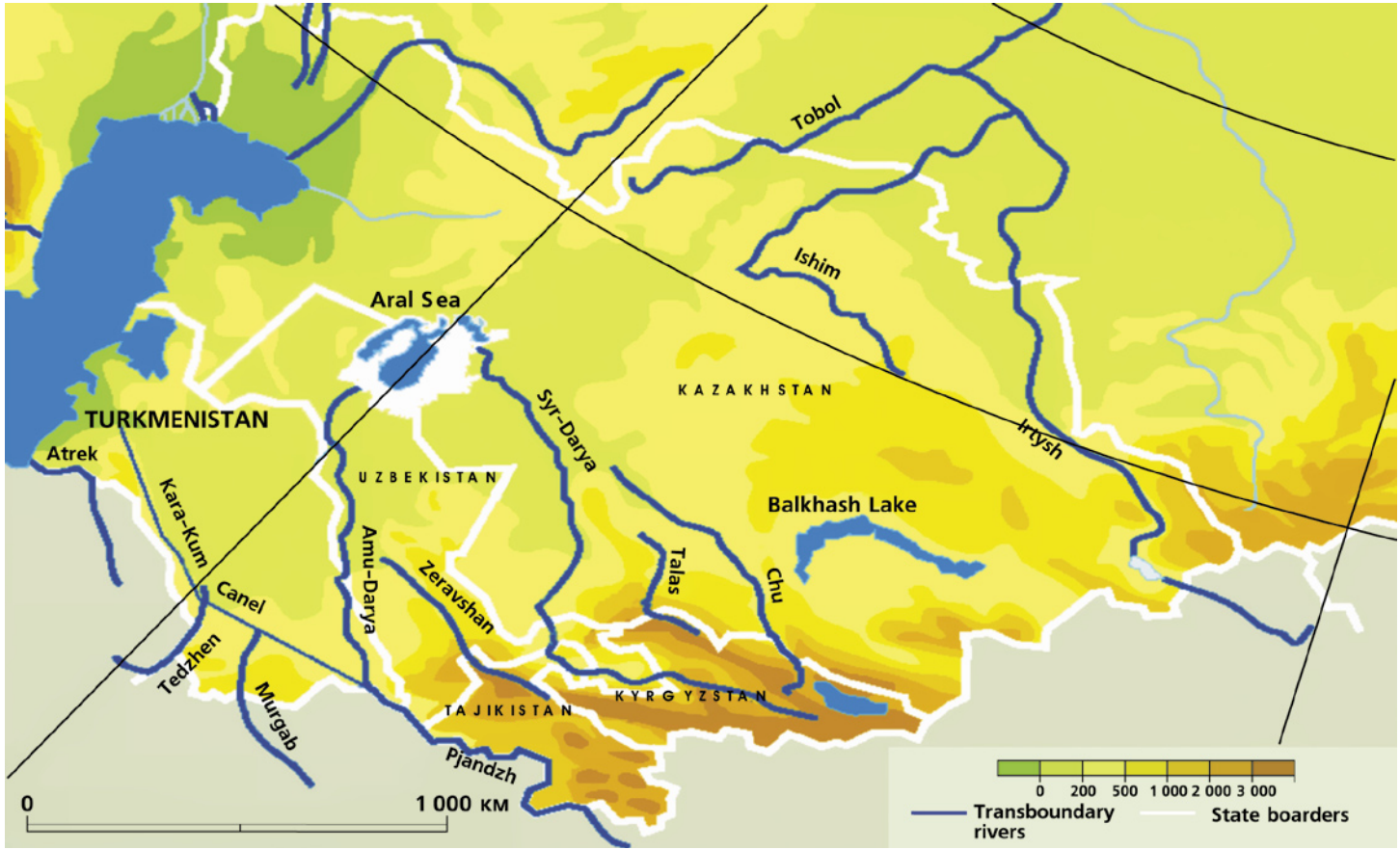


Fig.1 Transboundary Rivers of Central Asia
From the map "Transboundary Water Cooperation in the Newly Independent States", Moscow-Geneva, 2003 (Philippe Rekacewich, GRID-Arendal at request of Swedish EPA and UNECE).

Introduction

It has long been known that humans tend to label everything they come into contact with, especially any historic events. The 20th century just past was labeled as the oil or nylon century, but also the atomic and space, information and computer age. This century from the very outset has been frequently called a "water" age while inveterate pessimists call it even the age of "water wars". This definition could be understood as a "journalists' exaggeration" but in recognition of the importance of this problem the UN General Assembly very symbolically already declared the year 2003 as International Fresh Water Year.

Meanwhile, scientists long ago computed that this small planet has stocks of around 1366 million cubic kilometers of water, or two hundred something million tons per average human being[1]. For a comfortable existence, though without any extra luxury, an average human being needs not more than 100 tons of water per year, considering reasonable water supply standards. And each ton of water, subject to the inexorable worldwide recycling process, sooner or later returns to Mother Nature; so why all the fuss?

However, the reasons for concern are more than sufficient. To begin with, over 97.5% of the planetary stocks of water resources, found in seas, oceans and depths of the earth are not suitable for drinking due to excessive mineralization[2]. Theoretically, we can process the water even today, but the cost of the end product would be comparable to the price of exotic delicacies. Meanwhile, the stocks of fresh water in reality are not so substantial, since almost 90% of the stock can only be found in polar ice and glaciers, mainly in the Antarctic or in Greenland. It is still a subject for science fiction today to consider seriously the projects of large scale transportation of pieces of the ice shelf from Greenland to the waterless deserts.

If we deduct the share of fresh water found only in the clouds in the atmosphere, hidden in highly elevated glaciers or hardly accessible depths of the earth, we will find as a result that in practice only fractions of one percent of the total water resources are available to sustain the life of the globe's population.

The population of the planet is growing irrevocably, and so are the essential vital needs of people, resulting in the unprecedented pace of growth of the global water consumption curve. Last century, the consumption of water grew six times compared with the 19th century, exceeding the population growth rate by half. Complicating this trend, the problem of sustainable water consumption is aggravated by the fact that treacherous nature, having covered two thirds of the planet with seas and oceans, in addition has divided the remaining one

[1] Vital Graphics. An overview of the state of the world's fresh and marine waters. Nairobi, 2002
[2] Extra high percentage of minerals found in water.

third of the land into arid and humid zones, i.e. areas with either insufficient or abundant natural humidity rates. For instance, Brazil and Australia feature approximately same acreage and are not too different in terms of latitude, but the annual precipitation rate in Brazil is eight times higher than in Australia.

One third of the planet's population inhabits the regions suffering from sharp shortages of water resources, while every fifth citizen of Earth is running out of fresh water to drink.

Antoine de Saint Exupery wrote about this in the late 1930s in his famous "Planet of Humans":

"Water! Here, in the desert it takes more than a day to reach the nearest water well, and if you are lucky to find one, it takes hours to dig in the sand before you quench your thirst. Here... dark skinned kids do not beg for money - with an empty can in hands they ask for water: Drink, please..."

One can judge by impartial statistics just to what extent the situation has changed since then - in the world today, a quarter of a billion of people suffer from diseases which can be prevented merely by improving the quality of drinking water, sanitation and hygiene.

The inhabitants of Central Asia are fairly well provided with water - on average, about 4000 tons of surface (river) water per person annually. Nevertheless, everything that has to do with water issues in this region has recently been subject to the extra attention of the international community. This attention is not by accident - indeed, throughout many centuries of history in this vast territory called Touran, Turkestan and then Central Asia, where invisible borders became wider or narrower depending on the degree of influence of a current conqueror, only one important thing has always remained true: disputes over shared water could at any time grow into the "war of ketmens"[3]. Water has always been more than just a source of life, but a trump in political gambles. This tradition still rings true in memory today while arsenals are filled with more sophisticated weapons of mass destruction instead of hoes. Keeping this in mind, not only the heads of the state in the region, but also the majority of people in the region with common sense firmly believe that a poor peace is better than a good fight. However, the controversies in water relations are not over yet, since water resources are inevitably decreasing, yet the population of the region is predicted to grow by an estimated 40% by 2025. That is why, in spite of the overall desire for friendship and peace between brotherly nations, one cannot exclude a possible outbreak of emotions over the shortage of water that could lead to unpredictable consequences.

The founding father of OPEC, Sheikh Yamani allegedly was the author of the following: "The Stone Age did not end because there was no more stones and so the oil era will not be over because we'll run out of oil". In the same way,

[3] Ketmen (Turkish) - hoe

the end of the water age in the history of civilization will not be associated with the depletion of water resources but with the time when people will learn to use water in the most efficient and conflict-free way, when any person regardless of his/her habitat, public or financial status, will have guaranteed access to this resource.

Global experience shows that under a thorough planning and mobilization of all national capacities in a country, even developing states may solve problems of such scale within a relatively short period of time. For instance, in 1994, one third of the population of the South African Republic had no access to clean drinking water, whereas in 2001 (in just 7 years) the number of people in need halved, and the problem of the drinking water supply for the population is expected to be solved completely throughout the country by 2008.

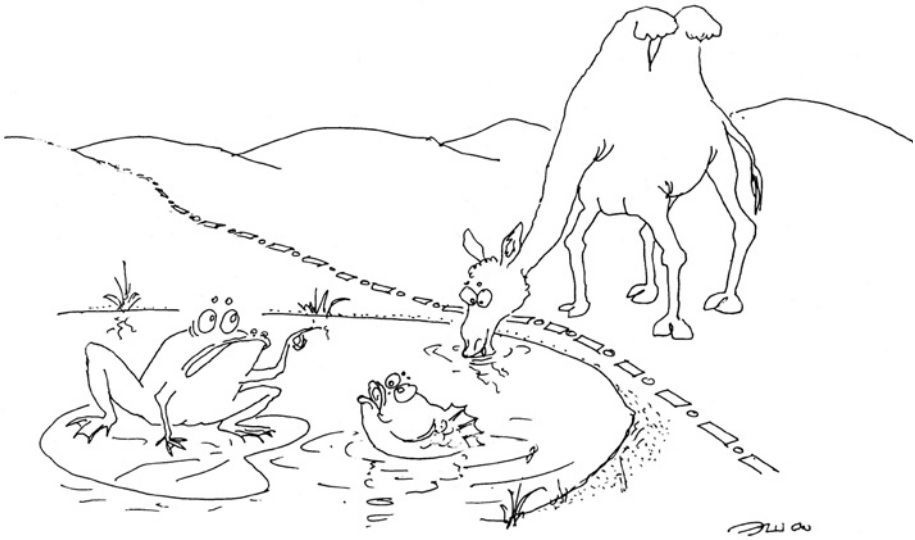
The five Central Asian republics, when they were under the same government, used to deal successfully with even more grandiose water-related projects, which in a very short time substantially modified the geographic layout and living conditions in the region. The sudden "march of sovereignties" did not just kick back the level of socio-economic development in the young independent states a few decades into the past. It initiated the rise of then sleeping symptoms of separatism, the medieval fight for leadership in the region.

It took several years of the most severe hardship to realize the unquestioned superiority of global integration over such ideas, augmented by the genetically fixed traditions of the Asian peoples, referred to almost identically in different languages: "hashar", "kashar" or "ashar" - solving common problems together in times of hardship.

We have developed a number of such problems, with the water problem being of paramount importance for peace and stability in Central Asia. This publication discusses exactly how these problems emerged a long time ago, the way such problems sometimes turned into insurmountable barriers and possible preventive approaches for the resolution of conflicts over water.

This publication is the manifestation of the authors' hope to bring back to water issues the attention of all those whose actions could help to solve water problems in the region much more rapidly. Whereas, if some readers get the impression that the authors have not been able to free themselves from personal preferences and strictly national interests of the countries of their respective citizenship, in the second part of this book we present the findings of the sociological study, with a summary of other views across the spectrum of the most vital water problems.

I. WATER PROBLEMS OF CENTRAL ASIA AND THE HISTORY OF THEIR EMERGENCE



The role of water resources in the development of civilization

«My wits are distressed by the deeds of this world...»

O. Hayyam

Human genius has so far been unable to understand the characteristics of water, that simplest substance comprised of three atoms, inappropriately splashing underfoot and pouring down, resulting in many worries and at the same time vitally important. And this despite the fact that dozens of frequently competing sciences deal with water studies.

For example, at the end of the 19th century, hydromechanics was offensively named hydraulics, as a pseudoscience in which the shortcomings of theory are compensated for by the inaccuracy of empirical coefficients. Hydraulic scientists are people with a purely practical turn of mind, and they will counter that their dams, canals and bridges, erected based on their completely approximate formulas, have existed for centuries; yet those wise pillars of hydrodynamics are still incapable of deriving exact equations for the energy balance of water flow, even for the city gutter. It was even necessary to invent a special science – the study of stalagmology, as the behavior of only

one drop of water in different conditions is described by a great number of complicated mathematical expressions.

The materialistic views of philosophers categorically rejected the possibility of a divine and mystical origin of the water element accepted by ancient wise men. But even here everything is not that simple. It has become known that the legends of living and dead water have a practical rationale, since you can now purchase mass-produced equipment for producing "the water of life", which supposedly possesses many useful qualities. Moreover lately there has been a suprising addition to the long list of anomalous qualities water possesses: water is capable of storing and accumulating information in almost the same way as the living ocean in the fantastic novel "Solyaris".

By the way, in this book the famous philosopher and futurologist Stanislav Lem vividly demonstrated that it's better to relate to oceans without using brute force. Unfortunately the chronology of the Earth's civilization has many other examples and one can already affirm the existence of a special branch of historical science studying the development of water relations in general and water conflicts which apply "water weapons" in particular.

Even in 1503 Leonardo da Vinci, in cooperation with Machiavelli, developed a technical design for the diversion of the flow of the river Arno from the city of Pisa as an effective means for the pacification of obstinate Pisans fighting against Florence. Almost four and a half centuries later, in May 1944 the armada of the British air forces actually used water weapons, having massively bombarded not the accumulations of the enemy's forces or German miltary plants, but dams on the rivers Menne, Eder and Zorpe on the territory of Northern Rhine-Westfale. The destruction of the Menne dam alone killed 1200 people and resulted in the destruction of the majority of buildings within a distance of 50 kilometers along the river valley.

In contrast to the civilized Europeans, generalissimo Chiang-Kai-Shek had no strategic aviation at his disposal in 1938. Therefore under his order to impede the attack of the Japanese Army, the bank protection dikes on the river Huankhe, to the west of the modern Kaifyn were exploded like in the old days, with the help of dynamite. As a result of this action a temporary tactical success was achieved – some of the enemy forces got bogged down in the whirlpool and almost all of the heavy military equipment got stuck in the mud, but at what price! According to Chinese sources, some three to five thousand square kilometers of flatlands were flooded, and the number of victims ranged from dozens of thousands to a million people. If even this approximate estimate is close to reality, "the most famous of generals" ought to be included in the Guinness Book of World Records as the instigator of the most barbaric

example in world history of the use of water weapons, comparable only with nuclear weapons in their effectiveness.

The author of "The Chronology of Water Conflicts" Peter Glyak'[1] has traced dozens of such examples over the past 500 years and on five continents, when in the case of armed conflicts or even insignificant political complications between different countries, large water management facilities were either exposed to serious attack or the water factor was used or otherwise applied as a radical means of pressure on the opposing side.

If the author looked a bit farther into the remote past, to the expanses of Turan lowlands, he would mostly likely award a sad gold medal not to the Chinese military leader, but to the bold trinity of commanders under Genghis Khan (Djutchi, Chagathai and Ugadei). Their favorite tactical technique was the preliminary demolishment of the water supply systems during the siege of a fortress. However in 1221 according to the evidence of the Uzbek historian G.Hidoyatov[2], after a useless siege of many months of the ancient capital Khorezm they blocked the Daryalyk river bed and the dam on the Amu Darya was demolished. As a result, large prosperous Gurgandzh (Gunya-Urgench) was ruined, burned to the ground and then flooded to eliminate all earthly traces of that rebellious city. The number of victims, refugees from the whole of Khorezm trying to seek shelter behind the walls of the fortress, was beyond count. And who could calmly count them in the raging sea of blood, fire and water, as, according to the melancholic evidence of the Arabic chronologist Djuveini, "Gurgandzh became the abode of jackals and the owl and kite settled here".

Such lessons are especially instructive for Central Asia if one takes into account the strategic importance of the dozen mostly large reservoirs in the mountain areas, the depths of which reach hundreds of meters and which contain over 30 cubic kilometers of water overall. Over seventy "time bombs" of such a type exist in the region without considering thousands of ponds and water intake facilities which are smaller in size.

Many scientists are insistently trying to substantiate the water use development scenarios if not for centuries, then at least for dozens of years in the future. As a rule two stable tendencies are taken as the basis in such computations – the increase of the population and the warming of the climate. So far the projections are not very comforting: by 2050 the earth's population will reach about 8 billion people and already within a quarter of a century two thirds of the planet's population will live in regions suffering quite a significant

[1] Gleick P. H. Water and Conflicts. In the World's Water 1998-1999. Island Press, Washington, 1998.
[2] G.A.Hidoyatov. My Native History. Tashkent. 1990.

lack of water resources. Central Asia is undoubtedly among them. From 1957-2000 the glaciers of Pamir and Alai – the main sources of river flow – have lost about 20-25% of their ice reserves, which had been accumulating for eons. The climate warming during the forthcoming quarter century will most likely result in an intensive glacier melting with an irretrievable loss of even larger quantities of ice and temporary increases of water flows in those rivers supplied mainly from glaciers. Apparently in the future the water supply of rivers will depend more and more on the snow-rain regime as opposed to the glacier factor, and subsequently, on the short-term whims of nature.

In any case, following this scenario closer to the middle of the 21st century, the reserves of surface and then underground water in the region will decrease, although it is still unclear to what extent this will occur.

At the same time, there is the theory that with the increase of average annual temperatures by several degrees, water evaporation from the surface of the world's oceans will increase and under the influence of this surplus water vapor, the quantity of precipitation in the atmosphere in the form of rain and snow will increase. However it remains unknown whether the majority of new cyclones will reach the territory of Central Asia or will continue to roam about in remote geographic latitudes, and what the future population of this region can expect – the Biblical flood or the drought – remains unknown.

However the ability to logically substantiate rosy predictions and then to look later for excuses as to why these predictions did not come true is, in the opinion of W.Churchhil, more the business of professional politicians. In the meantime, scientists are looking for key solutions to quite a practical task – how to adapt the population of the globe to the negative consequences of the water resource deficit in the worst-case scenario.

One such solution can be found in statistics – over two thirds of the world's water consumption volume is used for agricultural purposes, mostly for the needs of irrigation. This indicator has historically been high – about 90% – in Central Asia. Much of the massive infrastructure and human effort to deliver water from its sources to the fields is wasted effort, as evaporation, infiltration, leakage and other losses account for almost half of the water intake volumes (in developing countries, water losses in the irrigation sector are even higher, up to 60%). One may suppose that with the efficient use of this resource, the world community should be able to avoid the most acute water crises in the near future, and – who knows – the demographic situation will become more stable and the economic possibilities will improve to such an extent that fantastic projects of intercontinental transfer of water resources will become a reality.

It might seem that it's worth following the example of the South African Republic, investing more state budget funds in the development of water management infrastructure,and water saving technology, or at least borrowing them from the World Bank or somewhere and then things will really get moving! Alas: the experts-technocrats who are convinced that such a way of resolving all water problems is the most realistic one start arguing with representatives of other sciences, mostly sociologists and economists.

Based on their sound ruminations, the provision of investments simply for the elimination of technical water losses in the source user chain will provide at best a half-way effect. Because having filled the gaps in leaking channels and pipelines or even having rebuilt them, leaks can be avoided, but not the careless use of water as of any other natural resource gotten for free. This being the case, they believe that one must first encourage thrifty water consumption among all categories of consumers, and there's no better recipe for that than to encourage the nationwide introduction of a "fair and reasonable" payment for water.

"Having let the genie out of the bottle" economists had to decide the next course of action, as a stated thought requires implementation. But how can a decision be made if puzzled questions and indignant remarks are heard from all sides? What should one pay for – for water supply services or for water itself as a natural resource? Who should set a real price so that the inclination to water savings would be noticeable and all costs recovered, and the majority of water users would not be brought to penury? Against the background of those secondary details economists were feeling quite sure of themselves until a philosophical question was raised: is water a commodity?

Jumping ahead, one has to state that even now mankind has not yet delivered the final verdict on this principle issue. If the problem is viewed just from modern market ideology and Marxist-Lenin philosophical dogmas, then why not, since anything can be a commodity if human labor is involved in the buy-sell object and supply and demand exist. This in a way can bring the parties of the disputes to the first stage of the axiom – water is the subject of business activity. Environmental representatives are in complete disagreement with this postulate. By no means, they insist: water was one of the six base elements of the global ecosphere, long before homo sapiens appeared on earth and started ruining nature with his entrepreneurial activity. This is the real meaning of water. During the heated discussion, legal representatives became actively involved, expressing another version – water can be the subject of property and management and therefore, before selling water, all attendant legal issues must be resolved: who is the owner of water, who manages it, who bears responsibility for its safety and punishes violations of water use laws?

Clearly each of the above-described approaches has the right to exist and any civilized state should build a system of water relations on a sustainable balance of social, economic and environmental values.

The equal involvement of the social component in that formula is naturally the merit of representatives of the humanities. Thanks to their joint efforts the elementary thirst and natural desire of the majority of earth dwellers to keep their body, dwellings and implements clean are now judged as a fundamental right of a person to water or, in the words of the UN High Commissioner on Human Rights, Serge Viyera di Mellu as "an inseparable component of the human right to a fair living standard and the right to life".

However, if the human right to an adequate amount of water is as fundamental as the right to breathe why should one pay for it? And, in general, why is the many-sided essence of water forcefully limited to only three basic values, since the discrimination of human rights and the discrimination of water itself can be meant by that.

In the first article of the information agencies of the UN system on the occasion of World Water Day one more additional approach to the problem was identified: «We should view water as a spiritual and economic value". It is not improbable that even more unexpected qualities of water will be added to the truly valuable features of water. In any case, "the Johannesburg Declaration on Sustainable Development" (September 2002) enumerates the list of the priorities of civilization in the following order: «need for clean water, sanitation, adequate housing, energy, health protection, food security and biological diversity protection".

One may think that the world community has achieved a consensus regarding the highest status of water. Economists calculated immediately that to be able to maintain this status the earth's inhabitants need to annually invest 105-180 billion USD in modern prices in water management and water protection fields.

By this time the constant debaters – hydrologists and hydrogeologists – have managed to come to the agreement that surface, underground and return waters are one whole thing and they should be viewed in totality based on the hydrographic principle, i.e. within large river, lake and sea basins. Geographers have also introduced their contribution to the overall business, having drawn a line around those basins and the spheres of national water interests in accordance with the borders of states. It's difficult to overestimate the contribution of oceanic and glacier science, limnology, hydrochemistry and other sciences in estimating the value of the wealth mankind possesses. And it's still impossible to develop a common global strategy of optimal use

of this wealth – the initial socio-economic and natural-climatic conditions and political systems even in neighboring countries differ.

At the Johannesburg summit in September 2002 the leaders of the majority of the countries on the planet agreed to develop a plan of water management operation and efficiency improvement by 2005.

Half a year after that meeting in one of the UN publications with a symbolic name "The cup is half empty?" the urgency of the resolution of water problems sounded not as a good wish, but as a battle cry: «We don't need declarations any longer. We need concrete steps right now!"

However to correctly implement these steps the weighty word of historians is very important, as the experience of development of water relations covers thousands of years.

The Emergence of Water Related Issues in Central Asia

«We have hardly come far from those who trampled with their heels upon the glacial hills"

R. Kipling

Chroniclers have done a wonderful job. Many interesting details related to the water topic can be found. Not all of them are characterized by a fearless impartiality from political orders, religious and ideological and personal prejudices. But facts remain facts.

They testify that earth dwellers have recognized the multifaceted essence of water since ancient times as "allaying the thirst of fertile field, masters, slaves and livestock feeding from it", but at the same time threatening them with uncountable troubles and bloody civil discord.

For Central Asia, where since time immemorial a significant share of the water withdrawn from nature has been sent to the fields, the history of water relations is mostly represented by irrigation. The climatic conditions of the region conditioned the appearance of the first sites of civilization in oases adjacent to river basins. Five to six thousand years ago, nomads developed their first settlement, seeded the first plots of land around it with millet or sesame and then dug out several canals to the fields the length of which was a bit over two kilometers. Thus the first irrigation system in our region was born.

This was during the bronze age when estuary farming and then irrigation farming was spreading in the river valleys of Zerafshan, Surkhandarya, Fergana (now Uzbekistan), Vakhsh, Kafirnigan, Guissar, in the vicinity of a modern Hudjant (Tajikistan) and Murgab (Turkmenistan) not to mention the fertile flatlands in the delta of the Amu Darya. There KKhorezm dwellers laid canals dozens of kilometers in length and 20-40 meters wide. Many of those canals having, been renovated many times, are still successfully operating today. The historians S.Tolstov[3], Y.Gulyamov[4], B.Andrianov[5] and others provide convincing evidence that the irrigated areas of the ancient period downstream of the Amu Darya and the Syr Darya compare with similar indicators of the mid-twentieth century. The period of the maximum prosperity of irrigation dates to the first to fourth centuries A.D., or to the epoch of power of the Kushan khanate – one of the four famous Asian despotic governments that strongly governed the fates of the peoples and tribes from India to the Aral and from the Caspian to Xinjiang.

[3] S.P.Tolstov. Ancient KKhorezm, Edition of the Academy of Sciences of the USSR, 1946
[4] B.V.Andrianov. Ancient irrigation systems of the Aral Sea area. M., 1969 г.
[5] Y.G.Gulyamov. The history of irrigation of KKhorezm since ancient times until nowadays. Publishing house of the Academy of Sciences of Uzbekistan, 1957.

At that time irrigated farming started to gradually move from delta areas to piedmonts and the ancient engineers invented multi-headed water intakes which were adjusted to the conditions of wandering Djeikhun (Amu Darya), sophisticated facilities to use tapering waters (kariz) and the first small reservoirs (khauz).

The latest topographic mapping has proven that without possessing modern laser and optic-mechanical devices our ancestors laid canals with an amazingly constant down-grade, apparently using the natural abilities of donkeys and camels to move with a minimum energy consumption.

After a thousand year break caused by endless wars, in the 11th to 14th centuries stable areas of irrigated farming fell by more than one third. However Arabic newcomers enriched the local culture with advanced mathematics and architectural achievements. As a result the medieval irrigation in the area between the two rivers Amu Darya and Syr Darya went through a new qualitative period. Now the length of trunk canals such as Kyrk-Kyz and Chermen-Yab already reached hundreds of kilometers and the scope of earth works – millions of cubic meters (according to H.Ahmedov), in other words the volume of irrigation projects almost doubled.

The development of mathematical knowledge allowed the development of principally new methods of canal routing even on slopes and limestone cementing materials; the predecessors of hydrotechnical concrete, baked bricks and typically Arabic arched structures, became quite customary. At that time many attributes of modern hydraulic engineering such as flood-control outlets, bank protection dikes and back-connected water passages of dams were used for the first time. The fundamental study "Irrigation of Uzbekistan"[6] contains a few examples including interesting evidence – the statistical and hydrological computations of medieval dams turn out to be quite suitable for modern construction rules and standards.

The geographical and climatic specifics of the region made the rulers of the feudal epoch understand the usefulness of the statement "If you want to govern the country, first learn to govern water". This they did, commanding up to forty thousand diggers simultaneously for construction or repairs of canals or depriving rebellious Turkmen tribes of access to water sources as the Khiva khan did. The historian V.Nepomnin[7] discovered quite vivid documentary evidence dating back to about 1870 (the time of rule of the Kokand khan Hudoyar): "When the khan was laying the canal near the place Hindkul, about thirty persons did not obey the khan's order and did not show up. For having

[6] Irrigation of Uzbekistan, T-1.Tashkent. Publishing house "Fan", 1975.
[7] V.Y.Nepomnin. To the history of Uzbekistan irrigation. Tashkent, 1940.

done so they were buried up to the throat in the ground and left in such a position until they died".

Generally the opinions of the majority of the authors of historical studies lead to the conclusion that the period of the 15th through 19th centuries is characterized by the division of the centralized state into khanates and emirates, endless internecine wars in the fight for power and, as a result, deepest depression in all spheres of life.

An emotional assessment expressed by the academician A.F.Middendorf in the mid- 1870s could serve as the distincive assessment of the irrigation developments during that period: «These irrigation facilities unintentionally arouse even greater surprise. We are amazed to see that such a technically underdeveloped people could drain off water to their fields ... past mountains and valleys, that these works are done without any of the necessary instruments, we are surprised at the sight of canals carved in solid stone, at the sight of tunnels through which water passes or at how it is drained off to the mills on the crest of embankments several miles long".

«Colonial period» or breakthrough to the future?

«It's easier to light a small candle than to curse the darkness"

Confucius

Extremely lengthy feudal traditions in the middle of the 19th century were rapidly destroyed as a result of the expansion of tsarist Russia. Already by 1860 vast areas which now belong to Kazakhstan and Northern Kazakhstan were annexed without strong efforts. Afterwards the possessions of Kokand khanate were merged into "Turkestan Province", and the Bukhara Emirate and Khiva Khanate practically lost their sovereignty.

It's difficult to deny that the Russian colonial policy of the end of the 19th century differed little from, say, the English or French; any manifestation of the national-liberation movement was mercilessly nipped in the bud. The impression that Turkestan was initially viewed as a raw material appendix and potential sales market for goods which were non-competitive in Europe is partly correct. This is all true, but eventually there would have been no more place for the atrocities of khan Khudoyar, and within half a century, feudal Turkestan, having passed the interim stages of socio-economic development, started to become a part of rapidly developing Russian capitalism. The role of Russia as the developer of the benefits of civilization and cultural values in Turkestan, which had recently been tightly isolated from the whole of the world, is no longer doubted by anyone.

In addition to this, one should not forget about a peculiar feature of Russian liberal policy – the colonial administration apparatus, being based on a reasonable striving for support from local influential nobles, did not in fact interfere in the daily relations of the latter with citizens except in emergency circumstances. If these were noted, it was often sufficient merely to politely remind, say, the Bukhara emir, in whose property the sources of Zerafshan irrigating his possessions were... Given those common traditions one should take with a grain of salt the conclusions of Soviet researchers who had to present any manifestations of "the hateful tsarist regime" in black colors.

For example, the indifference of the Russian Treasury to local irrigation needs is noted in the already mentioned "Irrigation of Uzbekistan," as only 36.4 million rubles of public funds were allocated over 20 years (from 1895 through 1915). However this statistic doesn't take account of the flow of independent investments supplied to the Fergana valley and other irrigated areas in connection with "the cotton rush". Simple logic dictates that without significant financial injections it would be impossible to develop 330 thousand

irrigated hectares, build 60 cotton processing plants and create a sustainable transport corridor from the fields sown by American varieties of cotton right to Ivanovo textile factories.

On the contrary, irrigation during the "colonial period" was fairly successfully developed with the most active participation of Russian experts.

Thus Russian military engineers M.Ermolaev and then S.Maximov implemented the dam and irrigation construction project on the territory of the "State Murgab estate" with a total irrigation area of 24 thousand hectares. In the valley of the river of Murgab, V.Vasilyev, who later became an ideologist and practitioner of the irrigation construction in the Chui valley of Kyrgyzstan, began his first research.

In an impartial monograph of A.Mamedov[8] one may find mentions regarding these and dozens of other glorious Russian engineers, soil scientists who introduced worthy contributions to the development of pre-revolutionary period irrigation.

The grand duke N.K.Romanov – a disgraced offspring of the family – "inspired by the thirst for glory and easy success" became engrossed in irrigation for a long time. Already the first canal Iskanderaryk constructed on his initiative irrigated four and a half thousand hectares of lands in the basin of the river Chirchik. After a series of large technical failures he did not become disheartened and started to develop the waterless Golodnaya steppe with the help of the Nikolaevsky (1895) and then Romanovsky (1913) canals. The latter irrigated 35 thousand hectares. This project is noteworthy as the first example of the complex development of virgin territory, as it included the construction of 17 settlements for the hired workers and staff, forming so-called tsarist "virgin collective farms".

From 1907 -1915 over 21 thousand applications were submitted from Russian and foreign candidates for long-term concessions of about two million hectares of lands within the area of Turkestan. This promised an unprecedented scope of water management activity, which was interrupted at the initial stage of the first World War and then by revolutionary events.

However, tangible results were still achieved both from an organizational and technical perspective. Besides the development of new lands and the construction and reconstruction of canals and facilities, new low-capacity pumping stations appeared in Fergana near modern Hudjant, Termez and Chirchik, starting from 1908, and experience was gained in the operation of

[8] A.M.Mamedov. Russian scientists and development of irrigation of Central Asia. Tashkent. Publishing house "Uzbekistan". 1965

the first modern water intake facilities and first experimental systems of closed and vertical drainage.

Already ten years after the conquest of Turkestan, in 1877 in the depths of the office of the governor-general, the first regulation "Temporary Rules on Irrigation of the Turkestan Region" appeared, that first enacted the water management procedure preserved since feudal times, though under the direct supervision of visiting officials. In 1888 an improved document – "The instruction on rights and obligations of irrigation ranks, district heads, aryk-aksakals and mirabs responsible for irrigation in the Turkestan region" appeared. In terms of the level of details this instruction is probably not inferior to modern regulations.

Its implementation required the reform of the executive vertical tiers, therefore in 1897 the Department of Farming and State Properties of the Turkestan region was created with the function of state supervision over "irrigation and forestry works and agricultural institutions".

These extensive functions were carried out first by two officials under the governer-general. Such a modest management staff very quickly became unable to cope with the extremely extensive responsibilities, which resulted in the creation of a new subdivision – first the Hydrometric and then Hydromodular units. It's worth noting that these units were headed by the experts V.G.Glushkov and A.N.Kostyakov, who later became academicians and founders of the Soviet hydrological and melioration schools respectively.

Thanks to the diligence of the former, the hydrometric observatory net in the Turkestan region already had 50 water metering posts, 3 meteorological and 14 rain stations by 1912. Thus the first valuable data were included in the century series of observations on the water-carrying capacity of the largest sources, which is used now in the process of computations and projections.

The operation of the Department of Farming and State Properties initially pursued one strategic objective – to turn Turkestan into a large exporter of not only cotton, but other agricultural products. For that purpose the "Turkestan Agricultural Society" was created in 1895, to initiate studies of the agricultural potential of the region.

Famous persons were members of this society, such as the agronomist Nikolai Demo who created the first soil map of the region and also a coherent theory of the soil creation of deserts and semi-deserts. Or another agronomist, Rikhard Shreder, the founder of the unique school of breeders and also the initiator of the first tests using chemical fertilizers in Turkestan. Their colleague Mikhail Bushuev organized a testing station in 1905 (with the assistance of the grand duke Romanov) that implemented pioneering tests on washing salinized

lands using open-out and closed drainage, on the use of modern furrow irrigation and of agricultural machinery brought from Europe, which had been unknown earlier.

It should not be forgotten that the daily efforts of these and hundreds of other visiting enthusiasts were frequently connected not only with tremendous difficulties, but also a direct risk for their lives. They were almost always surrounded by illiterate local citizens, the hostility of which was steadily supported by the clergy, the class of *bays* (the rich) inclined to preserve the feudal laws and the panturkic moods of a part of the young national bourgeoisie. The dissatisfaction of the people with the new administration was caused by the seizure of land to be given to settlers from Western regions. A wave of revolts affecting the majority of the regions of Turkestan from 1872 to 1916 was the result. By the way, the majority of "the colonial period" researchers note that closer to its completion those revolts were more of the social, rather than nationalistic type.

Regional irrigation from 1918–1965

«When the canal became the refuge of waters
Unrest stirred up all of the people»

A. Navoi

If the history of the development of water relations and especially irrigation in Central Asia from ancient times until the beginning of the the 20th century has been comparatively little known even to many experts, a great number of publications are devoted to the Soviet period. Therefore to understand the main consequences of the national ownership of water from 1918 through 1966 it's sufficient to note only the most notable benchmarks.

Already half a year after the October revolution, or in May 1918, V.I.Lenin signed the first water management legal act – a "Decree on the Allocation of 50 Million Rubles for Irrigation Works in Turkestan and the Organization of such Works".

This document envisaged the priority of irrigation development in Fergana, Chui and Zerafshan valleys and also in the Golodnaya and Dalverzinskaya steppes. Soon the Department of Irrigation Works in Turkestan, headed by the famous G.K.Rozinkampf, was created.

The Civil War cut Turkestan off from the metropolis for several years, but in 1920 the Department of Irrigation Works still managed to come to Tashkent and attend to its responsibilities, already as the Turkestan Water Management Department. That same year the famous "GOELRO Plan" was approved, in which the electricity development program had a significant impact on prospects for the construction of hydroelectric power plants (HPPs) in our region. Particularly the construction of the Chirchik-Bozsu cascade of HPPs and such large facilities at that time as the Uch-Kurgan and Farkhad HPPs were envisaged in the Plan.

In 1921 the Decree of the Labor and Defense Council "On the Struggle against Drought" identifying, among other things, urgent measures to be undertaken for repairs of irrigation facilities in Turkestan, the Caucasus and the Volga River area was adopted. Apparently the need for restoring order in that document was directly connected with the catastrophic consequences of the economic recession during the First World War and overall ruin from the Civil War.

One may judge the scale of those consequences based on the statistics published in "News of Irrigation" for 1923: the total area of irrigated lands in

the country fell from 4 to 2.2 million hectares over the 10-year period from 1913 until 1923, including that in Turkestan by almost half.

Soviet chroniclers of "the period of the establishment of Soviet power in Turkestan" (1921-1924) mostly focus on the outcome of the overall water-land reform that liquidated landowners' farms and reduced land plots of the main agricultural producers – kulaks and the middle class – to a minimum. During this campaign there were sufficient "revolutionary exceeses" in place. In any case a special joint resolution of the Soviet government and the authorized agency of punitive bodies in Turkestan was needed that prohibited local authorities from interfering in the technical operation of water management organizations (1923).

Three other notable events of that period have not received due appreciation even dozens of years later. In 1923 the joint decree of the Central Executive Committee and the Soviet People's Commissariat of the Turkestan Republic assigned the creation of "meliorative partnerships", or the idea of water user's associations, which is now, at the beginning of the 21st century, going through its third revival in Central Asia. Shortly after the death of Lenin, they tried to delete from people's memories another decree in the spirit of short-term prosperity of "the new economic policy" (the notorious NEP) – regarding payment for using state irrigation facilities. The third outstanding event is connected with the qualitative change – the transition from an empiric to an evidence-based system of irrigated farming. This happened in 1926, when the water use plan in the basin of Mailisuu river (Fergana valley) was developed in Turkestan.

A little earlier, in 1924 the decision of the Political Bureau of the Central Committee of the Communist Party (b) "On the national separation of the Republics of Central Asia" eliminated the notion of Turkestan as a single regional administrative formation. Confirming the theory of the right of nations to self-determination, the country's government did not forget the principle of "democratic centralism" that is very similar to the tsarist institute of general-governorship. Therefore, just to be on the safe side, the position of the resident authorized representative of the Labor and Defense Council of the USSR was preserved in Central Asia and later the specialized regional agency – the Water Management Department (Sredazvodkhoz). This confirms once again an important circumstance having quite far-reaching consequences – the central powers have always viewed the regional water management system as one whole system.

By 1928 the irrigated areas in the renamed region managed to recover to the pre-war level of 1913, and during the first five-year successful operation, the important task of ensuring the country's independence from cotton

imports had mainly been accomplished. At this stage the increase in irrigated lands was ensured mainly at the expense of available land reserves and water resources within the earlier created irrigation systems. Thus the total irrigated area in the USSR accounted for 5.3 million hectares by 1932, with the area under cotton in Central Asia increasing 1.7 times.

In the second five-year plan (1932-1937) the pace of water management construction significantly increased under the influence of the intensive development of heavy industry in the USSR, with the level of agricultural mechanization also significantly improving. This allowed the construction of large water management facilities to begin in all Central Asian republics using vehicles, digging equipment and construction machines manufactured by local industry. As a consequence, the area under irrigation in the USSR increased by another 0.55 million hectares for these years.

The next short-term period in the history of the Soviet irrigation (1938-1941) is marked as "the period of people's constructions, truthfully people's movements under the slogan of the struggle for water, a vivid example of the political maturity, high patriotism and labor enthusiasm of the Soviet people initiating from Lenin's subbotniks (voluntary unpaid work performed on days off)"[9]. For some reason this author and many others acknowledged authorities missed a suspicious correlation between manifestations of mass heroism and the simultaneous wave of political repressions that flooded the huge country. Meanwhile it was also well-known before that imprisoned "counterrevolutionaries, Trotsky supporters and other enemies of people" out of of the number of creative and technical elite of the multinational state had become an active core of people's constructions. Millions of free citizens who awaited arrested at any moment had to demonstrate a forced heroism to almost no purpose. No wonder the Big Fergana Canal was dug in only forty-five days, if one hundred sixty thousand workers were daily fetched to dig out manually sixteen and a half million cubic meters of soil within one a half months!

But it was not only fear and blood that were mixed into the solid hydrotechnical concrete of that time, laid in the construction of three Fergana lines, Big Tashkent and Right Bank Zerafshan canals in Uzbekistan, Chiiliysky in Kazakstan, Big Chui Canal in Kyrgyzstan, Big Gissar Canal in Tajikistan, Tash-Sakinsky in Turkmenistan, not to mention thousands of smaller constructions.

The belief in Stalin and the hope that children and grandchildren would finally live happy lives – and the endless patience of the people – also played a significant role. All the efforts of the local farmers who had been patient

[9] A.N.Askochensky. Irrigation and Inundation in the USSR. Moscow publishing House «Kolos», 1967

for thousand of years and the efforts of Russian, Ukrainian and Moldavian resettlers who had been bouncing along on carts for thousands of miles up to a remote Turkestan were not wasted, one could be patient a little more and then...

...And then the Great War started and hunger, sorrow and a true patriotism without a shade of servility came to each house. Already in 1941 the Central Asian Republics accepted millions of forced re-settlers and hundreds of industrial enterprises evacuated from the European part of the USSR. Besides at the cost of incredible efforts dozens of new plants and factories were constructed, which often started manufacturing their products without rooves over their shops. The rapid growth of industrial potential demanded an immediate commissioning of new hydroenergy capacities by reducing irrigation construction programs. This determined the prioritized erection of the large Farkhad HPP on the Syr Darya river and medium HPPs near industrial centers.

Having accomplished in such a way the strategic task of the logistical supply of military activities, Central Asia at the same time accumulated huge experience in the comprehensive use of water resources which became quite useful later on. During the war the region became the main supplier of food and technical crops having reduced the areas of irrigated lands under cotton almost by three times as compared to the pre-war period, as the country needed bread most of all. In general during 1941-1945 irrigated lands in the USSR first decreased by half a million hectares, with farming yields and gross yields of products rapidly reduced. This was mostly caused by the lack of labor, the reduction of agricultural machinery and the complete absence of mineral fertilizers. Nevertheless one should not characterize the war period as a deep crisis in irrigation, as the Northern Tashkent and Big Gissar canals, Kassansai reservoir and a series of other large hydrotechnical facilities continued to be constructed using the tested method of people's constructions.

It's quite noteworthy that despite the extreme tension of the USSR state budget one could still manage to allocate over a hundred million rubles over four years for regional water management needs. Looking ahead, we note that within a quarter of a century, billions of rubles were already being allocated annually.

Soon after the end of the Great Patriotic War, in 1946 "the Law on the Five-year Plan of Rehabilitation and Development of the USSR Economy" was passed and then a series of special resolutions encouraging an accelerated upgrading of the irrigation infrastructure were adopted. Among them is a rather interesting resolution of the Council of Ministers of the USSR of 1950: "On the transition to a new system of irrigation for the purpose of a

more complete use of irrigated lands and improvement of mechanization of agricultural works".

That document had two good objectives – to improve the return of the not numerous and extremely depreciated stock of agricultural machinery and also to enlarge irrigated areas for using plowing and harvesting machinery in a more efficient way. In the end the outcomes turned out not to be very successful. Concentrated together like a tank corps during the war, the agricultural machinery which had lost its owners deteriorated much more quickly compared to previous times. The idea of enlarging fields was initially used just on newly irrigated lands.

The reorganization of plantations, for instance, of Fergana and KKhorezm, that had preserved sizes and configuration for ages, required cutting valuable mulberry trees and huge labor costs connected with the transfer of roads, irrigation and drainage networks. This become a source of resistance, reminding once again that even a reasonable innovation quickly imposed onto someone from the top level is appreciated with difficulty by the bottom level. But despite that, by the beginning of the 1950s, for the second time in 30 years the rehabilitation period in irrigation was completed, as the statistics testify – the gross harvest of the most important crop, raw cotton, exceeded the pre-war level by almost 60 percent. By that time the recovered heavy industry already allowed the mechanization level both in construction and farming to be increased.

The complication of the foreign policy known as "the height of the cold war" was another significant event. In such conditions the problem of full self-provision with food and technical raw materials for all sectors of industry became not only a matter of prestige but of vital importance for the USSR. To be able to resolve this strategic problem without using market incentives the politicized socialist economy allowed only one way – an extensive path with the uninterrupted development of new capacities.

For instance, the development of non-irrigated virgin lands of Kazakhstan in such a way significantly relieved the grain problem caused by chronic low crops in the European part of the USSR. Irrigated farming was also paid attention to; by the end of 1965 it accounted for almost 10 million hectares out of which 60 percent were accounted for by Central Asian Republics. A simple list of water intake points and reservoirs, trunk canals and collectors, pumping stations and hydroelectric power plants built over 15 years (1951-1965) would cover many pages, confirming the famous slogan "Comrades, you are moving the right way!"

But in that list the Karakum canal, naturally named after V.I.Lenin as were the majority of other construction projects, would stand out. As if the well-known Suez Canal, whose length is only 161 kilometers, not to mention the Panama Canal, only half as long and constructed over dozens of years, could compare. This canal, laid out in the desert for 800 kilometers, was constructed in just over 5 years. The world has not known such a pace of hydro construction! Therefore the quotation from yellowed newspapers of that time – "the successors of illiterate mirabs have become the arbiters of fashion on the whole of the planet" doesn't seem to be a journalistic exaggeration. Meanwhile an insatiable extensive economy required the development of more and more new lands...

Melioration at the Edge of a Crisis

«Let's be lenient to great deeds – they are rarely deliberate»

A. Berte

At the beginning of Soviet power in the bubbling reserves of the revolutionary conscience an imperishable example of the poetic stereotype *"The water of (...) river flows where Bolsheviks order it to"* was born. Later on without torturing oneself for years by excessive doubts one only had to insert the name of the conquered flow.

In fact the custom of easily conquering a Nature that has become a certain hostile power rather than the feeding mother, took root not only on Soviet land. Already in the first quarter of the twentieth century, the majestic Rhine was turned into the drainage ditch of Europe, then came the turn of the Danube. Only dozens of years later thanks to the joint efforts of the whole continent, it has become possible to transform these manifestations of "negative anthropogenic influence" into a civilized flow.

In contrast to Europe a fragile environmental balance in the majority of the water basins of Central Asia was preserved until the mid-1960s. Such a long postponement of environmental crises is explained not only by the difference in the quantity of industrial companies on the rivers of the Rhine and Amu Darya, but also by local folk traditions of respectful attitude to water based on bitter lessons of the past. It could not be otherwise because for so many times in the history of the region an unrestrained river element has ruined cities and villages or changed flow unexpectedly, turning blossoming oases into deserts. This unkind memory is clearly reflected in toponymics – Djeikhun (violent), Shaidan-Sai (devil's river) – with earlier deified water sources named after the manifestation of their devilish power.

At the same time, in the East, the defilement of a canal or stream has always been viewed as sacrilege since time immemorial – one could be deprived not only of reputation, but life. Without realizing it these remarkable traditions became something like superstitious remnants during the epoch of great achievements.

Now one can only guess why in a country with significant scientific potential there has not been any authorized scientific school or single rebel found who would point the public to an obvious truth – the Central Asian water ecosystem is not a bottomless barrel and one can not extract from it endlessly and with impunity. If so, environmental collapse was already a question of

time and now its consequences are characterized by quite a narrow range of alarming assessments – from tense to catastrophic. But even now there's no agreement regarding the age-old question: who is to blame?

It would be too simple to seek a "scapegoat" looking for suitable quotes from resolutions of the party and the government dated forty years ago. In this connection the following historical parallel can be drawn. If one accepts the assertions of historians regarding the fact that not only raids of external conquerors, but also unsound land reform served as the reason for the collapse of the Roman empire, then in analogy one of the reasons for the disintegration of the USSR could have been the outdated practice of the corporate administration of land, leaving it without a diligent owner.

However by the mid-1960s a new melioration rush had come over the whole of the country from the Far East to the Carpathians and naturally, Central Asia became one of the main bridgeheads for attack.

Even such large trunk canals as Amu-Bukhar and Karshinsky, Takhiatash, Tuya-Muyun or Toktogul hydro units were no longer perceived as the projects of the century, but only as lines in a long list of new projects. Only within three five-year plans (1966-1980) the irrigated land areas in the region increased by more than two million hectares, and the final indicators of five Central Asian republics on the eve of the break-up of the USSR (1990) look even more impressive: irrigated areas had increased 1.7 times and agricultural output – by three times.

In the official publications of the Central Statistics Department of the USSR one may find all the evidence regarding the replenishment of the overall food basket of the state by Kazakh bread and rice, Kyrgyz sugar or Uzbek cotton after the May Plenary – only the data regarding the irreparable environmental damage is missing. Now when the reverberations of the triumphant successes of those years have become silent, it's high time to give a sober assessment to the losses incurred.

According to the generalized information of the hydrological annuals for many years, the water intake in the stem streams of the Amu Darya and Syr Darya has exceeded 50 cubic kilometers on average per year and this circumstance ensured the maintenance of the environmental balance not only in the area of the Aral Sea, but on a large adjacent territory as well. If one paraphrases a statement of the "epoch of stagnation", "the times then were nasty and infamous, but there were fish in the Aral Sea". However from 1960 until 1990 the total water intake in the Aral Sea basin increased from 60.6 to 116.2 cubic kilometers per year, or by 1.8 times and was able to be compared for the first time with the average annual indicator of water resource reserves

created within the whole of the basin[10]. Thus the death sentence of the unique natural formation, which had been pronounced even in May 1966, was executed. The majority of fish have disappeared from the Aral Sea, and the Sea itself has disappeared as well – having shrunk several times in volume, it has split into separate water pools, the fate of which is also questionable.

This is just the most vivid manifestation of extensive natural resource use. Similarly to the Persian satrap Darius I, apologists of the idea of the conquest of nature again demanded "land and water" and having received them again failed to manage these treasures in an appropriate way. Hydro constructors are not the ones to be blamed – they brilliantly performed their role and started conquering new shores. However from those persons who replaced them and started the agricultural development of these new areas, the unconditional fulfillment of gross indicators, or the filling of hoppers with centrally planned harvests was required. The career prosperity of the whole executive vertical, from the collective farm irrigator to the first secretary of the regional executive committee of the Communist Party of the Soviet Union depended on that notorious "gross data". If in pursuit of record crops, several dozen hectares of arable land were turned into swamp or fully salinized soil, the first "pointsman" – a certain neglectful head of the hydro section could always be neutralized.

The end of this systematic destructive policy can be quite well characterized by the statement from the report "Environment, Water and Security in Central Asia"[11], prepared by a group of experts in 2002 under the support of the Regional Environmental Center and European Economic Commission (UN EEC): «As a result of management activity that did not consider natural boundaries of the ecosystems, more than half of the territory of Central Asia is exposed to desertification processes. The share of salinized irrigated areas has reached 50% in Uzbekistan and 37% in Turkmenistan. In connection with wind, water energy and secondary salinity, agricultural areas in Central Asia have decreased by 16.4 million hectares. The area of desertified and degraded lands in Kazakhstan accounts for 179.9 million hectares or 66% of its territory and up to 80% in Uzbekistan and Turkmenistan".

A dismal conclusion can be drawn: the «historical intention» of 1996, not supported by sensible environmental compilations and economic incentives for the thrifty use of newly developed land and water resources turned out to be a strategic mistake. If out of the regional agricultural turnover a certain amount of areas had been withdrawn by the beginning of the 21st century, and many earlier irrigated lands had been ruined, then billions of rubles and a quarter of

[10] Aral: The history of the disappearing sea. Publishing House of IFAS. Dushanbe, 2003.
[11] Environment and Security in Central Asia. Report of the UN EEC and the Regional Environmental Center, Almaty, 2002.

a century of the heavy labor of a whole generation of water and agricultural experts were invested inefficiently, to put it mildly.

It was planned to spend many more funds as "the main directions of the economic and social development of the USSR for 1981-1990" unambiguously envisaged "...the continuation of scientific research and development for the transfer of a part of the waters of Siberian rivers to Central Asia and Kazakhstan".

However the public resistance that became possible only during "the epoch of openness and restructuring", or the end of the 1980s and then the deep economic crisis on the eve of the disintegration of the USSR did not allow the implementation of that gigantic project, estimated now at 20 million USD. Otherwise, in addition to Lake Sarykamysh, the capacity of which is 100 cubic kilometers of water and the Aidar-Arnasai depression (20 cubic meters), there would have been created still more dead bodies of water filled with the saline solution of collector-drain and discharge waters.

The environmental aspects of regional water relations require, most probably, closer attention, and in summarizing the historical time span before the disintegration of the USSR it's worth mentioning one more consequence of the melioration boom which also caused an ambiguous reaction.

In the statistical handbook "Fifteen Years of Courses of the May (1966) Plenary of the Central Committee of the CPSU" interesting information is given – 820 thousand hectares were developed in Uzbekistan, 700 thousand hectares in Kazakhstan within fifteen years, while in Kyrgyzstan and Tajikistan, 80 and 120 thousand hectares respectively. Such territorial unevenness of land development seems to confirm a certain discrimination of interests, with some Central Asian Republic enjoying the special sympathy of the Central authorities at the expense of other republics.

However the disproportion of the agricultural development of the Central Asian Republics originating from the published statistical data can most probably be explained pragmatically.

The fact that the system of centralized planning in the USSR was initially based on the following mechanism testifies to that: the fruits of labor of all citizens were supposed to be collected into a single state fund and then redistributed based on the following principle: «something for everyone», more or less equally. However as the cost of development of one hectare, say, in Karshinskaya steppe, was much cheaper as compared to the piedmont areas of Vaksh and Naryn, the main flow of investments was sent to territories promising a quick rate of return without considering the quite provisional boundaries of the Republics at that time. Therefore one can confirm with

greater certainty the manifestations of discrimination in the intraregional market. For example, while in the Surkhandarya region of Uzbekistan, which is characterized by an exceptionally hot climate, one could receive two-three harvests annually, Karakalpakstan located in the north of Uzbekistan territory already belongs to a risky farming area. Based on this fact, purely pragmatic decisions were made. The pumping stations "Iskra" and "Amu-Zang" were built near Termez, which pump out a hundred cubic meters of water from the Amu Darya every second, while in the vicinity of Nukus a chicken can wade in the shallowed Djeikhun during the low-water season.

If the game is played on a bigger scale, with two-three crops per year, all the indirect consequences were not taken into account by the republican authorities, such as the fact that the citizens of the Aral Sea area started to consume, instead of drinking water, a cocktail flavored with additives from half the harmful elements of Mendeleyev's Table.

For the sake of fairness it's worth mentioning that the agriculturally deprived Republics located in the area of the creation of the surface water flow received in return quite powerful energy and industrial facilities and water resource management incentives in the whole of the region. Nevertheless we should frankly admit that the failure of the "common pool" theory and its consequences serve as the main source of the unsettled contradictions in the water relations of the former Soviet Union Republics of Central Asia.

Since the Soviet Union has ceased to exist, there's no longer anyone to appeal to, and the time has come to adapt to completely new conditions. But this is the topic of the next section.

The March of Sovereignties

«May you live in an epoch of changes!»

Ancient Chinese proverb

At the beginning of 1992 the five newly independent countries on the map of Central Asia were in no mood for guessing – they had to post-factum immediately validate sovereignty, create and launch all the attributes of state power and at least approximately create the fundamentals of a national policy as best they could. As soon became clear, not a stick or stone remained of their former single-mindedness.

Certain countries selected the way of democratic plurality and a liberal economy, though it was known beforehand that this option would be fraught with political convulsions during the transition period, for example, connected with the social consequences of "shock therapy". However the prospect of quickly joining the circle of highly developed states which placed liberal-democratic values above all else was too attractive. Others preferred "the steady hand" policy, or a strong centralized power running the risk of incurring reproaches for authoritarianism, yet intending to save society from convulsions in any way. Fate turned out to be the most complicated for Tajikistan – the only country of Central Asia where a fragile agreement managed to be reached at the expense of civil war.

Along with political perturbations all five countries of the region were faced with the consequences of an unheard-of economic collapse. The Soviet ruble, which had long been called "wooden" by the people, devaluated in no time to the level of toilet paper and soon was replaced with national banknotes, which at first were not supported by gold or currency reserves, external loans or other assets. Naturally the overall manifestations of inflation that accompanied the crises soon extinguished the romantic impressions of a quick conversion of national currencies.

In addition the most difficult economic consequences were connected with the same system of "the common pool". As a result the products of hundreds of industrial enterprises, many of which had served the military-industrial complex, turned out to have no demand; stable agreement connections and systems for the mutual exchange of equipment supplies and raw materials collapsed. The technical elite, drawn from the number of ethnic Russian speakers, left for their historical birthplace, which significantly weakened the human resource capacity of Central Asia.

The loss of the economic system based on cooperation of production and territorial labor division had an influence on agricultural systems as well. In the past the all-Union conveyers of the mutual exchange of grain for meat and vegetables for cotton worked almost perfectly. Now the independent accumulation of national food baskets and the search for external sales markets for food and technical crops had become problematic. It became unexpectedly clear that for the first time in a hundred years the payment for such supplies turned out to be unaffordable for the main consumer – Russia – and for Asian and European markets the majority of proposals were not met with interest – competition there is high enough without our participation. In such conditions one could enter external markets only with a flexible reaction of agricultural producers to changed supply-demand conditions.

The need became apparent for radical reforming of the archaic structure of community-based farming, requiring encouragement of entrepreneurial activity of the producers themselves and large investments.

As the agricultural sector has traditionally been the priority in the region, the maximum possible funds out of scarce state budgets have been allocated to maintain it since 1992. However, possibilities have been very limited as budget accumulation at the expense of a rapid increase of taxation rates could result in social explosion. If one summarizes all loans received by the region over ten years, a significant number calculated in billions of USD will be reached.

Unemployment and poverty in their turn have been catalysts of the chain reaction of new social problems connected with the decline of health care and education, disorderly migration of the population from the villages to the city and from the city abroad. Since the degradation has also affected the system of law enforcement, criminal entities have become prosperous and religious extremism has appeared.

In sum, all this threatened to turn an earlier successful region with highly educated citizens into a hotbed of terrorism and drug addiction for the whole of the world. Naturally all these tendencies, as illustrated by the ancient Chinese curse placed in the epigraph of this section, are quite well known. Probably one could avoid their routine establishment; however, periodically opinions are expressed by some politicians or foreign experts that the currently existing water problems in the region are subjective. One could ignore the standard rhetoric on that topic as that of opposition forces or journalistic "exaggerations". However such types of statements on behalf of authorized analysts capable of influencing the overall attitude of the international community to our region are quite worrisome. To give one example, we simply present a quotation from an observation by Erik Sievers, a famous lawyer -

internationalist who knows the region well, published in the USA in autumn 2002[12].

«..Central Asian countries joined international conventions just for the sake of the fact of joining such types of conventions and avoid agreements that would result in state policy reforms or that mention water. In their turn international donors spend their USD for delivering workshops and making reports in capital-cities, while the rest are suffering from starvation, disagreements and desertification. Thus state declarations regarding the aspiration for reforms are only exercises in rhetoric and double talk (saying one thing to one person and other things to others), which is surpassed in terms of impudently obscuring the senses only by the glittering reports of different development agencies published in English and claiming success among the audiences of Washington, Brussels and New York".

It's not difficult to notice that this opinion testifies to the prevalence of the subjective factor, the reasons for which are a lack of understanding of water problems by national power branches, an excessive politicization of these problems or the incompetence of higher officials.

Still one can only partially agree with such opinions. In fact the necessity of having a balanced water policy in the form of unambiguous national strategies or long-term programs of the countries of the region has been recognized lately. Therefore in reading carefully the earlier editions of national water legislations, one can be easily convinced they reflected not the whole objective spectrum of water relations but rather the narrow interests of the authors. In the absence of an officially approved doctrine designed for the approval of a wide modern public and at least the next generation of water users, tactical mistakes, indecisiveness in implementation of reforms or decisions made in haste can be better understood. One should not forget that the current psychology of a range of persons in the region involved in the decision-making process was created during the period of Soviet power when one of the precepts of bureaucracy stated – "Any initiative is punished!"

Nevertheless it would be much too simple to place the blame for a major part of the current water problems on imperfect political and purely technical decisions. On the contrary one may state quite objective reasons for their origin, aggravated by the consequences of the economic crises and "the change of benchmarks" in all manifestations of the public life.

Undoubtedly one of the main objective reasons is the collapsed "common pool" in which each Republic and each able-bodied person of the USSR invested

[12] E.W.Sievers. Water, Conflict, and Regional Security in Central Asia. Environment Law Journal, 2002, Vol.10, #3.

their share and from which they were fed without particular concern for the future. Now the remains of this pool must be shared between the heirs, and the shares for each have turned out to be far from equal. Reluctantly, one has to agree with the principle of apportioning land, property and mineral resources according to territorial possessions. Water doesn't acknowledge borders and its division results unavoidably in disagreements.

One more historical "root of all evil" is the inherited system of interrepublican water relations, which under the earlier conditions of a single state was closer to optimal. It's worth remembering that it was based on the "Comprehensive Schemes of Water Resource Use" within water basin watersheds and also on the limits of water division between the Republics and the balance of agreed obligations between them and the Soviet Union's center. In such an arrangement the latter circumstance played an exceptionally important role in the prevention of tension between water relation entities. For instance if on the territory of any Republic the construction of an industrial or water management facility was planned, all costs of that Republic connected with land allocation, supplementary operating costs, resettlement of citizens etc. were compensated for from the same "pool". But since the guarantor of fulfillment of all former obligations has suddenly left the scene without saying "goodbye" and having failed to pay off debts, lots of mutual unsettled claims remain.

In addition a rich water management heritage unexpectedly turned out to be an excessive burden for certain countries of the region. This is connected with the fact that large hydro units such as Toktogul, Andijan, Kairakum, Orto-Tokoi and other reservoirs were initially designed as interrepublican facilities. Fulfilling their functions in the interests of several countries, those hydro units have started to be maintained just at the expense of the owner countres. Should the interested countries have a richer treasury, this obvious unfairness could be eliminated at a much earlier stage. However the fragmentation of the Soviet Union "pool of funds" into two dozen unequal independent budgets rapidly reduced the field for financial maneuvering. The economic crises which followed even further aggravated the financial flows injected into the water consumption sectors. According to the World Bank study "Irrigation in Central Asia, Social, Economic and Environmental Aspects"[13], operation and maintenance expenditures on irrigation and drainage systems in Kazakhstan decreased by 21 times during the 1990s, and in Kyrgyzstan not more than one third of the costs of maintenance and technological surveys of the system were covered from the state budget.

[13] World Bank Report «Irrigation in Central Asia. Social, economic and environmental aspects", 2003.

While naming the economic factor as the main reason for modern water problems one should not just focus on the trivial lack of investments. Economic reforms connected with the change of priorities from "socialist planning" to the market mechanisms of management activity have also had an extremely negative impact on those problems. Let's be frank – hearkening to the declaration of adherence to free market ideas, many of us hoped that very soon this wonderful remedy would allow the countries of the region to have a dignified competition if not with European countries, then at least with the rapidly enriched East Asian "tigers". However a series of interim barriers needs to be overcome on the way to this fondest objective. Particularly – organize a radical change of "public" property, accumulate the start-up capital for future businessmen, create and develop a state system of democratic management with limited corruption and interference in business activity, and finally ensure the profitability of investments not only in the shadow economy, but in business projects beneficial for the country.

If this standard route of familiarization with world liberal values is compared to everyday reality, one can be easily convinced that the five countries of Central Asia are at different stages along the way. Differences in views on payment for water – an indicator of attitude to market reforms – can serve as a vivid example. Kazakhstan, Kyrgyzstan and Tajikistan introduced this mode into their internal use already during the first years of independence, however they have so far failed to regulate the water use tariffs to acceptable cost-effectiveness rates for maintaining the irrigation systems and everyday water-supply. In fact a similar decision was made in Uzbekistan only in 2003, while Turkmenistan still continues to stick to the firm opinion based on the Soviet traditions of free water use in its own interpretation.

An obvious lack of synchronization of reforms and difference in ideology of their implementation by Central Asian states cannot be fit into stereotyped arrangements prepared for the recovery of "transitional economies of developing countries" by the international expert community. This incompatibility and resulting intergovernmental disagreements are hardly caused by the malicious intents of certain hostile powers or simply by the impulsive reaction of the heirs of the super-state included in the category of insufficiently developed countries. The version of complete incompetence can also be eliminated if the opinion of E.Sievers expressed in the already-mentioned publication can be disregarded: "Many local professionals understood a long time ago that in many human qualities western experts can be weaker as compared to Soviet colleagues, especially in the technical fields".

Thus using the method of exclusion one can come to the following conclusion: the third primary reason for the modern water problems of Central Asia, along with the historical and economic, is the crisis of public mentality, which has an even greater destructive power than economic convulsions.

Based on these basic prerequisites we will try to analyze those problems which seem to be significant.

The Ownership of Water as the Source of Contradictions

«Property is the spirit of the law»

C. Montesquieu

From the formal point of view, the modern constitutional standards of all countries of Central Asia don't provide a rationale for disagreements, as they declare national sovereignty over all natural resources and over water within their boundaries. First it's worth noting that such an interpretation is quite different from the religious doctrine of medieval centuries stating that water is the gift of Allah and nobody except for God can own it; it does not coincide with the rather vague "Doctrine of Common Interests" which is a hundred years old.

However in the most categorical formulation of constitutional norms a certain paradox is hidden – how can one state or another exercise an absolute right of property to water if it doesn't possess a sufficient number of cans, tanks and other different containers for stopping the leakage of water outside the national jurisdiction? Therefore considering this circumstance it's more useful to transfer the issue to a different area: how do the states use their rights – exclusively in the national interest or given the reasonable demands of their neighbors?

The world community has been moving to the formulation of a single legal decision on that tricky issue on a step by step basis for twenty five years. For instance, in the "History of Diplomacy"[14] one may find a reference to one of the provisions of the oath of Delphi-Fermopil Amfiktionia (the union of 12 antique Greek tribes) dating back to the 6th century B.C. already prohibiting "the unauthorized draining off of water during war or peace". Historical memorials of ancient times and medieval centuries contain other similar examples; however, the norms of modern international law are rather based on precedents of a later period[15].

Thus in 1824 an agreement between France and Switzerland was concluded on the joint use of the Rhine river in which the following wording is included: «...the free use of the water resources of the river for the operation of mills and other facilities and also for the purpose of irrigation should not be subject to limitations. The rule covers both of the parties, and the water intake should not exceed half of the flow volume received by the downstream country".

[14] The history of diplomacy. T-1. M., 1959
[15] Irrigation and drainage in countries of the world. M., Publishing House «Kolos», 1947

Too simplified an interpretation of the meaning of this standard is noticed even now as many politicians see a convenient way of splitting transboundary rivers' waters strictly evenly between the parties to the agreement. Later on the agreement between Belgium and Luxembourg (1843), Spain and Portugal (1866) and dozens of others based on the idea of compromise of interests of the agreeing parties have become a part of world experience. The chronology of the creation of water law is fixed, but other examples contradict the spirit of parity cooperation.

For example at the beginning of the 20th century the Minister of Justice of the USA Harmon as an act of pressure onto Mexico on the eve of concluding the convention on using the river Rio-Grande, proposed the doctrine of "absolute sovereignty". This means the award of the right of the more powerful state to make any manipulations with water on its territory without considering the consequences for any neighboring country.

Though the objective of that doctrine was not included in the text of the joint convention made in 1906, nor in the follow-up agreements between the USA and Mexico as of 1933 and 1944, the idea itself was not left without the attention of later generations.

A vivid example is the conflict between Turkey on one side and Syria and Iraq on the other in connection with the initial filling of the Ataturk reservoir. We should mention that as a result of a purely technical operation on the Turkish side, agriculture, energy and the civil water supply of the downstream countries in the basins of the temporarily waterless rivers Tigris and Euphrates suffered a great loss. The total capacity of the hydro unit Ataturk has been filled with water for some time, yet legal scientists have not ceased discussions about the regularity and legal consequences of that unilateral action. No wonder the definitions of "historical rights" or "overall accessibility of water resources of transboundary water flows" that were founded a long time ago have been exposed to doubt.

One may suppose the current descendants of the first citizens of Mesopotamia, who have stayed without water since the times of Sumerians, hardly have access to these theoretical passages. But that precedent can be repeated in any other corner of the planet including Central Asia.

The Persian king Darius I, as is known, started war with the Greeks demanding the obviously unimplementable requirement of "the whole of land and water". World history has preserved the impulsive reaction of the ancient Spartans to that requirement – they simply threw the ambassadors extraordinary and plenipotentiary of Persia into a well, having suggested they take all the water for their king.

Remembering that, by the middle of the 20th century the world community started closely developing a reliable legal barrier to political conflicts. The UN Charter adopted in 1945 converted the principle of "cooperation based on sovereign equality" from the realm of good intentions to a direct responsibility of UN member-countries. Moreover the deviation from these responsibilities has become accompanied by the risk of incurring not only economic, but preventive military sanctions against those who are guilty.

In the development of the stated principle, the "Helsinki Rules of International Water Use", which belong to the category of documents of the so-called "soft laws" -- being simply recommendations -- contain the following base provision: «Each state has the right to a fair and reasonable share of the productive use of international waters within its territory" and "no state can be refused reasonable water use due to the fact of preserving this possibility in the future for another state".

These "rules" later on were reprocessed in the "UN Convention on Protection and Use of Transboundary Water Flows and International Lakes" (Helsinki, 1992), where the responsibilities of each state to operate water resources considering the need for prevention of negative transboundary consequences were agreed. An important addition to that Convention is "the minutes on water and health problems" (London, 1999), standardizing a series of principle provisions. One of them, particularly, envisages: «the sovereign right of the state to develop its own resources according to the policy in the sphere of environment and development of responsibility of the state to ensure that activities within its jurisdiction or control don't cause environmental damage to other states or regions outside its national jurisdictions".

If "the Helsinki UN Convention" is mainly focused on legal water protection activities, the follow-up "UN Convention on the Right of Non-navigable Types of International Water Flows" (New York, 1997), seems to leave no space for misinterpretation in the whole of the international water relations sector. The principle of "a fair and reasonable use of water resources of international water flows" combined with the responsibilities of the states to cooperate without causing significant damage to each other is used in it as a cornerstone.

Without being limited to general declarations the norms of this Convention envisage specific procedures as well that exclude the possibility of conflicts due to unilateral actions. Obligations on information exchange, regulation of disputable issues through consultations and negotiations or using standard arbitration procedures as a last resort are included.

One can judge by the following example to what extent it was difficult to reach a common opinion on these laconic formulations. Just the identification

of the degree of damage caused by one state to another (significant, considerable or just plain damage without elaboration) required an agreement to be reached over a long time, as specific interests of different groups of countries stood behind each interpretation.

Eventually modern international water law focused on the sustainable balance of sovereign rights of each state to use water resources in their national interests and their responsibility for attendant actions infringing on the interests of neighboring countries. Thus having overcome the stage of confusion and discord, humankind has returned to the folk wisdom "Try to live better yourself and don't prevent others".

If one compares those responsibilities with everyday reality one has to face an obvious contradiction. The constitutional and legal acts of Central Asian countries unambiguously declare adherence to international law standards and frequently the priority of international conventions and agreements with regard to domestic legislation. At the same time an uninterrupted range of one-sided actions in the water management field over the previous ten years, even caused by objective reasons, can hardly testify to the unconditional belonging of the region to the international legal field.

Regular violations of agreed conditions of interrepublican water division and the lack of desire of Kyrgyzstan to comply with the traditional irrigation regime of water discharges from the Low Naryn cascade of HPPs and the renewed failure of agreed supplies of energy resources from its opponents can be included in those actions.

The ambitious project of Turkmenistan connected with creation of "the Lake of the Golden Century" could be a vivid example, the completion of which will undoubtedly change the water balance of a vast territory to the clear displeasure of not only Uzbekistan and Kazakhstan. Against this background the intentions of Tajikistan and Kyrgyzstan in a so-far insufficiently specified prospective to increase their volumes of national water consumption or the projects of Uzbekistan envisaging the construction of new reservoirs in the Fergana valley don't look that impressive. However all of them are capable of undermining the unstable water relations system in the region.

The efforts of ten years of trying to return these chaotic processes to an agreed flow with the help of political declarations at the highest level or framework agreements has not yielded great successes. The need for a generation of new agreements including both a list of specific responsibilities of stakeholders and the detailed procedures of their implementation is required.

By the way, even in 1994 the five leaders of the countries of the region agreed in Nukus (Uzbekistan) on a joint decision "to prepare a common strategy of water distribution, efficient water use and protection of water resources and also to prepare draft international legal and regulatory acts regulating the issues of the joint use and protection of water against contamination, given the socio-economic development of the region".

Since this intention has failed to be implemented, the essence of the problem is not only the question of who is the nominal owner of water resources, but also who actually manages them now and who should manage them in the future at the national and regional levels. This idea automatically draws attention to the next problem – an institutional one.

The Development of National Water Resources Management Systems

«State ownership – is when everybody wants to eat, but nobody's willing to wash the dishes»

W. Finch

During the period of the establishment of Soviet power the question itself of who should manage water resources could cause sincere perplexity. If "the people and the Party are one" the party apparatus should manage "de facto" that part of public property regardless of in which power corridors the appropriate party units were located. As is known, the most important decisions on water, as on any other problem, were initially reviewed at Communist Party meetings and then were validated in the form of government decrees and ministerial orders. But since different ideological decisions were implemented by the efforts of bureaucratic entities as the water factor grew in socio-economic development, the water management structure gradually developed and became more complicated.

By formal characteristics natural resources were divided into surface and underground. Respectively the control functions over their condition were split between two agencies – the Department of Hydrometeorological Service and the Ministry of Geology. A major part of functions connected with the regulation of practical water management activity was transferred to the Ministry of Melioration and Water Resources of the USSR by the 1960s. Following the laws of Parkinson the number of overall Union ministries and State Committees at the moment of USSR disintegration exceeded a dozen and many of the Charters envisaged certain authorities regarding water relations. Such duplication of functions resulted in the appearance of inter-agency contradictions reducing the effectiveness and efficiency of management. For example, at the end of the 1980s even the powerful Ministry of Water Resources did not have the right to independently approve the agency's standard, having failed to receive a preliminary approval from Gosstroi and Gosstandard, the Ministry of Geology, Ministry of Health, Ministry of Agriculture and others... We should note that the majority of water protection functions at that time were preserved with the Ministry of Water Resources, however the idea of empowering a specialized water protection agency with those functions had already been planned.

Obviously the large institutional structure inherited by the Central Asian republics required urgent reforming. The urgency of reforms was mostly conditioned by economic motives – it had become an impossible luxury to

maintain a large group of officials at the expense of scarce national budgets. Besides, international lenders demaded the reduction of governance bodies as one of the main conditions for providing grants and loans. Therefore it was quite natural that initial steps envisaged not structural changes, but a simple reduction of the staff number.

In «the diagnostic report for the preparation of the regional strategy of effective and efficient use of energy and water resources" (UN SPECA Program, 2002) it is noted that the reform of national water resource management systems proceeds fairly painfully in all countries of the region.

In our opinion this is mostly connected with an uneasy choice out of multiple institutional arrangements, each of which contains advantages and disadvantages. For example if one proceeds from the principle of "containments and counterweights," guaranteed a quiet life by the top Soviet government, it's easier to scatter functions and authorities connected with water relations between different ministries and agencies. But then one should manage to live with the preserved inter-agency contradictions and quite an inefficient implementation of national water policy conditioned by the fight of competing parties for the right to own an ardently desired administrative resource.

A completely new approach is connected with accumulation of all water management functions in one agency. In that case the speed of making and implementing management decision increases significantly and the army principle of the common beginning excludes the possibility of disagreements between agencies, though the danger of the agency's monopoly increases and the country where absolute power over water is entrusted to incompetent or corrupt masters is in trouble. In this connection the implementation of this reform requires the implementation of detailed procedures of democratic choice of the agency-monopoly managers and also public control over their performance.

We have already mentioned "the principle of the unity of the three" envisaging social, economic and environmental values in water. To that end it's extremely important first to determine which of those values will be preferred in the eyes of the manager, or, more precisely, which agency will manage water – one for water protection, nature protection or an exotic Ministry of Public Works as is practiced in a series of European and developing countries. Ideally the water management structure and policy, regardless of different inclinations of the agency's manager, should ensure the implementation of the social, entrepreneurial and water protection aspects identified in national water strategies and action plans.

To be objective it's worth mentioning another option in the spirit of radical liberalism, neglecting the involvement of states in water management at all. The implementation of this idea requires a complete denationalization of the whole water management infrastructure and its transfer to the ownership and management of independent water users. It is supposed that initially water users will voluntarily and with state support start creating local public associations (associations or WUAs) according to territory or to the common use of one and the same water flow. Later on they will create an independent management hierarchy, for instance, basin, regional associations and Republican federations.

The idea of creating public water user's associations originating from the ancient eastern traditions of "ashar" in fact is supported by the majority of Central Asian countries. The difficulty of its implementation is a special topic; however, it's hardly relevant to consider a completely independent structure of water resource management as a real alternative to government agencies even in the remote future.

This conclusion can be substantiated by the following ideas. First, independent water users will be unable and will be probably reluctant to undertake the burden of water protection management activity and that part of the infrastructure which is important for the whole country but cannot be of a real benefit to entrepreneurs. In this connection all bank protection dikes, mudflow protection facilities, large pumping stations, trunk canals and reservoirs may remain ownerless.

Secondly, instead of inter-agency contradictions even deeper disagreements between separate groups of WUAs may appear. As the decisive vote among them will belong to representatives of the agricultural sector, the protection of the constitutional rights of all the remaining categories of water users may become an unresolvable problem. Besides, the issue of whether a public organization can become an authorized representative of the agricultural sector, while regulating water relations with other states, remains open. The defendants and opponents of that version could add to these ideas with other contrasting thoughts. But probably institutional reforms should envisage a reasonable combination of the mechanisms of state, democratic and market regulation. The so-called method of integrated water resource management that has been tested in different modifications by a number of countries – France, Spain etc. – corresponds mainly to this condition.

The main attraction of this method is in the possibility of establishing partnership relations between competing powers – industrial sectors, agencies, municipal powers, non-governmental movements and water users.

For that purpose the integrated approach suggests the creation of joint agencies of different levels – Republican, basin, systemic or administrative-territorial ones – out of the authorized representatives of the interested stakeholders. The main objective of these bodies, called differently in different countries as water management councils, commissions etc. is to develop "common rules of the game", or a comprehensive planning of principal decisions in the whole of the water management spectrum and also supervision over the implementation of these decisions. Along with this, a hierarchy of executive bodies should be simultaneously created, the activity of which will be gradually limited to the function of regulatory-legal regulation, state control (inspection) and issuance of licenses.

The degree of involvement of the executive power in management activity depends on which share of the water management infrastructure the government intends to privatize and which part to preserve under its management and control. In our opinion "the zero option" envisaging a complete denationalization of water management assets is hardly possible for Central Asia given the strategic importance of large hydrotechnical facilities for the safety of not only the country-owner, but the whole of the region.

Therefore the operation and maintenance responsibilities of strategically important facilities and utilities should stay under government ownership or, at least should be transferred to the management of independent companies, but under strict state supervision. Obviously in any case management, inspection and regulatory functions should be disseminated in different executive power agencies.

It's worth emphasizing that the integrated approach to water resource management allows the possibility of using many structural arrangements and models for decision-making, conditioned by the specific features of the local conditions and political structure of each state. In the comprehensive planning of water management and water protective measures with the involvement of all water relations entities, neither the number of administrative agencies, nor personal desires, nor those of managers are of significance. In fact, not having the intention of advertising an integrated management method, we should identify its negative manifestations. One of these would be the transformation of, say, the Republican or basin water management commission into a sort of a discussion club, where the trials of developing an optimal decision based on a consensus could be easily blocked by an opposition coalition sharing a common interest.

Let's now try to summarize the essence of the given problem. For one thing, the majority of countries in the region recognize the imperfection of the

national water resource management systems and declare their readiness to implement reforms in that field.

In each country there are quite a large number of highly qualified experts who are capable of combining the diversity of institutional models developed by the international community and of offering their government the preferred option. International agencies and development funds are also interested in the accelerated reform of national entities in the region and will provide logistical, financial and technical support for doing so.

Along with this, one must objectively admit the unjustifiable delay of institutional reforms and their half-hearted or merely formal character. One can hardly confirm radical positive changes if so far the outcomes have simply been reduced to the merger of ministries, the transfer of authorities from one agency to another, or the change of supervisors, for instance, vice-prime-ministers of national governments. No wonder that frequently the interference of the president or head of the country's government is required in trying to resolve a simple water problem that had earlier been regulated by ordinary ministerial decrees.

One can clarify the reason for the situation as it exists only having clarified who stands to gain from it. Without applying computer analysis and again excluding the impact of mysterious hostile forces, it not difficult to verify the root of evil in the manifestation of the agency's egotism. As the collegial principle of decision-making is based on openness and the search for compromises, this reduces unavoidably the possibility of the uncontrolled regulation of funds. This forces the clan of officials to hinder any attempts to change "the status quo," using the instruments refined by the Soviet epoch apparatus.

Probably only the concentrated political will of the upper echelons of power can counteract this massive pressure. Naturally each state has the right to independently decide on such types of issues and it would be inappropriate to impose any types of decision onto them. However in stressing the topic of upgrading national water management entities as a priority, we were trying to focus on the fact that without first addressing that issue, it would be difficult to figure out the whole tangle of regional water problems. If only for the reason that any interstate cooperation is mostly based on close contacts between national branches of power.

Who Should Regulate Water Flows in the Region?

«Fair reckoning makes long friendships»

Russian proverb

One of the most important principles of international water law – the overall responsibility of states to cooperate for the purpose of achievement of an optimal use and a due protection of international water flows (Article 88 of the UN Convention as of 1997) – dates back to the remote past. At least it could be traced already in the 18th century. For example in the agreement of 1754 between the empress of Austria and the Venetian Republic, the creation of a bilateral commission responsible for joint water use in the basin of the river Olia was envisaged. In another early "Agreement of Fontainebleau" between Austria and the Netherlands (1785) the establishment of a bilateral body for the agreement of construction of dams on the river Maas is also mentioned.

In 1911 the Madrid Resolution of the International Law Institute generalized the idea of the creation of such multilateral entities as the recommended norm. Finally Article 24 of the "UN Convention on the Right of Non-navigable Types of Using International Water Flows" contains the resulting formulation in the following form: "The water flow states at the request of any of them enter into consultations regarding the management of the international water flow which may include the establishment of a joint management mechanism".

According to that provision, 90 multilateral and bilateral commissions, committees and other joint entities regulating the use of river resource and lake basins have already come into existence since 1970. The Danube, Rhine, and Mosel Commissions in Europe, the Commissions on the rivers Mekong and Indus in Asia, similar entities on the basins of the lakes Chad and Niger, Nile and Senegal in Africa, the Intergovernmental Coordination Committee of the river basin of La Plata in South America and also the joint commissions of the USA with Canada on the Columbia River and the USA with Mexico on the Colorado, Tijuana and Rio Grande Rivers are the most famous of these.

Due to the diversity of conditions of water use in each large water basin – where the priorities are the needs of navigation, hydropower, irrigated farming and fisheries, and the problems are water pollution and low water or, on the contrary, protection against floods – the structures of joint management entities cannot be formed using the same template. For instance the structure of the commission on the river Mekong includes three permanently existing bodies – the Council, the Joint Committee and the Secretariat – with quite a complicated operational procedure. In contrast to this, the permanent India-Pakistan Commission on the river of Indus includes only one authorized

representative – the Commissioner on behalf of each country. However such a modest staff in terms of number has managed to regulate water use disputes quite efficiently even during periods of increasing confrontation between both parties.

High government officials, technical personnel ("high rank engineers") and lawyers can become members of such commissions; however, in major cases the state delegates its authority over the operation of water management facilities quite reluctantly. As a rule, it's preferable to preserve this authority in the hands of executive agencies.

For these reasons the terms of the agreements on the creation of intergovernmental water commissions frequently limit their performance to simple agreements on water use modes, planning and coordination of joint water management projects, control over their fulfillment, settlement of disputable situations, etc.

In some cases, such as the agreement between the USA and Mexico of 1944, executive functions are laid onto national departments of the Commission within the limits of their jurisdiction, but this is rather an exception. However modern water law doesn't deny the principle possibility of water facilities management on transboundary water flows as intergovernmental structures and independent transnational corporations, consortiums or Joint-Stock Companies if there is agreement between all interested parties.

At about the mid 1970s long before the disintegration of the USSR, the need for the creation of interrepublican entities of water resource management had become obvious on the territory of Central Asia as well. By that time the Ministry of Water Resources of the USSR had started experiencing difficulties in the division of water resources in the situation of a long deficit in the flows of the rivers Amu Darya and Syr Darya. As the traditional procedure of consultation of the Soviet Unions' ministry with the management of the five Republics was becoming less and less effective, multiple teams of officials from Moscow and other Republics had to settle water conflicts in the field. When similar voyages to "remote areas" became systematic and extremely long, in 1986 the decision was made to create two Basin Water Management Organizations – BWO "Amu Darya" and "Syr Darya" with the headquarters located in Urgench and Tashkent (Uzbekistan) respectively.

According to a special Decree of the Government of the USSR all large reservoirs and head water intake facilities with a carrying capacity of over 10 cubic meters per second in the flows of both of the rivers and their tributaries were supposed to be transferred to the BWO's management. They were also endowed with the right to change the water consumption quotas of each

Republic up to 10% depending on the operational situation, however they did not have the possibility of interfering in the water use processes inside the Republics and did not control water quality.

Among their functions were drafting operational plans of water division for the forthcoming half a year and preparing schedules for water intake and discharge out of reservoirs based on the projections of water reserves developed by the Republican Hydrometservice.

An important situation is worth noting – the idea of the transfer of all key facilities of the water management infrastructure to BWOs could not be fully implemented even with the existence of centralized power and thus, the BWO's authority turned out to be significantly limited as compared to initial plans. Despite this, after the disintegration of the USSR BWOs persistently continued demonstrating their viability, though their legal status as agencies capable of making decisions pertaining to the interests of the newly established independent states required immediate clarification. Therefore already in February 1992 in Almaty the first "Agreement on Cooperation in the Field of Joint Water Resource Management out of Interstate Water Sources" was signed. It is notable that this international regulation was not signed by heads of states, government or foreign policy agencies, but by heads of Republican Ministries of Water Resources, who had been policy makers before realizing the urgency of standardizing water relations between one other. Until now doubts have been expressed regarding the legitimacy of the indicated document, though several months later, in March 1993, the heads of five states of the region post factum confirmed the legality of its provisions.

Based on that Agreement the Interstate Coordination Water Management Commission (ISCWMC) was soon created with the parity right of each country, or equal rights and responsibilities of its members. The governments of the member-countries included a series of functions in the responsibilities of ISCWMC mainly connected with the development of the main directions of regional water policy, the agreement of the regimes and conditions of water resources use, taking into account the interests of each country.

Initially nobody somehow noticed the discrepancy of the coordination role of the ISCWMC, clearly indicated in its name, with its executive functions, particularly connected with water division and also the maintenance and operation of hydro units. Two BWOs were entrusted with implementing the second objective, having been converted to executive agencies under the ISCWMC, but preserving their former disposition and the same functions.

Lots of reproaches have been received in the more than 10 years of existence of the Commission, some of quite an oppositional character. Some

radical analysts publicly see a "pro-Uzbek" orientation of the ISCWMC based on its permanent location and find in this the rationale for a regular rotation of staff and change of location from one capital of the Republic to another.

Others draw attention to the domination of irrigation interests in the commission and "too much focus" on the Aral Sea problem giving arguments for insufficient attention paid to hydro power needs and other water consuming sectors and also water protection measures in the areas of flow creation.

The list of such claims in the critical file of the ISCWMC is quite big, but, in our opinion the canonic opponents of the Commission are trying to diminish its definite constructive contribution to preventing regional water conflicts. Probably due to the fact that technocrats and not politicians prevail in the staff of the ISCWMC, it has managed even during tense periods of low water level to avoid the destructive collapse of the established system of interrepublican water division.

Nevertheless with the passing of time, the founder-countries started to be convinced that the mandate functions of the ISCWMC don't fully allow multiple regional problems to be resolved. In this connection three options of reform were planned, mostly connected with the expansion of the ISCWMC staff through the inclusion of representatives of water protection agencies, water consumption sectors and even independent water users. Another proposal envisaged the improvement of the status of that commission by placing in it high-ranking representatives on behalf of each country, for instance the vice-prime-ministers of the national governments. Finally the third option was aimed at the creation of alternative intergovernmental entities also connected with water problems.

By the way, parallel entities to the ISCWMC – the Intergovernmental Aral Sea Council (IASC) and the International Fund for Saving the Aral Sea (IFAS) were created by the decision of the heads of the five states already in 1993 as the executive and financial instruments for the implementation of the first Aral Sea Basin program (ASBP-1)[16].

It's no secret that this program, which is quite ambitious and received strong publicity at the beginning, very soon began to fade away without any sound. Such an outcome was probably natural, as the possibility of financing projects out of national budgets was illusive, plus the idea of saving the Aral Sea was viewed skeptically by the wider public as technically infeasible and even irrelevant against the background of the impoverished condition of the majority of the region's population.

[16] 10 years of IFAS (decisions and events). Dushanbe, 2003.

These circumstances have led over time to a significant adjustment of the ideology of the program as well as its plans for action and organizational schemes for its implementation. Most of all, the area for suggested action was slowly expanded from the Sea itself to the area around the sea and then to the whole of the basin, or, in fact, the whole of the Central Asian region. With this the program started to acquire attractiveness for Kyrgyzstan, Tajikistan and subregions of other countries adjacent to the upstream areas of the transboundary rivers.

The follow-up organizational reforms of the IFAS have resulted in the creation of a new IFAS Board at the level of deputy prime-minister of the five countries, jointly taking responsible decisions on water issues or drafting decisions for follow-up approval by the heads of state. To implement this objective the Executive Committee of the IFAS was established– a permanent body also including responsible representatives from each country.

Let's turn attention to the fact that when those new entities were created certain preventive measures were reasonably planned, helping to prevent criticisms of the ISCWMC. In particular, the level of representation of members was increased to the rank of vice-prime-minister and also the periodical relocation of the Central Office of the Executive Committee of the IFAS was envisaged.

At the time the present publication had been prepared, there was not yet a sufficient basis for evaluating the performance of the reformed IFAS structure and its perspectives. On the one hand, in the Dushanbe declaration (September, 2002) the heads of four states of the region expressed their intent to use the IFAS capacity as the main instrument for the regulation of water relations and to promote its strengthening, also with the attraction of external donors' assistance.

However the plans of specific actions of the Fund within the Aral Sea Basin Program (ASBP-2) are still at the stage of development and the issues of their funding have not yet been resolved.

At the same time the image of the IFAS suddenly fluctuated after an official proposal of the President of Turkmenistan in August 2002 regarding the transformation of the Fund into a purely management agency with a reduction of its status. It would be probably premature to consider such a step as the sign of the future dismantling of a working but not yet mature enough system of interstate cooperation. But one should not forget about its possible consequences; therefore, new approaches to upgrading the organizational structures of cooperation appeared.

Currently one may state the existence of at least two versions which are now becoming the subjects of advice and negotiations. The first is based on the idea that it's much easier to reach a compromise decision on disputes if the number of the members in discussion is reduced to the minimum possible, in other words to two, as the number of contradictions is thereby automatically reduced as well.

This option was first tried by Kazakhstan and Kyrgyzstan in concluding the "Agreement on the use of water management facilities of interstate use on the rivers Chu and Talas".

Despite being a framework document, this Agreement has finally allowed a practical review of the issue of cost compensation connected with the maintenance of hydro units serving the interests of both countries.

When the document took effect and some experience was gained in its implementation, the parties considered it useful to create an intergovernmental commission for the rapid accomplishment of practical tasks connected with the use of resources of the indicated river basins. With the support of international donor agencies a special project is currently being implemented for the development of the organizational, technical and economic conditions of the future commission. It's quite possible that it will become a pilot example for the creation of similar entities in other regions of Central Asia.

Naturally a similar model cannot be applied to the basins of the largest rivers of the region, where the unconditional participation of all stakeholders is required. Kazakhstan initiated another option based on the creation of transnational water or water-energy consortiums. For the future authors of the "History of Diplomacy in Central Asia" the procedure of coming to an agreement on this issue could serve as an example for the specific methodology of negotiations for our countries at the turn of this century.

We should remember that by the encyclopedic definition of the Soviet era, a consortium is not a management entity, but rather an agreement regarding the mechanism of the economic involvement of the stakeholders in the implementation of capital intensive projects[17]. Subsequently the idea of a consortium is quite in line with the spirit of the "Agreement on the Creation of a Single Economic Space" concluded by Kazakhstan, Kyrgyzstan and Uzbekistan in 1994.

One must bitterly confirm that the single economic space exists only on paper and the parties to the agreement have so far managed to join other political and economic unions, yet still erect new barriers against each other.

[17] Soviet Encyclopedia Dictionary M., «Soviet Encyclopedia», 1982.

Nevertheless the idea of a consortium continues to exist and the regional leaders except for the head of Turkmenistan publish joint declarations at nearly every summit regarding their aspiration to acheive practical results. However one of the statements at the meeting in Dushanbe at the end of 2002 suggested additional work to be done by experts regarding the creation of the consortium, or in other words a return to the previous situation. But in July 2003 the joint statement of the heads of four states as a result of the meeting in Almaty within the framework of the "Central Asian Cooperation Organization" seems to give an additional accelerating impulse to the negotiations process: «The heads of states of the CACO authorized their representatives to speed up the development of draft agreements for the creation of international water-energy, transport and food consortiums". And then: "Heads of states have made the decision to turn to international financial institutions with the request for providing assistance in the development of the concept of activity of the indicated consortiums".

An inquisitive part of the general public can develop optimism based on such official publications in the mass media, but has no access to the texts of the preceding draft agreements on consortiums or the unpromising results of the consultations on that issue.

In our opinion, the sluggish process of negotiations is explained yet again by the objective differences of the interests of the parties. For Kyrgyzstan and Tajikistan the appearance of international consortiums on their territories is attractive only in the case of an attendant influx of significant foreign investments that would allow the water management projects suspended at the beginning of the 1990s to be completed, mostly in the field of hydropower. Therefore for instance there's an idea clearly followed in the published draft of "Water Strategy of the Kyrgyz Republic"[18] – the country is planning to manage on its own the whole of the water management infrastructure created up until now. Consortiums are feasible on its own territory only in the form of joint mechanisms for the implementation of construction projects and follow-up operations of incomplete and new projects.

Along with this, one can presume the completely understandable aspiration of Kazakhstan and Uzbekistan to use organizational entities of consortiums for access to the management of key facilities on the transboundary water flows.

While analyzing several formulations in draft agreements of already abandoned or still discussed agreements the latter idea seems to be confirmed. The management and administrative role of consortiums and not the economic role dominates in them, and one discusses the management of water resources

[18] The draft water strategy of the Kyrgyz Republic, Bishkek, 2003.

rather than the management of water facilities. This serves as the basis for making the supposition that the authors of the documents are dissatisfied with the role of interstate entities - the ISCWMC and BWOs.

The counter efforts become explicable, the unification of forces of all supporters of the ISCWMC regardless of nationality to block the creation of consortiums or other alternative competing agencies.

When comparing all those facts, ideas, hidden "subsurface flows", a certain pattern can be drawn.

For one thing, four out of five countries of the region have recognized the usefulness of international entities, at least, as coordination entities and mechanisms for the quick regulation of disputable water problems. At the same time only proposals regarding the creation of bilateral commissions or the strengthening of the IFAS are taken positively by everyone -- in other words, those entities that don't claim water resource management for the whole of the region. But any initiatives connected with the transfer of management functions to the regional level are openly opposed or calmly "dropped".

The situation will probably be preserved until confidence is built between our countries and water is turned from the apple of discord to an object of mutually beneficial cooperation. For this it is necessary, above all, to exclude the possibility of fears that interstate entities are capable of managing water resources to the detriment of the national interests of certain countries. It's already clear that symbolic quasi-measures are hardly capable of finally dissipating the atmosphere of hidden mistrust; therefore it's high time for a dramatic change in the character of their activities.

In fact as long as regional water relations are regulated by an incomplete package of utterly unclear framework agreements, and water division conditions are developed by a conclave of heads of water management entities within the framework of the ISCWMC, any reasonable decisions will be taken apprehensively. This attitude may change if the same participants turn to a scrupulous implementation of agreements -- codified in detail, balanced in terms of the interests of countries, sectors and population groups and having of course gone through all required procedures of agreement and approval.

In connection with this version, the problem of drafting a reliable legal framework of regional water relations appears again. After all, one can impartially assess the quality of the work of existing interstate entities and subsequently the expedience of their upgrading, liquidation etc. only by using the criteria as to what extent their activity fits within the regulatory framework.

If so it's worthwhile to temporarily suspend the trials of providing an attractive image to existing regional entities and instead to focus efforts on the joint development of a detailed legal cooperation framework. Again we would remind one of the precedents from international practice – the duet of Commissioners from the Indian-Pakistan Commission and the large staff of the similar American-Mexican entity have been successfully functioning for years mostly because any voluntary improvisations on their behalf are restricted by the strict terms of the agreement.

The shortest way out of the dead - end situation is more or less clear; however it's unclear who will develop the cooperation norms and how, if not all countries have finally determined yet their national water policies, and it remains frightening to completely entrust this whole business to the international experts of the IFAS or ICWMC.

Let us be frank – the hidden fight for water management leverage in the region has not yet ceased and might not yet have reached its peak. Besides, powerful investors have not yet appeared on the battlefield who could propose to calm down political discussions for the sake of tangible economic benefits. Probably for that reason our leaders are turning to the EBRD, ADB, IDB and other development institutions to request assistance in the development of a new concept for the creation of a consortium.

Eventually our countries have no other alternative but to try to achieve agreement on each water problem, including institutional ones, on a step by step basis. And for the beginning, for instance, they need to fulfill the old promise of their leaders to develop a new regional water division strategy.

The Optimization of Regional Water Division– Approaches and Forecasts

«There are never enough sweet cakes for everybody»

B. Okudjava

Let's turn back to the beginning of 1992 – the period of complete confusion, of political chaos in the region, of vague prospects and not-yet-abandoned illusions for the rapid restoration of a unified state. In these conditions the Almaty decision[19] of the managers of Republican Ministries of Water Resources to preserve the inviolability of the former mechanisms of water division until better times was indeed the only possible one. A year later the illusions of the reanimation of the Soviet Union had faded, but the ideology of radical modernization of water relations between our countries was still unclear; therefore the Kyzylorda Statement of the heads of the five countries, including the theme of prolonging the previous conditions of water allocation, was completely natural. However, the past decade has seen apparent dissonance between public announcements of the desire "to develop, modernize, hasten" as applied to the new strategy of regional water allocation and any kind of actual achievements in the field.

The current situation with water allocation, clearly, is not within the canons of formal logics. Indeed, there are some problems, significant for everyone; there are certain approaches for solving them and undesirable consequences in delaying such decisions. Finally, there is a declared firm desire to agree amicably, so all preconditions for cooperation are available. But nobody is in a hurry to negotiate.

This is even more strange, taking into account the fact that the majority of the concerns of the negotiating parties were settled in the 1970-80s by the Ministry of Water Resources of the USSR, which had developed "Schemes for the Complex Usage and Protection of Water Resources". The annual river flow of 90% of the supply, taking into account underground and returned waters within the borders of each large river basin, was accepted as the calculation basis of water resources reserves in those schemes. Furthermore, one needed only to calculate the future water needs for each republic and allocate the quote (percentage share) from annually measured actual reserves of water resources for each republic. This was done, and not only for the border transits of the Amu Darya and Syr Darya but also for each transboundary river in the Fergana valley, the basins of the rivers Chu, Talas, Zeravshan etc. This

[19] 10 years of IFAS (decisions and events), Dushanbe, 2003.

is actually the essence of the previous mechanism of interrepublican water division, which was in the fundamental plan and which is not disputed today by most professionals.

In particular, the delegations of the four country-members of SPECA formulated the opinion in the aforementioned final version of "Strategy of regional cooperation on rational and effective usage of energy and water resources in Central Asia" at the end of 2003 that the principle of water resources quotas should remain for future in the region. The draft of the strategy proposes the following algorithm of actions for adaptation of this principle to modern conditions

First of all, one must clarify and agree upon the calculation of the reserves of water, since climate conditions have changed over the last few years and due to this as well as due to anthropogenic influence there has been a transformation of river dikes, reserves of underground water deposits and returned waters. The participation of all countries of the region would be required for agreeing on amended water reserves but there are no expectations of special difficulties of methodological, technical or political features.

Major impediments on the way to an agreement are predicted in the process of evaluating the water needs for each state and the corresponding reallocation of percentage quotas.

Contradictory opinions with regard to these themes are indicated rather clearly. Particularly, Uzbekistan and Kazakhstan prefer to retain their earlier-won positions, i.e. to extend the previous conditions of quotas for the foreseeable future. Representatives of Kyrgyzstan and Tajikistan take every opportunity to stress their striving for a complete recalculation of quotas, of course, in favor of their countries. However, one should not forget another potential participant of negotiations whose positions are capable of considerably complicating the water division in the Amu Darya basin. It is Afghanistan, which until now has been concerned mainly with its own internal political problems.

In line with this one needs to remember that at one time water relations between Afghanistan and the former USSR were regulated by a bilateral agreement dated 1946 and the additional protocol of 1958, which ultimately acknowledged the right of this country to use the water resources of Pyandja, Kunduz and other flows of the Amu Darya within the limits of 9 cubic meters per year. During the past decades, due to the well-known events in that country, irrigated agriculture in the Northern provinces of Afghanistan fell into decline, and thus annual water usage did not exceed 2 cubic meters, i.e. a completely insignificant influence on the water balance of the drainage-basin

as a whole. But sooner or later the issue of ownership of the difference of 7 billion tons of water (making up nearly 10% of the total annual flow of the Amu Darya!) will be inevitably raised, and one needs to be prepared for this case beforehand.

If one presumes that this part of the distance will be covered by the negotiating sides in optimal composition and on the basis of common compromise, then some secondary barriers still remain on the way to the finish line. Among these barriers are: the coordination of schedules and modes of water division, taking into account ecological needs, and also the elaboration of control mechanisms on the conditions of water division and their operative adjustment under force-majeure conditions. There is no need to generate new ideas for this, just the need to borrow from positive world experience and to determine conclusively the positions of the authorities of national and regional structures relevant to the issue of water division.

Now, when the chain of necessary actions for problem solving has become clear and its weakest link revealed it makes sense to examine it in further detail. For starters, let's reject the presumption that the passive attitude of regional countries to the modernization of the system of water division is caused by an excess of water. For example, the report of the international organization "International Crisis Group" entitled «Central Asia: Water and Conflict»[20] contains the following straightforward statement: «There are enough water resources in Central Asia and under a good system of water division the tension around division could be lessened».

This thesis, very likely, is based first of all on the statistics of the temporary decline of national water usage volumes due to the long economic crisis and secondly, on the excessive waste of water in the region in comparison to highly technological Israel and even to Egypt, which is not counted on the list of advanced countries in the area of water conservation.

In favor of objectivity it wouldn't hurt to compare this optimistic version with the pragmatic forecasts of the development of the situation at least for one or two decades ahead, taking into account two important circumstances. The first can be based on the pragmatic scenarios of socio-economic growth of the five countries of region, which suggest, at a minimum, the restoration of national water usage volumes to the levels of 1988-1990 within this period. Secondly, one should take into account the recommendations of the Scientific Consultative Board of UNESCO on the problems of the Aral Sea, on the expediency of allocating up to 20 cubic meters of water annually for the ecological needs of the region until the year 2015, above all for stabilizing the

[20] «Central Asia: Water and Conflict». Report № 34 International Crisis Group. Osh –Brussels. 2002

situation in Aral area. Meanwhile, the natural outflow of one of the main water arteries – the Syr Darya – is already now practically depleted in the vegetation period in the middle of its flow and in mid-autumn below the Char Darya hydro-junction it consists half of mineralized returned water. The stable growth of the population, above all in the Fergana valley, obviously does not suggest the possibility of decreased water usage, and the deficit of water resources may be worsened by plans to fill four new water reservoirs in Uzbekistan and the Kambarata HPP in Kyrgyzstan, not to mention other projects of more modest scale.

It is not appropriate to place special hopes for water reserves on the Amu Darya drainage-basin. Even without considering the aforementioned prospect of the growth in Afghanistan's needs in the short-term plan, the possibility cannot be excluded of filling the capacity of new water reservoirs in the up-rivers of Vahsh and Pyandj on the territory of Tajikistan, even more so the filling of "Golden Age Lake" with a capacity of 132 cubic meters in Turkmenistan, the plan for which envisages an annual extraction of 10 cubic kilometers of drainage dike from the flow of the great river into the desert. Thus, since the forecasts of changing water reserves due to global climate warming do not give much confidence, one is left to hope for measures directed at the overall economizing of water.

Let's turn to another independent source in relation to this issue – the report of the World Bank entitled "Irrigation in Central Asia: Social, Economic and Ecological Aspects»[21]. This document convincingly evaluates the economic possibilities of the agrarian sector, leading to an important conclusion – irrigation in Central Asia, first of all, is important for the poor.

But since the majority of water reserves will be used for irrigation needs and almost all the countries of the region intend to assign the task of maintaining the internal domestic irrigation network, where the water losses are especially great, to poor farmers, then there is no question of any appreciable economy of water in the near future. The point is that national budgets are not capable of allocating enough funds for introducing water-saving technologies, and newly established entrepreneurs of agrarian and industrial sectors would not start this before providing themselves with all the necessary conditions for the tolerable existence and development of their business. Moreover, the increase of water losses in irrigation is explained not only by the degradation of the state control system but also by objective technical and organizational reasons due to the fragmentation of a unified irrigation system into small parts.

[21] World Bank report «Irrigation in Central Asia. Social, economic and ecological aspects», 2003

Also the structure of losses has changed – the outflow of water due to the abrasion of channel casings has increased but the consequences of unjustified pirate water usage has become even more evident. Besides this, purely administrative methods of fighting against lavish water usage do not justify themselves since the work of state water inspections is not streamlined and adherence to the ideas of the free market forceably limits the interference of states in the entrepreneurship activities of independent water users.

Therefore the arguments about both an excess of water in Central Asia and the real possibility of decreasing water losses by half in the coming years seem illusory. One should acknowledge that against this background the revision of water usage quotas in favor of the countries with the up-river areas of transboundary rivers can be implemented only at the expense of their lower-lying neighbors.

The subject of the polemic is often not the concrete figures of prospective national water usage or arguable formulations of draft agreements but the reasons and facts of the discrimination against Kyrgyzstan's and Tajikistan's interests in the past. This polemic takes on more and more of a scholastic hue with time, since there is no longer anyone to present with a bill, as the Soviet Union does not exist any more.

In line with this, there is still no visible intention on the part of discussion participants to compare the level of public claims of one or another country for increasing their quota of water consumption with their official programs of social and economic development.

According to official statistical data from Kyrgyzstan, the maximum volume of the water gates at one time was a bit less than 14 cubic km annually, but by 2002 it had decreased almost 1.5 times. The idea is to increase this indicator in the coming years up to 17-20 cubic km, with other maximalists saying up to 30 cubic km annually.

And now we shall compare the forecasts with the information published in the "Comprehensive Development Framework of the Kyrgyz Republic - 2010" where the reduction of the share of the main water consumption industry – agriculture – relative to GDP is being planned. Under such a plan it is not surprising that the pragmatics of the Ministry of Agriculture and Water Industries of the Kyrgyz Republic have forecasted for the coming five years quite a moderate increase of irrigated lands of around 70 thous. hectares.

The zone of water flow includes not only the territories of the Kyrgyz Republic, but also Tajikistan, the piedmont regions of Uzbekistan and south Kazakhstan and, to the least extent Turkmenistan. Further extensive

development of irrigated farming in this part of the region will undoubtedly be connected with huge expenditures for the following reasons:

Firstly, the reserves of the vegetation flow of small and average rivers, mainly of those irrigating the fields in this zone are exhausted, thus it is important to build new reservoirs for seasonal regulation or to implement interbasin flow diversion, and then to build cascades of pumping stations, lay canals and develop new lands.

Secondly, the development of each new hectare in a zone with difficult relief of the terrain requires high costs for planning, implementation of erosion-preventive activities, tracing of irrigation nets on hillsides, etc. Finally, the uncertain climate of the piedmont zone forcibly designates farming as a risky activity.

All this allows the presumption that in the coming 10-20 years there will be no real preconditions for a sharp increase of water consumption in the region of the formation of the water flow, since the financial sources for large-scale irrigation projects are not certain, and the increase of the water demand by industries and municipal water supply can be easily compensated through the saving of the losses amounting up to 40% of the magnitude of the water gates. In this case any announcements on a radical review of the quotas for water consumption have to be considered not in an immediate way, but as a good intention to reserve additional volumes of water for the needs of future generations of these countries. Consequently the response to such declarations from the "underlying" neighbors-opponents could be more restrained.

Let us keep in mind that in such situations even in the case of such constantly conflicting countries as India and Pakistan, or such unequal countries both in force and economics as the USA and Mexico, there is a way of finding mutually acceptable decisions. In the same way, the countries of Central Asia, based on the norms of international law, could declare on the highest level their adherence to the principle of quotas for water resources, in line with the expediency of periodic joint review of quotas to take into account any changes in the objective conditions of water consumption.

For the purpose of immediately easing tension, a concrete deadline for an agreement to review quotas is recommended, let's say by 2010, and the commitment should be made not to undertake unilateral actions related to the essential increase of quotas in the transition period. As the countries have voluntarily agreed to take part in such projects, it will be advisable to agree further on deadlines and on plans of action for modernizing the mechanisms of the interstate division of water using the approaches already implemented within the framework of ASBP, SPECA, GEF projects and others.

If these primary steps are realized, the negotiating parties will be able to start without any fear on the technical details, which are very important for conflict-free collaboration. Nothing interferes any longer now with the regulation of the issues of border controls of water - apportioning conditions, with agreement on the procedures of environmental drawdown of water for transboundary rivers or with efforts to approve new models of water-apportioning on a bilateral basis, presumably in basins of small rivers where the consequences of possible wrong actions would be not so visible. Let the benefits for both sides at the first stage be very low, but we can hope that they will activate the political will of the national authorities in resolving the main task.

Currently it is not easy to forecast which principle of water division exactly will be accepted in the region in the middle of the 21st century, whether the input of each country to the "pool" of the new model will be proportional to the population of our countries, or whether certain advantages of those countries where major water reserves are formed will be considered. Most likely, a compromise will be found on this basis, if the decisive argument during negotiations will not be the correlation of army arsenals. But let's be optimistic, remembering that the first example of achieving a temporary compromise on water disputes for the post-Soviet period is already evident.

Is it possible to combine the irrigation and power-generation interests of the region?

«Markets, like parachutes, only work when they are open».

H. Schmidt

Since 1993, the problems around the Lower Naryn cascade of power plants in the territory of the Kyrgyz Republic have continually topped the list of regional water concerns, sometimes even overshadowing the Aral Sea disaster. The main object of concern is very well known: the Toktogul water reservoir (19 cubic kilometers), originally designed for the purpose of developing the irrigated lands of the Syr Darya river basin. Guided by this high priority goal, this water facility has been used in accordance with the schedule of irrigation: accumulating during winter and early spring, and letting the stocks of water out during the vegetation period. The construction of this water facility in the Soviet era allowed the development of some 400,000 previously unused hectares of land and the improvement of the irrigation situation of around 1,000,000 hectares of land in Kazakhstan and in Uzbekistan.

Along the way, we can note that the Kyrgyz Republic lost some 32,000 hectares of fertile land in the Ketmen-Tyube hollow, as well as a couple dozen villages, which were flooded. This damage was never compensated for. On the other hand, all the costs borne by the Kyrgyz Republic for the maintenance of the Toktogul HPP and other power plants of the Lower Naryn cascade, serving the interests of the downstream republics, used to be covered out of the Soviet Union's budget through supplies of equipment, goods and fuels.

After supplies stopped as a result of the collapse of the former Soviet Union, the Kyrgyz Republic, for want of other options, had to cover the deficit of the power balance through the increased generation of power at this cascade of power plants, comprising around 90% of all the generating capacity of the country. Because the highest rate of power consumption is during winter, the schedule of operations at the power plants had to change accordingly: the maximum amount of water out of the storage facilities is used during winter instead of summer. The effects of this schedule change on the downstream areas of the Syr Darya river were truly staggering. For the first time since the construction of the Toktogul water reservoir there has been the threat of drought. Due to the depletion of water stocks by the beginning of the vegetation period, some hundreds of thousands of farmers and

landowners may be left without subsistence, while the countries as a whole would be facing significant scarcity in their food baskets and reduced exports of agricultural products.

In addition, the downstream areas have not faced massive salvos of water for decades and the natural bed of the river after the Char Darya facility has narrowed to a minimum due to industrial and civilian constructions and agriculture. In addition, due to the snow and ice during winter, this part of the river cannot let through a manmade few-meters high flow of water. This results in broken dams, destroyed communications and flooded villages and fields, adding up to huge financial damage.

The option of returning the bed of the Syr Darya river to its previous condition is completely out of the question. So the only way to reduce the damage caused by winter floods is to forward the water (priceless for irrigation and for the Aral sea) into the Aidaro-Arnasay hollow near the Char Darya water reservoir. Suffice it to say that this forced solution means a loss of at least 20 bln. tons of water for the regional water balance!

None of the four states in the Syr Darya river basin benefited in any considerable way from the development of such a scenario whereas political and economic costs for each of the countries became obvious by mid 1994.

To solve the problem, joint working groups consisting of experts in the area of water resources management and hydropower from Kazakhstan, Kyrgyzstan and Uzbekistan worked out an option for the comprehensive use of the water and power resources in the Syr Darya river basin, guided by the following principles:

- The reasonable irrigation interests of Kazakhstan and Uzbekistan must be taken into account when scheduling the operation mode of water storage facilities at the Lower Naryn cascade of power plants;
- Excessive power generated by power plants within this cascade during summer must be purchased by Kazakhstan and Uzbekistan in equal shares.

Sine 1995, this scenario has been supported by annual agreements between governments, but in March 1998, the governments of Kazakhstan, Kyrgyzstan and Uzbekistan made in Bishkek a special "Agreement on the Use of the Water and Energy Resources of the Syr Darya River Basin"[22]. Tajikistan became a part of this agreement later, in July 1998.

The five-year term of this agreement is coming to an end soon, and so it appears necessary to either prolong the agreement, making some cosmetic amendments, or start immediately modifying previously agreed terms, if such

[22] 10-th anniversary of the IFAS Dushanbe 2003

seem unacceptable today. However, even before doing so, we may need to carefully analyze the role of this document in the system of regional water related issues throughout the period past.

To accomplish this, it would not hurt, we believe, to acknowledge the positive contribution of the 1998 Agreement serving as a constraining factor as well as a legal framework for the rehabilitation of the water and energy exchange between states, interrupted by the collapse of the Soviet Union. On the other hand, one can easily see that some provisions of this Agreement were never implemented. Particularly, the basin water resources management organization "Syr Darya", designed to coordinate the schedules of water flows from reservoirs, never got any access to the locks of the water facilities in the Kyrgyz Republic. Also, the state was not able to demonstrate the same tariff policy in respect to all kinds of energy resources or to show the coordinated transition from barter transactions to financial accounts. Good intentions, such as the creation of water and energy consortiums, the application of water conservation technologies and the joint construction of water facilities, are still left on paper.

In a practical sense, as we admit frankly, the firm handshakes of the governmental officials who signed the agreement were not always accompanied with similarly firm execution of the undertaken obligations. Each violation of the Agreement entails a similar counter-violation, followed by a number of reciprocal claims, with the result that one cannot tell the causes from effects, or whether the violations are due to natural deviations, economic considerations or political intrigues.

For example, just as soon as a couple of extra cyclones find their way to the territory of Central Asia, water for irrigation becomes momentarily unnecessary, and therefore, Kazakhstan and Uzbekistan no longer consider it necessary to cover the bill for the supply of electricity from Kyrgyzstan. But if, as a matter of response, the Kyrgyz Republic fails to pay for natural gas in time, it runs the risk of being cut off from gas supply by its neighbors, and so the disputes go on to the next cycle, according to the following standard scheme.

As a rule, as natural gas supplies stop, central heating radiators grow rapidly cold, coal prices skyrocket and people, in panic, sweep electric heaters off the shelves of appliance stores. The next stage is: obsolete wires, cable lines and transformers break down, whole neighborhoods lose power. This scenario, with certain variations, was experienced by all people in the Kyrgyz Republic throughout a number of winters, while the end was always the same: the total depletion of stocks of water at the Toktogul reservoir, just as of the stocks of good judgement of certain politicians.

As a result, the mass media is full of burning topics on re-drawing borders and re-distributing assets. There is sensational information about mines planted along the border or soldiers in uniform a day's march from the Toktogul dam.

After such a bombardment, one could expect comments from officials, and they appeared immediately. In 2002, the mass media in Bishkek published correspondence between the former leader of the Kyrgyz Republic, the current member of the parliament Mr. Usubaliev and some high-ranking opponents from Kazakhstan and Uzbekistan[23]. The publication contains a very detailed list of mutual claims between the three states, including in relation to the operation mode of the cascade of power plants. Instead of repeating some commonly known facts and figures, we will try to get the essence of this debate.

Ultimately, the Kyrgyz Republic is confronted with the following reproaches: using the cascade of power plants as an instrument of political pressure upon neighboring states; attempting to obtain unilateral economic benefits by selling water-management services and power at heightened tariffs. In turn, the Kyrgyz Republic appears sincerely perplexed, being forced to maintain facilities of regional significance all by itself, while purchasing oil and gas from neighbors at world market prices. To an equal extent, the Kyrgyz Republic is concerned with promises and specific actions that might isolate the country from the outer world. These, with no exaggeration, may include tougher border procedures, blocked transportation routes, not to mention the manipulations of gas pipelines and regional electricity belt switches. Quite curiously, there is a certain trend one can track down in any official justification of such actions, regardless of what country publishes it: first, there is some nostalgic preamble which reminds one of the good old days when everything was so fine in the former Soviet Union, but then some country messed up, resulting in a significant losses for another country, which was forced then to take adequate measures in response...

None of such statements indicate any attempt of the authors to take on the role of a hypothetical Central Asian Ministry of water resources, in order to calculate the total amount of regional losses resulting from the lack of ability or willingness to reach consensus throughout the past decade. Most likely, the total amount could many times exceed the cost of the technical implementation of projects that would have solved the problem. As estimated by the Asian Development Bank, the annual cost of the unproduced harvest

[23] T. Usubaliev. Law of the Kyrgyz Republic "On the use of water objects, water resources and water management facilities in the Kyrgyz Republic" The Kyrgyz Republic, as well as the whole of Central Asia, is facing global pollution with radioactive wastes. Bishkek, 2002

alone in the five states due to technical weaknesses of irrigation systems and ineffective management reaches around 1.7 bln. US dollars[24].

The most acceptable though expensive solution for the combination of irrigation and energy interests within the Syr Darya river basin is well known. It requires some 2.5 bln. US$ for the construction of two Kambar Ata power plants above the Toktogul facility along the Naryn river. The installation of the new generating capacities is estimated to fully cover the growing needs of the Kyrgyz Republic, to allow increased exports of electricity and to use the water from the Toktogul reservoir mostly for irrigation purposes, in favor of the downstream states.

However, from a geopolitical point of view, this scenario would strengthen the role of the Kyrgyz Republic as the main regulator of water in the Syr Darya river basin. Obviously, influential forces in the region do not treat this prospect with enthusiasm. Otherwise, it would be hard to explain the reason for publishing alternative projects of inferior technical and economic quality, compared with the Kambar Ata project. One such project deals with the construction of a shallow Kok Saray water reservoir for purposes of seasonal counter-regulation of water flows. This project was so weak as to be rejected by its own initiator -- Kazakhstan -- in 2002. Meanwhile, Uzbekistan expresses its intention to create at least four reservoirs for similar purposes, including two in the Fergana valley.

From the point of view of a pragmatic outsider, the intensive development of this idea in Tashkent (well known for its excellent hydro-technical school) appears less than logical. In fact, the cumulative storage capacity of the four new reservoirs would not allow the accumulation of more than a quarter of the winter flows of the Toktogul facility. However, to achieve this humble target, Uzbekistan appears to be prepared to go for significant costs, flooding vast areas in a densely populated zone and in addition, taking on a share of the criticism from neighboring Tajikistan and Kazakhstan which is traditionally addressed at Kyrgyzstan.

The readiness of Uzbekistan to make such a sacrifice may be explained only by political considerations, namely by the desire to coopt at least a part of the water management leverage in the Syr Darya basin.

While such a policy provides certain short-term benefits, its longer term prospects are not so obvious. For instance, commonly accepted forecasts demonstrate that out of all countries of the region only Kazakhstan possesses some significant stocks of organic materials, whereas the gas and oil deposits

[24] Asian Development Bank. Agriculture rehabilitation project. Report and recommendations for the proposed loan and technical assistance grant. November 2002

in Uzbekistan are bound to be exhausted within a matter of a few decades. How is that country going to cover the shortage of electricity: by building atomic power plants or buying power from abroad (the chances for building hydropower plants in Uzbekistan are not so great)? But perhaps it is much more beneficial to be the holder of a large share of stocks in transnational power companies?

Such companies have a lot of business to do in Kyrgyzstan. In addition to the above-mentioned Kambar Ata power plants there are about eight other promising projects on the upper Naryn cascade and a lot of tempting spots for the construction of power plants at other rivers in the Naryn basin, the potential power generating capacities of which are estimated to exceed 6,500 MW[25].

Similar prospects are revealed in Tajikistan, with objective demands for the construction of the Rogun HPP, two more Sangutdin HPPs at the Vaksh river, and the even more impressive project of erecting the Dashtidjum HPP at the Pyandj river.

By securing the finance for implementing these plans, Central Asia will be provided with cheap power for the whole century ahead and will be able to export power outside of the region. In addition, it will be able to use the remaining coal, oil and gas in a more rational way than burning in power stations, for instance in the chemical industry. It will also resolve the problem of coordinating operating modes at water facilities for irrigation and power generating purposes, due to the larger number of buffer capacities. With the help of new facilities the flows of the Syr Darya river will be fully regulated, thus allowing effective management of water resources and significant reduction of costs for the prevention of floods along the main regional water arteries.

Thus, the plans are well known, their benefits are without doubt, but it is also clear that the economic situation in these countries does not allow their implementation to be begun immediately. Let us remember, however, that the latter factor is not often associated with the unstable political situation in the region. This develops not as a dialectical spiral but rather presents a vicious circle. As a result, internal economic hardship in countries appears to cause separatist trends, the search for "external enemies" and rash one-sided measures. This leads to political disputes, while the long-awaited foreign investors postpone their visits to the region for an undetermined period of time.

[25] A. Zyryanov. «Status and problems of joint use of the Toktogul water reservoir in the Central Asian region».In "ISAF: towards regional cooperation" Dushanbe 2003

Once again, we do not want to be forced to end this chapter with a rhetorical question – who can break the vicious circle and make the first step?

That is why, let us return to the issue of the above-mentioned agreement of March 1998. Obviously, none of the major projects in the Syr Darya river basin will be completed within the next five years. Therefore, the most realistic approach today is to stick to the same arrangement of water and energy distribution between the states in the region in the immediate future. In light of this, compromise can be achieved through the coordination of modified obligations of the countries and specifying mechanisms of guaranteed compliance with obligations.

We may suppose, that the draft new agreement will additionally regulate also the ecological aspects of the water flow distribution, omitted earlier. Perhaps, we will be able to find mutually acceptable solutions for the disputed subject of tariffs, unless the old irritating question comes up at the negotiation table: is water a commodity?

On charges for water resources and water-management services

«We don't care how much something something is worth, until it is worth nothing to us. »

A. Maurois

Water: a commodity or public benefit? In an attempt to answer this naive question raised by an ordinary citizen buying a bottle of water, we in most cases are running the risk of facing at least perplexity if not some major troubles. Similarly, this question will not appear appropriate for someone having to cover bills for water supply at home or irrigation services at a farm. But if we rephrase the question a little bit differently: "What exactly do we have to pay for - either for water as a commodity, some natural resource owned by the state, or for services, related to the production, purification and delivery of water?" then we will most likely fail to get any clear answer.

Meanwhile, even the famous jurists of Ancient Rome used to indulge in reflections on this subject, thereby leaving to us the compilations of their works, the so-called digests. In scholarly translations of those digests one can find, particularly, a definition, reading that the responsibility of running ancient Rome was associated with expenses, including for the delivery of water, construction and maintenance of water pipes, sewage, etc. Please note that prior to the evolvement of the "Code of Justinian" the digests had been commonly recognized as the guidance for the application of laws and could even be used in lieu of laws in the absence of such. For instance, the digests specified the terms of exemption from public water management works and taxation for households having more than five children, vessels' owners, olive oil traders and other categories of citizens. For the sake of comparison, let us mention that the existing water legislation of the Kyrgyz Republic also contains references to certain exemptions with no clear indications as to eligibility.

Legislation in most countries of the planet contains provisions concerning payment for the use of water in various ways, but features certain diversity of national approaches.

For instance, in Great Britain, the water supply sector has been completely privatized but the system of tariff-based regulation is so well-developed it does not create any special concerns or frustration of the public. Whereas in Bolivia, judging by a recent publication in the "Washington Times", the privatization of a publicly-owned water supply company resulted in a 90% increase of utility bills for poor households. It must be stressed that while some

countries have introduced a direct water tax, in some other countries citizens have to pay based on the readings of water meters, that is, for the quantity of cubic meters of water actually consumed, for the hectares of irrigated land, or for the number of members in a household, but even this variety of internal water economic policies never reflects upon the domain of international water relations.

The Law of the Kyrgyz Republic "On the international use of water objects, water resources and water facilities in the Kyrgyz Republic" was passed in July 2001. This law, unlike many hundreds of pieces of internal legislation developed and passed by the parliament of the Kyrgyz Republic, was for a long time a best-seller among regional politicians, who were discouraged by a phrase in article 5, containing a commitment to the principle of charging for the use of water in the area of international water relations. Whilst other articles of the law show the connection between this principle and the provisions of international law, and other principles of the mutually beneficial cooperation and terms of treaties involving the countries concerned, it was interpreted in Uzbekistan and in Kazakhstan to mean that Kyrgyzstan was intending to benefit from the sale of water to the neighboring states. We shall not be inclined to go into the past for the literal reproduction of the scandalous expressions in the regional press or less-than-elegant exchanges between highly reputable politicians of these countries.

Instead it appears very useful to carefully figure out to what extent this legal act actually contradicts international law and legitimate practice. To this effect, please be reminded, that the authors of the law found the legal justification for its provisions mainly in the fourth principle of the "Final declaration of the international conference on water resources and environment" in Dublin 1992, reading precisely as follows: "Water has economic value and must be recognized as an economic good". One may dispute as to whether the English phrase "economic good" should be translated into Russian as "economic commodity" (which does not sound very well in Russian) or as "economic benefit", thus imparting a definition with a slightly different meaning. However, instead of going deep into such linguistic nuances, let us emphasize that every later act of the international "soft" law following the Dublin declaration contains much more cautious definitions.

For instance the "Johannesburg Declaration" indicates that better water policy means progress in all three components of sustainable development: social, economic and ecological. The same declaration prescribes, as a matter of strategic partnership in the issue of water and sanitation, to "encourage the development of innovative financial mechanisms and financially stable

strategies, including the introduction of a water-pricing policy sensitive to the needs of the poor".

Let us add also some of the commonly accessible data from the Internet, particularly that "the World Bank, IMF and WTO increasingly consider the privatization of water resources as an effective way of improving access to water in poor states". The official web site of the UNDP has got a similar recommendation: "We need a creative approach to the process of pricing in the area of water resources to find alternative ways of providing farmers, industrious enterprises, cities and other consumers with inexpensive water".

Having studied the international treaties registered with the United Nations, one becomes convinced that most of such treaties actually regulate the financial participation and distribution of benefits between the founders of joint water-management programs and projects. These include, for instance, the treaties between US and Mexico (1944), US and Canada (1961), UAE and Sudan (1959), India and Nepal (1999). On the other hand there are well-known economic agreements, wherein water is considered as an object of sale, for instance between Malaysia and Singapore, China and Hong Kong and Macao, Lesotho and South Africa. In these cases water is exported to neighboring states through channels and pipes. Whereas under a contract between Turkey and Israel, the water is shipped by sea; however the cost of water thus imported in Israel is three times less than the cost of processing the mineralized water available domestically.

The most frequently quoted agreement throughout the recent regional debates was the one between Turkey and Bulgaria (1993). Under this contract Turkey paid less than 2 mln. US$ for 16,000,000 cubic meters of water from the river of Merig. On the other hand there is a project for the daily transportation of 0.8 mln. cubic meters of water from Iran to Kuwait, estimated to cost around 2 bln. US$. Commencement of the technical implementation of this project in 2002 will mark up the beginning of a new era as economically feasible projects of water transportation can be compared in terms of costs with similar inter-continental projects of transportation of oil and natural gas. Please make special note that all of the above-mentioned projects very well correspond to the provisions of the Vienna Convention (made in 1969, effective as of 1980), for such projects are made on the basis of treaties concluded by the parties concerned under consensus.

Fully relying upon this condition, the parties involved in the tough debates around the above-mentioned law of the Kyrgyz Republic could recognize these debates as absolutely groundless, and so they should rather deal with the whole set of water and economic regional problems, one at a time.

To do this there is one indisputable fact: the economic conditions in the states of Central Asia do not allow any space for bygone disinterested brotherly help or all kinds of manifestations of charity. Therefore, in order to avoid the risk of undermining the brotherly relations among neighboring states, any costs incurred by one country in favor of another country should be properly compensated. This obvious consideration has been established in the agreement between the governments of Kyrgyzstan and Kazakhstan "On the Use of Water-Managing Facilities by the Two States at the Rivers of Chui and Talas" in 2000. However, it would not hurt to establish this principle also in a multi-lateral declaration or within the text of a regional water strategy.

This principle should most probably be followed with purely technical joint procedures – the formal agreement on the list of shared water installations used by states jointly, as the list is well known to everyone, and agreement about the costs related to the maintenance, use and upgrading of each of the installations, and finally, the distribution of costs among the parties concerned proportionately to the expected effect.

It is not so difficult to make and agree on such calculations with respect to water reservoirs, intakes, regulating facilities and channels used by states in a joint way. At the same time, a certain part of the domestic water use activity by states in the area of runoff formation may indirectly benefit neighboring states, but it is not always possible to define the benefit in capital terms just as it is impossible to define the share to be borne by neighboring states in financing such activity. This quite disputable area of cooperation may include, for instance, the joint maintenance of observatory hydrological networks, or flood prevention, regulation and bank enforcement activities, not to mention forest rehabilitation, etc. Most likely, some contradictory approaches in calculating compensation may be revealed at the initial stage of negotiations while the resolution of such contradictions may lead to constructive dialogue.

Another part of the problem, related to the sale of water, should most likely be resolved along with the review of mechanisms for the establishment of quotas for water resources. If the overall stock of water could be prudently divided into national quotas, it would be difficult to think of, for instance, Tajikistan or Kyrgyzstan having convincing arguments to justify their claims with respect to water assigned to their downstream neighbors. At the same time, no legal barriers will stand in their way should they desire to give up a share of their quotas to the neighbors, in exchange for some compensation, of course. There are precedents in international practice, for instance in the agreement between the US and Mexico, that establish compensation for using a share of the quota of fresh water that belongs to another state. Potential buyers have the right to go for such a deal voluntarily or to reject such a deal,

so that no domestic law or Dublin principles shall stand in their way of making the final decision.

One can think of the desired prospects of the development of water and economic issues in Central Asia in a very laconic way: sooner or later, economic interests shall prevail over political ones, water supplies and other services will be compensated for by interested neighboring states, whereas the notion of water as a commodity shall come up only after demand and supply have been balanced.

We suppose this simplified scheme will be further developed along with the emergence of new actors at the Central Asian water exchange: Russia, China, Afghanistan or even more distant investors. Besides, there are good chances for principle changes in water-economic relations in the case of the creation of transnational corporations and consortiums, or as a result of the privatization of the former national water management infrastructure, along with the growing influence of independent water users and private water supply companies upon the development of the services market.

It would be useful to keep such imminent changes in mind today, in light of attempts to develop an uninterrupted system of water and energy exchanges in the basin of the Syr Darya river within the framework of the above-mentioned modified Agreement of 1998. As, by the way, environmental problems, regularly mentioned in the joint communiqués, but nonetheless kept frozen, are awaiting...

Ecological Aspects of Regional Water-Related Issues

«We don't preserve what we have – and when it's lost, we cry»

Scholars in the field of ecology have long given up the simple-minded term "mother nature," replacing it with "environment" or even "ecological niche", bounded by six cornerstones (depth, water, soil, atmosphere, flora and fauna). One possible reason is the frightening degradation of all basic elements of the global eco-sphere, so visibly reflecting upon the development of the whole of civilization and this region in particular.

Since it is impossible to identify the whole spectrum of environmental problems and approaches to their resolution, let us just mention briefly some of them, for two reasons, as follows: First of all, as already mentioned earlier, specific climatic conditions in Central Asia determine the key role of water both for the survival of the population as well as for the preservation of nature and all its inhabitants. Second of all, the use of water in the region has always been accompanied with trepidation towards the sources of water. By the end of the 20th century the relationship between the use of water and environmental protection had reached its closest point ever, such that not a single major water project can be implemented without proper consideration of all ecological effects.

At least, this is the language of the framework "Agreement on Cooperation in the Area of Environmental Protection and the Rational Use of Nature" concluded by the government of the Kyrgyz Republic, the Republic of Kazakhstan, and the Republic of Uzbekistan in March 1998 in the city of Bishkek, for 5 years. Unfortunately, we have to once again admit that the provisions of this framework agreement, containing a long list of areas of cooperation for the sake of environmental protection, have not been eagerly implemented by the states concerned in the absence of specific references of responsibilities and obligations.

In addition to the lack of financial support, such a passive attitude could also be explained by some facts of the improvement of ecological conditions in the region throughout recent years.

Indeed, diagnostic reports by ESCAP and GEF, and many other publications, mention a lower degree of mineralization in the Amu Darya and Syr Darya rivers, while still in excess of the level of 1960-1970. There are also indications of a reduction in the number of sources of pollution of the

water and atmosphere. This has been the result of reduced industrial output in the region for a long time, as well as the reduced use of mineral fertilizers and chemicals in agriculture. A similar favorable effect was created by the reduced consumption of water and reduced output in mining and chemical industries, which use and store large quantities of poisonous substances.

But we should not be deceived by these facts, for the trends will naturally be reversed along with the rehabilitation of the national economies. Afterwards we will be left with the indirect effects of the economic crisis accumulating year after year in the most unnoticeable way.

A lot of concerns related to water issues have to do with out-of-date industrial and municipal sewage systems and purification facilities. Their degradation is directly linked to the growth of infectious diseases caused by the poor quality of drinking water. A significant portion of the rural population is still forced to use water from street channels and wells, thus further aggravating the epidemic situation. The very nature of the sources of pollution of the environment has changed: disorderly household wastes have grown into the dominating factor of pollution of fresh underground water and river eco-systems, thus replacing industrial enterprises.

However, even these side effects of the technical benefits of civilization may affect the nature and the population of the region in a less dangerous way than the still sleeping "echo" of the "cold war". You must already understand we are talking about the waste of mining plants, containing uranium and mercury, lead and cadmium, antimony and arsenic, and dozens of other extremely dangerous combinations of chemical elements, in such quantities that the consequences of their seepage into the water environment could be considered a disaster on the scale of the Chernobyl accident.

Many such waste dumps are located in river valleys, and partitioned off with sand dams, constructed over fifty years ago with no essential reconstruction since then. Earthquakes, floods, land slides and mud torrents may at any time break through the symbolic, in most cases, barriers and cause millions of tons of fatal waste to flow down the rivers without stopping at state borders. It would not even be appropriate to try to figure out the amount of damage from any such accident in capital terms, for no damage could be compared with the possible harm to the population in the vast surrounding areas.

The wastes of the mining industries in the run-off formation zone are not the only source of potential regional catastrophes. We have already

mentioned the need to maintain large water reservoirs and water intakes safely. Comparable quantities of water can be found in highland lakes. The most notorious example is the Lake of Sarez in Tajikistan, created as a result of an earthquake in 1911. After gigantic landslide in 1982, the erosion process became even more intensified in the canyon of the Murgab river – higher than the dam, and it would not be able to support even one wave of over 6 meters. The earthquake of 1998 in neighboring Afghanistan, that is, on the periphery of the same Pamir geological structure, was a reminder of the risk of the collapse of the Usoisky dam from the effect of seismic phenomena. The price of this risk is no joke: with 16 billion tons of water, the Lake of Sarez would pour onto 55-70 thousand square kilometers, home to 5-6 million citizens of four countries – Afghanistan, Tajikistan, Turkmenistan and Uzbekistan. In connection with this, let us remember that the destruction in 1998 of flooded dams of three lakes in the river basin of Shakhimardan, whose total volume of water was incomparably less in comparison with the Sarez Lake, entailed human victims and significant material losses in Kyrgyzstan and Uzbekistan.

Thus, large lakes in the mountains, major water reservoirs, and hazardous wastes, mostly of a toxic or radioactive nature, may become the main potential sources of accidents on a regional scale, directly or indirectly related to water resources. Most of them are found in the run-off formation zone - i.e. in the territory of Kyrgyzstan or Tajikistan mainly, and to a lesser extent in the mountainous areas of Kazakhstan and Uzbekistan. Phenomena of local scale, typical in this area, such as floods, landslides, earthquakes and soil erosion, require very close attention, measures of prevention and, indeed, some significant funds.

As for the zone of run-off dispersal, including the larger part of Kazakhstan, Uzbekistan and Turkmenistan, almost every local and foreign expert identifies two major problems: water mineralization and the desertification and salinization of land. These problems have been attached the highest priority in the report on "Environment, Water and Security in Central Asia" made under the patronage of International Save the Aral Sea Fund Executive Committee.

Each of the problems today is the subject of discussion at endless seminars and conferences where the existence of a problem is not questioned but interpretation can sometimes be disputable. Let us mention just a couple of views. First of all, it is believed that problems result from disorderly and ignorant water use activity, and second, that upstream states should not bother with these problems.

While recognizing that agricultural practices in the downstream countries are far from being sinless, let us assume hypothetically, that suddenly the situation has improved to become almost perfect: in technical terms and in terms of the application of chemical fertilizers. The question is: how is this going to affect the water and salt balance in the rivers' basins?

Obviously, the percentage of herbicides, pesticides, and other harmful substances should be reduced, just as happened as a result of the economic crisis (not thanks to technical progress). On the other hand the cumulative runoff of the Amu Darya and Syr Darya rivers alone contains an estimated 50-125 mln. tons of various minerals. A share of the minerals finds its way into the river without human involvement, while a substantial part ends up in rivers as a result of the irrigation of fields. This practice will not be given up in the foreseeable future.

Evidently, there is no need to prove that no good intentions such as the introduction of droplet irrigation in the region could change the mineral balance, whereas economically feasible technologies of processing mineralized water are not yet foreseeable.

Until recently these minerals were accumulating in the Aral Sea basin and could only influence the population of certain fish. Nowadays, it does not matter where they are deposited. Sand storms raise these "dry tears of Aral" into the atmosphere and it is hard to predict each time whether they will fall down upon the glaciers in the Pamir or Tian Shan mountains or undermine the existence of people living in the downstream areas. There are also suggestions that the acid rains which regularly destroy the famous orchards in the mountainous valleys are yet another manifestation of the travelling waters and salts in the air.

At this point we need to once again remember the principle "the polluter pays" found in international law and admit that our countries have accumulated irrecoverable arrears before their own water ecosystems. We have already identified the list of the major polluters but their respective shares of responsibility for the depreciation of water quality will most likely change with time.

Along with the process of the rehabilitation of agriculture, industries and the development of the energy sector, these three sectors will continue to provide the most visible impact on the environment. We may also assume that since threats coming from tailings, wastes and unprocessed sewage so significantly impact the subsistence of the population, necessary measures

of response will be taken as a matter of priority to stabilize and then reduce the impact of such factors upon the quality of water.

The overall quantity of automobile exhaust will most likely grow in the future, but national authorities are quite able to bring some compliance into this sector. Even if the pollution of water from all of the listed sources stabilizes in a miraculous way, the degree of mineralization of water, still considered as fresh today, will gradually increase due to the higher rate of consumption. This fact necessitates the inclusion of water-protecting actions into the list of the most important areas of international cooperation.

So far it appears to be a subject of contradictions which arise due to the division of countries of the region into the "upstream" and "downstream" states. Indeed, even with the current miserable condition of water quality monitoring, the downstream countries have the ability to track down discharges of pollution occurring in the upper reaches of the transboundary rivers and to sue Kyrgyzstan or Tajikistan, if necessary. These latter states, on the other hand, are not able to monitor violations of the environmental standards committed by their neighbors, or especially, to provide documented evidence of the contribution to erosion of their own territory made by any given neighbor.

The lack of balance between interests and responsibilities may account for the refusal of the states (except Kazakhstan) to accede to the 1992 Helsinki convention or for the irritated reaction of officials to any reference to the "polluter pays" principle, just as for being indifferent to ideas of joint water quality control or the auditing of pollution sources.

Indeed, any activity in this area can only impose unnecessary trouble and potential economic sanctions upon the upstream state, which appear to outweigh the benefits of cooperation.

However, water protection activity is not confined to the prevention of pollution or the treatment of water affected by pollution or other impacts. We have already mentioned that the condition of glaciers in the mountains, as well as highland forests, directly impacts the regional stocks of water resources. At the same time, there are a large number of local ecological problems which appear a lot more significant from the point of view of the local population than, say, global climate change. Some of these problems are typical for the whole of Central Asia, such as those having to do with pollution and the depletion of underground water sources, protection of

marine flora and fauna, unique natural parks and reserves, construction of drainage collectors, etc. On the other hand, there are some measures of water protection which require an individual approach.

Most people understand, for instance, the reasons why Kazakhstan is concerned about the utilization of water resources at the Black Irtysh by China, or the degradation of ecosystems in the Ural and Balkhash basins, and the lower reaches of the Syr Darya river. But one can presume that Uzbekistan is more concerned with the development of the situation around the Denghiz-Kul, Sary Kamysh and Sudochye lakes. Kyrgyzstan focuses upon the promotion of investments in its famous resort area - Issyk Kul lake, while Turkmenistan is overwhelmed with its own problems in the Kopet Dag area, in the desert oases and along the Caspian Sea.

We are making references to these problems in connection with the delicate aspect of the Aral Sea problem, left unmentioned in the joint declarations, but still causing agitation at conferences. The crux of the matter is that in January 1994, the leaders of the five countries of Central Asia agreed upon the "Inter-state concept", containing an assessment of the future condition of the Aral Sea and surrounding areas, as well as a proposed set of measures for the stabilization of the ecological situation in the area.

Provisions of this document found further development within the Nukus declaration in 1995 and were later specified within the Aral Sea Basin Program. The ideological assumption of this program is that "the patient is more dead than alive", meaning that instead of the Aral Sea itself, the states of the region must rescue the surrounding areas. The fact that throughout 1999-2000, some hundreds of cubic kilometers of water were delivered to the Aral Sea basin, does not necessarily mean that all countries of the region have unconditionally recognized the Aral Sea as the "sixth water user" in the region and granted to it a share of their own national quotas of water consumption.

When it came to economic commitments and the obligation to allocate funds from national budgets to the Aral Sea Rescue Fund, they soon found out that the upper stream countries were obviously unprepared, while donors' funding (around 1/3 bln. US$) was insufficient and used ineffectively. As a result the first Aral Sea Basin Program for a while turned into an arena of mutual accusations and claims. Predicting the frustration of neighbors, the Kyrgyz Republic and Tajikistan presented a number of counter-arguments, expressed through independent experts, instead of simply sighing with distress at the lack of funds.

As a rule such arguments were limited to the following three main reasons, according to which funding projects within the Aral Sea Basin Program allegedly make no sense. The most primitive argument referred to the inevitable loss of the whole Aral Sea ecosystem, without any specific references to the indirect effects of this drama for the whole region and addressed to the least sophisticated part of the international community. Two other arguments were prepared for politicians and professionals. One of them could be formulated the following way: the countries mostly responsible for the death of the Aral Sea and mostly interested in the rehabilitation of the Aral Sea must cover all the costs. The other argument pointed to the planning and implementation drawbacks of the program.

We, in turn, shall try to present and justify our own version: the first Aral Sea Basin Program was originally planned without giving proper consideration to the balance of national interests, and successful implementation of that program was in fact impossible.

Let us take the angle of a poor Tajik or Kyrgyz peasant subsisting on an agricultural field poisoned with chemicals somewhere in the Fergana valley. He/she lives as a rule without electricity, natural gas, or a drinking water supply, using a latrine in the backyard. Moreover, he/she lives in fear of local natural calamities, questioning his/her ability to feed and educate children and relatives. It is not difficult to predict the response of such an average person to the news that the government has left him/her to the mercy of fate, while intending to allocate a part of the national budget to support some distant dying sea or other peasants in Karakalpakstan. Since such peasants make up the majority of the electorate, it is very clear that elected parliamentarians must not allow any amendments into legislation to provide funding for the "Interstate concept" and "Aral Sea Basin Program".

But things could be quite different if in those documents the Sarez Lake was mentioned along with the Aral Sea, highland forests listed next to the Aral wetlands, with Balkhash, Arnasay and Issyk Kul lakes referred to as objects of common concern. We can only hope, that the modified version of the 1998 Agreement and the new Aral Sea Basin Program II would take these views into proper consideration. This does not mean that donors' funds must necessarily be dispersed among numerous local projects. Of course, priorities have to be identified, but in a way that avoids the perception of "pro-Uzbek" or "pro-Kyrgyz" sympathies among donors, detrimental to other countries.

The liquidation of this very important psychological barrier, we believe, will allow environmental cooperation to be activated, predominantly in

areas that do not require excessive capital investments, but are important for each country. These may include for instance the rehabilitation of observatories, the modernization of water monitoring systems, the exchange of information and early warning about emergency situations, the development of common water protection standards, the safety of the water management infrastructure, etc. The list of such important areas could be significantly wider. Indeed, the implementation of more ambitious ecological and water projects in the absence of support on the part of international organizations, development agencies from industrialized states and independent donors will still be impossible in the coming decades. Therefore, it would make sense to mention at least briefly this category of necessary players in the sphere of water-related issues in Central Asia in recent years.

The Contributions of International Organizations – Practical Support and Theoretical Costs

«We don't help people by doing for them what they could have done themselves. »

A. Lincoln

We are going to mention specific donors' assistance projects a bit later. First, let us draw attention to some aspects of the programs run by international organizations which provided grounds for such a sarcastic opinion by Dr. Sievers in his work on "Water, Conflict and Regional Security in the Central Asia".

The fact is, that the first series of pilot projects supported by donors' assistance and funding resulted in a mixed feeling of appreciation for the support, inspiration due to additional revenues and irony among most of those referred to in Mr. Siever's publication as "local professionals" because of the extreme aplomb of some foreign managers and consultants as well as the essence of the solutions they proposed. A number of such projects allowed overlap and duplication, or contained either controversial or commonplace approaches. Some of them, being based on stereotypes common for the humid zones of the developing countries of Africa thus could be more harmful rather than useful. Obviously, such models naturally could not rely upon the centuries of water use traditions in the region or the balance of interests existing in the region. Central Asian water resources management professionals realized all of these nuances, but in full compliance with the oriental traditions of hospitality, they nodded politely, accepting any proposals, which were later put aside.

They also took notice of some other peculiarities of internationally supported programs. First of all, none of the projects provided for any significant investments into the development or application of sophisticated technologies or the rehabilitation of industrial capacities which could then facilitate the accelerated modernization of the water managing infrastructure. In most cases, the projects stipulated the importation of equipment and technologies from abroad, leading to the speculative conclusion that the West would not encourage any development in the sectors of the national economies for fear of future competition. Some projects mentioned also the intention to sell to this region some out-of-date technologies for water resources management.

Another very popular trend was to find some hidden political context within the system of planning the programs of international assistance to this region. For instance, why would development agencies of the world

focus on the Aral Sea, which was a victim of the "evil empire" (that was how one artistic American president referred to the former USSR), whereas few people know about the similar miserable fate of other water basins degraded through the direct involvement of donor states. That was true for Lake Chad in Central Africa, at the borders of four African states, an area of influence of such former colonial powers as France and Great Britain as well as some transnational corporations.

During the 20th century, the territories surrounding that basin delivered endless amounts of cotton, coffee, peanuts, cocoa, oil, nickel, aluminum, and other materials. As a result of that practice, Lake Chad today resembles a large puddle of mud, the social and economic damage for Central Africa is incalculable, and one inevitable question (that comes up every time) is: Who is to blame? For that reason, perhaps, Central Asia is so unbelievably lucky: it is a lot easier to gain political capital through charity here, rather than anywhere else.

Even though programs based upon such considerations make up just a small part of the total, they indeed call into question the very foundation of the noble idea of donors providing support.

These are the costs due to tactical errors at the data collection stage; donors should have first carefully studied the peculiarities of the psychological climate as well as the tricky Soviet bureaucratic school, which educated and raised some part of the modern managers. Anyway, we are not so interested in the reasons behind some of the projects. Especially, because it is hard to overestimate the actual contribution they have made to the stabilization of the situation in Central Asia.

Particular emphasis should be given to the humanitarian component of international assistance which happened to be very timely and appropriate at a time of economic hardship for the most disadvantaged and vulnerable categories of the population, such as children, pensioners and the handicapped. Such humanitarian assistance was not confined to simply supplying food or medications, but in addition supported and even provided an impulse for the development of health care, education, social protection and national culture. One may also claim that the inevitable degradation of the energy and transportation infrastructure, water resources management facilities, and particularly systems of irrigation and communal water supply, were reversed to a great extent through targeted grants and loans.

Many years of hard work and unbelievable efforts made by technical services in order to maintain such systems are left invisible for ordinary consumers, since water continues to flow along channels and pipes in spite

of any political and economic perturbations. Only very rarely do we recall such professionals in the most unpleasant terms if the flow of services gets interrupted for just a few hours. Unfortunately, very few people are aware of the many accidents prevented, or channels cleared and equipment installed through the direct financial involvement of the global community.

Perhaps, it is even more difficult to appreciate the radical changes in living standards and labor organization due to the mass invasion of modern information technologies accompanying missionaries.

Literally, within just a few years, we have got rid of obsolete abaci and typewriters inherited from grandfathers, not only in the capitals, but also in the provinces. This aspiration towards progress is also due to the influence of international programs, for almost each of them included supplies of new computers, various office equipment and Internet connections for a growing number of users.

What would have been the development of the social, economic and political situation in Central Asia since 1992 in the absence of any foreign aid? Most likely, if we look at various options, even the most orthodox opponents would be forced to admit the cumulative positive effect of the decade-long efforts made by international institutions.

Some arguments in support of this undisputed conclusion have been provided earlier and there is no need to continue the subject. Besides, there are reasons to believe that international development agencies, while helping the region to integrate into global processes, have also learned a lot and have continued to develop.

Judging by the nature of changes in the contents of international programs, one may also trace the evidence of a new phase approaching. For instance, such projects now rarely employ as consultants some persons who try to impose behavior stereotypes and outrageous technologies hardly suitable for this region. These new projects are better than ever designed to get opponents seated around a table, to accelerate progressive changes and to focus cooperation on the rational use of nature. Examples could be found in the preliminary plans for the already mentioned Aral Sea Basin Program II. These plans feature the aspiration to avoid old mistakes, to comply with the comprehensive approach to resolve the most essential water-related problems, while trying to avoid the impression of unnecessary bias in favor of certain countries or sub-regions.

However, the same old frustrating subjectivism, unanimously condemned in the assessment reports made by foreign missions, still stands in the way: the lack of political will, implicit vested interests, inappropriate personal ambitions. These considerations may have a frustrating effect; yet, paradoxically, we instead feel encouraged. Indeed, if we're not so morally weak, it's time to get rid of our inferiority complex, get a little bit rich and stop sitting and waiting for the long-anticipated new phase to come -- a phase not of donors and recipients, but of cooperation of equal business partners.

* * *

Frankly, we intended to raise the interest of the audience by using in the first part of this publication the genre of a popular brochure, similar to hundreds of publications by "Znanie" with colorful covers at the time of the former Soviet Union. As a result, we came up with a kind of new version of the "Thousand and One Nights", in which stories flow smoothly one into another, alas, with no happy end foreseen. Or it may appear as a very transparent compilation of the plot of the legendary Japanese movie "Rashomon", in which the truth is always around the corner, but not quite here.

At this point you have the right to ask a legitimate question: what is the truth? But have we not consistently sent the message that the positive resolution of water-related problems is being held back by economic hardship, the absence of general "rules of the game", the lack of ability or willingness to play by such rules and finally, the lack of political will? It is still possible to get by without the painful pressure of such will if political priorities surrender to the superiority of business activities and economic integration.

Keeping in mind that any attempt to establish the absolute truth merely by counting votes "pro et contra" shall be lost in vain; we did not design the transboundary study for this purpose. The study was designed to compare our own subjective assessments and views of regional water relations with other opinions. Some may find the diametrically opposed views expressed by interviewees frustrating, but this is just further eloquent evidence of the very complex path ahead of us.

II. FINDINGS OF THE SURVEY OF THE MOST IMPORTANT WATER PROBLEMS OF THE CENTRAL ASIAN REGION

Trying in every way to somewhat dispel our own doubts concerning the prospects for the development of water relations in Central Asia, we requested the views of other experts. Therefore, in mid-2003 we were able to involve 69 respondents from four countries – the Republic of Kazakhstan, the Republic of Uzbekistan, the Republic of Tajikistan and the Kyrgyz Republic. Unfortunately, for a number of reasons, we were not able to include representatives from Turkmenistan in the sample. Without disclosing our respondents' names, the data provided in Table 1 characterizes their field of activity and background.

Table 1

	Kazakhstan	Kyrgyzstan	Tajikistan	Uzbekistan
Total number of experts	20	21	12	16
Employment				
Legislature	0	1	0	0
Bodies of executive power	7	10	5	1
Research and educational institutions	8	2	4	10
International organizations and foundations	1	1	1	1
NGOs	3	3	2	1
Enterprises	1	4	0	2
Political parties and movements	0	0	0	1
Representation				
• capitals • sub-regions	5 15	21 0	12 0	11 5
Background				
Water resource management	18	9	12	6
Environmental protection	5	5	5	3
Political science	0	2	0	0
Economics	0	2	1	4
Law	0	3	0	0
International relations	0	7	1	1
Other	1	3	0	3

The respondents are qualified experts, directly involved in the process of making or implementing decisions concerning water or environmental protection at the national and regional levels, as confirmed by the data, provided in Table 2.

Table 2

The professional activity of the experts mostly involves:	Kazakhstan	Kyrgyzstan	Tajikistan	Uzbekistan
Theoretical research	1	3	0	1
Applied research and development	6	3	1	2
Both theoretical research and practical activity	11	11	7	11
Public activity	3	3	2	1
Other	2	3	2	1

Now that we are so lucky to bring together such significant intellectual forces, the only concern is to channel these forces into the right direction. To do this, respondents were offered a uniform questionnaire, including both a series of closed-ended questions (requiring either "yes" or "no" as an answer) as well as open-ended questions, offering the author a brief opportunity to express his or her view with respect to specific issues. It is possible that even a quick glance at the long list of questions provided in the attachment to this report may find it extremely overloaded, but this was due to the very versatile subject of the research.

It should also be specified that each country of Central Asia was represented by a different number of experts, and so just to sum up their views with respect to each issue would be a significant distortion of the research findings in favor of the better-represented nations. That is why, for purposes of the better representation of the study, data was summarized separately for each country. Such an approach is believed to identify the most characteristic peculiarities of national views concerning the development of regional water relations. We can say in advance, that national views are characterized by an extremely broad spectrum of opinions regarding key aspects of water problems. We found them sufficiently eloquent not to require any additional detailed explanations. Therefore, any further comments are kept to a minimum and designed merely to draw attention to the most interesting findings of the study.

General Assessment of the Current Situation in the Region

The set of questions concerning the current situation in the region in the first part of the questionnaire was designed to identify the social, economic, technical and other problems characteristic of Central Asia as a whole, and to establish the importance of water problems within the regional development context as well as the individual national context.

In response to the question about the three most important problems for Central Asia, the experts indicated 13 such problems, as follows: (Table 3)

Table 3
The most important problems for the Central Asian region (% of the total number of problems quoted)

Problems	Kazakhs-tan	Kyrgyzs-tan	Tajikistan	Uzbekis-tan	Cumulative
Socio-economic development (poverty, unemployment, etc)	20.0	23.8	16.7	6.3	17.6
Water problems	50.0	33.3	33.3	93.8	52.9
Globalization	0	0	16.7	0	1.5
Corruption	10.0	14.3	0	12.5	10.3
Drug addiction	0	9.5	0	0	2.9
Trans-boundary issues	15.0	33.3	16.7	12.5	20.6
Democratic development, human rights	5.0	4.8	16.7	0	4.4
Poor or no regional cooperation	15.0	33.3	16.7	18.8	20.6
Development of the real sector of economy	20.0	0	16.7	6.3	10.3
Market reforms implementation	0	9.5	33.3	0	8.8
Poor governance	15.0	14.3		6.3	10.3
Poor or no economic integration in the region	25.0	2.1	16.7	6.3	13.2
Environmental problems	55.0	12.5	16.7	56.3	41.2
Other	15.0	8.3	8.3	6.3	9.5

Data from this table point to the predominance of professional interests, for water problems are recognized as the most relevant by almost 53% of the

experts. The fact that the highest priority is attached to water problems by almost all experts from Uzbekistan is another confirmation of the importance of the water factor in the social and economic development of that country. It should also be noted, that over 50% of experts in Kazakhstan and Uzbekistan underline the importance of environmental problems, while representatives of Kyrgyzstan and Tajikistan consider their importance three times lower. Therefore, drawing on the answers to the very first question, once can trace how interests diverge among the countries of the origin and dispersal of water flows. It is also interesting to note how the views of experts from different countries split over the problem of market reforms.

At the same time, one should mention the concern over such issues as the low level of socio-economic development in the region and the degree of regional cooperation, particularly in the area of economic integration, and lack of regulation of border issues, shared by most experts.

In response to the question concerning the three most important problems of water relations between the states of Central Asia, the experts have indicated 16 such problems, as follows: (Table 4)

Table 4

The most important problems of regional water relations

Problems	Kazakhs-tan	Kyrgyzs-tan	Tajikis-tan	Uzbekis-tan	Cumula-tive
Poor legislative and legal framework regulating water relations between states	1	6	1-2	1	1
Technical problems of the existing water resource managing infrastructure	13	5	-	8	9
Water use problems in the region due to prospective demand in Afghanistan and China	-	-	10	-	18
Poor development of the informational exchan-ge between states in the region	13	11	6	-	12
Limited nature of water resources in the region	13	11	6	5	7
Absence of effective moni-toring of water resources	8	-	10	11	9

Ineffective regional cooperation (lack/poor mechanism of implementation of inter-state agreements, no integration, etc)	5	4	4	3	5
Absence of a program of development of water resources in the whole region	-	7	-	-	13
Weak mechanisms of water division between states	4	3	1-2	5-6	3-4
Economic problems (lack/no investments, poor development of market relations, etc)	3-4	1	3	7	2
Environmental problems	2	2		3	3-4
Aral Sea problems	9	7	-	-	12
Problem of regulation and use of water resources	13	-	-	11	15
Transboundary problems	6	11		8	9
Problems of water resources management	9	11	10	3	6
Poor involvement of NGOs and civil society	9	-	10	11	13
Other	13	11	6	-	17

In Table 4, these 16 problems are arranged depending on the number of experts' views attaching priority to any specific problem. It is characteristic that first and foremost, a majority of experts are concerned with the undeveloped legal framework for regional water relations, followed by the lack of effectiveness of regional cooperation mechanisms, as well as with economic and environmental problems. Whereas such problems as the changing structure of water consumption in Central Asia due to prospective growing demand for water in Afghanistan or the insufficient degree of involvement of NGOs and communities in the process of water resources management are not yet recognized as substantial. By the way, the latter is in contradiction to the principles of national ideologies in most countries of the region, supporting the priority of stronger democratic institutions. Also, notice should be taken of the low priority attached to the problems of the Aral Sea.

Experts have indicated 15 problems, in response to the question about the three most relevant national water problems (see Table 5).

Table 5
Most important national water problems

Problems	Kazakh-stan	Kyrgyzstan	Tajikis-tan	Uzbekis-tan	Cumula-tive
Social economic problems in the country	6-7-8-9-10	7-8-9-10-11-12-13	*	9-10	*
Technical problems of rehabilitation and development of the water resources management infrastructure	3-4-5	5-6	5-6	2	4-5-6
Professional training in this area	*	7-8-9-10-11-12-13	*	*	11-12-13
Lack of international experience	*	7-8-9-10-11-12-13	*	*	11-12-13
Environment (tailings, land slides, mud flows, glaciers, water security and environmental protection)	3-4-5	5-6	3-4	3	4-5-6
Quality and accessibility of water	2	2-3	3-4	1	1
Economic problems (market relations, investments, tariffs, etc)	*	1	1	4	2
Poor development of the legal framework	1	2-3	7-8	*	4-5-6
Monitoring	6-7-8-9-10	*	*	*	11-12-13
Absence/weakness of the information base	*	*	5-6	*	9-10
Transboundary problems	*	7-8-9-10-11-12-13	*	5-6-7-8	7
Aral Sea problem	6-7-8-9-10		7-8	9-10	
Institutional problems (creation of water resource ministry, etc)	6-7-8-9-10	7-8-9-10-11-12-13	*	5-6-7-8-	8
Water resources management	3-4-5	4	2	5-6-7-8-	3
Involvement of the civil society	6-7-8-9-10	7-8-9-10-11-12-13	*	*	9-10
Other	*	7-8-9-10-11-12-13	*	5-6-7-8	11-12-13

«*»- not indicated by experts

The problems indicated by the experts are placed in the table depending on the number of responses which attached each of the 15 specific problems the highest priority. Please note how experts' views coincide in recognition

of the highest importance of such problems as the quality of and access to water, underdeveloped market relations and lack of investments in the water management sector, the need for urgent modernization of the water management infrastructure, and underdevelopment of the legal framework and water resources management structure.

At the same time, the problems of the Aral Sea, the poor development of national water resources monitoring systems and particularly, the low degree of involvement of the public in the process of water resources management are of rather secondary importance for the respondents.

The Distribution of Water Flows in the Region – No Obvious Common Approach Yet

Diagram 1
Should any consideration be given to the "historically developed terms" while planning for the distribution of flows between states ? (%)

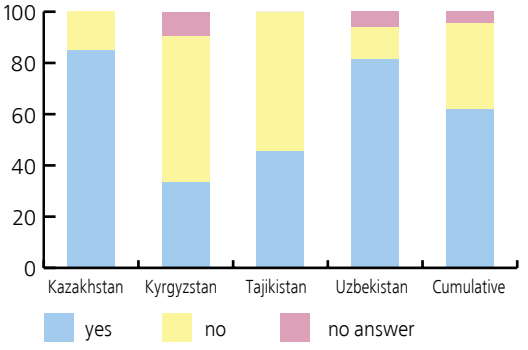
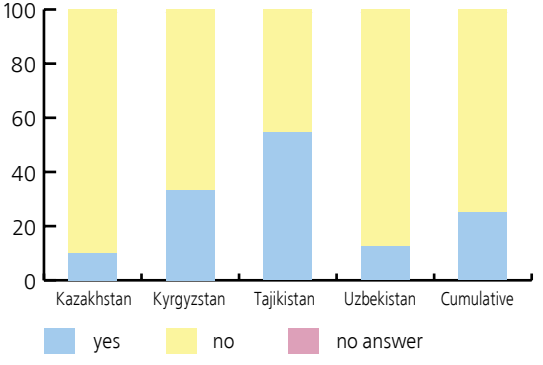


Diagram 2
Is it acceptable to establish limits for national water consumption regardless of the interests of other states? (%)



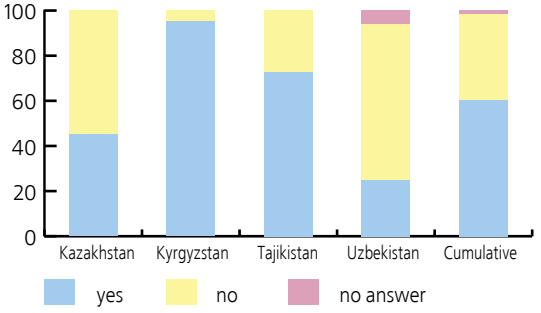
Taking into account the outcomes of numerous discussions, one could predict beforehand the extreme variety of views on most issues related to the distribution of water flows among states. These expectations appear to have been fulfilled... Nevertheless, it was a pleasant surprise that most experts appreciated the importance of water conservation and water quality considerations in planning for water division between states, not to mention the consideration of other states' interests in this regard.

The following diagrams 1-3 illustrate the experts' views on the development of conditions for inter-state water division in Central Asia.

One should emphasize that experts from Kazakhstan

and Uzbekistan mainly approve of the principle based on precedents and the observance of the historically developed terms of use of water in the region. Experts from Kyrgyz Republic and the Republic of Tajikistan mostly share negative views about this principle, obviously due to the claims of their respective states, located in the area where water flows originate. It is pleasing however, that the overwhelming majority of experts, regardless of their citizenship, consider it necessary to establish limits for national water consumption, considering the interests of neighboring states.

Diagram 3
Should any preference be given to countries where water resources originate? (%)



One can also explain why experts from Kyrgyzstan suppose their state has the right to certain advantages in determining the terms of inter-state water division, while their colleagues from Kazakhstan and Uzbekistan, mainly, question this right.

Experts look mostly positively at the problem of the revision of the limits for national water consumption in the case of higher water needs in Afghanistan, as illustrated in Diagram 4.

This fact can be accounted for, most likely, by the data from Table 4, in which the experts defend their opinion with the view that a higher level of water consumption in Afghanistan will considerably affect the system of water use in the region only in the distant future.

The following Diagram 5 illustrates the attitude of experts to the problem of defining the Aral Sea as a separate, sixth, water user in the region of Central Asia.

Emphasis should be given to the sharply negative perception of this idea in the Kyrgyz Republic, the variety of views among experts in Republic of Tajikistan and the

Diagram 4
Is it necessary to review water quotas in light of the growing needs in Afghanistan? (%)

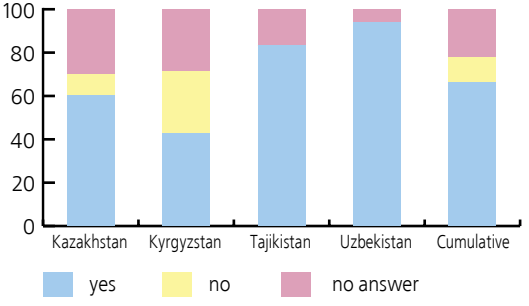
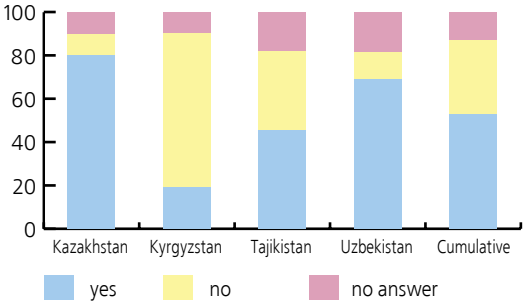


Diagram 5
Should the Aral Sea be considered as a separate water user?



predominantly positive views among experts from Kazakhstan and Uzbekistan. As a whole, the views pro et contra split equally in half, thus demonstrating the need for additional consultations at the governmental level for the achievement of consensus over such a disputable matter.

Being requested to provide reasons for their respective views on the problems of water-division between states, 23.5% of experts believe that "water is a resource to be shared equally by all countries". Besides that, they emphasize the need to balance the interests of all water users in the countries of the region, and to combine the interests of citizens of their respective countries with the issue of regional security on the whole. Quite characteristically, 29.4% of respondents value their respective national water use interests over regional interests.

The experts' views as to the need to consider water conservation activities in inter-state water division planning are illustrated in Diagram 6.

In general, most experts recognize the need to take into account water preservation factors at the time of planning water division, while a significant (though less than predominant) part of respondents from Tajikistan do not consider water conservation activities as a priority.

In explanation of their views, most experts believe that the accelerated introduction of market-based mechanisms must be the main trend in stimulating water conservation at the national level. At the least, some 80% of respondents share this point of view, while only 20% of them prefer public regulation of tariff policys on water use.

Diagram 6
Is it necessary to consider water conservation measures in planning regional water division?
(%)

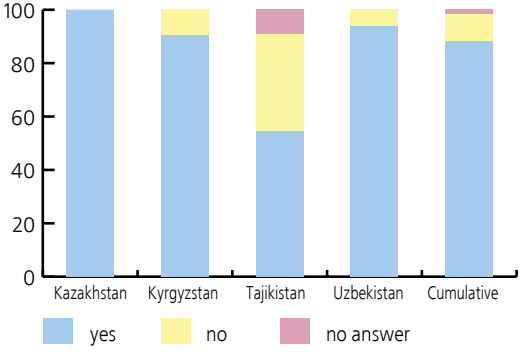
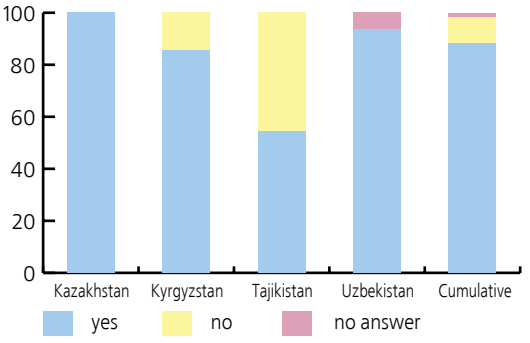


Diagram 7 illustrates the experts' views concerning the need to consider water quality for purposes of planning international water division.

Most experts admit that the problem of the quality of water resources should be made a pre-requisite for planning water division. However, the views of experts from Tajikistan in this respect are less straightforward.

Diagram 7
Should water quality be considered in planning water division between states?(%)



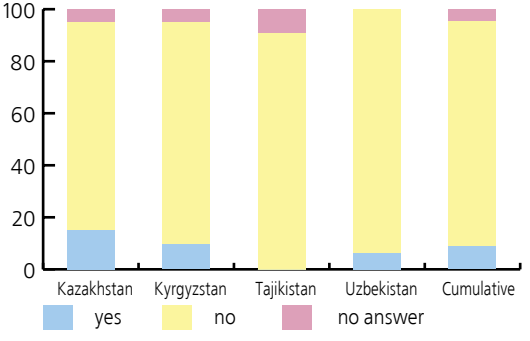
It is difficult to present the contents of the new package of inter-governmental agreements concerning the optimization of conditions for the regional use of water based just on the controversial views presented above. That is why we are forced to formulate the following question in more general terms: what is the attitude of experts to the legal framework as a whole?

The views of the experts as to the existing legal framework for regional water relations are illustrated in Diagram 8.

It is very indicative that the overwhelming majority of experts, regardless of their nationality, once again recognize the poor state of the development of the existing legal framework regulating water relations between the states of Central Asia. This necessitates active international cooperation towards modernization and the further development of a set of water-related treaties.

The shared view in respect to the previous question is in contrast with the broad range of proposals from the experts concerning the priority areas for the improvement of the legal framework of regional water relations. Most often they suggest simultaneous actions in different directions. 30% of respondents propose developing a new regional concept covering the whole range of water-related

Diagram 8
Is the existing legal framework regulating water-related issues adequate today? (%)



issues, while some 25% of respondents recognize the need to join existing international conventions. Some 18%-21% of respondents are in favor of spelling out previously made inter-governmental agreements or developing new legal treaties between states.

In response to a request to provide grounds for their respective views concerning the usefulness of the existing legal framework, consisting of previously made treaties at the national and regional levels, experts provided the largest number of comments. Nevertheless, some 22.7% of respondents preferred to make no comments at all, whereas about 20% of respondents were not able to point out any useful legal act.

In general, the effectiveness of previously concluded agreements between states with respect to water problems has been rated by experts as very low, and in most cases only bilateral agreements have been recognized as the most useful, rather than multilateral ones. Experts have indicated the three most effective international agreements, as follows:

- The 1998 Agreement and consequent annual agreements concerning the use of water and energy resources of the Naryn and Syr Darya river basins. (13.2% of respondents)
- The agreement on the establishment of the IFAS and the creation of the ICWMC and BWO of the Amu Darya and Syr Darya rivers (9.9%)
- The agreement between the governments of the Kyrgyz Republic and the Republic of Kazakhstan concerning the utilization of water-management facilities by the two states at the Chuy and Talas rivers. (8.8%)

However, the rating of even these agreements appears very low.

The main argument used by all experts in favor of these previous agreements is that there is not yet any realistic alternative to them. Most of the weaknesses of the legal framework for regional water relations are due to its excessively declarative nature, characteristic of any framework document, and its insufficient focus upon the balance of interests of the participating states at the time of working on the contents of the framework. Besides, some experts mention that a number of provisions of the existing agreements have not been implemented in practice.

The Economy of Water Use: No Longer a "Common Pot", but Not Yet a "Joint Venture"

We admit that we intended to formulate questions concerning the value of water with special caution, keeping in mind that recently, any reference to the value of water as a commodity has inevitably been a matter of irritation in regional relations. But in the end, we decided to raise the first question in the most straightforward way: Is it appropriate to charge for water, if the water user is a country, not just an individual peasant?

The experts' responses are illustrated in Diagram 9.

As follows from the diagram, most experts think negatively about charging for the use of water at the international level. At the same time, two thirds of the respondents in the Kyrgyz Republic think about it in positive terms. Interestingly, some 20% of experts from the Kyrgyz Republic and 25% of experts from the Republic of Tajikistan found it difficult to answer this question. On the other hand, it must be emphasized that only two experts from Kyrgyzstan and a single expert from Kazakhstan directly recognized water as a commodity.

On the whole, most experts believe that water supply services at the international level must be paid for by the interested countries. However, it would not be prudent to jump to conclusions based on the straight sum of votes cast pro et contra, since only the experts from Kyrgyzstan and Tajikistan, the countries of potential service suppliers, consider the need for water fees obvious. Meanwhile, experts from Uzbekistan and Kazakhstan - potential consumers of such services - are not inclined to consider the introduction of charges for water supply services as a reasonable action. Therefore, the data from Diagram 10 identifies this problem as one of the most disputed.

Responses from the experts concerning the need for compensation for lost profits due to water management activities at the regional level are illustrated in Diagram 11.

Diagram 9
Is there justification for water charges at the international level? (%)

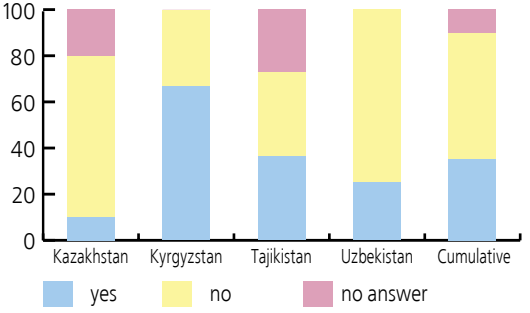


Diagram 10
Is it justified to charge for water delivery services at the inter-state level?
(%)

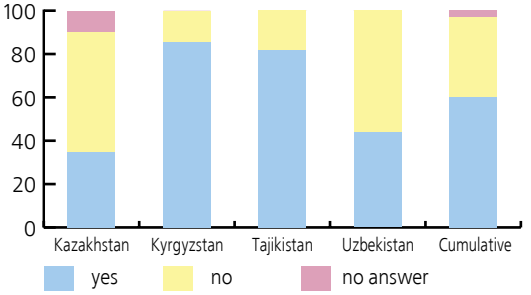
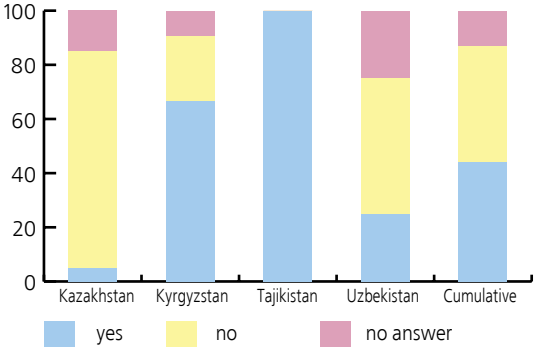


Diagram 11
Should there be compensation for lost profits due to water management activities at the regional level?
(%)



Once again, please note the extreme variation among views. One could also observe the similarity of positive responses coming from experts from the Kyrgyz Republic and the Republic of Tajikistan vs. the negative views of experts from Kazakhstan and Uzbekistan. This problem also appears as one of the most disputed, in view of the equal distribution of negative and positive responses, particularly in the absence of any specific proposals from experts concerning mechanisms for such compensation.

For the experts' views on compensation for damage due to water management activities at the regional level, see Diagram 12.

Please note the significant dispersal of views among experts, including those coming from the same country. In addition, some 18% of the total number of respondents found it difficult to answer the question. This is evidence of the insufficient attention paid to this issue even at the level of methodology.

Experts' views on the introduction of fees for water resources at the national level are in Diagram 13.

Once again, please note the significant difference in views, as evidence of different approaches to the development of market policies both among the states of Central Asia, as well as among individual experts. Most probably, this can be explained by the lack of experience in the implementation of market-based mechanisms in the region.

For experts' views as to the need to introduce differentiated water tariffs at the national level, see Diagram 14.

It is encouraging that in this case most respondents share the same view, particularly, that the introduction of differentiated tariffs (water users' fees) facilitates the development of market relations, for such tariffs are based on the actual cost of water management services in different sectors of the economy and local specific conditions under irrigation, industrial, communal and housing water use systems.

Experts' views regarding the problem of developing a tariff policy at the national level, based on the principle of cost recovery can be found in Diagram 15.

As follows from the diagram, almost two thirds of the respondents share the view that any national tariff policy, in principle, must support recovery of costs for water user services. The widest variety of views can be observed among experts from Kazakhstan, while views shared by experts from the Kyrgyz Republic show less deviation.

Experts' opinions of the need to take account of the actual purchasing ability of water users when determining the level of water tariffs are illustrated in Diagram 16.

Diagram 12
Is it justified to claim compenstion for damage resulting from water managing activities at the inter-state level? (%)

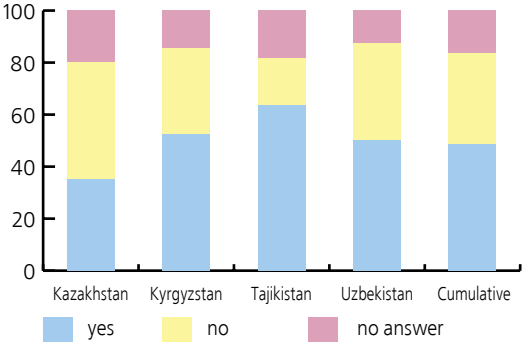


Diagram 13
Is it justified to charge for water resources at the national level? (%)

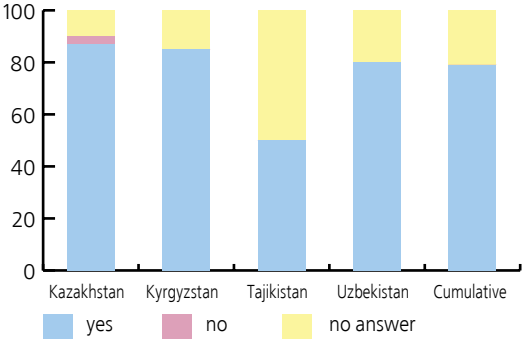


Diagram 14
Is there a need for differentiated water tariffs at the national level? (%)

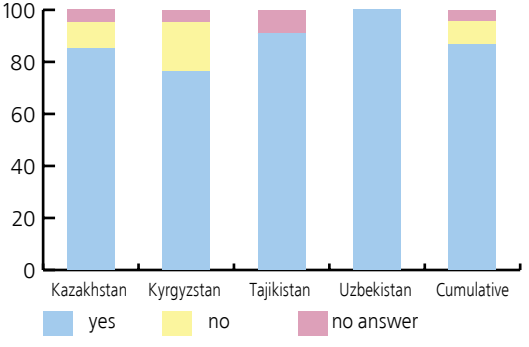


Diagram 15
Should water tariffs be sufficient to cover the costs of water delivery services at the national level ? (%)

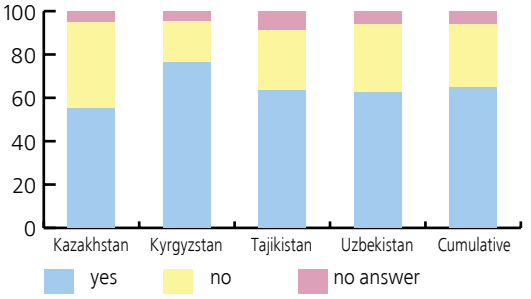


Diagram 16
Is it necessary to consider the purchasing ability of consumers when establishing water tariffs? (%)

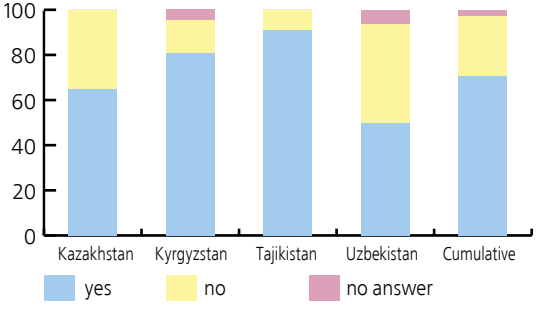
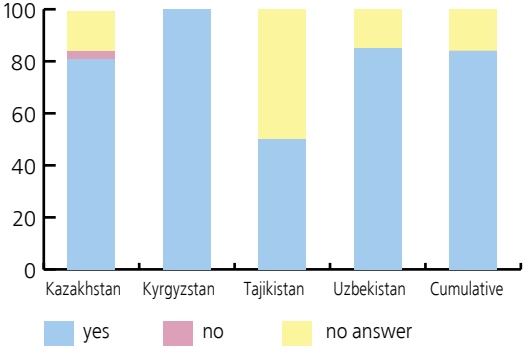


Diagram 17
It there a need for preferences and subsidies to stimulate the development of priority sectors of the economy at the national level ? (%)



Almost three quarters of all respondents are convinced of the need to take measures for the social protection of water users when regulating tariff policy at the national level. The largest variety of views can be found among experts from Uzbekistan, which may be evidence of the lack of experience with water users' fees in that country.

For the views of experts regarding the need to introduce preferences and subsidies within a national tariff policy, see Diagram 17.

In this case it is fairly easy to observe similarities in the views of the majority of experts concerning the need for a flexible economic policy at the national level, including through tariff regulation, preferential taxation and subsidies in order to stimulate the development of the prioritized water-consuming sectors of the economy.

Water Resources Management in the Future – Forecasts and Drawbacks

Indeed, with very rare exceptions, the principle need for the further promotion of projects designed to modernize and develop regional water management facilities can hardly be questioned on reasonable grounds. However, whenever we talk about any specific project it is very hard to expect our respondents to speak unanimously. This theory has been proven true through the following series of questions.

Experts' views concerning the idea of re-directing Siberian rivers to the territory of Central Asia are illustrated in Diagram 18.

As follows from the diagram, on the whole, the experts share a negative view about this project. At the same time, it should be mentioned that the views of experts from Kazakhstan, Tajikistan and Uzbekistan split approximately in half, while the views of experts from the Kyrgyz Republic are mostly negative. Experts' comments manifest their concerns due to the unpredictable ecological consequences of such a project (33%), while 14.3% of respondents are concerned with the inevitable significant financial and other costs, whereas some 20% of all responses contain doubts about the economical, ecological and social feasibility of such a project. Meanwhile, three experts from Uzbekistan and Kazakhstan are firmly confident that the shortage of water in the region cannot be compensated for with the internal stocks of water resources in the territory of Central Asia. This conclusion is in contrast with some opinions contained in earlier chapters of this publication, which confirm the sufficiency of water resources in the region in the foreseeable future.

The opinions of experts concerning the idea of the creation of the so-called "Golden Age Lake" in Turkmenistan, using drainage water from the basin of the Amu Darya river are illustrated in Diagram 19.

Diagram 18
Experts' views on the plan to re-direct some Siberian rivers to Central Asia. (%)

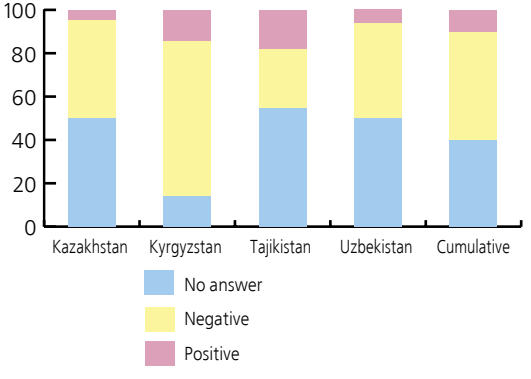
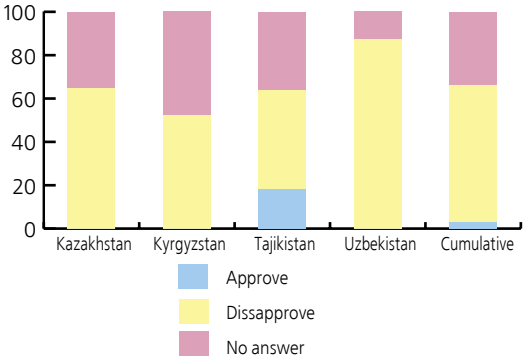


Diagram 19
Views on the "Golden Age Lake" project in Turkmenistan (%)



Please note that two thirds of respondents express a very negative opinion of this idea. Interestingly enough, some 11 experts consider this project as merely an unnecessary political action, while five more experts characterize this project as another "dead sea". Almost 30% of respondents could not answer the question about this project due to a complete absence of information. Among comments supporting the experts' views, one may find suggestions that this project could substantially affect the water balance in the Amu Darya river basin and throughout the region as a whole, could aggravate the situation in the Aral Sea basin, and would only promote the interests of Turkmenistan detrimental to the national interests of other states.

Experts' views as to whether the construction of the Rogun HPP in Tajikistan and the Kambar Ata HPP in the Kyrgyz Republic will facilitate regional development are characterized by data from Tables 6 and 7.

Table 6
Question: "Do you believe that the construction of the Rogun HPP will facilitate regional development?" (experts' answers in %)

	Kazakhstan	Kyrgyzstan	Tajikistan	Uzbekistan	Across the sample
Yes	68.2	76.2	83.3	93.3	83.3
Depends on composition of the Rogun HPP management	9.0	-	-	-	-
No answer/ cannot answer	18.2	23.8	16.7	6.7	16.7
Other	3.6	-	-	-	-

Table 7
Question: "Do you believe that the construction of the Kambar Ata HPP will facilitate regional development?" (experts' answers in %)

	Kazakhs-tan	Kyrgyzstan	Tajikistan	Uzbekis-tan	Across the sample
Yes	76.2	90.5	90.9	86.7	87.9
Yes, in case of joint manage-ment	4.8	-	-	-	-
No	-	4.8	-	-	1.5
No answer/ cannot answer	14.3	4.8	9.1	13.3	10.6
Other	4.8	-	-	-	-

It follows from Tables 6 and 7 that most experts positively accept the idea of these two projects (81% and 85% of respondents respectively). Not more than two experts in each case objected to the implementation of these projects, explaining their positions by an absence of sufficient information.

For the views of experts on the construction of new reservoirs in Uzbekistan, see Table 8.

Table 8
Experts' answers to the following question: Do you believe that the construction of new reservoirs in Uzbekistan will facilitate regional development?

	Kazakhs-tan	Kyrgyzs-tan	Tajikistan	Uzbeki-stan	Across the sample
Yes	14.3	22.7	10.0	25.0	18.8
No	61.9	45.5	10.0	43.8	44.9
More no than yes	-	4.5	-	-	1.4
Construction will lead to additional loss of water	4.8	-	10.0	-	2.9
Will only promote the interests of Uzbekistan	4.8	9.1	-	-	4.3
Will have negative ecological results	-	-	-	6.3	1.4
No answer/cannot answer	9.5	13.6	50.0	12.5	17.4
Other	4.8	4.5	20.0	12.5	9.2

As one can see from the table, there is a wide range of opinions regarding this project. Some 45% of respondents have a negative view, whereas 19% of respondents have a positive view and 17% found it difficult to answer the question. It is worth noting the comments in support of some of the views, namely that such projects promote only the interests of Uzbekistan, rather than the whole region and may result in additional losses of water, thus leading to negative ecological consequences.

40% of respondents preferred not to answer the following question: what other major projects may be of regional significance? Only three experts emphasized that no new projects were necessary, while some of them chose to formulate their views in general terms, proposing the joint development of regional programs for constructing water management facilities (11%), projects of water protection in the areas of runoff formation (8%), and indicating in principle the need for cooperation in this area (5.6%) or the need for the implementation of such projects within the framework of the Aral Sea Basin Program II.

The following specific proposed projects deserve mentioning:

- Construction of the Dashti Juma HPP
- Completion of the construction of a cascade of HPPs at the Vaksh river
- Reconstruction of the Uch Kurgan HPP
- Redirecting the runoff from the Pyandj river basin into the Vaksh river basin
- Reconstruction of the Kaira Kum reservoir
- Redirecting the runoff of the Zeravshan river into the Sogdian area
- Construction of the Ala Buka HPP
- Construction of the Kampyr Ravat and Sokh mains
- Construction of intakes along the Amu Darya and Syr Darya rivers
- Construction of mains on the territory of KKhorezm and Karakalpakstan

Environmental Protection as an Integral Component of Regional Cooperation

Since the idea of consolidating the countries of the region around the improvement of the ecology in Central Asia is one of the few ideas accepted unconditionally in principle, the following series of questions was designed rather to identify the problematic points in the water ecosystems and to provide a list of measures for their resolution.

Following a request to list the three most important environmental problems in Central Asia, the experts identified 15 of the most pressing current problems, with the degradation of the Aral Sea (15% of all responses), the degradation of other water ecosystems (13%), as well as the degradation and secondary salinization of the soil (11%) predominating.

The other most important ecological problems identified by the experts were as follows:

- Atmospheric pollution (6.7%)
- Deforestation (3.0%)
- Glacier erosion (6.7%)
- Drinking water supply (9.7%)
- Rehabilitation of tailings (7.3%)
- Protection of surface water (7.9%)
- Reduction of the bio-diversity in water ecosystems (4.8%)
- Prevention of water breakthrough into the Arnasay hollow (1.8%)
- Prevention of breakthrough of highland lakes (2.4%)
- Problem of utilization and rehabilitation of wastes (2.4%)
- Non-rational use of nature in general (1.2%)
- The difficult social and economic situation in the region, resulting in the deterioration of the ecological situation (4.2%)
- Other problems (2.4%)

In response to a similar request -- to identify the three most important environmental problems, characteristic of certain states of Central Asia -- the experts identified the 20 most significant problems, in most cases common to the whole region.

In particular, among the problems identified by experts, the following predominated: degradation of water ecosystems (12.4%), degradation and

erosion of soil (16.5%), degradation of the Aral Sea (7.1%), protection of surface water (7.6%) and problems of quality of the drinking water supply (7.6%). The other most important problems, identified by the experts, include the following:

- Shortage of investments for water-protecting activities (4.7%)
- Deteriorating ecological situation in the area surrounding the Balkhash lake (1.2%)
- Deteriorating ecological situation around the Caspian Sea (0.6%)
- Deterioration of the technical condition of water-purification facilities (3.5%)
- Problem of rehabilitation of forests (4.7%)
- Degradation of glaciers (2.4%)
- Unsatisfactory condition of tailing ponds (4.7%)
- Prevention of water breakthroughs into the Arnasay hollow during winter (2.4%)
- Prevention of breakthroughs at highland lakes (0.6%)
- Problem of disposal and utilization of wastes (3.5%)
- Unsatisfactory ecological monitoring (0.6%)
- Overall weaker role of environmental protecting activities (1.2%)
- The difficult social and economic situation in the region, resulting in the deterioration of the ecological situation (4.2%)
- Other problems (2.4%)

The experts' views concerning the 8 most important ecological problems, arranged according to the degree of importance for Central Asia, are characterized by the data summarized in Table 9.

Table 9

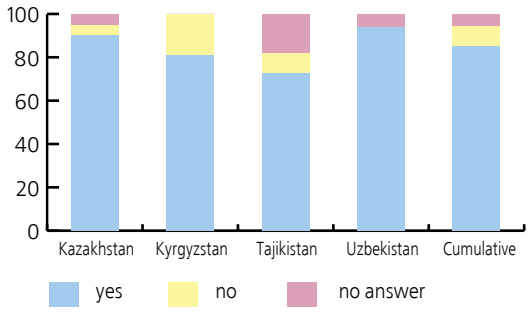
Problems	Kazakhs-tan	Kyrgyzs-tan	Tajikistan	Uzbekis-tan	Cumulative
Aral Sea basin degradation	II	VI	II	I	I-II
Water ecosystem degradation	I	IV	V	II	I-II
Water pollution	III	III	I	III	III
Degradation and secondary erosion of soil	V	V	III	IV	IV

Breakthrough-prone tailings	VII	I	VIII	VIII	V
Glacier degradation	VI	II	IV	V	VI
Reduction of stocks and depreciation of quality of underground water	IV	VII	VI	VI	VII
Breakthrough-prone mountain lakes	VIII	VIII	VII	VII	VIII

The summary of the data in Table 9 reflects not only some opposing views of experts from different states but also the similarity of approaches in certain cases. For instance the problem of the degradation of water ecosystems, including those in the Aral Sea basin, have been identified by experts from Kazakhstan, Uzbekistan and Tajikistan as the highest priority, whereas experts from Kyrgyzstan attach the highest priority to the problem of tailings and degrading glaciers. It is well understood that experts from countries belonging to the area of dispersal of the run-offs do not consider the problem of highland lakes as very considerable while a similar response by experts from Tajikistan requires clarification. Please also note that the problem of water pollution in general is almost unanimously considered as the third most important problem whereas the degradation of underground waters has been placed seventh, i.e. the last but one in the list. It is difficult to suggest why such considerable problems as the rehabilitation of forests or the lack of funding for the implementation of ecological projects and utilization of hazardous wastes received less than 10% of responses.

The coincidence of positive opinions of experts from different countries testifies to the need for stronger efforts in the area of environmental protection under the overall framework of cooperation between the states of Central Asia.

Diagram 20
Is the broader involvement of ecologists in regional water resources management structures expedient? (%)

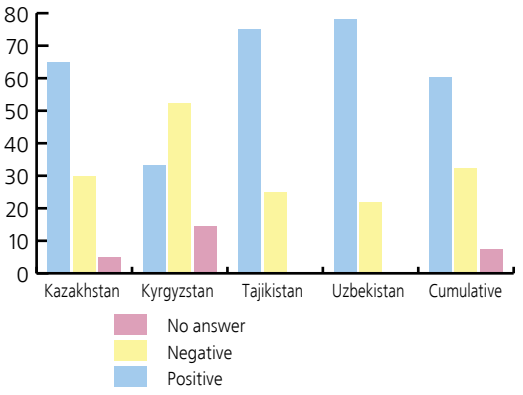


Experts' views as to whether professional ecologists should be more broadly involved in the activities of regional water resources management structures can be found in Diagram 20.

On the vote of confidence in managing structures, both existing and hypothetical

This series of questions was designed to identify the views of experts concerning the optimization of the water resources management structures on both regional and national levels. However, instead of an expected consensus, most readers may get the impression that the period of confusion is not yet over...

Diagram 21
Assessment of the Aral Sea Fund's Activities, in %



Experts' opinions regarding the activities of the International Aral Sea Fund are illustrated in the following Diagram 21.

Among those sharing a positive view, some 61.3% indicated that the International Foundation promotes cooperation in the countries of Central Asia, 16.1% indicate that it is the only organization with the required status for the distribution and management of water flows in the region, and 12.9% believe that it promotes investments, while 9.7% are convinced that it solves the ecological problems of the vast region.

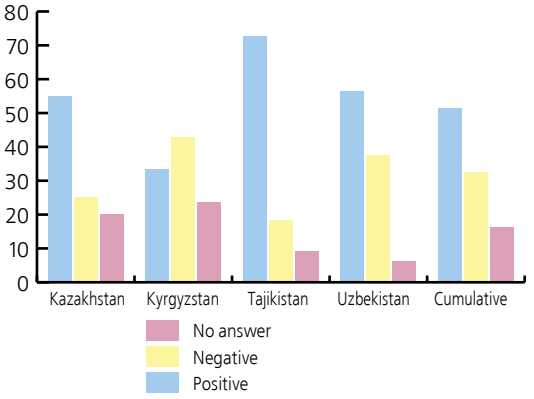
In contrast to these views please find below also the list of arguments explaining negative assessments of the Foundation's activities:

- The absence of any specific outcomes, or a low degree of effectiveness (46.2%)
- A lack of transparency in the foundation's activity (12.8%)
- The foundation only lobbies the interests of downstream states (12.8%)
- The foundation has not been able to make any progress in solving ecological problems (10.2%)
- A lack of relations with the public in the countries of Central Asia (10.2%)
- The absence of a legal framework regulating the activity of the Foundation and the high maintenance costs of the foundation.

Still, however, some 60% of respondents consider the Foundation's activity as rather positive.

Experts' views regarding the activity of the Inter-state Coordinating Water Resources Management Commission (ICWMC) are illustrated in Diagram 22.

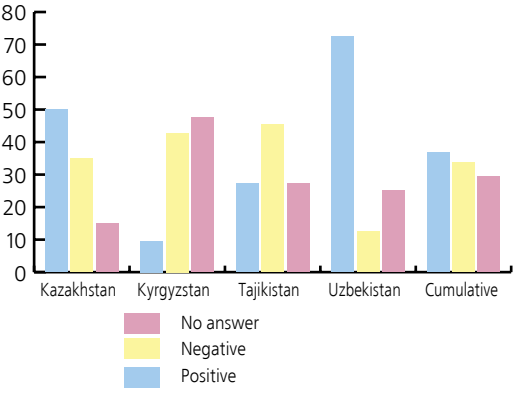
Diagram 22. Assessment of the Inter-state Coordinating Water Resources Management Commission



As regards this question, twice as many respondents could not or found it difficult to evaluate the activity of the Commission than in the case of the Foundation. Every tenth respondent indicated a lack of sufficient information for any answer. Positive views were mostly supported by arguments that "the activity of the Commission is aimed at the achievement of consensus and conflict-free management of water resources" whereas "some serious transformation and improvements are required" but that "the Commission has developed a very strong information base".

Among the arguments supporting negative views, the dominating opinions are the following: "the commission deals with issues of distribution of water flows only and keeps away from ecological and energy issues", or " there is no consolidated program" and "this results in a low degree of effectiveness of the Commission". Some experts from the Kyrgyz Republic and the Republic of Tajikistan have also expressed their view that "the Commission works for Uzbekistan and Kazakhstan". Some experts underline the high costs required for the maintenance of this organization, its lack of real power and the low effectiveness of cooperation and interaction at the regional and inter-sector level. Ultimately, positive and negative views split equally, thus providing evidence of the necessity for further improvement of this structure.

Diagram 23. Assessment of Basin Water Management Organizations, in %



Experts' views regarding activities of the Basin Water Management Organizations (BWO) are illustrated in Diagram 23.

The number of those who found it difficult to answer this question is even greater than in previous cases: three out of ten respondents referred to a lack or absence of information about the activities of the Basin Water Resources Management Organization (BWO) or left this question unanswered.

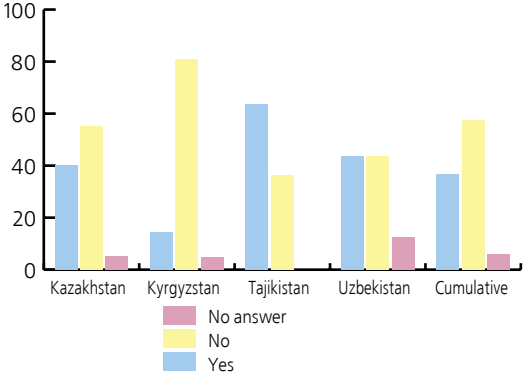
As a positive factor in the activities of the BWO some experts mentioned that the structure "deals with issues of water use and water distribution in the countries of Central Asia, controlling the activities of water users". There are suggestions for raising the status of the BWO in light of this or providing the BWO with real power for administering decisions.

Negative views are based on the opinion that the BWO "works for certain states only", or that "BWO activity is not in compliance with the original idea - water resources management at the regional and national levels" and that "BWO's functions are limited", while "there is no rotation within the management". Please take special note that while only one third of respondents consider BWO's activities as positive in general, positive opinions prevail among experts from Uzbekistan, shared by about 50% of experts from Kazakhstan and by only 10% of experts from Kyrgyzstan.

Experts' attitudes to the idea of creating a new regional structure to deal with water resources management or the coordination of the cooperation among the states of Central Asia in this area are illustrated in Diagram 24.

Let us emphasize that the attitude of the majority of experts is mostly negative. Six out of ten experts prefer to provide regional bodies with only coordinating functions, less than a quarter believe that such regional structures should have both coordinating and advisory functions, while the same number of experts in contrast recommends expanding their powers to manage the water resources in the region as a whole.

Diagram 24
Is there a practical need for a new regional structure ? (%)

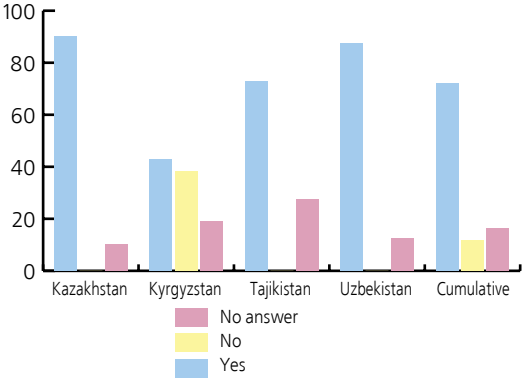


Fifty percent of the respondents believe that the function of management of water resources in the region should be performed by national bodies under existing agreements and treaties. 23.5% suppose these functions should be shared by regional and national bodies while another 16.2% suggest delegating these functions to water or water-energy consortiums. Overall,

the diagram illustrates the need for further consultations designed to harmonize national approaches to solve this problem.

Diagram 25 illustrates the opinions of experts towards the creation of a water-energy consortium in the territory of Central Asia.

Diagram 25
Is the creation of a water-energy consortium advisable?
(%)



Please note that most experts share a rather positive view of this issue. Only respondents from the Kyrgyz Republic demonstrate no single view concerning the idea of a consortium. Also, some 18% have not developed a clear opinion of the consortium, most likely due to the absence of sufficient information.

Questions regarding the creation of consortiums are mainly related to their potential ability to deal with problems of the whole region, not just of some of the countries. Some experts have expressed their fears that "consortiums are going to pursue their own interests rather than the interests of the public" and also that " the activities of such consortiums may not bring about any visible effect at the regional level".

In most cases, experts attach their hopes to consortiums that "they are going to promote cooperation in the use of water resources in Central Asia" (30.9% of the total answers across the sample). Some 8.8% of experts consider consortiums as an effective mechanism for development in the area of water resources management. The remaining experts hope that the creation of consortiums will promote the "development of integration in the countries of Central Asia, the resolution of economic problems, the implementation of beneficial projects and the construction of new facilities" and will also "protect the interests of natural objects in Central Asia".

One can clearly distinguish the two positions based on the views of the experts: consortiums should have a managing function (47.1% of all responses) and financial function (44.1%). 16.2% of experts foresee other functions and 4.4% could not answer this question.

Even in this case the experts tend to believe that the involvement of independent water users and civil society organizations in the process of the regulation of water issues at the regional level is quite appropriate in the future (72.1%). Only slightly over half of experts (57.4%) believe it is possible at the present time.

Diagram 26
Experts' views as to the most effective options for management at the national level (%)

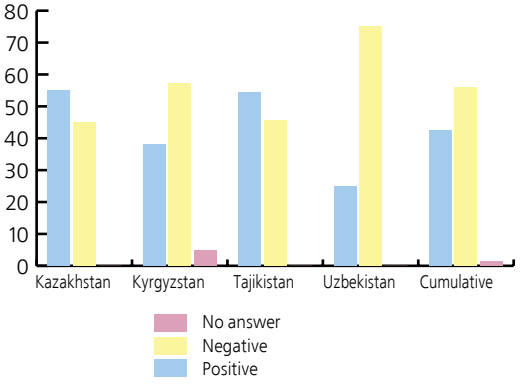


Diagram 27
Views about the privatization of the water management infrastructure in the irrigation sector (%)

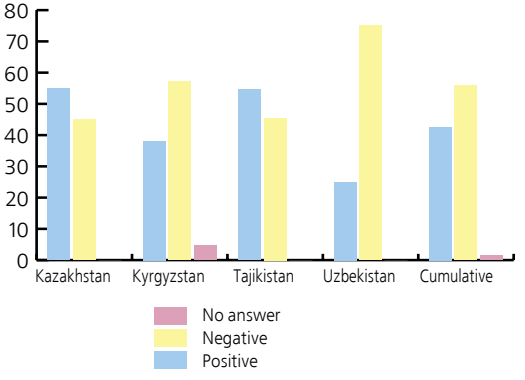
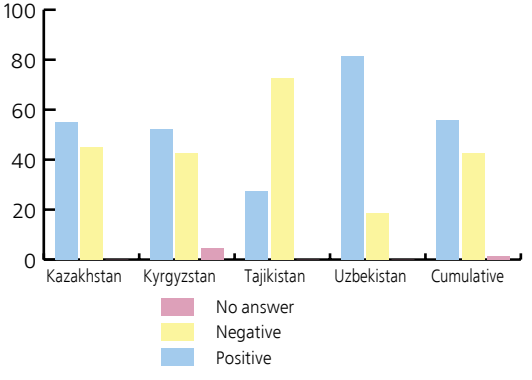


Diagram 28
Views about the privatization of the water management infrastructure in the industrial sector (%)



Experts' views concerning the problem of optimization of the structure of water resources management at the national level are illustrated in Diagram 26.

Let us point out that most respondents from Kazakhstan, Kyrgyzstan and Uzbekistan would prefer to concentrate the function of the management of water resources at the national level within a single public body, whereas experts from Tajikistan consider it appropriate to distribute these functions among all ministries and agencies concerned, including associations of water users.

Speaking of independent water users, it appears appropriate to list the whole range of views as to whether such water users or any other actors should have the function of managing objects of privatized water infrastructure, or even more so, natural water objects. In parallel, let us consider the issue of ownership, without the successful resolution of which it makes no sense to talk about the optimization of water resources management structures.

For experts' views regarding the privatization of water management infrastructure within the major water using sectors, see Diagrams 27-29.

As follows from diagrams 27-29, different experts' views concerning the privatization of water managing infrastructure provide evidence that the market is still at the developmental stage in Central Asia and approaches to the introduction of market relations at the national level have not yet been fully formulated. In general, a positive view towards the privatization of the main assets of the water management system prevails, in respect to both industrial and individual housing sectors, while views regarding the privatization of irrigation systems are mostly negative.

Experts' views regarding the problem of regulating the ownership of water resources are illustrated in Diagrams 30-33.

It is quite noticeable that out of the four options offered as answers to this question, the overwhelming majority of experts prefer that the states of Central Asia have the right to independently manage and own water resources in their respective territories while being guided and limited by the terms of international agreements and treaties. At the same time, please note the contradictory views in respect to shared ownership of water resources by the countries of the region.

Diagram 29
Views about the privatization of the water management infrastructure in the housing sector (%)

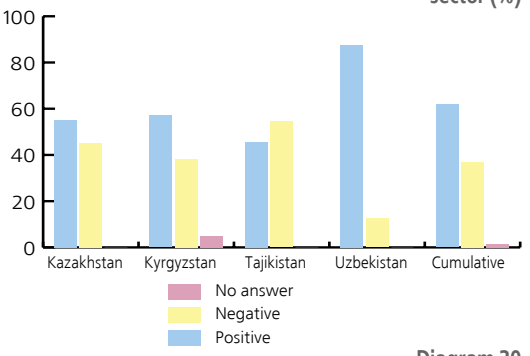


Diagram 30
Should any state have the absolute right to own water resources in its territory? (%)

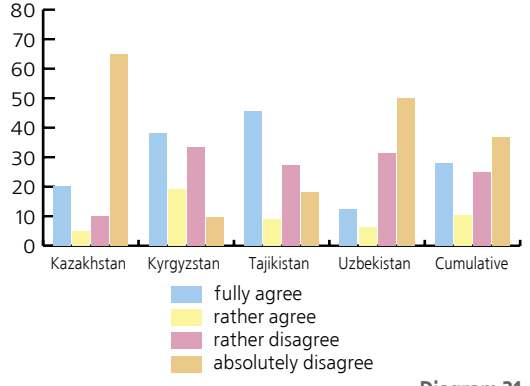


Diagram 31
Should any state have a limited right to own water resources as long as other states' interests are also considered? (%)

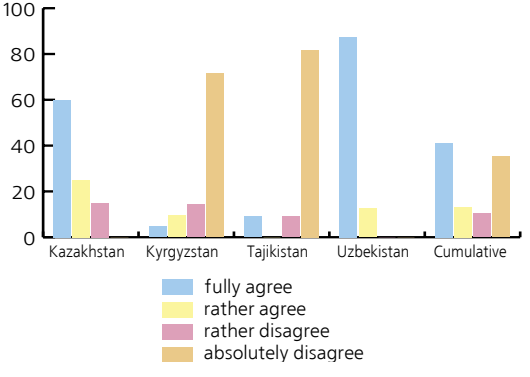


Diagram 32
Views regarding communal ownership of water objects by all states concerned (%)

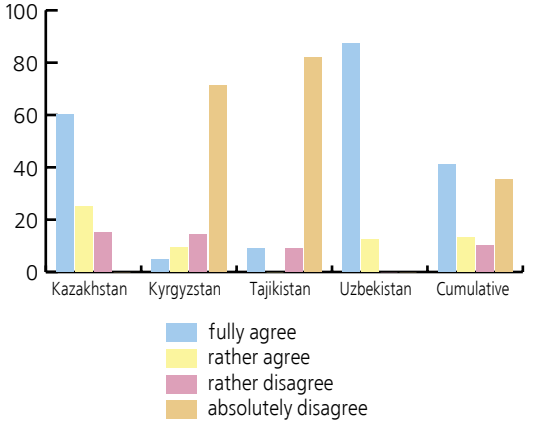
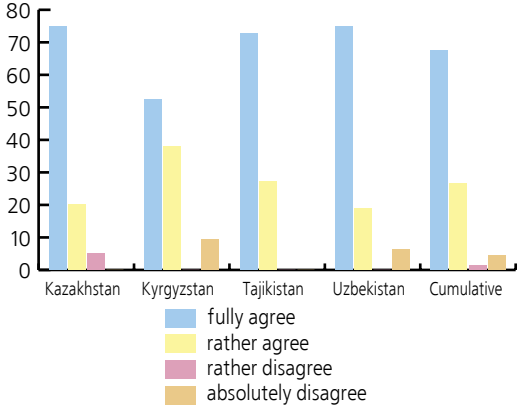


Diagram 33
Should any state have the right to own and manage water resources within the limits established by international agreements? (%)



The Kyrgyz Republic and the Republic of Tajikistan completely disagree with this view, while over 50% of the respondents from Kazakhstan and three quarters of their colleagues from Uzbekistan approve the idea of joint ownership. This confirms the theory described in the first part of this publication that the ownership of water is the source of most current regional contradictions in the area of water-related issues.

Experts' views concerning the problem of the regulation of the ownership of natural water objects are illustrated in Table 10.

From the summary of the data in Table 10, one can see that most experts, regardless of their nationality, are absolutely opposed to the idea of transferring natural water objects fully or partly to other states or independent business entities. Let us also emphasize the way the views of experts from Kazakhstan and Uzbekistan correspond to their own responses to the question concerning shared ownership over water resources by all states concerned (see Diagram 32).

One characteristic indicator is that most experts accept the idea of leasing natural water objects under a concession, except those of strategic importance for matters of national security of a given state.

Experts' views concerning the problems of the privatization, outside management and ownership of water management facilities are illustrated in Table 11.

Table 10

Is it acceptable:	Kazakhstan			Kyrgyzstan			Tajikistan			Uzbekistan			In general		
	+	-	=	+	-	=	+	-	=	+	-	=	+	-	=
To give up the ownership of water objects to other states	10.0	90.0	0	4.8	95.2	0	18.2	72.7	9.1	0.0	93.8	6.2	7.4	89.7	2.9
To transfer partly the ownership of water objects to other states	45.0	55.0	0.0	14.3	76.2	9.5	36.4	63.6	0	18.8	62.5	18.8	27.9	64.7	7.4
To delegate the right to own water objects to independent business entities	5.0	95.0	0.0	28.6	71.4	0	36.4	63.6	0	18.8	68.8	12.5	20.6	76.5	2.9
To delegate a part of the right to own water objects to independent business entities	20.0	80.0	0	47.6	42.9	9.5	63.6	36.4	0	37.5	56.3	6.3	39.7	55.9	4.4
To lease water objects under a concession	25.0	65.0	10.0	47.6	38.1	14.3	54.5	9.1	36.4	37.5	56.3	6.3	39.7	45.6	14.7
To lease water objects under a concession, except objects having strategic importance	60.0	30.0	10.0	76.2	14.3	9.5	81.8	18.2	0	50.0	43.8	6.3	66.2	23.5	10.3

Whereby:
«+» - yes
«-» - no
«=» - cannot answer

Table 11

Is it acceptable:	Kazakhstan			Kyrgyzstan			Tajikistan			Uzbekistan			In general		
	+	-	=	+	-	=	+	-	=	+	-	=	+	-	=
To give up the right to own and manage water facilities to other states	10.0	90.0	0	4.8	95.2	0	27.3	63.6	9.1	0	93.8	6.3	8.8	86.8	4.4
To transfer partly the ownership of water management facilities to other states	45.0	55.0	0	28.6	71.4	0	45.5	45.5	9.1	18.8	62.5	18.8	41.2	55.9	2.9
To delegate the right to own and manage water facilities to independent business entities	30.0	70.0	0	23.8	71.4	4.8	45.5	54.5	0	18.8	68.8	12.5	25.0	67.6	7.4
To delegate a part of the right to own and manage water facilities to independent business entities	45.0	50.0	5.0				63.6	36.4	0	37.5	56.3	6.3	48.5	47.1	4.4
To lease water managing facilities	70.0	25.0	5.0	52.4	38.1	9.5	72.7	18.2	9.1	37.5	56.3	6.3	55.9	35.3	8.8
To lease water managing facilities, except those having strategic importance	90.0	5.0	5.0	81.0	14.3	4.8	90.9	9.1	0	50.0	43.8	6.3	77.9	14.7	7.4

Whereas:
«+» - yes
«-» - no
«=» - cannot answer

Most experts opted for a very cautious and rather negative attitude to even the partial transfer of water management infrastructure to other states and independent business entities to manage or to own.

At the same time, over a third of respondents consider it acceptable to lease water management facilities to independent business entities, except for infrastructure of strategic importance for purposes of national security.

Assessment of the Role of International Organizations

Having dared to present our subjective views as to the contribution of international organizations in dealing with regional water problems in the first part of this publication, we could by no means have predicted at the outset that some highly reputable experts from other countries would share similar views. However, the following two diagrams and, particularly, the comments provided by experts in addition to their responses, bring some food for thought...

Experts' views concerning the usefulness of the involvement of international organizations in the solution of regional water problems are illustrated in Diagram 34.

As follows from this diagram, the majority of experts evaluate the role of international organizations in the development of regional cooperation in positive terms. It is quite curious however, that around one third of experts from Kyrgyzstan hold negative views and that some 20% of experts from Tajikistan found it difficult to give any answer to the question.

In comments to justify their assessments, over 30% of experts expressed the view that international organizations have experience which might positively influence the development of regional cooperation, whereas some 20.7% of experts are convinced that the region would not be able to deal with its current most essential problems in the absence of technical and methodological support from international organizations. Some 7.3% of respondents believe that the role of international organizations should be confined to that of technical and financial

Diagram 34
Do you consider it useful to involve international organizations in dealing with regional water problems? (%)

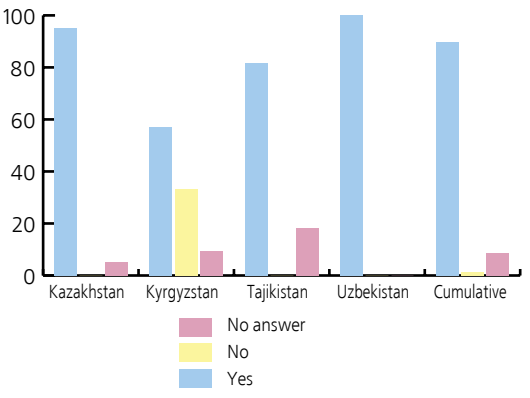
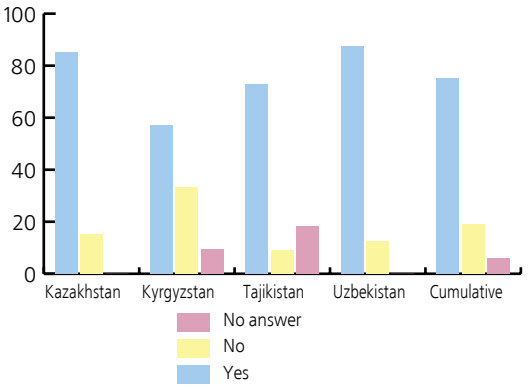


Diagram 35
Do you consider it necessary to set up a special commission under the auspices of international organizations for dealing with water problems in the region (%)



contributions, while 2.5% of responses suggest that there are enough experts in the region to render the involvement of outside experts unnecessary. In contrast to that, some 2.5% of responses emphasize the lack of experienced national cadres in the region: ecologists, jurists and managers, and thus refer to the positive role played by international consultants in the dissemination of useful knowledge of progressive technologies for water resources management and usage. At the same time, the experts expressed the view that international organizations operating in the region do not have the full picture and their actions therefore are not always adequate to the actual development of water-related issues in the region. Some experts are quite frustrated with the pressure allegedly placed by some of the international organizations upon the countries of the region and so they wish to limit the role of such international organizations to a purely advisory function.

Experts' views concerning the use of creating special commissions under the auspices of international organizations for dealing with water problems in the region are illustrated in Diagram 35.

It follows from the diagram that some three quarters of respondents share positive views, while some 30% from Kyrgyzstan expressed their negative opinion. It is not very clear why the data from Diagram 35 do not correspond to the summary of the experts' views presented in Diagram 24.

In response to the final request to indicate any other important water problems of Central Asia not mentioned in the questionnaire, the experts suggested giving consideration to the following:

- The absence of effective mechanisms for enforcing inter-state agreements;
- The need to develop jointly a Water Strategy for Central Asia;
- The need to develop new and more effective agreements on the use of transboundary water objects;

- The need to focus the intellectual forces of the region upon the joint formation of regional water policy;
- The need to activate joint exploration of the hydropower resources in the region;
- A stronger role of the public and NGOs in dealing with water problems and the formation and implementation of regional water policy;
- The need to develop a comprehensive set of adjustment measures in response to global climate change;
- The need to activate the development and introduction of water conservation technologies, and to involve the population in dealing with water conservation issues;
- The need to upgrade and develop the water resources' monitoring network;
- The need for an agreed solution to water and economic problems, following the patterns used in the questionnaire (tariffs, water as a commodity, the market stimulation of water resources management activities, etc.)

Overall, the experts made 107 recommendations and proposals in addition to those listed above, focusing upon the construction of new facilities and communications, the poor quality of water and environmental and other problems, more or less reflected in the questionnaire.

Please also note some individual views that the major obstacle in successfully dealing with regional water problems is the presence of corporate interests within the agencies in charge of the development and implementation of water policies (no references to specific agencies or ministries, unfortunately).

***

Overall, the findings of the survey have revealed the sincere concerns present among representatives of the Central Asian states with respect to the current state of water-related issues in the region. This is evidence of the need for active efforts by national authorities, international organizations and the public, aimed at the regulation of the most important water problems, identified in the experts' responses. At the same time, the survey has found also some significant deviations among suggested approaches to the solutions of the problems. One can easily track down the evidence that an overwhelming majority of respondents tend to insist on the supremacy of the national interests of their respective states, without denying, however, the need for the development of regional integration processes. Though one can see in some of the answers the signs of occasional frustration with certain specific actions taken by neighboring states in the area of water problems, still, not a single expert denies the need for the development of mutually beneficial cooperation between the states in Central Asia. Perhaps this should be considered as the most important outcome of the survey.

Conclusion

If the contents of the first chapters of this publication may be considered as just another comment within the years-long discussion of water problems in the region, the findings of the survey could serve as an intermediate result of such a discussion, mostly because the experts in the survey have suggested specific directions for dealing with the problems identified. Let us refer once again to the highest priority directions, jointly formulated by the experts.

Cumulatively, these suggestions are based both upon certain objective reasons, including in particular, the poor economic capacities of the countries in the region, as well as on subjective reasons, which mainly include the lack of attention to the development of integrating processes and stronger coordination of actions between states.

In light of this, the experts suggest modifying the legal framework for water issues at both the national and international levels, as a matter of priority, and focusing efforts upon the formulation of solutions across the spectrum of economic issues - investments' promotion, consistent development of market-based mechanisms of water resources management, planning and implementation of joint business projects.

Attaching obvious priority to legal and economic issues, the experts thus have established the direct link between these and the solution of other important water problems, including:

- Technical problems, namely, the reversal of the process of degradation of water management infrastructure, towards its further development;
- Institutional problems, reflecting the obvious weaknesses of the national regional water resources management structures and water management systems;
- Ecological problems, directly or indirectly linked to the disorderly use of water, lack of measures of protection or prevention of harmful impact on water;
- Secure access and quality of water for social and economic uses;
- Optimization of mechanisms of distribution of water flows between states;
- Cost-effective use of water resources;
- Upgrading systems of monitoring the condition and use of water resources;

- Upgrading information systems and technologies, for the re-organization of the procedures of informational exchange between states and prompt notice and coordination of decision making processes.

Having thus indicated the main routes of regional cooperation in the area of water problems, the respondents at the same time have suggested a number of tactical means for dealing with such problems. Their recommendations concerning the involvement of community-based organizations in the management of water resources, strengthening professional capacities or introducing the market-based incentives for business activity appear quite justified. It is not unnecessary to mention that already at the stage of formulation of such tactical approaches the view split: some experts prefer focusing upon stronger administrative and legal regulation of water related issues, while their opponents insist on democratization of the management process.

However, we tend to attach the greatest importance to the objective controversy between countries of the region rather than contradictions and disagreements among individual groups of experts. Findings of the survey have identified the list of the most disputed matters.

The most important question, beyond any doubt, is the following: who can be in charge of the transboundary water sources' management levers? Hence the split views concerning the joint ownership of water resources, in respect to the functions and powers of the existing or alternative regional structures, not to mention prospective consortiums or the privatization of certain elements of the water management infrastructures.

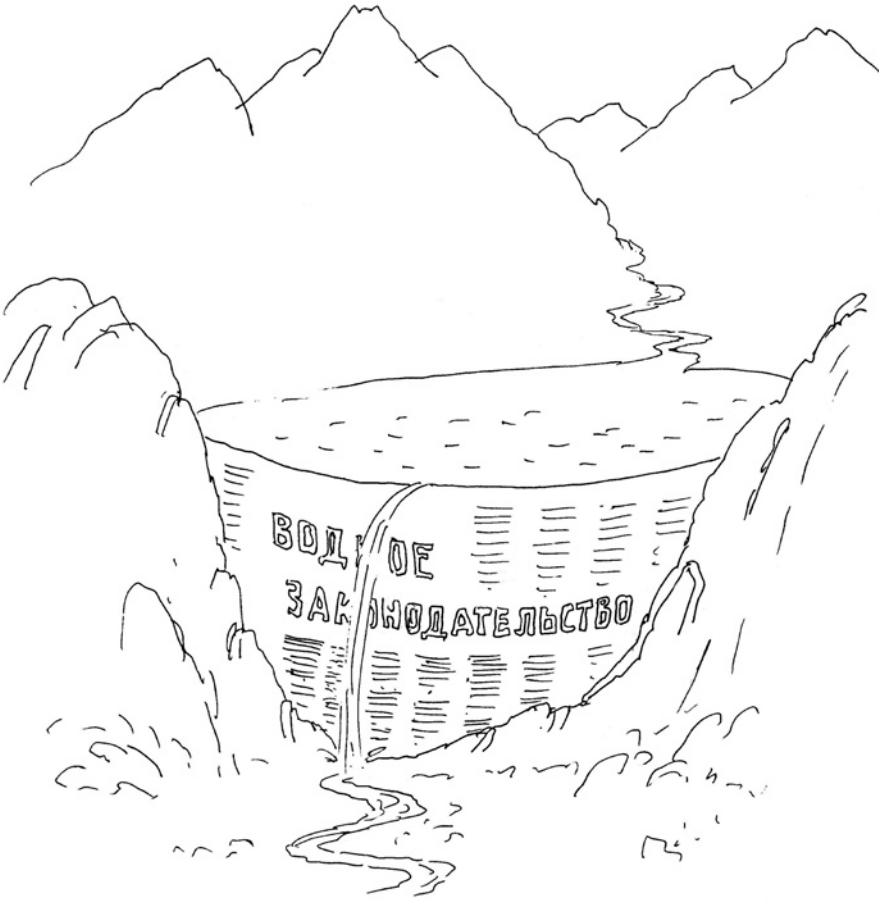
Another common point of concern in the absence of prospects for consensus is the problem of the distribution of water flows among regions. One can hardly attach hopes to the seeming similarity of views regarding the need to keep the mechanism of quotas in light of the clear fears present in every country in the region of a possible revision of quotas detrimental to their national interests. These fears are most eloquently supported by the data which show the different approaches to historically emerged and developed terms of the water flows' distribution, special preferences in favor of the upstream states and particularly, to considering the Aral Sea as the separate water user.

Most likely, only the forced division of the countries in Central Asia into water suppliers and water consumers can account for the lack of compromise across the broad spectrum of economic issues, starting from matters of principle, such as the issue of fees for water and water services, and going all the way to procedural matters, regarding mechanisms of compensation, the assessment of missed opportunities or specific tariff policies.

Finally, one may recognize the implementation and even plans for unilateral large scale projects that can substantially affect the existing conditions of water use or even the economic situation in the region as a whole as another factor of instability, identified through the survey.

Ancient sages claimed that the reasonable formulation of a problem is the pre- condition for its successful resolution. If this is true, the team of experts has played its role. Now, who will finish the task? But maybe this is not so important, provided that the first firm steps towards each other have already been taken, finally.

APPENDIX
Questionnaire



General questions

1. **What is the area of your occupation:**

- Legislature
- Executive branch of power
- Political parties and civil movements
- Local self-government
- Scientific and research institutions

- International organizations or funds
- NGOs
- Mass media
- Other

2. What is your background?

- Water resources management and water use
- Environmental protection
- Political science
- Economics
- Law
- International relations
- Other

3. Your professional activity is connected with:

- Mainly theoretical developments
- Mainly practical activities
- Equally spread over theory and practice
- Public activity
- Other

4. Please indicate the field of your main scientific, research and applied interests.

5. What are the most important problems for Central Asia today?

Regulation of water-related issues

6. Please list the three most important problems in the area of regulating water-related issues today:

- At the level of the Central Asian region
- In your country

7. How would you assess the efforts made by the International Save the Aral Sea Foundation?

8. Please comment on your assessment.

9. How would you assess the activities of the ISCWMC (Interstate Coordination Water Management Comission)

10. Please provide comments.

11. How do you assess the activities of the Basin Water Management organizations?

12. Please provide comments.

13. What do you think about the feasibility of the creation of a new regional structure?

14. What should be the main function of regional organizations?

- Management
- Coordination
- Supervision and inspection
- Consultation
- Planning
- Other (please specify)

15. Would you agree that water resources management in the region must be entrusted to:

- National bodies, but guided by international treaties;
- Regional basin water management organizations or bilateral commissions;
- Both regional and national institutions;
- Consortiums;
- Other

16. What do you think about proposed water–energy consortiums?

17. Please provide comments.

18. The role of consortiums must be limited to, mainly:

- Management
- Funding
- Other

19. Would you agree that independent water users and civil society organizations need to be involved in the process of regulating water related issues at the regional level today?

20. Would you agree that independent water users and civil society organizations need to be involved in the process of regulating water related issues at the regional level in the future?

Water regulation at the national level

21. What mechanism of water resources management would prove effective in your country?

- Single body in charge of water resources management
- Functions are assigned to all ministries and agencies concerned.

- Functions are assigned to all ministries and agencies concerned, including the associations of water users.
- Other
- Difficult to answer

22. What do you think about denationalization/privatization of the water managing infrastructure in the following sectors:

- Industry
- Housing
- Irrigation

23. What are the most effective measures to stimulate water conservation?

- Higher liability of water users
- Public tariff-based regulation of the water use
- Introduction of market-based mechanisms as incentives for water conservation
- Other
- Cannot answer

Ownership of water resources

24. There are different views concerning the ownership of water resources. What views do you absolutely share; rather share; rather disagree with?

- A country must have the absolute right to own water resources within its territory.
- A country must have a limited right of ownership, for interests of other states must be considered.
- Water resources must fall under the joint ownership of countries concerned, for such resources result from global processes.
- A country may have the right to own and manage water resources to the extent established by international treaties.

25. Is it possible, do you think:

- To transfer the ownership of water objects to other states completely
- To transfer the ownership of water objects to other states partially
- To transfer the ownership of water objects to independent business entities completely
- To transfer the ownership of water objects to independent business entities partially
- To lease water objects under a concession
- To lease water objects on a concession, except water objects having strategic significance.

26. Is it possible, do you think:

- To transfer the ownership of water management facilities to other states completely
- To transfer the ownership of water management facilities to other states partially
- To transfer the ownership of water managing facilities to independent business entities completely
- To transfer the ownership of water managing facilities to independent business entities partially
- To lease water infrastructure
- To lease water managing facilities except those having strategic significance.

Distribution of water flows among states

27. Would you agree, that so-called "historically developed conditions" (customs, traditions and precedents) must be taken into consideration in the distribution of water flows among states?

28. Would you agree, that a state may establish limits for national water use without proper consideration of neighboring states' interests? Please comment on your point of view.

29. Do you believe that states, from whose territory of which water resources originate, may/must have certain preferences in establishing the terms of the water flows' distribution?

30. What do you think about the existing mechanism of establishment of quotas for water use by states in the region?

- Existing mechanism of quotas and existing quotas are adequate to the current situation
- Existing mechanism should be kept, but quotas reviewed.
- Existing mechanism of quotas must be reviewed.
- Other

31. Do quotas need to be reviewed in the case of growing water consumption in Afghanistan?

32. Do you agree that the Aral Sea should be considered as a separate water user?

33. Would you agree that the following considerations should be taken in plans of water flows' distribution:

- Water conservation measures
- Water quality

Legal framework

34. Would you agree that the existing legal framework regulating regional water–related issues is adequate to the current situation?

35. What else should be done?

- Accession to existing international conventions
- Development of a Regional convention
- Specify existing agreements
- Development of new agreements
- Other
- Cannot answer

36. Please point out the most useful and effective Treaties (Laws, Acts and Declarations), concluded in the water sector at the regional level throughout the post-soviet era.

37. Please provide comments.

Water-economic issues

38. Would you agree with the following statements?

39. At the regional level:

- Fees for water resources are justified
- Fees for water supply services are not justified
- Compensation for missed profit is justified
- Compensation for losses is not justified

40. At the national level:

- Water fees are justified
- Differentiated water tariffs are necessary
- Water tariffs must allow the recovery of the costs of water supply services
- Water tariffs must be based on considerations of paying ability of end users
- Preferences and subsidies are necessary to stimulate the development of water-using sectors of the economy

Regional projects

41. What do you think about the project of re-directing rivers from Siberia to Central Asia?

42. Please comment on your position.

43. What do you think about the project of the creation of the "Golden Age" lake in Turkmenistan?

44. Please specify your answer.

45. Do you believe that the construction of the Rogun HPP could facilitate regional development?

46. Do you believe that the construction of the Kambar Ata HPP could facilitate regional development?

47. Do you believe that the construction of new water reservoirs in Uzbekistan could facilitate regional development?

48. What other major water–related projects could be of regional importance?

Environment

49. Please list the three most important problems in the area of environmental protection today:

- At the regional level
- In your country

50. Please arrange the following environmental problems by degree of importance for the region:

- Degradation of the Aral Sea and Aral Sea basin;
- Degradation of water eco-systems;
- Water pollution
- Degradation of glaciers
- Land degradation and secondary erosion
- Depletion and degradation of underground waters
- Breakthrough-prone mountainous lakes
- Breakthrough-prone tailings.

51. Do you believe that ecologists need to be more deeply involved in activities of international water–resources management structures?

52. Regional cooperation involving international organizations

53. Do you consider the involvement of international organizations useful?

54. Please specify your answer

55. Do you believe in the feasibility of the creation of a special commission under the auspices of international organizations for the resolution of water–related problems in the region?

56. What other water–related problems in the region would you like to point out?

Authors of the epigraphs for the book "Water Problems of Central Asia"

Omar Khayyam (ca. 1048-after 1122). Persian and Tajik poet, mathematician and philosopher.

Joseph Rudyard Kipling (1865-1936). English writer.

Confucius (Kung–Tse) (ca. 551-479 B.C.). Ancient Chinese thinker, the founder of Confucianism.

Nizamiddin Mir Alisher Navoi (1441-1501). Uzbek poet, thinker and government official.

Andre Berte (1818-1888). French writer.

Charles Louis Montesquieu (1689-1755). French educator, legal thinker, philosopher.

Werner Finch. Moscow, EKSMO Publishing House, 1999.

Bulat Shalvovich Okudjava (1924-1997). Soviet writer, bard.

Helmut Schmidt (1918). Chancellor of the Federal Republic of Germany from 1974-1982.

Andre Maurois (1885-1967). Real name: Emil Herzog. French writer.

Abraham Lincoln (1809-1865). 16th president of the USA from 1861-1865.

Lawrence Peter (1919-1990). Canadian-American pedagogue and man of letters.