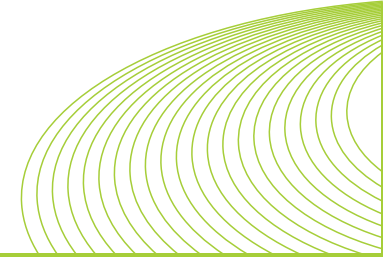




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Towards the 6th World Water Forum – Cooperative Actions for Water Security

International Conference

12-13 May 2011
Tashkent, Uzbekistan

Ensuring Sustainable Drinking Water Supply

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

**Towards the 6th World Water Forum —
Cooperative Actions for Water Security**

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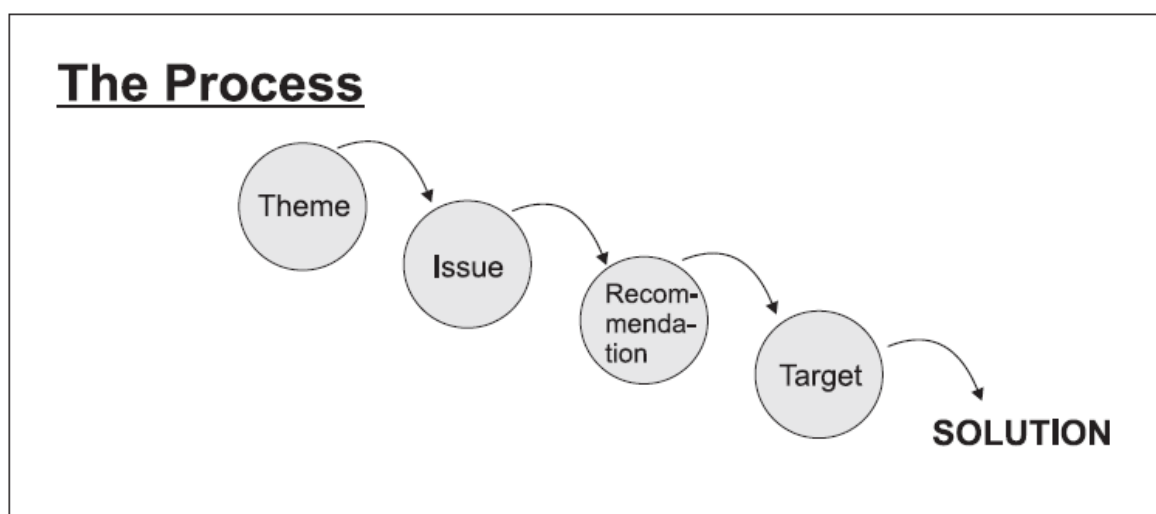
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Ensuring Sustainable Drinking Water Supply

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.



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

The proposed topic 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 relating to the access to drinking water in adequate quantity and quality.

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 drinking water supply sector.

Meeting Drinking Water Needs in CA Countries

In the recent 30 years, great efforts have been made in order to achieve 100% coverage of population with sustainable drinking water supply and sanitation. The water supply and sanitation systems used to be actively built in both urban and rural areas. Despite of certain differences in the scope of construction, operation and development of those systems, in general they were providing the population of the countries with sufficiently good quality potable water by disposing and adequately treating the waste waters. All aspects of the activities of the water management authorities (technical, financial, managerial, etc.) used to be governed by the State, that set the tariffs, subsidized the WSS sector, financed its development, etc. During the post-Soviet era, in the period of significant economic difficulties and in the beginning of the market economy formation, the existing governance structures and mechanisms of the WSS bodies had proved to be inefficient. Low level of the payment collection rate and insufficient state subsidies in the majority of countries had caused a drastic drop of the repair and maintenance works, which in its turn had caused increase of the wear-and-tear rate of the water supply and sanitation systems and the failure of some of their sections.

Recently, as far as the economies are stabilizing, the potable water supply to the population and disposal and treatment of waste waters is gradually becoming a priority trend in the national sustainable development programs over the region. At that, reforming of the WSS systems is being done differently in different countries.

It should be noted that within the last few years all countries have conducted an analysis of the potable water and sanitation problems in the region with assistance of a number of international organizations (OECD, WB, ADB and others). Immediately after beginning of IFAS activity, the ASBP-1 included the Project 5 "Clean Water and Sanitation" with the sub-projects 5.1, 5.2 and 5.3 for Kazakhstan, Turkmenistan, and Uzbekistan, respectively.

The summary conclusion of the available reviews is rather pessimistic: even though the sub-regions of Central Asia are rich in water resources in general, there could be observed a high wear-and-tear rate of national water supply and sanitation systems, inefficient water use, low operation level, undeveloped economic tools and ineffective governance the countries do not provide sustainable water supply services for their populations.

It is characteristic for all the CA countries that drinking, household, and industrial water supply as a whole account for a quite small share in the total water demand (Table 1).

Table 1**Demand for water by economy sectors for 2010, in million m³/year**

Country	Potable water supply	Rural water supply	Industrial water supply	Fishery	Irrigated agriculture	Other	Total
Central Asia							
Kazakhstan**	751	220	5357	550	15000	2177	24055
Kyrgyzstan*	175	150	550	70	9500	55	10500
Tajikistan*	700	900	800	150	13550	300	16400
Turkmenistan*	400	200	900	30	20000	0	21530
Uzbekistan*	2700	1400	1390	1320	52400	0	59210

*) Source: Report on SPECA Project (special UN program for economies of Central Asia) «Water supply and sanitation in the countries of Central Asia and Southern Caucasus», 2009.

***) Data of Committee for Water Resources, Ministry of Agriculture of the Republic of Kazakhstan, 2011.

Thus, the demands of the above-mentioned sectors account for 18.3 % in Kazakhstan, 8 % in Kyrgyzstan, 12.5 % in Tajikistan, 16.3% in Turkmenistan, and 45 % in Uzbekistan of their total water demand.

Majority of the water supply systems in the countries of the region were built in 1950-1980. During Soviet era the authorities due to the low prices for electric power and the relatively low cost of process equipment, construction of the water supply systems that did not require significant capital investment, but which required a considerably high operational cost, was prevailing. According to the experts' opinion, development of the water supply systems was mainly aimed at the use of new water sources, extension of the pump stations' capacity and the water treatment facilities (WTF), as well as the maximum flow capacity of the main water pipelines, etc. Problems of the efficient development of the water distribution systems, their zoning and rational water use, water metering and typical administrative issues actually used to lie outside of the operators' sphere of interest. Throughout the last 10-15 years of independence the quality of the services being provided by the WSS sector has dramatically deteriorated. This had been caused by considerable reduction of the WSS funding due to the general economic recession, decrease of the actual income of populations and the budget entering, lack of professional skills of the staff and other reasons. Consequently, by year 2000 a considerable part of the infrastructure was out of operation. High rate of wear-and-tear had led to the fact that instead of the preventive repair and maintenance, the WSS entities were forced to carry out the emergency and rehabilitation works.

According to the review of GWP CACENA (Global Water Partnership for Central Asia and Caucasus), the situation with the present coverage with water supply systems looks as (Table 2):

Table 2*

Republic	Urban	Rural
Kazakhstan	72 %	41 %
Kyrgyzstan	81 %	58 %
Tajikistan	93 %	49 % *
Turkmenistan	60 %	42,1 %
Uzbekistan	90 %	74 % *

*) According to data of SDC Project "Regional rural water supply", 2011, coverage with water supply system in rural area is 20 % in Tajikistan and 62 % in Uzbekistan.

The average water losses vary from 30 % in Kazakhstan to 75 % in Turkmenistan (Review of GWP CACENA, 2009).

From analyzes of data received from the national experts it can be noted that the state of the water supply systems in all of the countries does not vary much and is being characterized by the following common problems:

- High level of degradation of the water supply systems which is being proved by the worn-out and obsolete pipelines and equipment with damaged leak-proof insulation;
- High levels of water losses;
- Insignificant share of the round-the-clock water supply. High rate of the interrupted water supply under the fixed or unregulated schedule;
- Low level of accessibility of population to the potable water, especially in the rural settlements;
- Low tariffs for potable water and low collection rate of the water use fee, which does not allow coverage of the operational costs, as well as maintenance of the water supply systems and professional staff;
- Inadequate equipping of the water consumers with the water meters (especially in the rural area) that have adverse impact on the optimal metering of the supplied and consumed water, as well as to the water fee collection rate;
- Inadequate management of the water supply systems, insufficient number of the skilled specialists, especially in the remote areas and territorial subdivisions;
- Significant difficulties with supply of the required quality potable water to the population;
- Generally low level of the technical equipping of the WSS sector.

Meeting Sanitation Needs in CA Countries

The situation with provision of water for sanitation needs in the region is rather unsatisfactory. According to the data of GWP CACENA for 2009, the state of sanitation sector in CA countries is as follows (Table 3).

Table 3**Typical indicators of the sanitation systems**

Country	Coverage with sanitation system, %		Length of the sanitation network pipelines, km	Number of Sewage Treatment Plants		Settlements covered with sanitation systems	Average age of sanitation systems
	Urban	Rural		Total	incl. existing		
Central Asia							
Kazakhstan	84	10	90		60	220	>30
Kyrgyzstan	68	28	>1600	20	-	88	>30
Tajikistan	20	5	650	74	36	270	>20
Turkmenistan	61.8	2	>2200	1	1	1	>50
Uzbekistan	85	40	>10000	>100		197	>30

*) Review of GWP CACENA, 2009.

140 sewage treatment plants (belonging to certain sectors and municipalities) operate in **the Kyrgyz Republic**, out of that number only 84 plants comply with the sanitary norms, and 56 plants absolutely do not perform their functions. Sewage discharge into the water bodies is being effectuated by 41 STPs, while 71 STPs discharge water for irrigation purposes, and 25 STPs drain into facultative ponds. Centralized sanitation systems are available for less than 30% of the country's population. More than a half of the small towns and district administrative centers of Kyrgyzstan do not have the centralized sanitation systems. Untreated sewage water that makes over 27% of the total waste waters is being accumulated in the absorption or cesspits and being utilized in the water-collection areas (low land relief, collector-drainage networks, dry ravines and river beds, etc.) or being discharged into the water bodies. As a result, the soil and water get contaminated, the flora and fauna experience an adverse impact, and the risk of bacterial infection of people grows as well.

In **the Republic of Tajikistan** out of 62 cities, district administrative centers and the urban-type settlements only 28 have sanitation systems. Unsatisfactory quality of the household and potable water supply to the population of the country, as well as unfavorable sanitary and environmental situation is caused by contamination of the water bodies.

Sewage systems in **Turkmenistan** are available only in the major cities. Due to the fact that the rural population used to receive water out of the street water-pumping pipes, the lack of sanitation systems did not considerably affect the sanitary situation of the villages. However, the wide use of the pit latrines by rural population and discharge of the waste water directly into the courtyards still remain serious constraints in the fight against the diseases being caused by poor quality of water and sanitation. The amount of sewage water being drained by the sanitation systems makes only about 35% of the water volume being delivered by the centralized water supply systems. Only in the administrative center of Murghab Oasis a sewage treatment plant was built during the Soviet time. In other settlements the sewage is drained and discharged directly into the natural terrain. Apart from the damage to the desert ecology, the sewage waters represent a breeding pool and spreading of various infections, including malaria.

In **Uzbekistan** centralized sanitation systems exist mostly in the major cities. In the Capital of Tashkent there is an incomplete divided sanitation system, when the sewage is being drained from the territory of the city to the city's sewage treatment plants. Sewage water of the city is delivered to 3 treatment plants, with a total capacity of 1.9 million m³ per day (two-step treatment, i.e. mechanical and biological steps).

In the recent years, the large-scale work has been developed on the improvement of water supply and sanitation systems, both urban and rural, with the support of multiple donor organizations and through increased budget allocations in all of the Central Asian countries.

Public Programs of Drinking Water Supply in CA Countries

With modernization of process management at the state level, development of each sector and sub-sector is regulated by a specific concept and program that are also developed and implemented in the sector of water supply for drinking and household purposes. A whole range of projects are ongoing and were implemented in Central Asian countries, with the support of international financial institutions and donor organizations.

Thus, heavy efforts are underway in **Kyrgyzstan** with the support of Asian Bank of Reconstruction and Development in Osh, Jalalabad and Batkent Provinces, covering about two million people. The World Bank finances similar activities in Issyk-Kul, Naryn and Talas Provinces, covering more than 864.000 people.

In **the Republic of Tajikistan** in 2006 the Program on "Improvement of clean potable water supply to the people of the Republic of Tajikistan for the period of 2007-2020" was developed and adopted.

In **Turkmenistan** for meeting the needs of three major cities of the country, four large potable water treatment plants were built. Their total capacity is 610.000 m³/day at a cost of over 70 million USD. Implementation of another investment of more than 60 million USD of almost thirty smaller projects has been completed.

In **Uzbekistan** the "Adjusted structure of water supply development of the Republic of Uzbekistan based on the new regulatory and technological foundation until 2010" was developed. This structure has been reviewed and agreed by the relevant local authorities in all provinces of the country and has been approved by the Ministry for Public Utilities (Directive No.157 of 09.11.1999). Since that moment, it is the essential document for management of the design and development of the urban and rural water supply in the country. Foreign investments to the Republic are attracted in the form of soft loans provided by foreign banks, international financial institutions, and foreign governmental financial organizations against the guarantees of the Government of the Republic of Uzbekistan, as well as the grants and technical assistance. The following projects are under implementation in Uzbekistan:

- "Water supply of cities of Bukhara and Samarqand," "Clean water, sanitation and human health," World Bank for Reconstruction and Development and International Development Association;
- "Improvement of the water supply system of the cities of Gulistan, Djizzak and Qarshi," Asian Development Bank;
- "Improvement of the potable water supply system in the Republic of Karkalpakstan and Khorezm Province," ADB and Iranian Export Development Bank;
- "Improvement of the water supply of the cities of Nukus and Urgench," Kuwait Economic Development Fund;

- “Improvement of the water supply system of the city of Tashkent,” European Bank for Reconstruction and Development;
- “Reconstruction of the sewage treatment plants in the city of Qarshi with their additional purification and treatment of sediment,” Islamic Development Bank;
- “Improvement of water supply in Bukhara Province,” French Government and the Kingdom of Spain.

In 2002-2010 **the Republic of Kazakhstan** implemented the Sectoral Program on “Potable Water”. The program built and reconstructed 13 288 km of water pipelines and potable water supply networks, improved water supply in 3 449 rural settlements, including small towns (32), with the total population of more than 5 million people, including 3.5 millions of rural population. In 2010, in order to provide potable water in the required quantity and of the adequate quality to the country’s population, the Program “**Ak boulaq**” (“Fresh Water Spring”) was adopted for a period 2011-2020. A breakthrough approach to the development of this project was centralized designing of the potable water supply systems, including elaboration of the conceptual framework for approval of the design in a few steps. Moreover, the design should provide for building of water conduits in dwellings and obligatory installation of water maters in both urban and rural area. All this will ensure round-the-clock and uninterrupted supply of potable water.

The project is designed to solve the potable water supply problems in the republic. This includes: improvement of operation of water supply systems for settlements; raising of investment attractiveness of the water sector and maximal involvement of the private sector in financing of water supply works; use of groundwater based on scientifically-grounded data; establishment of monitoring system in the water sector; designing of such tariff policy that ensures cost-effective functioning of water-management organizations; setting of long-terms tariffs to guarantee return on investment; and, reduction of non-production losses to scientifically-grounded standards when transporting water to the consumer. It is planned to allocate about 900 billion tenghe for implementation of the Public Water Supply Program “Ak boulaq” during 2011-2020.

In addition, a range of projects was implemented and is ongoing with the support of international financial institutions and European companies.

One of good experiences of cooperation is an effort undertaken together with the French company SFEC, which studied availability of water and access of population to good quality potable water in Kyzylorda province in Kazakhstan. The company installed pilot equipment in Karaketken village (1200 people) of Zhalagash district of the province for treatment of water extracted from a well by using an ultrafiltration technique. As a result, the population is supplied with the required minimum of good quality potable water, which fits the WHO standards and the Republican sanitary standards. It is estimated that this plant operates only 2 hours a day and produces up to 1 500 liters of water, i.e. 1.5 l/person/day. This technique is quite relevant for the conditions of Kazakhstan since the settlements are located remotely from each other and thus water pipelines of many kilometers have to be constructed. This, in turn raises the cost of water. Whereas, the cost of one piece of equipment is 40 thousand euro.

Involvement of Water Users

Development of water supply under the above-mentioned projects and national programs is accompanied by transition to partnerships among communities and the state by establishing Water consumer associations in cities and rural settlements and, somewhere, by establishment of private water supply and sanitation operators. An example of fruitful cooperation among national water supply organization and donors is demonstrated by the SDC Project "Regional Rural Water Supply", which develops and improves the rural water supply systems in Fergana and Andizhan provinces of Uzbekistan and in Sogd province of Tajikistan. The project budget totaling 7.3 M\$, of which 3.4 M\$ are for Tajikistan and 3.9 M\$ are for Uzbekistan, is distributed in form of 60% of donor's funds and 40% of local investments. Moreover, 25 % of state's contribution is formed by national investments and 75%, by water consumers themselves. Consequently, 40 thousand people became united in 10 Water Consumer Associations – per 5 in each country – and 86 thousand people have got access to clean potable water.

Intensive training is held with both the staff of the Associations and the water consumers. Now the Associations are studying the matter of establishment of a Federation of water consumers within each economic sector. The developed rural water supply system is quite affordable in terms of water price. The average cost of potable water distributed by water carriers is 11-15 US\$/m³, whereas the cost of daily water consumption 50 l/s/pers is 30-37 cents/m³; thus, water costs 2 US\$/m³/month in Uzbekistan and 2.8 US\$/m³/month in Tajikistan.

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 (Fig.1). Moreover, stakeholders will be involved at each stage of proposal development exactly under considered solution during the preparatory process.

According to the **Millennium Development Goals of the UN Millennium Declaration** signed in September 2002 (Goal 7 "Sustainable environmental development"), until 2015 the number of population not having sustainable access to the quality water supply and the improved sanitation should be reduced twice. In order to assess actual situation and achieve the targets, it is proposed to determine the following topics for discussion at this round-table:

1. Inefficient water use, poor level of operation and economic mechanisms, and ineffective governance are the common problems for sustainable drinking and municipal water supply in the region's countries. In this context, it is proposed to set up an advisory body for provision of expertise in the drinking and municipal water supply sectors of the countries. Based on research and analysis, this body will offer concept designs in such area as:

- Organization of research efforts in area of groundwater use, analysis of investments rates in the water supply sector for drafting of recommendations to the Governments, environmental research in water supply and sanitation, etc.;
- Organizations of international exhibitions of equipment for the WSS sector;
- Organization of workshops on best practices in WSS (even today we can discuss the experiences in development of distribution networks, their zoning, efficient water distribution, water metering, and tariff policies).

2. The lack of clean and fresh surface water forces many countries to use artesian waters more intensively. This source is renewed during the water cycle and, therefore, abstraction should not exceed the speed of its regeneration. In 2008, a UNESCO project, where 13 countries participated, published the map of groundwater. At present, there is a need to carry out similar research in the territory of Central Asia so that the countries in this region could have scientifically-grounded approaches to use of artesian water;

3. The tariff policies in the countries is characterized by low level of water charges that does not allow to cover operation and maintenance costs of water supply systems and maintain skilled staff. In this context, research is also needed on development of recommendations for optimal site-specific tariff rating;

4. On the basis of existing water user associations in the region, we should consider a possibility to develop a sustainable water supply mechanism, with full cost recovery and public investments in reconstruction and development of the systems. Similar experience is to be summarized on international arena;

5. A multistage educational basis for training of specialists in the water sector, with integration into the world scientific space, involvement of CA water professionals, and application of continuity principles may become a forward-looking solution for provision of the sector with qualified staff and maintenance of adequate level of water supply system management.

Based on the above-mentioned issues for discussion, the following recommendations of the round-table are to be developed.

Recommendation 1

Establishment of an international advisory service on efficient use of water for drinking and municipal needs.

Recommendation 2

On the basis of the international advisory service on efficient use of water for drinking and municipal needs, a number of initial research efforts should be undertaken:

Research 1: Analysis of investment rates and of growth of coverage with water pipelines of urban and rural population in all countries of Central Asia in order to assess feasibility of completion of efforts on urban and rural potable and municipal water supply;

Research 2: Analysis of ecological compatibility of on-going WSS projects and extension of the coverage with sewage treatment plants in the region's countries;

Research 3: Generation of the Map of groundwater in Central Asia, including development of recommendations on amounts of their abstraction;

Research 4: Identification of rates of daily water consumption per person for drinking and household needs, including estimation of different indicators that influence on quantity of water used in any specific site;

Recommendation 3

Organization of an International Exhibition «Equipment and accessories for WSS» with participation of countries in Central Asia and Europe.

Recommendation 4

Within the framework of the International Exhibition «Equipment and accessories for WSS», establish a platform for presentation of the best water supply projects in Central Asian countries and sharing of experience in operation of water supply systems, tariff policies, involvement of private sector, etc.

