Republic of Armenia - Country Report

WATER RESOURCES MANAGEMENT IN ARMENIA

National Report

Content

Introduction

Republic of Armenia is mountainous country with total area 29.800km^2 and semiarid climate. About 75% of total area is located at height of 1.500m above sea level. Precipitation amounts for 600mm over 60% of area and 200mm over 20% of it.

There are 400 rivers in Armenia with length more than 10km. They are mostly small, quick mountainous rivers. Average annual total river runoff is 6.250 mln.m^3 , from which 3.029 mln.m^3 is formed from springs and ground waters. About 940 mln.m^3 is formed from frontier rivers Araks and Ahuryan. There are 14 large river basins within the country.

Lakes in Armenia are mostly mountainous and small except Sevan lake. There are 74 water reservoirs built in different time with useful capacity 988 mln.m^3. Construction of 31 water reservoirs is not yet completed. After its completion additional 832 mln.m^3 of water can be reserved.

Natural water resources amount for 4.017 mln.m^3/year from which 1.595 mln.m^3 comes from springs, 1.434 mln.m^3- from drainage outflow and 0.988 mln.m^3 - from ground water. There are more than 700 natural and artificial sources of mineral water.

Water resources use system is conditioned by parameters above mentioned.

Water use

Irrigation: Total water use in 1985 was 3.9bln.m^3-from which 70% was used for irrigation. Irrigated area has been reduced from 314.000 ha (1988) to 188.000ha (1998). Big part of irrigated area is irrigated by water lift (42% in 80-ies). There are more than 100 irrigation systems in the country mostly with unsatisfactory technical state.

Before 1989 O&M financing was provided by the state. Presently, these costs are covered by fees, collected from water users, but collection level is very low.

There are several plans for irrigation systems rehabilitation. Within the framework of the World Bank program 8 main canals rehabilitation has been almost completed. At expense of the World Bank credit 236 deep wells, used for irrigation, rehabilitation is being realized. Plan for irrigated area expansion up to 640.000ha in Ararat valley and 67 water reservoirs construction is to be implemented.

Government of Armenia has been developed and approved the plan on irrigation system rehabilitation up to 2005, which determines major directions of reforms.

About 15% of irrigated area requires drainage. Because of poor operation and maintenance of drainage systems ground water table came up. During last 10-13 years soil has been salinized. Almost 40% of land in Ararat valley is saline.

Municipal water use: Water supply per capita amounts for 3.000 m^3/year (11.600 m^3 /year in Georgia and 3.800 m^3/year in Azerbaijan). Central (with capital Yerevan), southern and north-west parts of the country are poor in water resources.

Drinking water in Armenia mostly (96%) has high quality and formed mainly in springs. As water recording in the country is absent water consumption is calculated basing on norms, that are higher compared with actual consumption. 55.7% of water is provided by pumping stations. 57.3% of water pipelines were built 20 years ago and because of that water losses amount for 55-65%.

About 170.000 people are provided with drinking water from surface sources through 16 treatment plants, which work unsatisfactorily. Most part of chlorination stations works unsatisfactorily, reservoir capacity is low, partly they are out of operation.

Sewerage collectors and sanitation network on 63% are close to failure. In water supply system water lift needs to replaced by gravity systems and distributive system needs reconstruction.

Cubic meter of water for municipal needs costs 0.08$. In the capital of the country water charge is calculated accepting 250 l/day per capita, in other cities - 200 l/day per capita. Cost of water in the cities is 0.84$ per capita per month.

Since 2000 the Government of Armenia pays serious attention to municipal water supply rehabilitation and development involving private sector and international investments.

Hydropower engineering: Hydropower constitute 23-25% from total energy supply. Hydropower plants are mainly located on Razdan and Vorotan rivers. 35 plants are in operation now, from which 13 are privatized and others are under process of privatization. Government has prepared programs for power sector capacity increase.

Industry: Industrial water supply is provided from surface and ground sources, sometimes from own or municipal network. Starting from 1996, proportional increase of ground water share use in industry was fixed. About 40% of industries are located in Yerevan.

According to the Ministry of Industry, during recent 5 years annual average water consumption was 54 mln m^3. It is expected, that it will rich 64 mln m^3 by 2005.

Industrial water supply system rehabilitation is priority issue. In most enterprises treatment facilities are out of operation and should be replaced. Investments should be directed to these facilities and water disposal.

Health services: Obviously, water supply infrastructure deterioration leads to infectious illnesses increase. According to the Ministry, 57% of water supply systems in 1998 did not meet sanitary standards. For the period of 1984-1991 infectious illnesses were not registered. Since 1992 similar illnesses were periodically registered. There is substantial difference between urban and rural water supply systems technical state. There are 883 rural water supply systems, from which 60% is not equipped by sanitary facilities. Rural system improvement carried out by the government is slowed down by lack of financing.

Environment protection: Geographic position of Armenia promotes biological diversity and rich fauna and flora including multitude of endemic and disappearing species. Water regime is determining factor for wild life.

About 350-400mln.m^3 of wastes are formed in the country, which are released without treatment to surface water bodies. 18 treatment plants are out of operation. New industrial enterprises threat environment, because they work without treatment facilities due to lack of investments.

Seval lake is a serious ecological issue because of biological misbalance. In 1996-1998 Armenia, under the World Bank support, has developed a plan of the lake Sevan ecological equilibrium restoration; in 1997-1998 and 199902001, respectfully, national action plan and IWRM plan were developed. Above projects clearly determined priority action plan, which implementation is limited by lack of funding.

From ecological point of view, most important are the following issues: ecological and sanitary protection of ground water sources and some surface water bodies, landfills management, non-point water pollution (landfills, agriculture, eco-tourism, etc.).

Water resources management

Water resources are property of the state. Water resources management is obligation of the Ministry of Environment Protection. Ministry of Agriculture is responsible for policy development in field of irrigation and drainage. Ministry of health is responsible for water amount and quality connected with population health. Power Ministry is responsible for policy and programs in hydropower engineering. Ministry of Finance is responsible for water charges establishing and other financial questions. These ministries directly or indirectly influence water and environmental policy. But coordination between these ministries is very weak.

To introduce new approaches to water resources management and development, based on market principles, and strengthen coordination among the ministries, the Government of Armenia has developed in February 2001 concept of reforms in water sector. State Water Council has been established at the same time. Its mandate is to supervise water use. In February 2002 Water Resources Management Agency has been established with mandate to

manage water resources. By this, main functions in water resources protection, management and use are divided between different bodies.

Some functions in water sector are transferred to private sector ("YerevanVodokanal", "ArmVodokanal", WUA in agriculture and privatization of hydropower).

Water monitoring

Ministry of Environment Protection carries out quantitative and qualitative monitoring of water resources.
State water protection agency is responsible for water pollution and environment protection measures realization.
Sanitary-epidemiological stations under Ministry of Health are responsible for drinking water quality.

There is still Soviet system of water quality standards in Armenia, which needs to be revised, because water treatment standards are nonrealistic.

Integrated water resources management

Agenda 21 states, that IWRM should be "based on considering water as inseparable part of ecosystem, as natural resource and social and economic good, which amount and quality determine nature of its use".

IWRM is new for Armenia, nevertheless, all measures undertaken are in line with Article 18 of the Agenda 21 "about fresh water quality maintenance, integrated approach to water resources development and rational water use". As IWRM is a multilateral and continuous process, the following interrelations can be distinguished.

a) Water balance component

This component includes methods and tools for water balance calculation, including hydrological and geohydrological assessment. Water balance modeling is aimed at reaching equilibrium between demand and supply. It is important to note, that within the framework of the IWRM Project, water-economic model for whole Armenia has been created based on separate river basins. This model is starting point for integrated planning and water resources management.
In this aspect Armenia can play basic role increasing the regional potential of water modeling and IWRM for river basins.

b) Engineering component

This component encompasses all analysis connected with infrastructure aspect (structures' capacity and size, technical-economic assessment, etc.).

c) Institutional and juridical component

This component includes all aspects connected with juridical documents formulation for water licensing, wastes releases permission, water resources monitoring and use.

d) Social and health component

This component concerns all those aspects connected with demography and society structure.

e) Environmental and water quality component

This component deals with water quality and all aspects of water in environment. It encompasses wastes collection and treatment and wastes release to surface water bodies.

f) Economic and financial component

This component deals with financial and economic aspects of water resources management,

including methodology of analysis for assessment of interventions and compromises between alternative options.

International issues

There are range of agreements between Armenia and neighboring countries on international water development and use. For example, Armenia has agreement with Turkey on Araks and Ahuryan river resources use. By this agreement all river resources are divided into two equal shares. Another agreement determines conditions of joint operation of the dam and water reservoir on Ahuryan river. Agreement between Armenia and Iran determines joint use of Araks river for irrigation and hydropower generation. This agreement divides the frontier reaches of transboundary rivers into equal parts. While these agreements were concluded by the former USSR, Armenia bears obligations on these agreements.

Between Armenia and Georgia there are agreements on water use from Debet river and between Armenia and Azerbaijan - on Arpa, Vorotan, Agstev and Tavush rivers.

In recent time some international agreements have been reached. They are: "Joint experimental project on the Mtkvari/Kura river basin monitoring and assessment", supported by the regional Ecological center "Caucasus" and TACIS, as well as "Strengthening stable regional water resources management in South Caucasus" under USAID support.

Presently, the Government of Armenia pays special attention to regional collaboration in transboundary resources management. It worth to note recent agreement with European Commission on international collaboration in Kura river basin through technical modernization of quality monitoring facilities, reforms in legal sphere.

Legislative (legal) base

Legal base in Armenia is gradually transformed to market relations. There are more than 50 ratified and acting juridical documents (laws, legislative acts, conventions, etc.) regulating water resources management, their protection and use:

1. *Constitution*
2. *Laws on natural resources*
   - Water Code (23.03.1992)
   - Land Code (2001)
   - Civil Code (1999)
   - Depth Code (19.03.1992)
   - Law about environment use and protection (30.12.1998)
   - Flora Law (23.11.1999)
   - Fauna Law (03.2000)

3. *Environment protection laws*
   - Basic Legislation on environment protection (09.07.1991)
   - About specially protected territories (17.12.1991)
   - About expertise of environmental impacts (20.11.1995)
   - Law on Sevan Lake (15.03.2001)
   - Law on hydrometeorological activity (2001)
   - About sanitary-hygienic security of population (16.11.1992)

Presently, in Armenia new water code and law on WUA are being drafted to adapt to IWRM.

Both laws are based on basin water management principle and transfer of certain management functions to the regional and local level. These laws create favorable conditions for private sector involvement.

International treaties

- Aarhus Convention on access to information, public participation in decision-making on environmental issues (2001);
- Convention on climate change under auspice of UN (1992);
- Convention on biodiversity (1992);
- Agreement on collaboration in environment protection (1992);
- International FAO norms for pesticides distribution and use (1985);
- Convention on wetlands (1971);
- International Convention on civil responsibility for damage by oil products pollution (1969);
- In 1997 Armenia has ratified UN/EEC Convention "Assessment of ecological impact in transboundary context", but it is not implemented, because Georgia and Azerbaijan have not yet ratified it.

Public participation in water resources management

Public participation and, particularly, NGO in water resources management should not be underestimated. There is effective mechanism of public participation in decision-making through public hearings in the process of environmental impacts assessment. At the moment, public involvement is unsatisfactory. Propaganda and public awareness as well as transparency in water use are necessary. Public awareness and participation in decision-making process through "public institute" establishing is priority task for the Ministry of Environment Protection. There is network of scientific-research, educational, consultative and other organizations in water resources protection, management and use in Armenia. Their involvement in regional collaboration will provide solution of existing problems.