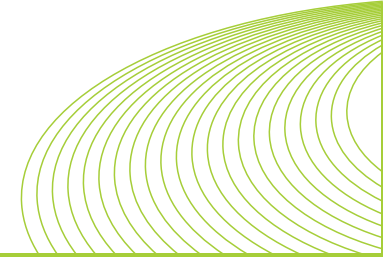




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Towards the 6th World Water Forum – Cooperative Actions for Water Security

International Conference

12-13 May 2011
Tashkent, Uzbekistan

Guaranteeing Water for Future Generations

***Regional Process Commission:
Central Asia Cross-Continental Process***

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Cooperative Actions for Water Security**

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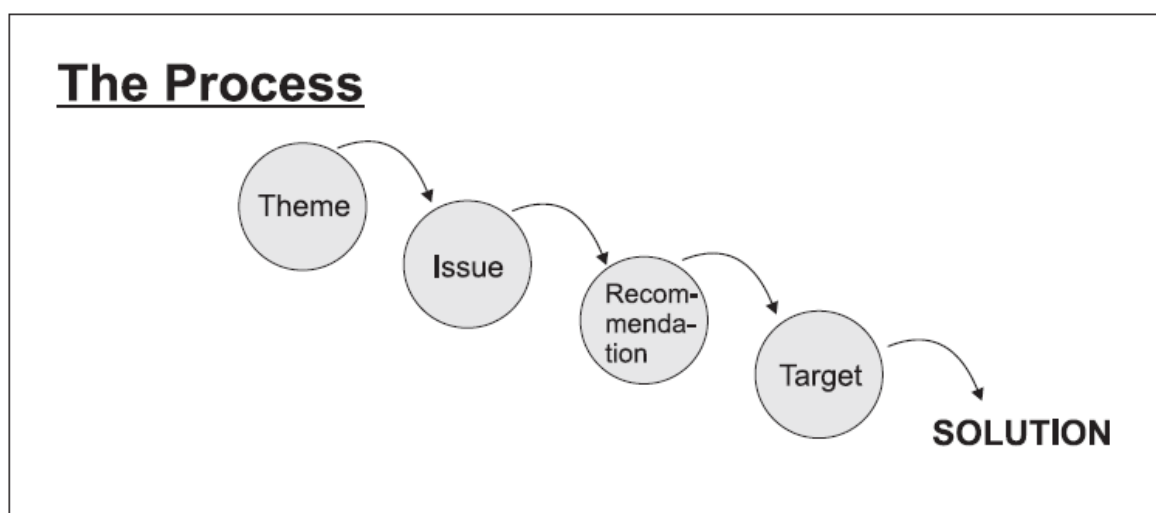
Concept Note on Thematic Priority

Introduction

This Concept Note was prepared within the framework of the Process development framework "From targets to solutions" (Fig. 1) adopted by WWC and the International Forum Committee. The Concept Note sets up successive steps for development of the proposals on solution of urgent water problems towards the 6th World Water Forum.

The proposed topic "Guaranteeing water for future generations" corresponds to the key priority 1.1 of the WWF6 thematic framework: "Guarantee access to water for all and the Right to Water", which is associated with topic 7 of the European thematic program. This topic is critical for achievement of MDGs both relating to the access to drinking water and sanitation as well as to ensuring of food security, employment, and healthy environment.

The Central Asian region similar to other countries within the Post-Soviet space is under influence of a number of dynamic factors contributing and increasing potential crisis in water supply, national development, and preservation of ecosystems. This is why presentation of this background note on behalf of the region as a Forum framework was preceded by stakeholder meetings, such as the International conference "Transboundary environmental problems in Central Asia: application of international legal mechanisms to solve them" organized by the Environmental Movement of Uzbekistan in Tashkent, 16-17 November 2010, the Symposium "Water in Central Asia" organized jointly by SIC ICWC and German Federal Foreign Office in November 2010, participation of EECCA at the Conference in Megeve, France in September 2010, and the EECCA NBO Assembly in Moscow in May 2010.



Schematic representation of the process involved in the development of "solutions" for the World Water Forum 6 (redrawn from the presentation of Prof. B. Braga at the Stockholm world water week, 8 September, 2010).

Fig. 1

Future water supply challenges

The region is under influence of a number of dynamic factors shaping potential water supply and depending on the balance of demand and resources. Traditionally, the resource side was characterized by flow variations that were reduced significantly in the 1960s to 1980s in of the last century by the newly developed system of seasonal and multiyear storage reservoirs with largest dams and other structures, as well as the network of intercepting canals. All these developments allowed to achieve high degree of natural runoff regulation. Another factor was population growth and industrial production, and, accordingly, of water demand in terms of quantity, quality, and service degree by all water users. Besides, agricultural focus of the region formed by arid and semi-arid climate and accompanied by fast-growing irrigation areas caused excessive water demands that were highly competing with the demand of nature and, finally, led to disasters of the Aral Sea and its costal zone Prearalie, Balkhash Lake, wetlands and deltas, and even on some rivers themselves. The current situation is exacerbated by new circumstances related to the following main factors:

- irregularity of flow formation between upstream and downstream countries and interdependence of the countries in terms of water;
- most main water sources are of transboundary nature and consequently competing aspirations and actions of the countries, based on their national and often sectoral interests, especially by the owners of hydropower plants, were developed. In result, the degree of uncontrollability increased and consequently, considerable loss of available water resource resulted from the reduced degree of flow regulation by reservoirs due to commercial hydropower interests;
- change in character and orientation of water demand;
- worsening of water measurement in transboundary sources and in the countries;
- weakening of financial capacities of the governments and water users and as a result, worsening of water supply reliability.

This is a result of both decay of government financial capabilities, weaker attention of some states to water problems and hence, to water management.

Due to the last factor, the actually irrigated areas have decreased significantly (more than 1 Mha in Kazakhstan), operation of the large-scale irrigation systems like "Kuban", "Freghat", "Linear", etc. was stopped almost completely, and vast drinking water supply systems, especially rural water pipe-lines, failed to function. In consequence, we have noted considerable losses of human capacity, destruction of the training system and services, brain drain in the sector, and poor financial incentives of the staff

Financial sustainability of water sector operation and development was affected also by jumps in the prices of agricultural products, increase of farming input costs, increase in the cost of oil and its products, of electricity, etc.

Under the early transition to the market, water users often do not possess enough economic capacity in order to exercise their water rights. As a result, physical access to water cannot be provided since it is financially unaffordable.

Climate change showing in periodical temperature increase and related phenomena, such as glacier melting and more frequent and higher amplitude extremes, raised the role of long-term flow regulation, which now is not sufficiently effective, of river runoff changes and of all-round water demand growth, etc.

Given growth of demands and increased instability of water sources, water would become even more expensive, regardless of whether we want it or not. This process was predicted as early as in the Soviet time, based on the rise in the cost of technological factors, growing water deficit, and more complicated abstraction of each additional cubic meter of water. It is estimated that higher is the degree of regulation, the more difficult is to extract additional water resources in a basin. This becomes more evident nowadays, where water shortage and competition over water exacerbate all over the world and in our region, as well.

Today, beside technological and natural technical growth of the cost of 1 m³ of water, quite new factors arise on the scene, such as globalization. Globalization has many manifestations and consequences, the major one being commercialization of agricultural product prices and global prices of fuel and energy. Prices of agricultural products, being often manipulated, determine capability of farms to cover the cost of water delivery to dry land, which otherwise cannot produce sustainable yield or any yield at all. On the other hand, growth of organic fuel prices has an effect on the prices of electricity that makes generation of hydropower absolutely more profitable than irrigated agriculture. In the Aral Sea Basin the net gain of 1 m³ of irrigation water averages 2-3 cents/m³, with the maximum of 5-6 cents/m³, including interests of farmers and water-management organizations, while the net revenue from hydropower generation regularly exceeds 4-5 cents/m³. Water-related tension, which occurs mainly in dry years, usually is popularized widely in foreign publications of quite serious authors. May be highly grotesque but, to a certain extent, enough realistic assessment of water situation in Central Asia is given by the former German Ambassador in Kazakhstan and Kyrgyzstan Mr. Klaus V.Grevlich: "Water deficit and transboundary water pollution are practically growing in Central Asia. The main cause of water deficit is not a physical shortage of water but rather the power relations, a lack of institutional capacity, and poorly developed water use management, which is often broken by participating actors".

Given this categorical statement and apparently rather superficial judgment, nevertheless, it is fair to say that there are four main threats to guaranteed access to water, despite the existing sufficiency of water resources for the nearest future:

- weakness of institutional mechanism of water resources management;
- lack of legal regulation both at international and national levels; this is especially manifested in change by the upstream countries of natural river regimes, resulting

in artificial water shortage in summer and floods in winter. As a consequence, the right of downstream countries to water is infringed;

- subjective interference in water management by “decision-makers” at different levels – from global, state to local (khokimiyat – local governments, shirkats – cooperatives, etc.);
- commercialization of water and attitudes around water;
- irrational and ineffective use of water resources, including fresh groundwater.

When assessing the future, one should consider that, irrespective of these four serious disadvantages, regional resources are sufficient to meet water needs of all users provided that earnest efforts are made that the whole mechanism of water management guarantees enough water for all water uses.

From theme to solutions

According to the methodological recommendations of the International Forum Committee, a regional process should follow the selected theme and develop towards the targets, with output to final recommendations specific for each region and, moreover, specific for each country. This Conceptual Note does not claim to be exhaustive for all the countries, and it is expected that members of the working group concerned with this theme will elaborate it taking into account the specific peculiarities of their countries. Moreover, stakeholders will be involved at each stage of proposal development exactly under considered solution during the preparatory process.

Theme – forecasting future situation in Central Asia for the next 25 years and water development options as recommendations based on national and international institutional practices.

This thematic direction will be developed in the following chain:

- forecast and its options ;
- based on the above, recommendations for the selection of best solutions;
- **target** – establish a mechanism for guaranteeing water for the future and build respective tree of targets;
- **solution** – national programs on joint actions for ensuring water security.

What is the forecast for the future?

Comprehensive scenarios of future water supplies that were developed by SIC ICWC on the basis of UzHydromet's climatic scenarios show the following:

- under scenario of air temperature increase and unchanged precipitation level, already by 2030 water resources shall decrease by 5-8% of the current basic norm in the Amudarya basin, while there would be no considerable changes in the Syrdarya river basin, i.e. all deviations would be within the range of natural flow variation;
- without consideration of precipitation in the scenario, taking to account only air temperature change, in the long-term (2050) this should lead to reduction of flow in both the Syrdarya and Amudarya rivers. Flow reduction could be within 6-10% of the norm for Syrdarya and within 10-15% for Amudarya.

For the Amudarya river, we have reduction of surface runoff by 5.5 to 9.8 km³ in average year, while in the dry year this reduction is by 18.5 km³ as compared to the average year! For the Syrdarya river, surface runoff does not decline in average year, and it decreases by 9-10 km³ in dry years as compared to average ones. In principle, in 2008, the total water resources were already 95 km³, i.e. close to predicted figures.

It is expected that depending on the scenario of water management interventions, the situation due to climate change could be improved or worsened in the following ways:

- if the HPPs (Toktogul, Nurek, Kairakkum) are operated in irrigation regime, with maintenance of long-term and seasonal regulation, there would be no idle discharges from the rivers, and the mean annual resource would be equal to flow norm. In dry year, through the long-term regulation of the Syrdarya river, about 3.5 – 4.0 km³ a year could be added, whereas, according to estimations of SIC ICWC¹, this addition could be equal to 3.0 km³ a year along the Amudarya river;
- in case if the HPPs are operated in the energy-generation regime, the situation would worsen – in the average year, additional decrease would be more than 5 km³ of water along Syrdarya and more than 2.2 km³ along Amudarya.

Thus, under the optimal option, the total available water resources for the average year would be equal to 126.5 km³, with 74.7 km³ in the Amudarya and 51.8 km³ in the Syrdarya system. In the dry years, the total resources under that option would be 95.8 km³ only: 56.2 km³ – Amudarya; 39.6 km³ – Syrdarya, i.e. values close to those already observed. In the worst option, these indicators would be 7 km³ less in average years and as much as 14 km³ lower in dry years. In case of climate change, giving priority to the commercial interests of the energy sector leads to the abrupt

¹ V.A. Dukhovny, A.G.Sorokin «Assessment of Roghun reservoir's impact on Amudarya river flow regime», T., SIC ICWC, 2007, 119 p.

reduction of Amudarya flows and results in a considerable increase in the range of flow variability. .

This picture of reduced resource is additionally complicated by growing water demand. Under the optimistic development option (restriction of the irrigation area to 8500 thousand ha, the mean gross irrigation application rate of 9400 m³/ha; domestic consumption of 250 l/person/day; water use by industry and other sectors of 5.0 km³ a year), assuming reasonable growth of water use, the region can survive to the demand level of 2035. That correspond to Syrdarya water availability in average years, with water shortage in dry years similar to that, which we experienced in 2008. The situation for Amudarya would be much more complicated, with permanent deficit of total demand (including environmental one) in the range of 9 km³ or more! Concerns arose that this deficit would be compensated at the expense of the Prearalie's demand!!! Hence, it shows that the priority attention should be given to Amudarya water management, including water saving, better water accounting, etc.!!!

Contrary to current attention of the donors, which is focused mostly on the Syrdarya river basin, the countries and donors should focus more on the first-priority sites of the Amudarya river basin, where unit irrigation water application rate is higher as well.

Recommendation-guidelines for selection of best solution ways

Comparison of the above set of future development options provides convincing guidelines for selection of the best solution in balancing water demand and supply that should be included into the national programs for future survival. These guidelines include:

- joint action of all the basin countries towards more precise long-term and annual forecasts by improving activity and cooperation of national hydrometeorological services; organization of an early warning system (as developed under round-table 7);
- transition to the system of long-term and seasonal regulation, which will take into account the need to mitigate extreme water conditions both in dry and humid seasons; rehabilitation of irrigation releases from the main flow-forming waterworks facilities (as developed under round-table 3);
- development of national programs of water conservation within the framework of all-round implementation of IWRM in all the countries, and, at the same time, development of a program for achievement of potential water productivity in all economic sectors, first of all, in irrigated agriculture (as developed under round-tables 5 and 4);
- development of a mechanism for adaptation to climate change and to the resulting increase of flow variability, taking into account the related economic aspects.

Target – how to guarantee the right to water for future generations?

The water management system, with its multisided, multisectoral, and multipoint structure, takes natural resources of water, transforms them and adapts them to the needs, first at national level and next zone by zone distributes water following the institutional water allocation structure. Next water is delivered to the aggregated end users (industries, residential areas, economic, agricultural complexes) and, finally it reaches the ultimate users.

If we follow this complex system with many interfaces between the managerial levels and numerous influences on supply and demand, then critical non-sustainability of water use and water supply becomes evident.

Hence, there arises the need to present a target – guaranteeing sustainability – in form of a hierarchical tree of targets (Fig. 2) presented in such a way that each level has:

- well determined water rights, both quantitative and qualitative;
- mechanism of their observance and control;
- provision of stability or compensation rules taking into account all the opportunities provided by the available resources or by demand, to be applied in case of flow fluctuations (natural and anthropogenic) or emergence of some other destabilizing factors.

Here, one should especially underline the issue related to sustainability and safety of the whole multipurpose water-resources scheme operation, the basics of which are addressed in thematic priority “2 – “risk management and water security”.

Sub-target 1.1. Sustainability of water supply for national and zonal levels in transboundary terms is of fundamental importance

Elaboration at the interstate and national levels of adequate political governance principles on transboundary water management and use is undoubtedly, an essential condition for the survival of the region. Those principles should take into account the internal water resources of each state and the peaceful ways of meeting their future challenges related to. The region possesses enough water and energy resources in order to achieve this target.

The Decision of the Heads of Central Asian States of April 28, 2009 gives hope that our leaders have general understanding that this is the only direction to be followed, since any other way is a path to losses, unexpectedness and confrontation.

In this context, there are three fundamental initial actions and solutions especially important:

a) *strict observance by all the countries of the international water law*, which is based on respect of the rights of each country located along international waterway for its stipulated water share, based on reasonable and equitable use and avoiding harm to riparians.

Combination of principles of “equitable and reasonable use” and “do not harm” that make part of the international water law may set the scope, within which the political will should be developed.

b) *development of mutual trust among the basin countries*, for building of which the signature of Conventions could be the first reasonable contribution. Next, the trust should be strengthened by avoiding categorical claims and measures that always do harm the trust (as in the case of operation of Naryn cascade). The trust can be promoted by transparency of information (particularly, economic indicators of hydropower, flows at the transboundary gauging stations, and other data of mutual interests). This could remove suspicions of speculative nature of HPP cascade operation or deception of riparians regarding the amount of water supply.

c) *elaboration and agreeing upon the regional water strategy* (within the framework of the forthcoming ASBP 3), which is to be based on IWRM principles stated in section II and implementation of IWRM principles through the promotion of water-conservation technologies in all economic sectors, taking into account demands of the nature and aquatic ecosystems.

This strategy should set:

- main rules and procedures for future joint planning and management of transboundary waterways , taking into account all of the above-mentioned destabilizing factors (climate change, demographic growth, economic development, etc.);
- objectives of national water conservation programmes to overcome negative tendencies that exist in all the basin countries;
- institutional and technological measures for utilization of additional reserves, such as use of return water, improvement of water measuring system, large-scale implementation of IWRM at national and regional levels. One important step in this direction could include strengthening of basin management (BWO Amudarya and BWO Syrdarya) and establishment of a Basin Council by involving representatives of other sectors, such as energy, environment and others, as members of the Council.

The Basin Council should have a right:

- to develop the mutually acceptable regimes of water distribution and releases from reservoirs;

- to involve hydrometeorological services in management and monitoring in order to improve reliability of forecasts,
 - to increase accuracy of water measurement, as well as responsibility for information provided to water-management organizations and water users;
- rehabilitation of the system of long-term flow regulation;
- elaboration and agreeing upon a procedure for overcoming extreme phenomena and ensuring safety of hydraulic structures (first draft of such document was prepared for the Syrdarya river and needs to be finalized).

Particular issue is the sustainability and safety of the whole multipurpose water-resources scheme operation, the basics of which are addressed in thematic priority “2” – “Risk management and water security”.

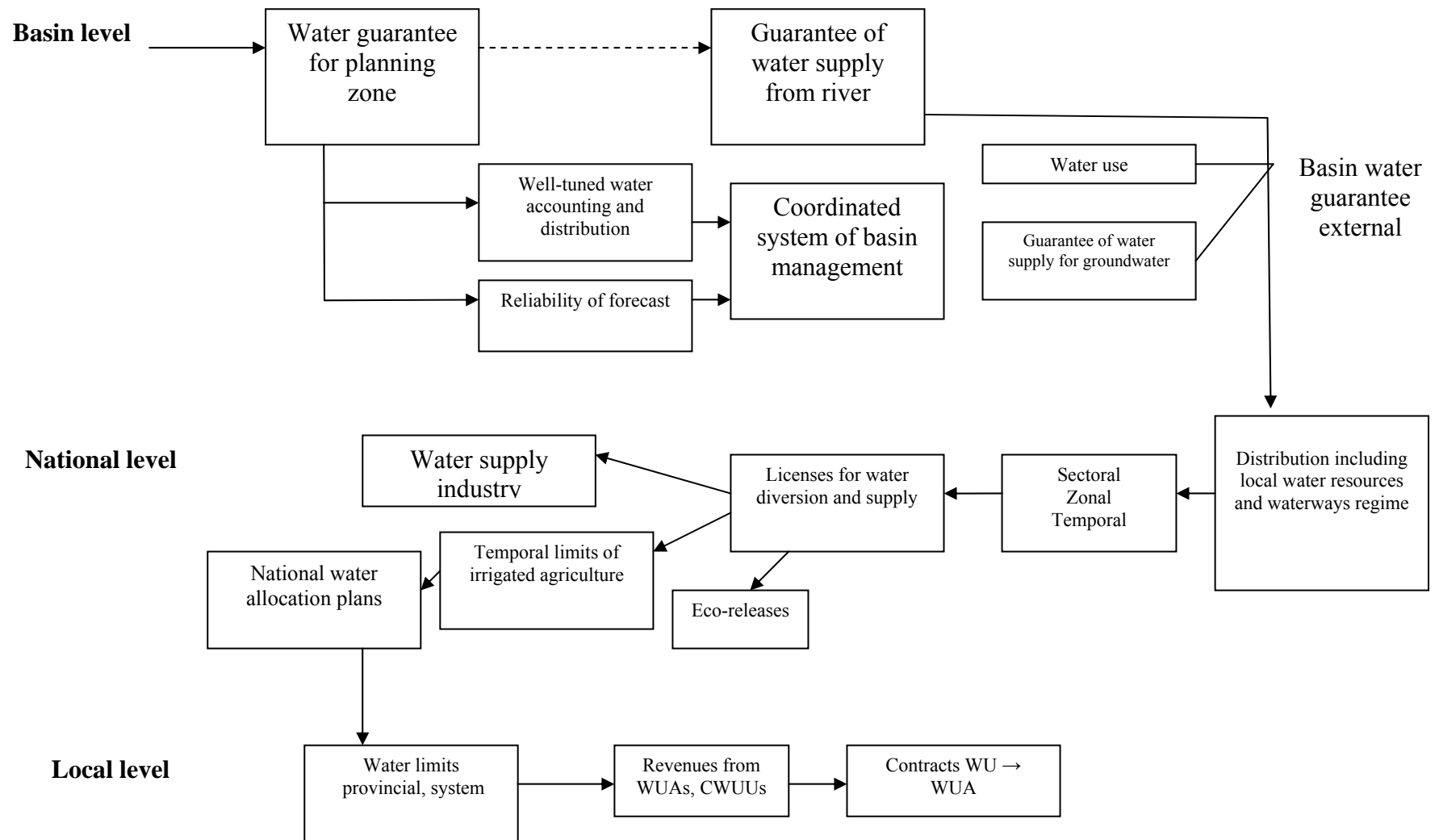


Fig. 2. Tree of targets for guaranteeing water for future and present water users

Sub-target II – sustainability of provincial, intra-national basin and local water users in terms of national guarantees for water

Major shortcoming of all intra-national guarantees for sustainable water supply is the fragmented character of national water management by sector and the effectiveness of such management. Though most countries in Central Asia declare the river basin approach to water management (water management in the hydrographic boundaries), without the appropriate support by public participation it is always possible that this approach will be replaced by sectoral one. In this context, all national water management systems need a whole range of improvements and reconstruction in order to remove the following basic shortcomings:

- Administrative-territorial system approach to water management;
- Absence of mechanisms for controlling the rights to water;
- Departmental approach;
- Non-sustainable water management;
- Vulnerability of water rights;
- Non-functional financial mechanisms;
- Lack of information on water or the situation that such information does not meet requirements;
- Absence of water accounting;
- Unstable water management systems which are unable to adapt to climate change.

The proposed solution is developing the "**National plans for improvement of water resources management in order to establish guaranteed water supply for the nature and all economic sectors**"

Such plan should stipulate the following:

- there is a single management of the national multipurpose water-use scheme in form of a centralized state department that fully coordinate (with public participation) all aspects of water management (such departments are available at present in Kyrgyzstan, Tajikistan, and Turkmenistan, however those in Tajikistan and Turkmenistan are not responsible for water conservation);
- water management is considered by the government as the highest priority issue;
- the government develops a mechanism, which ensures observance of water rights for all water users;
- the government accepts and supports IWRM as the major approach to water management, including involvement of stakeholders and equitable use of all types of water;

- there is a well-defined financial system for supporting the water sector, including the system of payments for water services and pollution charges; the system provides for subsidizing innovations, offering assistance to water users and promoting efficient water use; the government subsidize the system of water accounting and implementation of the SCADA system;
- the government should take financing of all main water sector's costs and subsidize a share of water user's costs both in terms of water delivery and water conservation and water quality protection, etc.;
- taking into account the experience of last 20 years, for the time being the government provides guarantees against privatization, denationalization and transfer to private sector of present water infrastructure
- the government supports the advanced training system for water specialists and users; organizers training for staff of different level; particular attention is paid to the program of future water leaders;
- the government promotes self-sufficiency of WUAs, canal water user unions (CWUU) and develops effective extension services for them.

The following conditions should be observed at the provincial and local levels:

- the administrative authorities should not be allowed to interfere directly in water management decision-making; they are involved in community water management as stakeholders;
- local authorities should be actively involved in the program of water productivity improvement and water demand management;
- local authorities, together with water-management organization, should watch over the development of a financial system for sustainable functioning of community-based water management bodies;
- State Water Inspection's agencies keep strong control over observance of water laws and water use limits.
- special attention must be paid to improvement of water quality, prevention and elimination of water pollution, creation of favorable conditions for normal evolution of flora and fauna, etc.

