Water and Globalization: Impacts on Central Asia

V.A. Dukhovny

The modern world is entangled in global networks more than ever in the world history. Information space has been formed according to rules of Internet and electronic messaging and ensures instantaneous communication and momentary dissemination of any news, thus bringing about apparent unity of the world. At the same time, many other networks (financial, trade, economic, legal, and institutional) with their own rules of existence and play, while being in continuous development and interacting among themselves, are nothing more than the phenomenon of globalization. This phenomenon, if does not rule the world, at least, is representing one of the fundamentals of its present status, past transformations, and future prospects.

It is quite natural that the water sector, as one of the economic branches and simultaneously a chief actor of environmental management, couldn't avoid being involved into the globalization process that affected this sector since the 1950s. Globalization analysts, both supporters and opponents, single out its several aspects.

- political, economic, technological and environmental; and
- cultural, ideological, and even religious aspects that are not particularly highlighted but both earlier and especially now, in the age of information and communication revolution, have gained specifically powerful influence

Each globalization aspect had a profound influence on the water sector in some countries, regions and all over the world. Undoubtedly, these aspects play different roles at each development stage, and the influence of globalization at the regional and national level are also different depending on the extent of adverse affects of "governance" or its withstanding such phenomena. The water sector was involved in various spheres of globalization even in those periods when the water sector was developing independently within national boundaries. Trends of these processes are quite well observed in Central Asian countries that could not withstand the world tendencies despite being behind the Curtain for a long time. Globalization effects have many-sides and multifactor. Therefore, a clear-cut distinguish between positive and negative aspects of these processes is needed. An attempt to analyze the influence of "globalism" on the water sector in Central Asia is presented below.

Globalization has initially demonstrated advantages

Globalization, as a process of spreading certain influence all over the world, became apparent in the water sector in the 1950s, when global water organizations were established and activities of UN agencies' in the area of water problems were initiated. Later, the International Commission on Irrigation and Drainage (ICID) and the International Association of Hydraulic Engineering and Research (IAHR) were established. They were the pioneers as early as in the 1950s, applied great efforts to establish national committees of these organizations in many developed and developing countries and creating a common platforms for experience sharing, knowledge and information exchange. These organisations have significantly promoted the cross-fertilization of water

management approaches practiced by developed countries into developing countries, as well as experience of former 'socialist states' into 'capitalist states' and vice versa. Exactly these activities have promoted not only scientific and professional capacity building and 'know-how' exchange, but also formation of professional relations. This has subsequently facilitated considerably in the establishment of the global community of water professionals at the end of the 20th century. In the past decades, we have been witnessing a rapid upsurge in diverse activities launched by the international water community. Activities of the interstate organizations under the UN umbrella has played an important role in disseminating 'know-how' and water knowledge. First of all, this can be referred to the UNESCO with its water assessment program that involved a great number of participants from various countries on both sides of the Curtain, as well as from developing countries. The same can be referred to the UN regional commissions such as the UN Economic and Social Commission for Asia and the Pacific (ESCAP), the UN Economic Commission for Latin America and the Caribbean (ECCLAC) and the UN Economic Commission for Africa (ECA), and associated international research centres involved in solving water-related problems such as the International Institute of Applied Science and System Analyses (JASSA) in Vienna and the Consultative Group on International Agricultural Research (CGIAR).

At that time, representatives of water science and practice of the former Soviet Union actively participated at the world water forums, for example, the Minister of Water Resources of the USSR, E.E. Alekseevsky, was the President of the ICID and the outstanding soviet scientists such as A.N. Askochensky, V.V. Poslavsky, K.K. Shhubladze and B.G. Shtepa were vice-presidents of this organization. The Ninth World Congress of the ICID was successfully held in Moscow in 1975; and the First Afro-Asian Regional Conference of the ICID was held in Tashkent in 1976. These events attracted attention to significant advantages in the field of land reclamation and water management in the USSR, raising the world-wide prestige of soviet water professionals and concurrently involving them into the process of improving the principles and approaches to water management on an international scale. This was two-way knowledge exchange. The USSR has gained experiences of advanced irrigation methods (drip irrigation, some types of sprinkler irrigation, automation of waterworks), while the soviet scientists made a great contribution to the world development through their achievements in hydrological school, in such areas as assessing water resources, plotting hydrographs of river flows with statistical uncertainty, drainage theory and practice, construction of large dams (Nurek, Toktogul, Bratsk and other dams) where the country played the leading roles in the world.

Great efforts were made to elaborate the so-called "integrated methods" of development and irrigation of virgin lands in the course of implementing the large-scale development projects in desert areas of Central Asia and Kazakhstan and reclamation of formerly abandoned lands in Azerbaijan, the Volga Region, and Kalmykia. All these activities promoted good foreign relations including signing the contracts for implementing works in various countries as well as procurement of equipment and technologies from abroad. Commercial activities in the field of water management has widely spread not only over countries of the so-called 'socialist block' (Vietnam, North Korea, etc.), but also over countries such as Egypt, Syria, Yemen, Mozambique, Iraq, etc. Constructing the Aswan Dam on the Nile River was undoubtedly a great success of soviet hydro-engineering theory and practice. This project had the great technical and political significance, demonstrating the world over the technological and organizational potential of the Soviet hydropower engineering. In the 1960s and 1980s, the irrigation and drainage activities boomed all over the world resulted in elaboration of a new water management and land reclamation concept, which had transformed irrigation, drainage and water management into recognized tools for reducing and even eradication poverty and famine, as well as solving many other social problems of the modern world. In this connection, the comment in the book for visitors made by the prime-minister of Turkey, Mr. Suleiman Demirel, during his visit to a site of

newly reclaimed lands in the Hunger Steppe in 1967, is quite noteworthy. He wrote, "Rulers, who are willing to provide their people with bread, jobs and opportunities of happy development, should come here and make use of this wonderful experience of social reconstruction through applying it in their own countries."

The 1970s and 1980s are marked with the new heights of global influence on water development processes. During those years, humanity began to see clearly that continuation of unrestrained use of natural resources by mankind, without care for their renewal capacity and considering ecological requirements may lead not only to regional disasters but even to a global crisis. However, this movement has initially failed to gain a worldwide support, but has initiated the development of two important principles of the global water policy. The first principle went back to Brutland's slogan: '*Man! You have not inherited nature from your ancestors, but borrowed it from your descendants*'. This slogan has gained worldwide recognition and promoted the prestige of those countries, which follow the principle of nature conservation for future generations. While *the prestige effect* that was of the great significance for political leaders and public movements, especially in developed countries was not a key factor, which could restrain the world from destructive over-consumption of natural resources, it had the immense moral and ever-growing political influence in any case.

Under the influence of activities of the Rome Club [46] in the 1970s and of the JASSA, an opinion regarding the need for environmental dimensions in all large-scale public action plans and programs was being formed in the Soviet Union. The State Committee for Nature Conservation and some government panels were established. For example, to solve problems of the Aral Sea and Caspian Sea. The "green movement" was supported by the Government, which resulted in a number of governmental resolutions and decrees. In particular, the Resolution on Socio-Economic and Environmental Improvement in the Aral Sea Basin that laid the foundation for future joint water resources management in the river basins of the Amu Darya and Syr Darya by establishing the Basin Water Organizations (BWO "Amu Darya" and BWO "Syr Darya"). The Water Code of the USSR has largely reflected new ideas and corresponded, in many respects, to new world tendencies. However, the Soviet management methods, being only formally democratic, did not provide real involvment of stakeholders and the general public in developing the mechanisms of public participation and control over the implementation of these quite correct decisions that remained mainly on paper.

The second aspect of this process was the emergence of documents that formed the legal basis for use of water and other natural resources at both the international and national levels, like the Helsinki Rules and later, after a long-lasting campaign, the Ramsar Convention; the Convention on Combating Desertification (1992); the UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes (1992) and, finally, the UN Convention on the Law of the Non-Navigational Uses of International Watercourses (1997). It is not surprising that the Central-Asian countries, just after gaining their independence, were forced to set up their national legislation and relations with neighbors on the basis of old traditions but keeping in mind the UN conventions. Though issues of legal force and jurisdiction are quite vague in these documents, they nevertheless afford an opportunity for conceiving the purposive political movement of the international community towards equitable and reasonable use of water resources, as well as adherence to the "polluter pays" principle.

Summarizing results of the first phase of globalization in the water sector in Central Asia, as well as all over the post-Soviet area, one can note its positive impacts on legal, scientific, and technological progress, on establishing cultural exchange between the countries that previously were isolated from each other, and on forming additional values based on joint actions. In addition, the foundation was laid for water technologies exchange on the commercial basis.

The Period after Independence: a New Impulse for Globalization

The declaration of independence by the Central Asian countries in September-October 1991 posed a problem to the new Governments - where to go and which way to choose for economic and political development? Naturally, the water sector had found itself at the crossroads due to its close relation with the public priorities and directions, particularly in the light of agricultural reforms. Taking into account that the world practice did not know the examples of transition from under-developed socialism towards capitalism and the free market, the governments of the five republics tried to find a acceptable model among the modern capitalistic economies.

The world became opened for Central Asia, and Central Asia has opened up for the world. This openness was dualistic: non-politicized groups that encompass most of water professionals and, in general, of highly-qualified unbiased western professionals were surprised by the existing scientific and technological potential and, at the same time, they have critically analyzed the shortcomings and mistakes of current water management practice.

The understanding of the similarity and differences in the technical approaches, drawbacks and ways of overcoming them was reached just due to such a co-operation. The co-operation with leading specialists was gradually established facilitating the joint elaboration of programs and action plans such as: the Aral Sea Basin Phase-1 Program (1994), the Principal Provisions of the Water Management Strategy in the Aral Sea Basin (1997) [9], the Water Resources Management and Agricultural Production Program" (EU TACIS WARMAP-1, 1995-1997) and others. One cannot but admit a great contribution to this co-operation of such outstanding specialists as Guy le Moigne, Janusz Kindler, Bob Rangeley, Arrigo di Carlo, Michael Armitage, Jutzchak Alster, Joop de Schutter and many others.

Activities of these specialists together with the regional water institutions contributed to the development of new approaches based on up-to-date technologies, information techniques, computerization, etc. In addition, the western work style based on participatory approach has become quite widespread. Both factors promoted the public awareness regarding the need to meet environmental demands with respect to preserving nature. As a result, in 1993, in parallel to the ICWC, the International Fund for Saving the Aral Sea (IFAS) has established the Commission for Sustainable Development; however, it was only a flash in the pan. Nevertheless, according to the saying: "nature abhors a vacuum", and thanks to the initiative of Kazakh specialists, the Regional Environmental Centre was established and managed to stir up relevant activities on the regional level. A cohort of environmental partners has joined the water institutions. Finally, these activities have resulted in implementing the pioneer environmental projects (the Aral Sea Wetland Restoration Project, the Amu Darya and Syr Darya Deltas Biodiversity Rehabilitation Project, etc.).

Another side of the openness is the transformation of the region into a scene for political games. A situation was curious enough, since the international financial institutions skilfully combined the granting of their financial resources with specific political requirements, became the key actors rather than the newly established embassies and missions with their diplomatic activities. The political approach of "the Greeks bearing gifts" had several targets: to prove the disastrous nature and incapacity of the socialistic system and once and for all, to undermine the confidence to its potential, and under the guise of democracy and progress to impose their own vision on the future regional development. However, one aspect was hidden here: transforming the region from the source of raw materials of the Soviet monopoly into the market for western competing economies and, first of all, into the source of fuel and energy resources. Central Asia has possessed rather

powerful industrial, agricultural, and human potential. For achieving abovementioned targets this potential need to be destroyed. For realization of such targets quite favourable local conditions have arisen - break-off of economic relations with Russia, loss of federal subsidies, and, at the start, inability of the Central Asian national governments to employ their potential for generating own financial resources for governmental regulation and support of national economies. These factors have caused certain economic recession, setback in agricultural production, disruption of the scientific potential, huge brain drain, and lowering the educational level.

What direction could be selected by national governments in the region? A key demand of all international financial institutions is denationalization and privatisation. A requirement to provide self-sufficiency as the prerequisite of the economic stability and as a new form of the slogan "people in trouble are left to themselves" has resulted in stagnation of the industrial sector at the first stage, and then in liquidation and step-by-step pilfering of the huge assets. For instance, in Uzbekistan, the production potential in the water sector amounted to more than 10 million m3 of reinforced concrete, 12 thousand km of drainage ceramic pipes, 15 thousand tons of polyethylene goods, hundreds of excavators, levellers, drainage machines, pumps and pumping units, water-measuring devices, facilities, etc. Over the period since 1991 until 1996, this huge production potential was destroyed; and the privatised assets made up less than 10% of the former ones. Moreover, many items, such as drainage pipes and machinery were completely liquidated and pilfered. The national governments were not able to assess and prevent this destructive process, which, eventually, led to loss of the economic potential in the water sector as a whole and, as a consequence, in irrigated agriculture. While in the past the scope of preventive flushing the subsurface drains amounted to about 2,000 km annually, at present, it makes up only 200 km. It remains only to be surprised that under such conditions 60 to 70% of subsurface drains remain to be operational, though their service life is more than 30 years, of which the recent 15 years only negligible maintenance works were being implemented (10 times less than required).

Orientation towards complete privatization of irrigated agriculture and denial of forms of cooperation were more fatal. Regional irrigated agriculture adapted to larger mechanized forms of production has practically degraded, being accompanied with considerable decrease in water and land productivity.

It is interesting that while the world suppliers of grain, such as the USA, Canada, and China, as well as of cotton, such as the USA and China focused their attention to large-scale farming and a high level of mechanization, recommendations for our region were aimed at small-scale privatization. As a result, the average plot of an arable land was reduced to 1 ha in Kyrgyzstan, 4 to 6 ha in Kazakhstan and 10 to 15 ha in Uzbekistan. High-efficient production of such crops as cotton, wheat and corn is impossible under given conditions. Therefore, some years later, an opposite phenomenon could be observed: consolidation of plots. For example, by 2005 in South-Kazakhstan Province, an average area of plots has increased up to 18 to 20 ha through sub-tenancy, transfer of title to tenancy, etc.

At the same time, the Japanese approach that is the most appropriate for small-scale farming and is based on combining cooperative and regional forms of ownership and responsibility was disregarded and not disseminated in the region.

Decrease in irrigated agricultural productivity under transition from the customary method of works (collective forms) concurred with the drop in prices for agricultural outputs (Figure 6.11). Figure 6.11 shows that over the recent 15 years, grain prices decreased twice, cotton - 1.5 times and rice more than twice. This has led to an abrupt drop in profitability of irrigated lands in the region. Data given in Table 6.6 taken from the Water Resources Management and Agricultural Production program (EU TACIS Program, 1994-1998) and the GEF Project: "Water Resources and Environmental Management in the Aral Sea Basin", Component A-2 ("Water Conservation",

1998) financed by the World Bank shows that the mean profitability of irrigated land decreased from 300 - 980 US$/ha in 1993 - 1995 to 150 - 580 US$/ha in 2002.

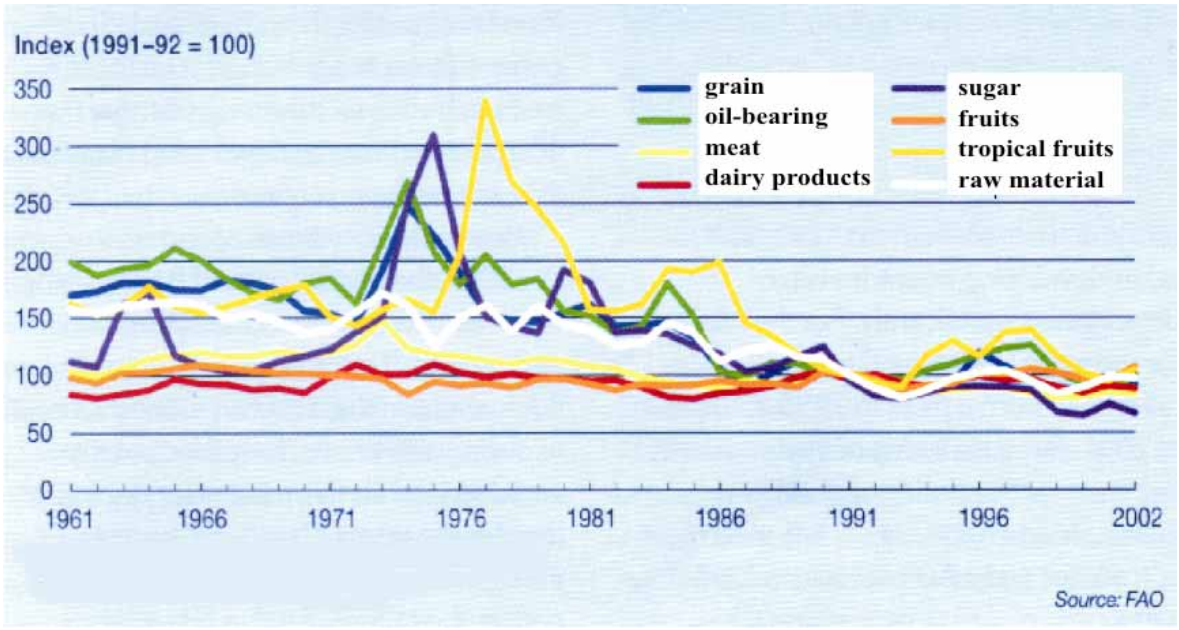

Figure 6. 11 Trends of Prices on Agricultural Output (1961 to 2002)

Table 6.6 Comparative Data on the Gross Revenue in Irrigated Farming

Country	Revenue, $/ha	
	1996	2002
Kazakhstan	982.0	356.0
Kyrgyzstan	759.9	578.9
Tajikistan	719.2	334.6
Turkmenistan	483.0	296.0
Uzbekistan	250.7	151.4

At the same time, calls for full payment for irrigation water-supply services and transferring responsibility for O&M of irrigation and drainage systems to farmers have resulted in the fact that farmers and water management organizations were unable to maintain the required operability of the irrigation and drainage systems, in particular, sprinklers and drainage tube-wells. Consequently, some irrigated lands were abandoned (about 1.0 million ha in Kazakhstan and 260,000 ha in Kyrgyzstan).

The case of Makhta-Aral District in South-Kazakhstan Province is typical. Here, based on efficient operation of drainage tube-wells, cotton yields averaged 3.5 tons/ha over the period of

1980 to 1999. However, over the period of 1991 to 1997, drainage tube-wells have failed over an area of 90,000 ha because of lack of control and maintenance by operational services, followed by soil salinization. The Kazakh Government has taken loans from the Asian Development Bank (ADB) and the World Bank for the rehabilitation of drainage systems, over an approximately 35,000 ha. However, after the rehabilitation, they are again not operable since 2003, due to lack of maintenance as farmer's net income of 250 to 300 US$/ha cannot cover the required maintenance costs of 60 to 80 US$/ha. As a result, during the recent decade, cotton yields amounts to 1.7 to 1.8 tons/ha, less than half of former yields.

The water sector faces a similar degradation. Budget deficit and the tendency to cover this deficit at the expense of fees collected from water users have led to the situation, where over the last 15 years, financing of main water infrastructure was substantially reduced (up to 14 to 15 US$/ha against former 80 to 120 US$/ha). At the same time, a greater share of finance is covering consumption of electric energy, with dramatic rise in price.

Thus, in economic terms, increase in the regional openness for the world tendencies had a negative effect and even, to a certain extent, became destructive for the sustainability in the water sector and irrigated agriculture as a whole. At the same time, it would be incorrect to forget about the great positive effect of increased attention to water in the world during the last 10 to 15 years. Undoubtedly, this should have an effect on Central Asia.

Water is a definite subject of world attention

Awareness on growing water deficit in the world has stimulated active establishment of international organizations and initiatives that involve many governmental and non-governmental organizations, decision-makers, intellectuals, water professionals and promotes water-related intellectual, ethical, informational and technological development. The World Water Council, four World Water Forums, the Global Water Partnership (GWP), Kyoto Protocol, the World Water Vision Report (Cosgrove and Rijsberman, 2000) at the Second World Water Forum in the Hague and the Resolutions of the Bonn Conference (Ministerial Meeting, 2001) have played an immense role in focusing the world attention. The attention of policy-makers (and not only in water management organizations but also in nature conservation agencies) to the need for a radical reorientation of water sector, from meeting water demands towards managing water demands and achieving the potential productivity of water in all economic sectors. Dissemination of advanced approaches and methods, addressing water issues, and their popularization have facilitated practical steps towards IWRM in many countries. It is very important to understand that there is a possibility to meet the needs of society at the rates of water consumption amounting to 250 to 450 m3/year/per capita even in arid areas of Jordan and Israel, based on the modern technical decisions. Also, the comprehensive policies of these states, which stimulate water conservation and supports financially and legally, the systems of upto-date water use and management, demonstrating a participatory approach in the governance of the water sector. Activities of the Global Water Partnership, ADB, Swiss Agency of International Development and Cooperation (SDC), EU with its Water Framework Directive (the European Commission, 2000) has promoted, first of all, the professional understanding of Integrated Water Resources Management (IWRM) and then its political support. Study tours, training seminars and advanced courses have rendered great assistance. Instructive examples have been demonstrated during visits to the French basin water management organizations; the water confederations in Spain having more than 70-years experience of integrated water resources management, and water communes in Italy. All of them use the combination of hydro-geographic principles of water resources

management with active participation of water users and their representatives in these activities (see Introduction).

The Japanese experience is worthy of praise, in particular the way that country manages to harmonize interests of nature and society under an immense population density. The same careful and respectful attitude to water is in the Netherlands, Canada and Switzerland and rudiments of hydro-environmental basin management is in the USA, are demonstrating the expediency to follow these practices and applying the instruments of rational natural resources use in developing countries and countries with transition economies.

A role of international financial institutions

At the first stage of transition from the former soviet system to market relations, the World Bank and other international financial institutions made positive contributions. Highly qualified professionals from these organizations selflessly and driven by high human aspirations rendered assistance to local specialists in coping with rules and regulations of these institutions. It took ten years to introduce appropriate advanced technologies, equipment, computerization, informatics and sophisticated methodologies. After 15 years of donor involvement, water management organizations and conservancies in Central Asia have managed to understand differences in approaches of various donors and their ways of collaboration with partners.

In quite a number of cases, donors' have supported local beneficiaries. These supports were in the manner that created opportunities for self-expressions, sustainability and use of democratic approaches to tackle problems, at the first stage with donors' support and then with their monitoring and participating. They mobilized the preparation of strategic approaches on a long-term basis, training of local specialists in advanced methods and practices, manpower development and raising awareness in western "approaches" as well as developing our own approaches adapted to new conditions. This is demonstrated in projects such as IWRM-Fergana Project being implemented by the SIC-ICWC together with the IWMI with the support from SDC (Switzerland), Canal Automation Project and SIC-ICWC Information Exchange Project, the SIC-ICWC Training Centre Project under supporting by the CIDA and McGill University. Such projects have laid the stable foundation for survival and effective functioning. In this case, donors acted in the interests of local needs and tried to satisfy priorities and tasks of beneficiaries without any political, economic and other preconditions under full mutual confidence in the project implementation. At that, local specialists are considered as equal partners and executives. Such donors are represented by Switzerland, Canada, the Netherlands, the NATO's Program "Science for Peace", the ADB, the EU with its programs FP-5, FP-6 and the International Association for the Promotion of Co-operation with Scientists from the Newly Independent States (INTAS). Another group of donors imposes their own priorities on beneficiaries, doesn't trust local specialists, delays fund allocations for longer times and puts conditions under which practically 70 to 80% of the funds return to the donors themselves in the form of paying for their consultants, equipment, etc. In addition, their projects usually are not aimed at final results, and in this case, the funds allocation is more important than its effectiveness.

It is necessary to consider separately the cooperation with the World Bank in the Aral Sea issues. The World Bank represents the complicated bureaucratic system where decisions on selection, preparation, approval and acceptance of projects by Bank officials take several years, even for projects, which are supported in principle and rather low-cost. For example, the strategic project: "Water Resources and Environmental Management in the Aral Sea Basin" (its total cost of US$ 12.2 million; with the participation of five Central-Asian countries) that was financed by the

Global Environment Facility (GEF) took four years for preparation and also four years for implementation. The project was completed in 2003. Selected Consultants did not fulfill the Terms of Reference, but the money was spent and all were satisfied - the consulting company obtained money, the World Bank closed the project, however the region did not receive the expected strategy.

Meanwhile, during the first stage of the ICWC and World Bank's cooperation, the work was well organized. Then the project "Principal Provisions of the Water Management Strategy in the Aral Sea Basin", as the inception of the above-mentioned project was implemented by local specialists with one moderator from the World Bank (Professor Janusz Kindler). However, further, the World Bank predestined to local specialists (no the institutions) a role of helpers doing the legwork and obtaining salaries ten times lower than salaries of foreign specialists. Because of the limitations imposed by borrowers and donors, local organizations could not independently take part in the biddings, resulted in drastically reducing the capacity of national research and design institutes in the region.

One of examples of high efficient assistance is the SDC donor support. The SDC has allocated funds for establishing the automation and monitoring system at waterworks of the BWO "Syr Darya" in the Fergana Valley. The Kyrgyz Company "SIGMA" was contracted to equip water infrastructure with SCADA under the supervision of the SIC-ICWC. Earlier this company had worked for the space industry. The "SIGMA" has executed the works related to automation of all structures in a short period of time at an average cost of US$ 6,000 per one automated point (see Chapter 5). The accuracy of water distribution has risen from ± 10% to ± 2% under extremely variable flow regimes of the Naryn River downstream of the Toktogul Reservoir with changes in daily flows up to 200 m3/s. For comparison, the same work done by French companies on the Southern Golodnostepsky Canal (Uzbekistan) has cost almost three times higher. The well-known French automation expert, Mr. Hervé Plusquellec gave the following assessment of works made by "SIGMA": "According to actual data on automation system performance at the Uchkurgan Hydroscheme, one can note that the system operated stably and performed key functions of automation and data collection on waterworks technological parameters over the period of 2002 to 2006. This system, providing automated regulation of water and flow rates in the Additional Feed Canal (AFC), the Big Fergana Canal and Northern Fergana Canal, ensured stable water supply under considerable fluctuations of flow rates and water levels in the forebay of the waterworks due to the daily power-generation regime of the Uchkurgan Hydropower Station. At the same time, it is necessary to note that costs of installation and O&M of this system were much lower than those in western countries" [38]. Thus, the effectiveness of donors' assistance could be increased largely in the case of raising the trust to the local capacity of beneficiary countries. Analysis of donors' contribution to the Aral Sea Basin Program, Phase 1 (ASBP-1) and a number of other projects implemented together with ICWC institutions (Table 6.7) shows that, on average, only 30% of the funds that were declared in IFI reports as the assistance to developing countries actually reaches the beneficiaries.

The extremes are represented by SDC, INTAS, and ADB projects where 70% of the funds are directly allocated to the beneficiaries (Table 6.7) and the assistance of the USAID and the EU TACIS program, where these funds amount to only 10 to 25%. There is no doubt that donors must retain functions of supervision over the final results and overall monitoring of project progress, but shouldn't be engaged day-to-day supervision over every step. To ensure successful implementation of the integrated regional programs there is a need of establishing a Board of Donors that will address the coordination and interaction issues. Such an arrangement will allow the international donor community to utilize funds in the efficient manner and to avoid the dissipation of resources, duplication of advertising campaigns and rivalry among donors. At the

same time, this might enhance the prestige of donors' community, concentration on joint efforts for providing assistance to developing countries and improving local living conditions.

Table 6. 7 Use of Donor's Funds by Beneficiaries Themselves

Project	Donor	Project amount, 000'USD	Including: used by beneficiaries
Principal Provisions of the Water Management Strategy in the Aral Sea Basin	Global Environmental Fund (GEF)	540.0	420.0
Evaluation of Previous Pilot Projects on Irrigation and Drainage in Central Asia	WB	100.0	100.0
Water Resources and Environmental Management in the Aral Sea Basin	GEF	22,500.0	5,200.0
Developing Recommendations on Distributing Costs and Incomes under Joint Inter-State and Cross-Sectoral Use of Irrigation and Hydropower Schemes on Transboundary Rivers	USAID	22,160.0	204.0
Automated System of Management and Control of the Dustlik Interstate Canal Headwork	CIDA	1,520.0	600.0
Water Resources Management and Agricultural Production in Central Asia	EC TACIS	10,781.0	2,796.0
The Aral Sea Basin Development Program, Component "Creation of Model Instruments on the Basis of Interaction of Water Resources, Socio-Economic Development and Nature in Central Asian States for Training and Use by Decision-Makers"	UNDP	220.0	104.0
The System of Automation and Dispatching of the Uchkurgan Hydroscheme on the Naryn River	SDC	5,954.2	4,116.0
Integrated Water Resources Management for Wetlands Restoration in the Aral Sea Basin	NATO Program "Science for Peace"	240.0	195.0

Monetization of the Water Sector

The significant deficit of investments in water resources development has resulted in arising two negative tendencies in the global water sector. The first tendency is the concept "water is an economic good" pushed by many monetarists who called for full payback for water storage, extraction, delivery and use, and the second one is privatisation of water infrastructure.

The slogan stated by the former World Bank Vice President Mr. Serageldin "water is the oil of the 21st century" gained the great support from financial circles. They saw in this approach the way to water monetization and making it a source of profit like other global goods - oil and gas. The legislations of some USA states widely support the water right to be going public. In regions of intensive development like Denver (Colorado), where all water resources have been distributed during the 19th century, this has led to monthly auctions where the cost of one share for the perpetuity of 1 m3 of water increased up to US$ 20. Stakeholders firstly sold shares for saved water and then water from all irrigated areas. If this trend would expand all over the world, mankind might lose up to 40% of the food being produced by irrigated agriculture due to competition of industrial and other economic sectors. It is not a real threat to America - this rich country will provide food for its population but what can developing countries do? Who will buy water to support the poor and the environment?

However, water (in contrast to oil) is a vital element of the noosphere[1] - it is "blood of life", natural essence and social security, non-observance of which will result in death of most of the global population. Only air can be equated with water in its value for human beings, because nothing can replace water and air. People can live without oil and gas over a period of all their life but without water only during one week! Oil can be replaced by coal, firewood, hay or electricity. Brazilians already successfully use bio-ethanol instead of oil, but nothing can replace water. The principle of water has an economic value that was stated in the Dublin Declaration should only support its rational use but not its trade, in any way. Water can become an economic good only after satisfaction of social and environmental needs under certain conditions: lack of water scarcity, possibility of its delivery at any time without damage to basic needs and in case of the capability of competing uses to pay for delivery of excessive amount of water.

Attempts to legalize the trade of water as a commodity were undertaken in the North American Free Trade Agreement (NAFTA) and in the World Trade Organisation (WTO). The new General Agreement on Trading Services (GATS) indicates the water supply services under the category "environmental services". Kavanah and Mander (2002) are absolutely right, proving that water monetization and privatisation according to free market laws deprives water of social properties since, in this case, access to water is ensured only to those who have money to pay.

Unfortunately, these trends affected the Central Asian region as well, when upstream riparian countries provoked by some donors began to compare water with gas and oil and to require from downstream riparian countries not their share of costs in maintaining common water infrastructure but charges for water as an economic good.

Fragmentary awareness of international experience by poorly-educated representatives of "a new democracy", with support of some international consultants, have initiated the campaign for sale of natural waters of transboundary rivers to downstream riparian countries, for example, Naryn River water to Kazakhstan, Tajikistan and Uzbekistan at the rate of US$ 0.12 per m3! Water sales by the Imperial Valley System to Los Angeles and San Diego or water auctions in Colorado are taken as the precedent, but it was forgotten that not the water but the licenses (the right for water within the state) were sold.

At the same time, sale of free water within WUAs and between them, as well as creating economic incentives for water conservation should be supported and expanded.

[1] The noosphere is 'the sphere of human thought' in addition to atmosphere and biosphere

Another side of the conception "water is an economic good" consists in the fact that the mega-companies with their aspiration for privatisation were attracted to the market. Though this was camouflaged by noble objectives - covering deficit of funds for water resources development by means of private investments, however, it at once resulted in an increase in water charges, decrease in cost recovery and, in turn, in investment outflow from the water sector.

Fortunately, the experience of privatisation was limited to activities of the only one Company "Tractebel" in Kazakhstan - this company was forced to go away because the social potential for water and power consumption was found completely unprofitable for such methods.

Discussions on issues of private participation in water management are still "seething." However, one thing is clear - water management in itself, being the element of state security, cannot be handed over into private ownership; the private sector may be involved only for providing certain services in water management under strict state supervision. Participation of companies and their capitals in water management improvement, water infrastructure development, water conservation and wastewater recycling should be supported by the state because the experience of water managers can help in raising the efficiency of water conservation.

Globalization of Water Resources

Can we speak about this process in principle? For instance, availability of water resources at the rate of 17,000 m3/ person/year in Brazil cannot cover water shortage even in northern district of Mexico, where amount of available water resources makes up 1,400 m3/person/year, let alone shortages in the Sahel region or the Takla Makan Desert [46]. Water demand of mankind is so huge and water conveying is so expensive that transfer of water from water-rich Turkey to money-rich Israel mainly remains as a subject of feasibility studies rather than of real actions.

Nevertheless, thanks to Toni Allan and Michael Rosegrant, many publications that treat water as a resource of global character have appeared [50]. According to the very interesting generalization made by Ashok K. Chapagain [46] water globalization reveals itself in:

- establishing many global and regional institutions that are aimed at tackling challenges of transboundary water use and developing the policy coordination of governments. In confirmation his words, he gives the examples of the Mekong River Commission, the Regional Commission for the Okavanga River, and the Nile Basin Initiative;
- diversion of runoff from one river basin to another one;
- bottled water trade;
- privatisation of water based on recognizing it as an economic good; and
- virtual waters as a tool of global influence on the water use efficiency and covering an water deficit.

The first two facts are of the regional nature, rather than of the global one. According to P. Gleick [50], a sales volume of bottled water of 144 million m3 is insignificant to speak about the ability to cover the water deficit on a global scale. In addition, nobody can make an example of export-import of bottled water between countries. At the same time, the technology of water bottling, as well as equipment for this production can be easily procured and installed; therefore, this is a local

process for meeting the demand of either country or any region suffering from shortage of safe water.

Privatisation of water based on recognizing it as an economic good, as mentioned above, is rather a tool of financial and economic pressure; and the number of its supporters, especially, in light of water conservation for the environment (who has to pay for water for nature?) is decidedly reducing. There are more realistic mechanisms to affect global processes in terms of water resources use:

- output prices of irrigated agriculture as the main water consumer in the world;
- electric energy prices and their trends due to the price growth of energy resources and the attempts to transform hydropower generation into a geopolitical tool similar to gas and oil production; and
- the growth of "virtual water" pressure as the incentive for international competition in contrast to the need of developing and supporting the irrigated farming sector in developing countries and countries with transitional economy.

Recent prices on agricultural output at the world market are far from reflecting the actual crop production costs of irrigated farming. The disintegration of the USSR concurred with an abrupt landslide of agricultural output prices, which was mainly caused by subsidy policies of the world leaders such as the USA and the European Community. One cannot better describe this process than A. Shady [44] did: "Subsidizing the national agricultural sector by developed economic systems causes considerable distortions and lack of support to billions of the poor. These systems can assist the rich to become richer based on subsidies to agriculture currently reaching US$ 300 billion a year. Major actors are the EU through its Common Agricultural Policy, which amounts to half of the EU budget, from which US$ 100 billion were allocated to European farmers in the form of subsidies in 2002, and the USA with its subsidies reaching US$ 40 billion in 2002 and ever growing. At the most, 10% of subsidy recipients, accounting for 313,000 farms, received more than US$ 104 billion of subsidies in the USA in the period of 1995 to 2004. This is 72% of the total subsidies during this period. When considering all OECD countries, this form of support is evaluated as 31% of the total farmer's receipts, including: 18% in the USA; 36% in the EU; 70% in Japan and 75% in Switzerland."

An example of the cotton prices is typical. The USA, while producing 3.6 million tons of raw-cotton, grants almost US$ 4 billion a year to cotton-growing farmers, i.e. US$ 1,000 per ton. This means that production of each ton of raw-cotton for American farmers is half the price of that for Central Asian producers. The USA, being one of the leading world cotton suppliers after China, has set dumping the world cotton prices during the last 10 years of the 20th century (the landslide of prices from US$1,750 to 1,880/ton up to US$ 880 to 1,200/ton).

Western subsidies practically made it impossible for the Central Asian fruits and vegetables to compete with the European ones in the Russian market, and Russia is buying cheaper fruits and vegetables with much worse taste. Thus, developed countries protect their national markets and agricultural production and, concurrently, promote the commodity invasion into developing countries. As mentioned above, this resulted in landslide of world prices on agricultural output nearly two times in comparison with 1980 and in *stagnation of developing agricultural production in many developing countries that became unprofitable without vigorous state support*. Roughly speaking, developed countries stimulate the dependence of developing countries from import. Today the consequences of this dependence can be not as painful as in the

future when domestic commodity producers will be winded up and world prices again will go up resulting in still worse living conditions for the poor in these countries.

When any country imports more than 30% of food products, it is at the risk of the food security. However, agricultural production is closely linked with overall economic development of each country, since the agricultural sector obtains its resources from 8 sectors of economy, and at the same time, provides inputs necessary for functioning of sixty other economic sectors. According to data of the Russian Academy of Agricultural Sciences, each employee in agricultural production provides job for five employees beyond the agricultural sector.

Adherents of globalization convince that powerful large-scale agricultural and industrial production and unlimited trade would become the determinants in fighting against famine and environmental degradation. They forgot that capital's egoism and its derivatives, as well as aspirations of the rich to be richer while they get away from real tackling the global famine and poverty challenges by means of granting "crumbs" of welfare, block these good intentions. Such a charity has also created the global network of quasi-philanthropic lobbyists, which capture a substantial share of funds into own pockets under the pretext of helping the poor and starving people.

Hydropower generation prices are another factor of global impacts on the water sector, in particular on irrigated farming. The fact that key power-generation facilities are usually located in upper courses of rivers creates competition regarding flow regimes with irrigated farming most areas of which is mainly located along the middle and lower reaches of rivers. There is a risk that two tendencies - the growth of energy costs (Figure 6.12) due to the increase in oil prices and the drop in agricultural production prices - can create unequal, in economic terms, conditions for compensating the so-called "loss of profit" to the upstream countries by the downstream countries.

Up to now, this problem has arisen only at the Naryn-Syr Darya cascade. Kyrgyzstan and Tajikistan utilize their water resources, first, in the interests of meeting their own energy demands and in expecting some benefits from the downstream countries. An intention of upstream countries to utilize their hydropower potential that is partly developed to obtain the maximum profit is quite understandable.

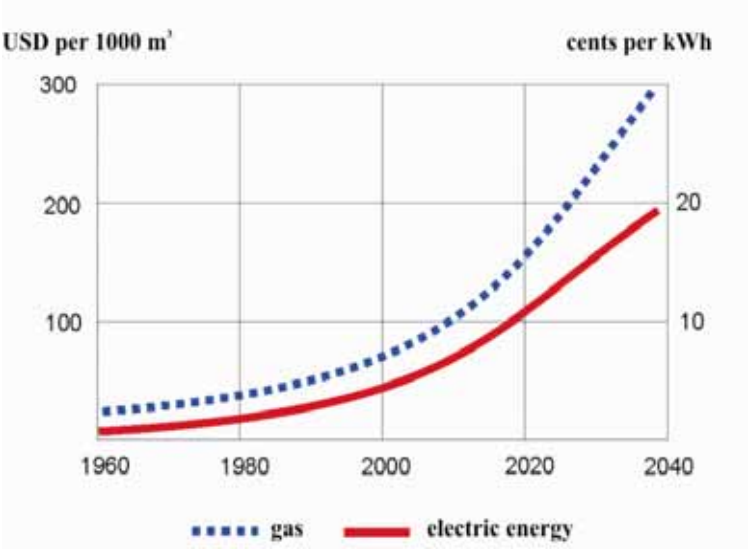

Figure 6. 12 **The Global Growth of Gas and Electric Energy Prices**

Besides, in the Soviet period, the principle of the common international law: "do not harm, otherwise pay" was applied in Master Plans developed for the Amu Darya and Syr Darya basins. The integration that is in fashion now was provided for by means of using the hydropower potential in such a way that would allow avoiding conflicts with interests of irrigated farming in

the middle and lower parts of river basins and with deltas' demand. At present, all countries in the region exploit their hydropower potential only on the basis of the large water infrastructure constructed during the Soviet period but under departure from the principles established at that time - transition from water releases from upstream reservoirs in line with the irrigation-oriented schedule towards mainly the power-generation-oriented schedule.

This problem was partially solved by signing the Agreement of 1998. According to this agreement the excess electric energy generated above the demand through summer releases should be compensated by countries located along middle and lower reaches of rivers at agreed prices. Currently, electricity prices (US$ 00.2 to 00.3/kWh) are still comparable with market prices (thermal energy costs US$ 00.45/kWh) but what is expected in the future? Therefore, Uzbekistan is already striving for almost full satisfaction of its demand for additional water through use of releases from the Andijan Reservoir and, partially, through construction of in-channel basins. Such an approach is possible in wet and average years relative to water availability but fails in dry years.

In addition, prospects of developing hydropower sector in the region, including an opportunity to construct the cascade of the Kambarata Hydropower Stations (HPS) on the Syr Darya River, Ragun HPS on the Vakhsh River, Dasht HPS and Juna HPS on the Panj River attracted attention of the World Bank and even of the large financing actors in USA, Iran, China and Russia. A possibility to export hydropower to Pakistan, Afghanistan, China and other energy-deficit countries will create commercialism for the hydropower sector and ability to establish, as a lost profit, higher prices of winter electric energy 2 to 2.5 times. A solution should be found using different instruments acting at the regional level, such as:

- Signing the new Agreements on the Syr Darya and Amu Darya rivers, as soon as possible, which have to state the provisions for new construction and operation regimes of reservoirs taking into consideration the interests of hydropower, irrigation and environmental flows. In particular, this Agreement should clearly set obligations of the parties regarding the rivers' demand as the natural object and of other riparian countries' demands. The principle "do not harm, otherwise pay" implies that any country that causes damage or is planning to undertake actions that may cause damage should enter into negotiations with the neighbouring countries and will have to implement a set of measures to prevent the expected changes, or compensate losses or pay for damage;
- Thus, agreed actions are needed to prevent probable damage. At the same time, one should bear in mind that the successful parity management of transboundary waters is feasible only if all the countries are not aimed at maximum effect for one country, and observing the so-called Pareto's principle, according to which every party can get a maximum effect without damaging another party;
- The present system of relations concerning the Naryn-Syr Darya cascade result in regular neglect of the environmental flows through the Syr Darya River in summer and in floods in the lower reaches in winter. If to evaluate the social and economic losses and to counter-claim to the hydropower sector, then it would be hardly advantageous for the latter to strive for maximum profit. Thus, if the consensus regarding equal profits will be achieved then the solution could be found: the effect of hydropower development while meeting the clear-cut reasoned social and environmental demands with specified compensations;
- Riparian countries by uniting with the countries interested in electricity supplies should establish the water-power consortium for constructing and operation of hydropower

station cascades that would balance the demand of electricity supplies proceeding from the demand of country-recipients and satisfy irrigation, nature and other downstream users' demands as specified by the ICWC;

- Establishing the River Basin Council in each river basin as the public body for governing activities of the BWO, which along with ICWC members, i.e. representatives of the national Governments responsible for water supply will include representatives of all provinces located in the basin and large water users such as the hydropower sector, delta management organizations, and conservancies. Their involvement and public control over management will promote equal and equitable water use and allocation on transboundary rivers.

It is advisable to consider and apply the experience of Canada and the USA, where hydropower station management is separated from river water management, and those in charge of hydropower buy water from the US Bureau of Reclamation or from Canadian provincial water organizations.

The Concept of "Virtual Water"

Thanks to Tony Allan's publications, the concept of virtual water has been recently developed. According to this concept a volume of water required to produce commodities or services which are exported from one country into another one creates an opportunity to reduce water demand in country-importer, especially in countries with scarce water resources. In the case study of the Middle East countries, such as Israel and Jordan, the concept was demonstrated as the means for country survival when water availability was less than 500 m3/year/capita. A. Hoekstra [47] and especially recently A. Chapagain [45] made a great contribution to the dissemination of this concept.

The approach is quite interesting for researchers and analyzing redistribution of water used for producing various commodities and services among countries. However, it doesn't discover any new fragment in the general picture: taking into account virtual water, water consumption per capita in countries of the G8 amounts to 1,676 m3/year whereas in other countries only 1,160 m3/ year.

However, the USA with a consumption of 2,483 m3/capita/year is on the top of water users' pyramid, and at the same time, in China a minimum amount of water is consumed (702 m3/capita/year). A very interesting situation is observed: the USA consumes more than 330 billion m3/year of foodstuffs produced using alien water and, hence, is responsible for pollution and depletion of almost 8% of the global "blue" water resources. In the similar way, A. Chapagain has estimated that EU countries consumed 20% of water taken out of the Aral Sea. This estimation did not consider losses in the irrigation systems, with accounting of which "the EU's share in depleting the Aral Sea would exceed 30 to 35%"!!! From this point of view, undoubtedly, the approach of "virtual water" is interesting for estimating the profitability of cultivating various crops under different conditions, for selecting the most profitable crops and comparing their potential sale at international or domestic markets. However, all authors make estimations only in terms of water, forgetting at all about economic indicators that are derivatives of income, especially in such areas as processing, marketing, consumption, as well as about economic benefit of agricultural production in itself, the role of associated effects and the social value of irrigated farming.

In addition, a water-dependency index taking into account virtual water is introduced in contrast to the food independence notion. A water-dependency index, as proposed, and assessment of water deficit based on virtual water create distorted picture of national food self-sufficiency. J. Worner [51] correctly noted that under the conditions of price fluctuations at the international market, an opportunity of developing countries to provide their population with food at reasonable prices may be lost due to a jump in import food prices or a great drop in export food prices. Therefore, the index (a water-dependency index as the ratio of the net virtual water import and the total national water resources use as proposed by A. Hoekstra and I. Hung [47]) that seems to be satisfactory may react to any landslide of prices of export showing the need to reduce food import for enhancing "own water security" while the food self-sufficiency can considerably decrease.

Therefore, the national food security is more important than fictitious water security. An index showing a share of consumed food that is produced in a country will guarantee that jumps in prices at the free market will not create the critical social situation in the country.

All publications make casual mention of the very important aspect of irrigated farming in developing countries, i.e. its social value as one of key factors of rural employment and a source of incomes for those who are directly engaged in irrigated farming and for employees in associated sectors, services, etc. In this context, the analysis conducted in the frame of the RiverTwin Project (www.cawater-info.net/rivertwin) is representative regarding a role of irrigation in generating the GDP in rural areas in the Tashkent oasis. A size of income generated on large-scale irrigation areas is comparable with that obtained from crop production and consumption at own small holdings. The latter sometimes exceeds the first mentioned component of rural incomes. Appeals of some globalists to head for the experience of countries ensuring employment in the industrial sector are hardly feasible for developing countries with low incomes, taking into account that the costs of job creation in industry (US$ 10,000 to 16,000 per one jobsite) is several times higher than in agriculture (US$ 1,000 to 2,000 per one jobsite).

Thus, virtual water as an indicator of food production profitability or its non-profitability in any country is just a potential theme for researches and macroeconomic exercises. As applied to countries with the transition economy, deficit of available assets and poor purchasing power, virtual water is a counterweight of national or regional self-sufficiency of food or agricultural raw materials. The policy of subsidizing in developed countries along with propaganda on the virtual water concept can also undermine the financial potential of local producers in the future when food and agricultural production prices will increase (this is quite realistic due to the WTO policy), and then famine challenges will be exacerbated owing to destruction of the national infrastructural potential.

How to withstand the global challenges? National policies vis-à-vis globalization

In our opinion, in such areas as information, scientific-technical and know-how exchange, the openness and opportunities to apply institutional, managerial, communication and other innovative advances, the global tendencies need to be widespread in the water sector and water-related sectors, first of all, in irrigated farming. At the same time, the specific "spirit of water" needs to be created. This implies the spirit of sanctity, free access to safe water, and overall responsibility of communities regarding water resources and water users regarding supporting its exclusiveness and rational use, as well as the overall understanding of impossibility of monetizing water and transforming in an economic good, its pollution and depletion. It seems that there are good lessons learnt from such countries as Japan, Canada, The Netherlands and Switzerland. These water-abundant countries have created the perception of uniqueness of water as both nature

component and a public good. This does not mean that water should not be evaluated in economic terms; moreover, only a stable and reliable financial basis aimed at conserving and enhancing the water potential may serve as the cornerstone for the future sustainability of society under the conditions of imminent water shortage.

Water ethics, which was developed in all religions and ideologies, have to be put into practice in the form of specific culture of water perception, awareness of all generations that water is unique for both a human being and nature and of elaborating the global water code as the statute-book with indisputable rules of water relations in the context of water right!

From this point of view, the international water law and UN documents (human rights, international conventions) don't state clear-cut recommendations, guarantees and mechanisms for enhancing the rights to access to safe water, water for food production and water for nature. This implies that these documents cannot be used as the basis for future sustainable water supply for population and society as a whole. On the one hand, the vagueness of many provisions in the international water law that may be interpreted by any country to its own benefit is certain impediment and, on the other hand, the lack of understanding of the enforcement mechanism as a chain of obligations and rights of actors and an opportunity to avoid the bureaucratic influence of national, provincial (governor) and local hydro-egoism at all levels of the water hierarchy from a basin to a water consumer. Understanding the need for elaborating strong and obligatory rules and regulations in the frame of inter-state agreements and the principles of water management at the national level should withstand new regional challenges. In Central Asia, water-related, transport, energy, economic and other interests are closely interlinked, especially taking into account certain geographic isolation of these nations, and only cooperation - and water as its pivot - may ensure the sustainability and long-term prosperity and peace in this region.

The most reliable "compass" for this cooperation is the efficient regional legal and institutional frameworks coupled with a present-day national systems of water governance, which include the National Water Codes and future development strategies stipulating efficient and rational water use, wide introduction of integrated water resources management (IWRM) at all levels of the water management chain, along with public participation and water users' initiatives based on local traditions of careful attitude of all our nations to water.

At the same time, one should also bear in mind that the forces of monetary globalization and egoism will seek various forms and loopholes to exert their pressure on the spheres of economy, policy, culture and education in order to perpetuate the power of money and the permanency of social stratification. As A. Shady underlines in the above-mentioned summary: "One cannot ignore those actors who are driven by their mercenary interests are present at the "water scene". These are large corporations that actively operate in the global food production chain: industrial contribution into agriculture (incomes from sales of ten best goods amount to US$ 370 billion), among which Syngenta, Bayer, BASF, Monsanto and DuPont; food companies of the processing industry and traders (incomes from sales of ten best goods amount to US$ 363 billion), among which Nestle, Cargill, Unilever, Midlend Arkera Daniels (ADM), Craft's foodstuff; food retail dealers (incomes from sales of ten best goods amount to US$ 777 billion), including Wal-Mart, Carrefour, Royal Ahold, Metro AG, Tesco." In addition, there are great interests of hydropower corporations, manufacturers of hydraulic machines and their accessories, financial corporations of "selfish nature."

How to withstand these phenomena? There is only one way. It is necessary to strengthen the national and regional policy that should be opposed to global tendencies and simultaneously make use regional capabilities and globalization advantages. John Ralston Saul in his book: "The Collapse of Globalization" [52] shows that the theory enunciating the freedom of market and competition as key driving forces of the economy and progress has led to a chain of crises like the

collapse of the Asian economy in the late 1990s, recession of Canadian development over the same period, and the growth of unemployment even in OECD countries in absolute terms. In contrast to that, China and India, by adapting to globalization trends, are dictating to the world their own rules of play and demonstrates their high and stable development rates. The basis of their success is the national strategy and purposeful policy that take into account market's driving forces and global challenges.

Some peculiarities of the modern market are driving forces of globalization: in particular, at the market of food, fuel and energy resources; deficit of some natural resources; respective natural and social phenomena. One may literally say that these forces, besides apparent management mechanisms and tools, are controlled by "invisible submerged parts of icebergs" such as international financial institutions and international financial and business monopolies reproduced by the globalization. Protectionism, subsidies, public relations and even the fight against international terrorism appear now at this scene as "pros-globalization", while trade barriers, customs fees and liberties, international unions and agreements, and wise national policies are the sides of "cons globalization" that defend national rights, food self-sufficiency, etc.

China showed an excellent example of benefiting from its anti-global strategy in cotton production and processing. Taking into account low cotton price, China processes all of its own cotton, 4.5 million tons a year, in textile manufactured under support by the Government and buys about one million ton of cotton a year at low prices for following processing. At present, China is the world supplier of textile at the expense of advanced technologies and cheap labour. In contrast to subsidies in developed countries, China has developed its own system of supporting agriculture and the water sector. As a result, these two sectors achieved the highest level of development according to both growth rates and crop yields, thus allowing to feed China's population and to provide export of goods.

A role of subsidies in irrigated farming and the water sector depends on those forces which manage these subsidies invisibly for us. Whereas subsidizing of food and technical crop production in developed countries is aimed at market penetration into developing countries, the latter have to protect their own commodity producers. Domestic subsidies or protection of national producers through setting custom and tax barriers for foreign importers can become the only response to backing of foreign producers. However, it is necessary to avoid the influence of personal interests of local bureaucrats, intermediaries, lobbyists who are eager to make money at any cost and often promote import to the detriment of fellow-countrymen instead of supporting national producers. Consequences of such harmful actions are affecting not only agricultural producers; they exert negative impacts on the whole social sphere in rural areas, development and maintenance of transport communications, secondary processing industries and supplementary enterprises, etc.

All these actions tangle a knot of incompetent solutions, which sometimes look like helpful ones, but often end up in failure on the national level. Let us consider the subsidies of the water sector. After independence, the World Bank and other international financial institutions, all the time, were urging on Central Asian countries to refuse from supporting the water sector. To their credit be it said that Uzbek, Kyrgyz and Turkmen leaders have not allowed to do this. Kazakhstan has decided to liquidate almost completely all sources that were formerly used for supporting the water sector and especially land reclamation activities. Initially, everything went well in this country, the Ministry of Finance was pleased, but drainage tube-wells, in particular in southern areas of Kazakhstan, went out of operation. Farmers could not afford to cover operation and maintenance costs of drainage tube-wells at the expense of their incomes. Gradual salinization (that had been forgotten in the nearest past) has now proliferated like a cancer all over Southern Kazakhstan, and crop yields on lands, which formerly used to produce 3 to 3.5 ton/ha/year of

cotton, have reduced up to 1.7 to 1.8 ton/ha/year! At present, the Government of Kazakhstan has launched an impressive program of subsidizing the agricultural and water sector that provides considerable support to these sectors in Kazakhstan.

Along with improving the national policy, the co-operation of regional communities, which will enable to develop joint measures for ensuring the regional security including water, power, food and environmental aspects, should become the response to globalization. Regional co-operation allows smoothing the regional differences in demography, availability of land and water resources and ensuring peace and prosperity in the region. The results obtained at our demonstration sites in all countries of Central Asia show that the cheapest grain is grown in Kazakhstan, most cost-effective sugar and potatoes are produced in Kyrgyzstan, fruits and vegetables in Tajikistan and Uzbekistan and maize in Uzbekistan. When an agreement (like in the EU) on domestic and regional foreign-trade prices on agricultural output will be reached, the region itself will be able to supply all necessary foodstuffs in full. By the way, the forecast up to 2025 allows making the conclusion: if this will not be done then Kyrgyzstan and Tajikistan will fail to meet their demands for food products even in the case of planned development of irrigated farming.

Co-operation of Central Asian states based on the understanding of mutual interests should become a barrier for harmful hydroegoism; since 60% of the rural population in Central Asian countries and 100% of total population, directly or indirectly, depend on water and irrigated farming, and the latter, as in other countries, is related to the sustainability and security of water supply.

Without negating positive implications of global challenges for our countries, it is necessary to note that there are threats related to apparent or latent tendencies of globalism that must be taken into account by Central Asian governments under strategic planning and decision-making. In Central Asia, nations united by centuries-old common cultural, human, social, legal and religious traditions need to use positive factors of globalization and to withstand its negative consequences based on the regional co-operation.