

AMERICAN UNIVERSITY OF ARMENIA

**INVESTMENTS IN WATER AND IRRIGATION SECTORS THROUGH
INTERNATIONAL FINANCIAL INSTITUTIONS: IMPACT ON THE
ARMENIAN ECONOMY**

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Abstract

After the collapse of the former Soviet Union and subsequent economic difficulties in Armenia, water systems management suffered significant setbacks. The overall management of water systems was loose and poorly coordinated, institutions were weak and systems functioned inefficiently. Lack of financial resources and need for institutional reforms in the water sector made the Government of Armenia to seek funds and technical assistance from international financial institutions and donor organizations. Since early 90s different financial institutions were deeply committed helping the Government of Armenia to provide access to clean and reliable water recognizing the significance of water infrastructure to the sustainability of their initiatives to reduce poverty, stimulate economic growth and meet the Millennium Development Goals.

The purpose of this paper is to investigate the impact of investments in water and irrigation sectors through international financial institutions on the Armenian economy.

At a first step of the studying the current state of the water and irrigation sectors in Armenia the international experience of two European nations (Czech Republic and Poland), which have some similarities with Armenia (transitional economies, comparable size, large number of small communities, etc.) was reviewed.

The paper next reviews the impact of the investments through international financial institutions on the health of the population, social and economic development, as well as poverty reduction of the country.

The final part of the paper focuses on the specificities of water and irrigation sectors in Armenia, the investments by international financial institutions, summarizes the result of interviews that were conducted with representatives of different IFIs and a government agency and provides a set of recommendations for further improvement of the sectors' efficiency.

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Introduction

The importance of water in the nature is not only its amount and quality, but also in relation to the transfer of energy and substances in the water cycle. In nature, water is a component of all substantial biological, physical and chemical processes and it contributes to climate formation. Water is essential for human beings as well as to life and nature itself. Water is essential not only as a life-supporting substance and for human health, but also for social stability and economic growth. In developing countries and countries in transition, amongst other things, the environmental infrastructure needs to be further developed. This is also true for water supply and sanitation, which is linked to the basic needs of human beings (water for consumption, hygiene and health, for irrigation, and other economic uses).

Rural Water Supply and Sanitation (WSS) in many regions of the world is not as well developed as urban WSS. This results in many developing countries, in a far from optimal supply of water for large parts of the population. The situation for sanitation in rural areas is often even worse. The problematic situation with WSS is well recognised by the international community, by including targets for WSS in the Millennium Development Goals (MDGs) (Human Development Report 2006).

In many countries the management of the irrigation systems remains under the exclusive jurisdiction of the government structures, irrespective of the reality, that day after day the financial and the structural possibilities of the state required for the implementation of the operation and the maintenance activities are decreasing. It should also be mentioned that in a number of countries the efforts to hand over the management of the irrigation systems to water users resulted in the improvement of the systems in those places, where the users of water themselves participated in the decision making process related to water distribution, maintenance and operation of systems (Irrigation Management, 2003).

In the water sector the focus should be on the expansion of urban and rural drinking water supplies in developing countries. Measures to remove waste water are increasingly seen as important. Making more efficient use of existing water resources, for instance through activities aiming at reducing water losses and wastage of water, is always given preference to the opening up of new sources.

The purpose of this paper is to investigate the impact of investments in water and irrigation sectors by international financial institutions on Armenian economy. A deficient irrigation system is one of the main impediments to agricultural productivity, and by extension, to national economic growth. Most of Armenia's agricultural products are still produced in over 300 thousand extremely small and small farms; the income level of half of such farms greatly depends on availability, affordability and reliability of irrigation (PRSP 2008). Structural and management reforms of the irrigation sector, introduction and strengthening of participatory management in the last years have greatly contributed to the improvement of irrigation indicators.

Safe and reliable water systems are a vital component reducing poverty through economic growth around the world. Water is fundamental to sustainable development and the lack of clean water most impacts the world's poor, particularly their health and education. Therefore national and international water policies will be increasingly important given the challenges of the 21st century. Some of these policies really need international collaboration and efforts, on the national levels many governments will still need support and assistance of the international community to reach the ambitious Millennium Development Goals. Different financial institutions are therefore deeply committed to helping national governments to provide access to clean and reliable water recognizing the significance of water infrastructure to the sustainability of their initiatives to reduce poverty and stimulate economic growth

worldwide. And in the last years there have been significant improvements in accessibility, supply duration and safety of drinking water. This is the case also in Armenia.

In order to meet financial needs of the sector major reforms should be continued in water governance. The emphasis on the relationship between governance and financing is not, of course, new. Investing money into the old management and inefficient governance will fail to provide long term sustainable solutions. Without good governance and the capacity to absorb and use funds effectively and repay loans, finance will not be attracted to the sector (Rees, Penny and Hall, 2008).

Research questions:

1. What are the reasons of investing into the water and irrigation sectors?
2. Who are the major providers of capital for investing into these sectors?
3. What are the terms of providing capital for the mentioned sectors and how the Government of Armenia is going to re-pay the loans?
4. How do investments in water and irrigation sectors influence national economy and foster economic development?
5. How do investments in these sectors help to reduce poverty?

Methodology

For the purpose of this research the following methodology was applied. The methodology is based on content analysis, which is mainly review of relevant literature and legal documents and international practice in the corresponding sphere. Interviews were also used for the research purposes. They were held with the representatives of Ministry of Finance, different international organizations and other experts in the mentioned sphere.

General Overview of the Water Sector in Other Countries and International Experience

The Millennium Development Goals (MDGs) are eight goals to be achieved by 2015 that respond to the world's main development challenges. The MDGs are drawn from the actions and targets contained in the Millennium Declaration that was adopted by 189 nations-and signed by 147 heads of state and governments during the UN Millennium Summit in September 2000. The eight MDGs break down into 21 quantifiable targets that are measured by 60 indicators: Goal 1: Eradicate extreme poverty and hunger; Goal 2: Achieve universal primary education; Goal 3: Promote gender equality and empower women; Goal 4: Reduce child mortality; Goal 5: Improve maternal health; Goal 6: Combat HIV/AIDS, malaria and other diseases; Goal 7: Ensure environmental sustainability; Goal 8: Develop a Global Partnership for Development (Millennium Development Goals).

The Millennium Project was commissioned by the United Nations Secretary-General in 2002 to develop a concrete action plan for the world to achieve the Millennium Development Goals and to reverse the grinding poverty, hunger and disease affecting billions of people. The Millennium Declaration lays out important challenges for the development community at the start of the 21st century. The Millennium Development Goals (MDGs) not only emphasize the enormous negative impact of poverty on the global community, but also the immensity of the challenge of significantly reducing world poverty over the next several years. Crucially, the MDGs identify the most important areas where development resources should be concentrated. The MDGs provide a benchmark for measuring progress towards the human right to water. That is why dividing the proportion of world population without sustainable access to safe drinking water and basic sanitation is a key target in its own right. But achieving that target is critical to the attainment of other goals. Clean water and sanitation would save the life of countless children, support progress in education and liberate people from the illnesses that keep them in poverty (Human Development Report 2006).

The livelihoods of the rural poor rely heavily on natural resources. The UN General Assembly, recognizing the urgency of addressing water issues, proclaimed the period 2005-2015 the International Decade for Action, “Water for Life”, to emphasize the importance of water for sustainable development and the eradication of poverty and hunger, and its indispensability for human health and well-being (General Assembly resolution 58/217 of 23, December, 2003).

Water infrastructure can be defined as a stock of facilities and installations needed to develop and manage water resources, including delivery, treatment, storage, supply and distribution of water to its users as well as for the collection, removal, treatment and disposal of sewage and wastewater. Water has always played a central role in human societies, but in order to sustain that role, it needs to be exploited and managed to increase its productive impact and to reduce the risk of destruction, while protecting water ecosystem which is crucial for the environment. This could be achieved by developing adequate infrastructure along with legal and institutional frameworks for water management (UNDP, 2005).

Developing countries face significant challenges in meeting water supply standards. In fact, almost none of the developing countries have a 24-hour water supply, while arsenic contamination and poor maintenance hamper access in rural areas. The following regions suffer from underprovision or lack of water supply: South Asia, East Asia and Pacific, Africa, Latin America and Caribbean. The key problems in South Asia are institutional rather than technical and financial. Service providers are not accountable to customers, incentives favor capital works projects rather than sustainable service delivery, and subsidies do not benefit the poor. Inadequate knowledge and a lack of systematic policy reform also impede progress. Increasing formal and informal urban growth and consequent environmental degradation are out-stripping the progress being made in water supply sector in East Asia and the Pacific. Sub-Saharan Africa has the greatest challenge to meet water supply standards. Millions of

people on the continent are facing an ongoing, endemic water crisis that limits economic growth, educational access, health and opportunities for a better life. According to the Economic Commission for Latin America, about 220 million people in Latin America and the Caribbean live in conditions of poverty.

Poor people in agriculture experience the link between water and human development as a living reality. Water security in agriculture permeates all aspects in human development. Land and water are two key assets on which poor people depend for their livelihoods, usually far more than do people who are better off. Water insecurity represents a powerful risk factor for poverty and vulnerability. Cross-country research shows that poverty levels are often 20%-30% lower within irrigated systems than in non-irrigated areas (Human Development Report 2006).

In the developing world over the past 40 years, the irrigated area has doubled and irrigated yields have raised two to fourfold. In the coming future, more food needs to be produced with less water. The reasons include worsening water shortages (potentially exacerbated by climate change), competing and sometimes conflicting demands for water among many users, and the imperative to protect the environment (Human Development Report 2006).

The biggest challenge in irrigation management is to improve the efficiency and productivity of water use in existing systems. Common challenges in irrigation systems are inefficient operations and maintenance, inadequate service delivery that is supply rather than demand-driven, low water productivity, poor cost recovery, degradation of soil and water through water logging and salinity, and lost opportunities for sustainable surface and groundwater use. Actions will be needed to modernize existing schemes to promote efficiency in farmers' use of water; make small- and medium-scale irrigation more profitable; and ensure more sustainable development of groundwater irrigation (The World Bank).

Policymakers are giving increased attention to issues associated with financing and investing in the drinking water and wastewater treatment systems, which take in water, treat it, and distribute it to households and other customers, and later collect, treat, and discharge wastewater. The attention is due to a combination of factors. These include financial impacts on communities of meeting existing and anticipated regulatory requirements, the need to repair and replace existing infrastructure, concerns about paying for security-related projects, and proposals to stimulate economic activity by building and rebuilding the infrastructure. Reform of water infrastructure is most often driven by pressure on government budgets, rising costs of providing services, and government desire to reduce subsidies (Human Development Report 2006). When it comes to financing of the water sector there are only three ultimate sources of finance:

- User charges or beneficiary payments. These can either be in cash or through donations of labor or materials.
- Payments from some users may be used to cross-subsidize others. Government budgets derived from taxation or the sale of state-owned resources, goods and services.
- Grants and aid from donor agencies, NGOs and charities.

Investment finance can be raised through loans – commercial, local or international, including from international financial institutions (IFIs) – or equity share holders but loans have to be repaid and equity investors will require dividends and/or expect their shareholding to increase in value. The benefits from such investments are real and recognized, and if the ultimate funding sources are willing and able to bear the costs involved.

A scarcity of public resources and very low rate of international aid have contributed to the deep crisis that water sectors in developing countries are in, as less has been invested than is considered necessary to improve and increase their efficiency. Private investment could

therefore play a crucial role in the building of new infrastructure and in the restructuring of existing services. In fact, according to the Global Water Partnership's forecasts, to achieve the UN Millennium Development Goal related to water, it will be necessary to increase the level of investment per year in the sector from 75 billion dollars to 180 billion dollars. The "Plan of Action" of the Second World Water Forum held in The Hague in 2000 stated that 95% of the additional investments in the water sector should come from the private sector, underlining the need for wider participation by the private sector through public-private partnerships. This means that water has to become a more attractive good from a financial point of view; however, this process requires the existence of a strong regulatory and legal system, transparent contractual procedures and risk allocation between parties. Through analysis of the private sector's behavior and amounts invested, and a description of the economic features of production and provision of water that have made it difficult for the private sector to be involved in an efficient way (Scheumann, 2008).

The weakness of public service providers in many countries is clearly part of the problem in water provision. The source of that weakness varies though poor governance and the infrastructure decay caused by underinvestment. Governance structures have a central role. Many public utilities operate a top-down service provision model that is neither transparent nor responsive to the needs of users. Operations, in many cases, combine inequity with inefficiency. Much of the water that public utilities provide is unaccounted-for either because it leaks out of pipes that have not been maintained properly or because of defective billing systems. Low revenue in turn fuels a cycle of deteriorating assets, water losses, low revenue collection, low investment and further infrastructure deterioration. Utility pricing is a central part of the financing problem in many developing countries. Tariffs are often set to cover only a small part of operating costs (Human Development Report 2006).

Water utilities cannot be considered in isolation. How well public providers meet standards for efficiency, equity and accountability is conditioned by the wider political culture of service provision – and by wider public investment policies. In many developing countries inefficiencies in the water sectors can be traced in part to chronic underfinancing of the network over a very long period (Human Development Report 2006).

The Czech Republic and Poland both had similar starting positions at the beginning of their transformation from planned to market economies; they also currently enjoy high rates of economic development. Despite these similarities, the two countries have ended up with different degrees of Private Sector Participation (PSP), with the Czech Republic being a clear leader, followed by Poland. Poland as a newcomer to the PSP scene, is forming a different model of PSP in countries, having water utilities run by both the international private sector and its domestic private sector. The water and irrigation sectors have been an issue in such countries as Czech Republic and Poland and in this respect it will be useful to investigate the practices of these countries in the mentioned sphere.

The Czech Republic

Water resource management policy and practices in the Czech Republic have already been developing for several centuries. The earliest water management activities, such as regulation of water regime by draining marshlands and establishing ponds date back to the period when the Czech territory was being settled. Protection against floods has been ensured by regulation of stream flow in watercourses and construction of retention reservoirs. Growing demands for water use evoked needs to construct impounding reservoirs and to exploit intensively natural groundwater resources (Water in Czech Republic 1998).

Increasing density of population has been associated with growing requirements for water supply and waste water disposal. The development in agriculture has been accompanied with the needs of irrigation compensating uneven spatial and time distribution of precipitation.

However, the water management system, reaching high European standard, has been affected significantly by the development in recent several decades. Exclusive State ownership and directive governing of economy resulted in low feeling of responsibility and interest of public and decision-makers in conservation of natural water resources and proper water use. The water management sector focused on large and visible investments, and, in spite of their certain benefits, this focus was reflected in neglecting maintenance and care of small water systems, water supply and sewerage systems, small hydroelectric power stations, and other water-related structures and installations. Land recovery measures implemented in extensive areas led to rapid draining of the landscape, groundwater storage diminution, and undesirable changes in biodiversity and microclimate of the landscape (Water in Czech Republic 1998).

Water management was also harmed by a tendency to consider it solely as a branch of production whose main purpose was to ensure water for municipalities, industry, electricity generation and agriculture.

Economic transformation in the Czech Republic after 1989 was reflected also in the water management. Gradual introduction of realistic prices resulted in a decrease in water consumption by inhabitants, in industry and agriculture (Water in Czech Republic 1998).

Water supply Water supply and waste water disposal and treatment systems are the most important user's systems in the water sector. In the Czech Republic, 8.868 million inhabitants, or 86.0 percent, are supplied with water from public water supply systems (Water and Wastewater Market in the Czech Republic, 2009).

The development in water supply industry in the CR was based mainly on a principle of large water supply systems using high-capacity water resources represented by upstream stretches of the so called water supply watercourses. The following systems are presently most important: Central-Bohemia Water Supply System (which includes Prague) for 1.49 million inhabitants, North-Bohemia System supplying 0.59 million inhabitants, Ostrava Region System for 0.97 million inhabitants, South-Bohemia System for 0.24 million inhabitants, and about 10 smaller systems. Since 15 May 1993, the operation of water supply and sewerage companies has not been subsidized, and the prices of water supply and sewerage services are controlled in terms of adequacy of costs and profit (Water and Wastewater Market in the Czech Republic, 2009).

Drinking water quality Czech National Standard (ČSN) 75 7111 on drinking water, which is based on principles and criteria of the World Health Organization, is a document in force for assessing drinking water quality. Drinking water quality observation is an important component of a Monitoring System of Population Health in relation to the environment. The System is conducted from a Central Office in the State Health Institute. The monitoring was implemented in 33 localities, such as Prague and selected district towns (including former regional towns). The drinking water quality observation was primarily made at outflow sites of treatment plants and in public water supply networks (Water and Wastewater Market in the Czech Republic, 2009).

The data on drinking water quality substantiate that health of population cannot adversely be affected by consuming water from the public systems. In terms of health safety, data on percentage of samples for which limits (maximum limit and limit of reference risk) specified for important parameters have been exceeded are the most important. The percentage of exceedance of 0.36% in the Czech Republic represents usual standard in member countries of European Union.

In 1996 of population supplied with water from individual or public wells, 95-98 percent uses water that is bacteriologically contaminated and thus unsuitable in terms of hygienic aspects. The main causing factors of this situation were as follows: insufficient knowledge about quality of water in individual and public wells, insufficient care of well owners (purification, disinfection, technical conditions of wells and their vicinity), and unsuitably located wells (Water in Czech Republic 1998).

Financing of further development By an adoption of Act on Municipalities, and consequent transformation of the ownership rights concerning water supply and sewerage systems, the responsibilities for water supply and sewerage services were transferred to municipalities. After an introduction of realistic tariffs for water supply and sewerage services, it is not socially acceptable to transfer the costs of the investments in further development of the systems to local population, particularly in those areas where the systems had not previously been built. During future 10 or 15 years, it will, therefore, be necessary to subsidize the investments from the central government budget (Water and Wastewater Market in the Czech Republic, January, 2009).

The Czech Government continues in providing financial support to investments in the development of water supply and sewerage systems. A strategy that has been adopted assumes that direct allowances would gradually be reduced and replaced with loans, while the costs of relevant investments would be reflected in prices of the services, taking into account social acceptability of the prices in given region (Water and Wastewater Market in the Czech Republic, January, 2009).

A type of the financial support can be as follows:

- financial support provided by Ministry of Agriculture of the CR to small municipalities for construction of a water supply system,
- systematic or individual financial support from the State budget,

- financial support from the State Environmental Fund,
- financial support provided by a District Authority,
- financial support from other sources.

The financial assistance policy of the CR in the domain of water supply and sewerage systems is focused on three priority objectives:

- finalization of large water supply systems, promotion of group or local system
- promotion of construction of large waste water treatment plants including main sewers, with an intention to ensure sufficient purification of waste water,
- promotion of the development of water supply systems in small municipalities (in 1996, the subsidies amounted 639.2 mil. Kč).

Use of water for irrigation Irrigation, representing further type of water use, is an important regulating factor of agricultural production because it reduces the impacts of drought events on the yields. Rational management and implementation of irrigation systems help to form conditions for stabilization of farming on agricultural land, particularly in regions with insufficient precipitation or precipitation unsuitably distributed during the vegetation period.

At the end of 1996, the irrigation systems were built on an area of 126 215 ha, or 3% of the total area of agricultural land in the CR. At present, the main irrigation systems that are in the State ownership are prepared to be privatized (Water and Wastewater Market in the Czech Republic, January, 2009).

Poland

Poland's national environmental policies and reforms in the 1990s provided the stepping stones to the much needed revision of environmental legislation which also incorporated

environmental issues. This was eventually written into Poland's Constitution in 1997, wherein it stated the importance for the "protection of the environment, while pursuing the principle of sustainable development" (Lieu, 2007).

Since Poland's accession into the EU in May 2004, the environmental sector received a significant boost due to the stringent EU legislations and emission regulations. Various EU funding mechanisms had an important role in financing additional environmental expenditure aimed at bridging the gap to meet the high standards set under the EU Directives (Encyclopedia Britannica, 2004).

After the accession to the EU, funds from the National Cohesion Strategy have been channeled to improve the infrastructure and environment in Poland. An estimated Euros 21.3 billion will be spent in this area, with approximately Euros 2.7 billion directed specifically at the processing plants and city sewer systems (Encyclopedia Britannica, 2004).

Growth in the Water Sector The largest household water consumption and sewerage system networks are concentrated in several counties referred to as voivodships, including: Mazowieckie, Śląskie, and Wielkopolskie. These populated regions harbor large cities including Warsaw and its metropolitan area which has about 7.7 percent of the country's population as well as Katowice and its satellite communities. Katowice is the coal producing region in Poland, thus also accounting for the large industrial waste water discharge in the Śląskie voivodship (Encyclopedia Britannica, 2004).

Although there was a growth of new sewerage systems in densely populated areas, the significant growth since 2005 occurred in the rural regions (Lubuskie and Świętokrzyskie) which are the least populated areas with the lowest levels of household water consumption. The increased levels of water consumption and the development of sewerage systems in the rural and less developed regions provides a good growth opportunity for the wastewater equipment market (Encyclopedia Britannica, 2004).

There was also a sizable difference in the overall amount of wastewater discharged in each voivodship. The highest increase of wastewater discharge since 2005 occurred in the less populated rural regions (Lubuskie and Opolskie); however, when compared to the more populated voivodships, these regions maintained some of the lowest levels of wastewater discharged. The varied levels are attributed to the investments in the sewages systems and systems discharging municipal wastewater in Poland. Although the majority of investments are directed at large urban projects, opportunities in the rural regions must not be overlooked as the rising levels of wastewater in the less densely populated and rural regions presents growing opportunities for the wastewater treatment market (Encyclopedia Britannica, 2004).

The water-line systems on a whole increased slightly from 2005. The areas with the largest growth in the water-line systems were found in the rural areas of the highly populated Mazowieckie voivodship and the less populated Warmińsko-Mazurskie area. The low growth may be a result of a high saturation in the waterworks distribution industry dominated by natural localized monopolies (Lieu, 2007).

Privatization and Significant Transactions in the Water and Wastewater Sector There has been limited development in the privatization of the Polish water and wastewater industry, as the majority of services are operated through municipal water services. Only a handful of municipalities which include Gdansk, Glogow, Dabrowa Górnicza, Tarnowskie Góry, Bielsko-Biala and Szczecin, have sizable private sector investments. The primary funding sources for infrastructure development in the industry stem from the National and Regional Fund for Environmental Protection, foreign donors, financial institutions as well as the European Bank for Reconstruction and Development (EBRD). The EBRD provides funding through loans to both public and private sector. A separate program for municipal and environment infrastructures has been developed to promote activities such as encouraging localities to participate in EBRD lending schemes (Lieu, 2007).

Most private companies enter into the water sector through minority shareholding and joint stock companies. An example of a joint stock company is observed by Gdansk's water and wastewater system, which was privatized in 1992 through the formation of Saur Neptun Gdańsk S.A. (SNG), a Polish company owned by foreign private capital. SNG was a joint venture company which held 51 percent of the company share while the city of Gdańsk owned 49 percent. In 1993, SNG signed a thirty-year lease contract with the city of Gdańsk to provide operations and maintenance services (Lieu, 2007).

Another case of privatization is seen in Thames Water's acquisition of PWiK's municipal water provider in Dabrowa Gornicza, which is viewed as a significant minority shareholding transaction. Thames purchased 34 percent of PWiK's shares in 2002, representing the third privatization in the Polish water industry. The contract spans over a twenty five year period during which Thames will manage Dabrowa Gornicza's water supply and wastewater treatment (Lieu, 2007).

In the recent years, private companies have entered into the Polish water and wastewater market through outsourcing. Grontmij, a Dutch consultancy and engineering firm, won a major contract to modernize water quality, improved wastewater treatment and collection as well as improve sludge handling and surface water. The project is commissioned to run through 2010 and is one of the largest contracts authorized by the EU through the Instrument for Structural Policies for Pre-accession (ISPA) and Cohesion Fund programs. Outsourcing in the water and waste water sector opens greater opportunities for firms wishing to enter into the market without bearing heavy investments typical of minority shareholding and joint stock companies (Lieu, 2007).

Around the world 1.2 billion people live without access to clean drinking water, and around 2 billion people do not have adequate sanitation. The consequences are devastating. An estimated 80% of all incidences of disease in developing countries are due to inadequate

water supplies and sanitation, and 3 million children die each year from dehydration caused by diarrhea. In many countries lack of water is a major obstacle to social and economic development (KfW Entwicklungsbank, 2009).

The reason so many people do not have enough safe drinking water is not the general shortage of usable water resources. Rather, it is the regionally unequal distribution and, in particular, the inadequate development and management of renewable water resources. Inadequate legislation and unregulated implementation of applicable provisions, weak supply and management organizations and distorted pricing structures combined with poor service and a low willingness on the part of the customers to pay their bills are often the causes for wastage of water and high losses in the distribution system. The poorer population groups are most severely affected by this situation (KfW Entwicklungsbank, 2009).

In order to make water accessible to people additional financing for the sector will be required to meet the goal. The efficiency and effectiveness of the expenditures need to be enhanced in order to make rapid and sustainable progress. The quality and coherence of institutions (in terms of governance arrangements and processes) is generally held to be the primary factor behind improved productive efficiencies and development effectiveness. Water supply and sanitation will not be achievable with current levels of investment from the public sector and the donor community in developing countries. Both the donors and the governments are attempting to raise additional funds in order to meet the desirable outcome.

Achieving the better infrastructure in the water and irrigation sectors requires a substantial increase of investments. Funds for investments have to be mobilized from all sources. Mobilizing local resources is hereby key for sustainable financing. In order to mobilize local resources for the water and irrigation sectors, sector reforms are imperative. These include reforms in financial sector and in public administration. Measures in the water and irrigation sectors alone will not be sufficient. Sector experts and policy makers have to

broaden their view and work across their sectors to achieve sustainable financing of the water sector. Moreover, the governments of the developing countries are responsible for creating the enabling environment. Development cooperation can assist in this task. Provision of overseas development assistance alone may not be sufficient. Capacity building is equally important and should accompany all development measures in the water sector (Scheumann, 2008).

The developing countries where more than five billion people are living are lacking adequate financial resources to meet the challenges in water and irrigation sectors. Cooperation between various donors and the partner concerned ensures that structural changes are made and a sustainable, economically efficient water supply is set up.

Water Sector Infrastructure in Armenia: Drinking Water

a. Access and Sector Quality of Drinking Water

After the collapse of the former Soviet Union and the subsequent economic difficulties in Armenia, water resources and system management suffered significant setbacks. The overall management of water resources was weak, institutions were unorganized and management in general was not integrated (Asian Development Bank, 2006).

Armenia is not short in water resources, but the management of resources has created sustainability and quality of service problems, which are associated with the poor condition of its water distribution and waste water removal networks, limited institutional capacity, and weak financial performance of its water supply and sanitation utilities (The World Bank, 2008). Armenia has over 80 medium-to-large water reservoirs and over ninety percent of its drinking water supply is from deep or shallow groundwater resources, provided by boreholes, wells or springs. In general, raw water is of very good quality and requires only minimal

disinfection and treatment. More than 80% of river flows are formed in the country, with the key rivers being the Kura and Araks. These resources, however, are scarce in the more densely populated areas of Yerevan, in the south, and the northeast. The biggest water basin in Armenia, Lake Sevan, has suffered drastic depletion from hydropower generation and irrigation. Lake Sevan's water elevation has already improved, as a result of programs to optimize water discharge, and diversion of Vorotan River. Access to potable water is limited in rural areas. Currently, 525 villages and small towns (about 65,000 people) are not covered by the water network, and only 60% of the population has access to improved sanitation. After the collapse of the Soviet Union poor coordination among various water sector agencies led to system deterioration, increased water losses and eventually collapse of the entire system. In order to rehabilitate and reform the sector, huge capital investments were required (Alipalo, Flor and Chiplunkar, 2008).

Under the former Soviet system, Armenian consumers generally did not explicitly pay for water services. After gaining independence tariff collection rates were very low, about 15% of the cost of production, and didn't even cover the costs for electricity to supply water, which was 80% of the tariff. Since the supplied water was not metered, it was not possible to measure the real volume of water consumption. Due to absence of the water supply network zoning, insufficient volume of daily regulating reservoirs, network deterioration and large volume water losses, water users started to receive water on average only 4 to 6 hours per day. In a few provinces the water was supplied only once or twice a week (Karapetyan 2006).

The poor condition of the network systems can cause cross contamination of the delivered water. Rehabilitation of this network is therefore a key priority of the Government and its water supply utilities. However, due to insufficient funds, scheduled network replacement and repair have been deferred. Half the water distribution network is over 20 years old and subject to frequent bursts and leakages. Likewise, prolonged underfinancing of the

wastewater network has resulted in badly deteriorated sewerage and non-functioning wastewater treatment plants (Alipalo et al, 2008).

Reforms have largely been a by-product of loans from international finance institutions, and their development, approval, and implementation have run simultaneously to the rehabilitation and entry of private sector participation to water utilities. In general, the country's reform of the sector began in 1999, a year before the management contract for Yerevan water services was signed and continued during the period of the management contract (Alipalo et al, 2008). The Government of Armenia (GoA) has admitted that only integrated management of the country's water resources will ensure their environmentally and economically sustainable use, and in 1999 it started the preparation of an Integrated Water Resources Management Planning (IWRMP) Study with the participation of a broad range of stakeholders and decision-makers, including Non-Governmental Organizations (NGOs) and water users (The World Bank, 2001). The Integrated Water Resources Management Planning Study and its main output (a plan for an integrated water sector) initiated the country's water reforms. It aimed to define a comprehensive policy framework, taking into account economic, financial, environmental, social, and institutional considerations. Reforms were designed to attain financial sustainability and commercial operations for all water supply companies by 2008. This required major capital investments through loans and improved billing collections. Estimated investments needed for the first 5 years totaled \$200 million. To achieve this, the Government needed to modernize the existing legal and regulatory arrangements governing water resource management, and to implement tariff, institutional, and administrative reforms (Alipalo et al, 2008).

Taking into account the difficult situation and market demand projections, the Republic of Armenia made a decision to reform the water sector. In February 2001 the RA Government adopted Decision #92 "On Reforms of Water System Management", which

aimed to rehabilitate the financial structure of the water sector companies, improve the services provided to customers, modify tariff policy, and introduce economic reforms within the sector. The State Committee of Water System under the RA Government was established in Decision #92. In 2002 the new Water Code was adopted, which helped to create a new institutional framework in Armenia. USAID provided the technical assistance to the Water Code revision working-group (Karapetyan 2006).

The independent regulatory body The Public Services Regulatory Commission (PSRC), functions since 2003 over the water, energy, and telecommunications sectors. The PSRC follows three steps in revising tariff structures. First, a water service company formally applies for a tariff revision with the support of the State Committee of Water Systems (SCWS). Secondly, a public announcement is made about the proposed tariff adjustment, and public hearings are conducted. Lastly, the PSRC makes a decision, which is final. Tariffs are set separately for each of the five service providers and on the recommendation of the SCWS. Tariff levels in Yerevan, Shirak, and Lori are currently set to recover operating and maintenance costs. For Armenia Water and Sewerage Co., a state subsidy has the deficit and the Government has agreed to begin increasing tariffs in 2009, starting with a 25% increase and reaching full operations and maintenance cost recovery in 2010. The same tariff is applied to all customers regardless of the use or type of customer—domestic, commercial, or bulk. Currently, because of the high dependence on pumped water, there is no price difference between pumped or gravity fed water, which creates a cross subsidy. The PSRC is also responsible for regulating the performance of any current or future water service contracts through the application process for use licenses (Alipalo et al, 2008).

The Government has also adopted a comprehensive “Reform Program to Improve the Financial Sustainability of the Companies responsible for the Provision of Drinking Water Supply, Wastewater and Irrigation/Drainage Services” (2001–2008). The main objective is to

introduce a commercial basis for the operations of all the water supply companies between 2001 and 2008. The eventual goal is to eliminate their dependence on budget subsidies. In order to reach this goal, significant capital investments were required from loans and increased receipts from billing collections. As it was mentioned before, investments needed for the first 5 years totaled \$200 million. The financial reform program also envisaged a restructuring of the debts accumulated by the municipal water operators. This restructuring includes a number of components including rescheduling (mainly postponing some payments beyond 2006); partial write-offs; the clearing of the cross-indebtedness of water utilities to energy companies and those debts in turn to the state budget; and the priority solution to the problem of salary arrears. To achieve financial reform, the Government articulated indicators that would be used in designing the performance-based management contracts with the private sector (Alipalo et al, 2008).

Lacking the resources within the national budget, the Government of Armenia sought foreign credits for the reforms. The World Bank and German KfW Rehabilitation Bank have contributed greatly to the reforms made in the water and wastewater sector, without which realization of the reforms would have been impossible. In this respect, the situation has improved recently due to donor financed investments in Yerevan and other major cities. In Yerevan, the Municipal Development Project supported by a management contract, financed improvements in water supply services, which resulted in significant improvements in availability of water (e.g., from about 7 hours to 18 hours per day) and quality. This was followed by the Yerevan Water and Wastewater Project, which is continuing with the reforms under the first project, through a lease contract. However, other cities that have not benefited from investments continue to experience poor service and intermittent availability of water (The World Bank, 2008).

There are five independent water supply operators providing water supply and sanitation services throughout the country (Alipalo et al, 2008):

- Yerevan Water and Sewerage Company CJSC covers the capital city and is privately managed through a 10-year lease and was previously privately managed through a 4-year management contract;
- Armenia Water and Sewerage Company CJSC covers 43 towns and 290 villages throughout the country and is privately managed through a 4-year management contract; and
- Three smaller municipal companies: Shirak, Lori, and Nor Akunq.

Outside these five independent water utilities, 530 rural communities are not serviced by any utility (Alipalo et al, 2008).

Armenia's water supply problems do not differ a lot from the ones in the developing world—high system losses, low tariff rates, and low collection efficiency. In 2002 across Armenia service coverage for water supply was 92% on average but the availability of supply ranged from 2 to 8 hours per day, with little of that enjoyed continuously (ADB, UNDP, UNESCAP and WHO, 2005). Unaccounted-for-water ranged between 40% and 90%. Nationally, the revenue collection rate has been estimated at only 15%. (Alipalo et al, 2008). However, in the last years there have been significant improvements in accessibility, supply duration and safety of drinking water. In 2006, the average supply duration across the country was 12.1 hours per day, exceeding 1998 corresponding indicator by 4 hours. At the same time centralized water supply coverage of rural areas has increased significantly growing from 64.7% to 78%. One of the major achievements was the drastic decrease of those users of centralized water supply system that received water for less than 1 hour daily; this number decreased from 16.3 percent in 1998 to 0.5 percent in 2006 (Poverty Reduction Strategy, 2008).

b. Investments in the Water Supply Sector.

Water utilities in Armenia use two management models: centralized and decentralized. The centralized model of management is carried out by contracting private operators and the decentralized model of management is that of community involvement (Karapetyan 2006).

The centralized model is applied for projects financed by the World Bank. The largest water company in Armenia, “Yerevan Djur” (Yerevan Water) operates based on a Lease contract. The company serves the capital city, Yerevan and the nearby rural communities. The second largest water supply company “Armenian Water and Sewerage” CJSC, which serves 43 towns and 290 rural communities, is managed by the French company SAUR, based on a management contract (Alipalo, 2008).

The preparation of the 4-year management contract for Yerevan’s water and wastewater services took 6 months at a cost of \$500,000, which was financed by a much larger World Bank-funded infrastructure loan for which the Yerevan public utility was responsible for repaying. The contract was awarded through a competitive bidding process to “A.Utility”, a firm belonging to the ACEA Group Italian Company. The contract was later extended for a fifth year. Over the course of the contract, large-scale works have been implemented, particularly in the sphere of water supply improvement. As a result of this management contract, the following indicators have been reached (The World Bank, 2006):

- Water supply has improved from an average of 2-6 hours per day to an average of 18.4 hours per day. 66.4% of Yerevan subscribers now receive 24-hour per day supply service.
- Energy consumption has been reduced by about 50%
- The quantity of installed water meters increased approximately 100 times and reached up to 90%
- Water consumption per capita per/day was reduced by more than 7 times (due to the elimination of leakages and unaccounted-for-water)

- Fee collections for water supply services have been increased by 3-4 times (The World Bank, 2006).

In order to continue the work started under this project, and to build upon the achievements of the RA Government, the World Bank approved a second loan project, envisioning an even deeper commitment to private sector participation.

The RA Government has analyzed different models of public-private partnerships to decide which form is best to further the management of the Yerevan water system. Through analyzing tariffs and accessibility, as well as a study of potential market participants, a “Lease Contract” was chosen as a more preferable and effective form of public-private partnership for management of the Yerevan water system (Alipalo, 2008).

Following an international call for tenders in 2005, a 10-year Lease Contract was awarded to the French company “Generale des Eaux”, Veolia Water in 2006. The company established the new “Yerevan Djur” (Yerevan Water) CJSC at the end of 2005 (Karapetyan, 2006).

The model of the reforms for the Yerevan Water Supply System shows that because of the step-by-step private sector participation, the water utility in the capital of Armenia has become very productive and the quality of services provided has improved (Karapetyan, 2006).

Similar to Yerevan Water, the management contract model is now being implemented in the Armenian Water and Sewerage Company. In 2004 the French company, SAUR was awarded a four-year management contract. This project also was possible by the World Bank loan.

The decentralized model of partnerships was applied for implementation of the KfW projects in three provinces of Armenia: Armavir, Lori and Shirak. In this case three companies have been founded (in each province) where the state has 51% share and the

communities – 49%. Afterwards, the share of the state should decrease; correspondingly the share of communities (the private sector) will increase. The General Meetings of the each company's shareholders are their highest management bodies. (KfW Entwicklungsbank, 2006).

The first project began in Armavir in 2002. Following its successful implementation, the second project began in 2004 in Lori and Shirak, and two companies have been founded with the same management structure (KfW Entwicklungsbank, 2006).

In addition to the PPP contracts that were employed to improve Yerevan Water, there was also the “Community-Based Urban Water Supply Management Project” grant project that was implemented in Yerevan from 2003-2006. The grant was provided by the Japanese Social Development Fund with the assistance of the World Bank. The main aim of the project was to improve the reliability of water supply in Yerevan's multi-apartment buildings using the community-based approach. Thus the creation and development of a management body in a multi-apartment building enabled the homeowners of the building to maintain and improve on their own the water supply system of their building. During the project, water meters were installed in the apartments, large public awareness campaigns and training programs were implemented, and technical assistance was provided to the condominium managers. Inner water supply repair works in the multi-apartment buildings was carried out as well. This Project encouraged the support to the owners for establishing condominiums, assisted the existing condominiums for their development and strengthening (The World Bank, 2006).

Public-private partnerships in Armenia have become an important mechanism for solving various and complicated problems in the water sector. Involvement of the private sector in company management and financial investment promotes the development of the knowledge and the transfer of private sector management experience to the water utilities. Thanks to public-private partnerships the state bodies are not as concerned with the “day-to-day”

management of the services and can now focus on regulation of the sector and quality of the provided services.

Cooperation between various donors and the RA Government ensures that structural changes are made and a sustainable, economically efficient water supply is set up. The Government submits corresponding project proposals to international financial institutions. And it is these donor organizations who take great care during the preparation phase to ensure that the projects do not exceed Armenia's performance capacity and that the relevant capacity is developed.

In this respect a number of international financial institutions and donor organizations, such as World Bank, KfW Entwicklungsbank, Asian Development Bank and USAID help and support the RA Government in implementing water sector reforms. This may entail providing consultancy services to the relevant authority on amending legislation, setting up new tariff regimes or preparing a systematic investment plan for the water sector, for example. It also involves establishing an efficient water utility and a regulatory authority.

With the support of international donors, the Government has invested in capacity development, improvement of infrastructure, installation of water meters, and revision of the tariff system.

To date, a total of about \$115 million of technical and external assistance has been provided by the World Bank, German development cooperation through KfW, USAID, and UNDP. According to government estimates, to achieve the UN Human Development Goal 7, the centralized water supply network should cover at least 86% of the population. To achieve this goal, the Government will need to provide secure water supply to an additional 120,000–130,000 households. This will require about \$200 million–220 million of investment in the WSS sector (UNDP, 2005-2009).

World Bank involvement in Armenia is primarily through its concessional lending arm, the International Development Association. The World Bank has provided assistance of about \$93 million to improve WSS services in Armenia at the interest rate of 0.75% per year, with maturity 20/40 year and 10 years of grace period.

The Municipal Development Project has rehabilitated water supply and sanitation infrastructure and recruited an international lease contractor to operate Yerevan Water and Sanitation Company. Optimized structure, improved efficiency, and streamlined operations of Yerevan Water and Sanitation Company have dramatically improved the quality and sustainability of WSS services in Yerevan (The World Bank, 2006). The Municipal Water and Wastewater Project aims to improve the quality and sustainability of water supply services provided to customers in Armenia Water and Sanitation Company's services area. Additional Financing for the Municipal Water and Wastewater Program, which was approved on October 1, 2008 provided additional financing in an amount of US\$20 million to the Republic of Armenia for the Armenia Municipal Water and Wastewater Project (MWSSP). The additional financing will support the scaling up of the previous program of water system rehabilitation and improvements, including extension of the ongoing management contract between the Armenia Water and Wastewater Company (AWSC), the water utility in charge of the project, and an international water supply utility operator (The World Bank, 2008).

German Financial Cooperation (FC) with Armenia started in the year 1995. Until 2006 the German federal government committed altogether approximately EUR 150 million in the framework of German Financial Cooperation (FC) in the form of reduced-interest loans and non-repayable grants. On behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ) KfW Entwicklungsbank uses Financial Cooperation funds to finance investments and to provide advisory and consulting services in Armenia (KfW Entwicklungsbank, 2006). Since FC was first granted to Armenia German development

cooperation through KfW has provided about €45 million to finance Communal Infrastructure Projects I and II, aiming to “(i) rehabilitate water supply and wastewater infrastructure; (ii) decentralize WSS management through involvement of communities and private sector companies; and (iii) improve the quality of water services in three regions of Armenia: Armavir, Shirak, and Lori” (Asian Development Bank, 2007). The projects have founded a community owned water supply company, whose shareholders include the State Committee of Water System and the 11 communities and villages covered by the program. The two FC programs aim at securing a continuous supply of hygienically safe drinking water of good quality in the Armavir and Metsamor programme region situated west of Yerevan and the Lori and Shirak program region situated in the north of Armenia, which are still suffering from the damage caused by the 1988 earthquake today. At the same time the sewage disposal systems are to be improved in order to significantly reduce the health risks to the people living in the program area. In addition, KfW promotes the establishment of local operating companies and a tariff policy in the water sector which will ensure a sustainable operation of the plants. This way FC contribution supports institutional reforms in the water sector and a sustainable management of the sector. [Since the year 1999](#), the total investments provided by KfW to Water and Sanitation sectors equals € 44,2, of which € 30,4 million is provided as loans and € 11,2 as grant (Asian Development Bank, 2007).

USAID’s water sector reform activities support the development of an efficient and sustainable integrated water resources management system. Despite recent improvements in performance of water companies and regulatory institutions, much remains to be done, particularly improvements to water networks in the rural areas. USAID’s program focuses on setting water and sanitation utilities on the path to financial self-sustainability, further improving legal and regulatory environment and promoting transparent and knowledge-based governance of the sector.

“Rehabilitation of water supply system of Artashat town and 27 surrounding villages” (05/2007-08/2009) project with the budget of \$3.2m was aimed to rehabilitate the water supply network for the town of Artashat and 27 surrounding villages providing 100,000 people with continuous supply of safe drinking water and helping the Armenian Water Company move towards commercial viability. The project compliments a World Bank-funded project providing management services from an experienced French water company, SAUR (Water and Energy) (USAID, 2009).

“The Water Sanitation Financing Options” (09/2008-09/2009) is investigating long-term financing options for the development of Armenia’s water and sewerage sector with investment of \$399K. The analysis will also help determine sources of funding and identify the legal/regulatory actions and preliminary institutional design required to establish a sustainable water sector financing mechanism or facility (USAID, 2009).

Armenia is classified as a Group B1 developing member country of ADB, eligible for resources from the concessional Asian Development Fund (ADF) as well as ADB’s ordinary capital resources (OCR). On the basis of the results of the 2006 country performance assessment exercise under ADB’s performance-based allocation policy, Armenia has been allocated \$66.66 million in ADF resources for 2007–2008 (Asian Development Bank, 2007). ADB Water Supply and Sanitation Sector project was approved in June 2008 (ADB loan: \$36.0 million, Government counterpart financing: \$9.0 million). According to Loan Agreement dated 18 December 2007 between Republic of Armenia, the borrower, and Asian Development Bank (Asian Development Bank, December 2007), the Government of Armenia shall pay to ADB an interest charge at the rate of one percent (1%) per annum during the grace period (the period prior to the first Principal Payment Date in accordance with the amortization), and one and one half percent (1.5%) per annum thereafter, on the

amount of the Loan withdrawn from the Loan Account and outstanding from time to time (Asian Development Bank, 2008).

The Project is aimed to be carried out by Armenia's State Committee on Water Systems and implemented by Armenian Water and Sewerage Company, and for this purpose Armenia will make available to AWSC the proceeds of the Loan. The Water Supply and Sanitation Sector Project is aimed at improving the public health and environment for about 576,000 people living in 16 towns and about 125 villages through safe and reliable water supply and improved sewerage and sanitation facilities. Based on the submission made by the Government of the Republic of Armenia and as appraised by the ADB, there are approximately 18 subprojects covering towns and villages where there is an urgent need for WSS improvements. The Project will help the Government provide the required institutional and management support to the AWSC and local municipal governments to enable them to be more self-disciplined in financial, managerial, and technical aspects. The outcome of the Project is improved access to safe, reliable, and sustainable water supply and sanitation services managed on commercial principles and environmentally sound practices. The Project will focus first on optimizing the operation of existing infrastructure and maximizing the operating efficiency of WSS service providers, followed by constructing new infrastructure (Asian Development Bank, 2008).

c. Operating Efficiency

According to Sustainable Development Program 2008 (Sustainable Development Program, 2008), there have been significant improvements in accessibility, supply duration and safety of drinking water. In 2006, the average supply duration across the country was

12.1 hours per day, exceeding 1998 corresponding indicator by 4 hours. At the same time centralized water supply coverage of rural areas has increased significantly growing from 64.7% to 78%. One of the major achievements was the drastic decrease of those users of centralized water supply system that received water for less than 1 hour daily; this number decreased from 16.3 percent in 1998 to 0.5 percent in 2006 (see Appendix 2, Table 3).

However, across regions the supply duration is still low. In about half of Armenia's urban communities the supply duration is less than 12 hours a day, and in 6 towns it does not exceed 4 hours. While the average supply duration in rural areas exceeds that in urban ones, the inequalities are even more acute in view of the limited coverage and dependence on carried water in some of the villages. The proportion of the population with access to sanitation has not changed considerably since the 1990s and remains at around 70%. This issue is particularly relevant for rural areas which account for the majority of households without access to sanitation. Another big issue is the collection of complete and systematic data on water supply in rural areas considering the fact that there are about 560 villages that are not covered by specialized service companies.

Current tariffs of the drinking water and sanitation do not fully cover the costs, and in all areas except Yerevan do not even cover the running costs of the service. The current situation jeopardizes further development of the management reform and it prevents private investment. This leads to the dependence of the long-term development of the drinking water supply system on the state budget capacities and efficiency of public spending which, according to international experience, seldom contributes to improved quality of the service and efficiency (Poverty Reduction Strategy Paper, 2008).

“The key indicator for assessing the access to drinking water is the ratio of the estimated minimum consumption to the total consumer spending” (Poverty Reduction Strategy Paper, 2008, p.139). One of the most frequently used standards for estimating the minimum

consumption proposed by WHO, is 50 liters per capita daily. According to the accepted standards for the affordable tariffs, the average daily consumption per capita or per household should not exceed 3% of the consumer spending or disposable income. According to 2006 estimates based on these values, the average national affordable tariff is AMD465/cubic meter per month, which considerably exceeds the current tariff of AMD181 per cubic meter (Public Services Regulatory Commission). At the same time and based on the same estimates, the affordable tariff for the first consumption deciles is AMD146 for cubic meter, which is almost the same as the current average tariff (Poverty Reduction Strategy Paper, 2008).

Taking into account the fact that at least in the medium term, the affordable tariffs will not cover the required capital costs, the sector will remain one of the public investment priorities throughout the entire period of Sustainable Development Program implementation. It is planned to finance this public investment mostly from bilateral and multilateral donor assistance including concessionary loans and grants. Overall, the level of public investment will reach and stay at the level of around 0.3% of GDP (Poverty Reduction Strategy Paper, 2008).

In view of the insufficiency of the public funds to cover the needs of the sector, as well as the fact that the size of concessional loans to Armenia will gradually decrease, in the foreseeable future there would need to increase the attractiveness of the sector for private investors. To meet this goal the Government will continue and extend the management reforms in the sector through further and wider denationalization of the system management.

d. Government Expenditures in the Water Supply Sector

Since the dissolution of the Soviet Union, the Government of Armenia has taken several of steps to rehabilitate and reform the water supply and sanitation sector, with the support of international donors. The legal framework—including Water code, Law on Condominiums, National Water Program—has been updated to provide a basis for better water services management. The water sector strategy has identified three segments for investments: the capital of the country, medium and small-sized cities, and rural settlements.

The following issues have been prioritized in the WSS sector: “(i) increase of accessibility, availability, and quality of services; (ii) improvement of subsidy targeting; (iii) enhancement of water sector management efficiency; (iv) streamlining and optimization of the tariff system; and (v) rehabilitation and modernization of the WSS infrastructure” Asian Development Bank., 2006, p.29). Currently, the Government is reforming water subsidies and revising water tariffs to ensure the sustainability of WSS services. The Government is planning to phase out water supply subsidies in Yerevan (end of 2006) and the rest of the country (end of 2008).

Within the framework of the projects implemented by different international financial institutions, the Government of Armenia made a contribution of about \$22.73 million or € 6.38 million in the water supply sector of the country.

Impact of International Investments in the Water Supply Sector on Poverty Reduction and Health

Due to donor investments in the water sector, there have been major accomplishments, such as improvement of water supply duration from an average of 2-6 hours per day to an average of 18.4 hours per day in Yerevan and , energy consumption reduced by about 50%,

water meters were installed in the apartments, and further the quantity of installed water meters drastically increased, water consumption per capita per/day was reduced by more than 7 times (due to the elimination of leakages and unaccounted-for-water), and fee collections for water supply services have been increased by 3-4 times.

Improved water supply conditions led to increase of centralized water supply coverage of rural areas from 64.7% to 78% and decrease of those users of centralized water supply system that received water for less than 1 hour daily; this number decreased from 16.3 percent in 1998 to 0.5 percent in 2006.

In conclusion, it should be mentioned that as a consequence of financial investments in the water supply sector, the water infrastructure has been improved and developed, so that with water became available for larger scope of the population. However, across regions the supply duration is still low.

The obsolescence of infrastructure assets continues to remain a major challenge for sustainable development and poverty elimination. In order to modernize and rehabilitate the infrastructure assets one of PRSP priorities will be ensuring increase of public investment, with parallel increase of the private investment (Poverty Reduction Strategy Paper, 2008).

Water is an essential component to human health. The projects implemented by the international financial institutions increased water availability and improve the physiological and microbiological quality of water supplied to consumers, which led to a reduction of the water-borne diseases and a general improvement in public health.

Discharge of sewage effluent into rivers and ground water could create health problems. Routine operations were enforced as well as the selection of appropriate systems for the collection and treatment of sewage before disposal or reuse, which brought to reduced health risks.

Water Sector Infrastructure in Armenia: Irrigation

a. Sector Quality

Due to climatic conditions, Armenia has traditionally been predominantly an area of irrigated agriculture. The soils are predominantly of the semi-desert gray type, and in the course of millennia have been cultivated by means of artificial irrigation and have become cultivated-irrigated soils. In semi-desert zone agricultural farming, fruit growing, vegetable growing are possible only in conditions of artificial irrigation. Irrigation in Armenia started about 3,000 years ago (Kundell, 2007). The modern irrigation systems have mainly been constructed during the Soviet times, parallel to which there has been an increase in the irrigated areas which have amounted to about 320 thousand hectares (Harutyunyan, 2003).

Agriculture remains important for the national economy and, together with processing of farm products, accounts for much of the country's employment and export earnings (The World Bank, 2009). Because of the natural climatic conditions of the republic, almost all the 490'993 hectares of lands need irrigation. The irrigated lands provide almost all the produce of the leading branches of agriculture of the republic, for instance, the grape and fruit production, the 75% of the melon crops and more than 65% of the potato (Hakobyan 2003). Agriculture is the main source of rural livelihoods, with farm income accounting for some 51 percent of the total income of rural households. (The World bank, 2009).

The eight major irrigation schemes of Armenia Arzni-Shamiram, Artashat, Armavir, Talin, Lower Hrazdan, Shirak, Kotaik and Vorotan provide water to about 180 thousand hectares of irrigated lands of the whole country (Harutyunyan, 2003). 83 thousand hectares of lands of agricultural value in Ararat valley are irrigated though three major irrigation canals of Artashat, Lower Hrazdan and Hoktemberyan. The irrigation schemes of Arzni-Shamiram, Kotaik, Talin, Shirak, and Vorotan are located in the low altitude zone (Harutyunyan, 2003).

Through the 124 pumping stations constructed in the Marzes of Vayots Dzor, Tavush, Lori, Syunik and Gegharkunik, the irrigation of 61 thousand hectares of land is carried out by pumping water (Harutyunyan, 2003).

The total drained area increased from 6,900 hectares in 1975 to 60,400 ha in 1994, with a major increase from 1989 onwards. This is explained due to construction of dams and water reservoirs. Most of the drainage is surface one (Kundell, 2007). The wetlands in the republic are in Ararat Valley, Shirak Valley and Vardenis region. In Ararat Valley the wetlands become a cause for the land salinity and turn them into useless lands for the agricultural purposes (Harutyunyan, 2003).

Due to the high level of ground water in Ararat Valley, fertility on 35 thousand hectares of land has decreased. Starting from 1950s a construction of a collector and drainage system has started in Ararat Valley to prevent ovelogging and expansion of the malaria disease. The collectors are also considered as water reservoirs constructed for the pumping used for the irrigation purposes. In general, at average 120-150 million cubic meters of water is annually pumped through Mkhchyan, Ranchpar, Arazapi, Armash, Aygevan, Khor-Virap and other pumping stations (Harutyunyan, 2003).

Armenia's agricultural land resources were privatized in 1991–1992 when 70% of the land was transferred to private ownership. As of 1 January 2006, there are 339,174 family-owned farms producing about 97% of total agricultural production. Agricultural sector has four sources of water: direct precipitation, stream-flow diversions, reservoir storage and releases, and groundwater withdrawals. Storage of water in reservoirs is one form of drought mitigation. When more precipitation is available, however, farmers can rely less on their stored water supplies, and withdraw less water from streams and aquifers as well. The average farm has about 1.4 hectares of agricultural land, of which one third is irrigated and two thirds is dry land. An estimated 15% of farmers' plots are left uncultivated because of the

poor quality of the land, expensive and hence unaffordable chemicals, fertilizers and other inputs, lack/shortage of water, or poor access to the farm. As a result, arable land is gradually turned into pastures, which in turn become eroded, thereby accelerating land degradation and loss of agricultural potential. Yields are relatively low: the average yield of grain, which covers around 60% of the total cultivated area, was 1,608 kg per ha in 1998–2001 compared to an average of 2,407 kg per hectare in European and Central Asian countries (Asian Development Bank, 2006). The irrigation water supply current tariffs to water user companies, water user company associations and other users within the service area of "Sevan-Hrazdan Intake" CJSC for gravity-fed irrigation water supply are 1,01 AMD/cu m and 11,52 AMD/cu m for pumped irrigation water supply. The current tariffs water user companies, water user company associations and other users within the service area of "Akhuryan-Araks Intake" CJSC for gravity-fed irrigation water supply are 0,71 AMD/cu m and 4,94 AMD/cu m for pumped irrigation water supply (Public Services Regulatory Commission).

Most of Armenia's agricultural products are still produced in over 300 thousand extremely small and small farms; the income level of half of such farms greatly depends on availability, affordability and reliability of irrigation (Poverty Reduction Strategy Paper, 2008). However, irrigation infrastructure is deteriorating and system losses generally exceed 45%. Irrigation infrastructure requires extensive maintenance and rehabilitation. Water and land resource constraints are key causes of the low productivity of subsistence and commercial cropping. The availability of irrigation water is limited in most areas of the country as a result of deteriorated and nonfunctioning infrastructure and insufficient electricity generation for pumping. Poor operation and maintenance of the systems is partly due to low tariffs, covering just 30–60% of irrigation costs. In July 2002 the National Assembly approved the Law on Water Users Associations (WUAs) and Water User

Federation (WUFs) aiming to manage the secondary and tertiary irrigation and drainage infrastructure but WUAs are still weak, lacking technical and financial capacity (Asian Development Bank, 2006). Structural and management reforms of the irrigation sector, introduction and strengthening of participatory management in the last years have greatly contributed to the improvement of irrigation indicators. According to latest surveys, the size of the areas that are not irrigated due to the lack of access has decreased considerably, and so has the number of rural households, which believe that their key problem is the lack of access to irrigation (Poverty Reduction Strategy Paper, 2008).

b. Investments in Irrigation Sector

Today, over one million Armenians live in rural areas and are dependent on semi-subsistence agriculture. Farmers are operating on small plots of land and are constrained by poor roads, inadequate irrigation, and an under-developed market economy (RA Ministry of Nature Protection, 2005).

The construction, operation and maintenance of the irrigation systems require major capital investments. Irrigation leaves a significant impact on the capital assets and their structure, which means that the value of the capital assets per hectare is growing, increasing the share of the machinery and equipment. This in its turn contributes to the growth of the productivity and work efficiency (Hakobyan, 2003).

The Ministry of Agriculture is designated to formulate and implement policy measures to enable sustainable growth in the agricultural sector. The Ministry of Territorial Administration, through the State Committee of Water System, is responsible for development of the country's irrigation systems. Between 1994 and 2000 budgetary resources

allocated to the agricultural sector represented less than 5% of total state expenditures. Consequently, financing public goods and service delivery to the sector from domestic resources is highly insufficient. This lack of adequate attention and resources to the rural sector adds to the public's general distrust of public agencies. Furthermore, there is no formal authority to plan, implement, and manage rural infrastructure development as there is neither a lead agency in charge of rural development nor an interministerial body for coordinating rural development (Ministry of Agriculture, 2002).

The main guarantee for further effective operation of the sector is to ensure complete self-financing of the irrigation sector, which is impossible for the current state of the infrastructure. Very large pumping stations, constructed during the Soviet period are able to operate now only with state subsidies, meantime, there is an option for replacement of these pumping stations by gravity systems, which should be included in the investment projects of the sector. At the same time, it is necessary to re-equip and increase efficiency of the pumping stations and tube wells, which are impossible to replace with gravity systems, but currently are in a very poor condition. Main and secondary canals with high water losses, collector-drainage system in the Ararat valley, as well as irrigation tertiary systems also need rehabilitation, since accidents may occur any time running the risk for thousands hectares of irrigated lands. In this respect there is a need for large investments in the sector.

Armenia may be classified as a blend country (country with access to ordinary capital resources as well as the Asian development Fund) with eligibility for both the concessional and the nonconcessional ordinary capital resources. The concessional loans given to the country include 27-40 years of maturity, including 5-10 year grace period and a service charge of 0.75%-1%.

In 2006 the Government of the Republic of Armenia (GoA) has received a grant from the Government of the United States of America through the Millennium Challenge Corporation

(MCC) to support a five-year Program of strategic investments in irrigation aimed at increasing agricultural production in poor rural areas of the country. The Compact includes a \$146 million project to increase the productivity of approximately 250,000 farm households (34% of which are headed by women) through improved water supply, higher yields, higher-value crops, and a more competitive agricultural sector. This project consists of two activities: an infrastructure activity that aims to increase the amount of land under irrigation by 40% and will improve efficiency by converting from pump to gravity-fed irrigation, reducing water losses and improving drainage; and a water-to-market activity that will improve the efficiency of water delivery to farmers and boost farm productivity and profitability through technical assistance and credit support. Administrative and monitoring and evaluation costs of the Program are budgeted at approximately \$23 million (Millennium Challenge Corporation, 2006).

High in the mountains of Armenia lies Lake Sevan, the largest body of sweet water in the Caucasus. It is the country's main water resource and an important tourist and recreational attraction. Over the past decade most of the region's small wastewater treatment plants have fallen into disrepair and construction of a number of new plants remain unfinished. As a result, the lake's waters have become polluted by effluent from the towns that encircle it, upsetting the ecological balance and threatening its natural beauty (RA Ministry of Nature Protection, 2005). An action plan to address these issues was put together by the EBRD's Project Preparation Committee (PPC), the Armenian water and waste-water companies and other national bodies. The plan identified a number of wastewater treatment plants that were in need of urgent repair – specifically the construction of a new mechanical treatment capability at the wastewater treatment plant in Gavar, together with the modernization of the sewerage system. The wastewater plants in the cities of Vardenis and Martuni will undergo renovation of their biological treatment capabilities as well their sewage collection networks.

There will also be improvements made to the sewerage systems in the towns of Sevan and Jermuk (The European Bank for Reconstruction and Development, 2007).

Financing for the project included an EBRD loan of € 7 million disbursed in April 2007 to the state-owned Armenia Water and Sewerage Company (which is managed by SAUR of France, an international utility operator), complemented by an investment grant of € 5 million from the EU and a € 1.2 million grant for technical assistance from the multi-donor ETC Fund. The challenge has been to provide the much-needed infrastructure improvements and institutional support, all within affordability constraints and the requirement for concessional lending agreed between Armenia and the IMF. The project was modeled on two previous water projects in Georgia that used an affordable loan combined with investment grants and technical cooperation targeted at a local authority to achieve transition impact and address implementation risk (The European Bank for Reconstruction and Development, 2007).

World Bank financed Irrigation Development Project (\$24.9 million), which was launched in 2001 aims to enhance the profitability and sustainability of irrigated agriculture, providing the basis for stabilizing irrigated agriculture as a predominant source of productive employment (The World Bank, 2007).

Natural Resource Management Project (\$8.3 million) aims to adopt sustainable natural resource management practices and alleviate rural poverty in mountainous areas where environmental degradation is now reaching a critical point. The project will help avert further deterioration of natural resources (soil, water, forest, fishery, and biodiversity) and stabilize incomes in the local communities (The World Bank, 2007)

Irrigation Dam Safety Projects (I and II) (\$26.6 million and \$6.8 million for the first project and \$4.7 million for the second project) aim to protect the population and the socioeconomic infrastructure downstream of the dams facing the highest risk of failure (The World Bank, 2004).

Rural Enterprise and Small-Scale Commercial Agriculture Development Project (\$20.0 million) aims to help targeted farmers and rural entrepreneurs have a better link with markets, increase their income from rural activities, and increase employment opportunities in rural areas (Asian Development Bank, 2006).

International Fund for Agricultural Development financed The Rural Areas Economic Development Program (\$15.3 million), which aims to increase sustainable employment of rural communities in mountain areas and stimulate economic growth in rural areas (The International Fund for Agricultural Development, 2004).

Agribusiness Small and Medium Enterprise Development Project (\$13.6 million) financed by United States Agency for International Development (USAID) aims to strengthen the capacity of Small and Medium Size Enterprises, agricultural support organizations, and financial institutions (Asian Development Bank, 2006).

United States Department of Agriculture: Marketing Assistance Project (\$6.9 million) assists farmers and agribusinesses in production, marketing, and exporting food and related products to increase incomes, create jobs, and raise the standard of living of Armenian workers (Asian Development Bank, 2006).

Food and Agriculture Organization (FAO): US\$254,000 Support for the preparation and implementation of land consolidation and improved land management schemes (\$0.32 million). The project contributed to a viable and sustainable agricultural structure, and strengthened rural and regional development (Grigoryan and Vardanyan, 2002).

c. Operating Efficiency

Agriculture in Armenia remains an important economic sector representing around a fifth of GDP and employing some two fifths of the country's active population. About 36 percent of Armenia's population lives in rural areas, and rural poverty, at 25.5 percent, remain higher on average than in urban areas. In rural areas, agriculture remains the main occupation, also for the rural poor. More than 80 percent of the agricultural Gross Domestic Product (GDP) is produced on irrigated areas. If the irrigation infrastructure deteriorates further, agricultural production in Armenia would decrease significantly, having great impact on rural employment and adverse effect on people's living conditions. Thus, irrigated agriculture is essential for maintaining rural employment and economic growth in Armenia (The World Bank, 2009), (Appendix 2, Table 4).

Structural and management reforms of the irrigation sector, introduction and strengthening of participatory management in the last years have greatly contributed to the improvement of irrigation indicators. According to Sustainable Development Program (Sustainable Development Program, 2008), the size of the areas that are not irrigated due to the lack of access has decreased considerably, and so has the number of rural households, which believe that their key problem is the lack of access to irrigation. Armenia has achieved substantial progress in preventing deterioration of the irrigation and drainage system and in establishing a basis for sustainable management of irrigation and drainage (I&D) infrastructure. A long-term national program was conceived in the mid-1990s to support the rehabilitation and restructuring of the I&D system (The World Bank, 2009).

In conditions of wear and tear of irrigation systems, high energy consumption and inefficient management, only 70 percent of irrigable land is irrigated. Because of inefficient and low return on cultivation of some crops, introduction of cost-recovery tariffs for irrigation may make agriculture financially unappealing for many farmers (The World Bank, 2009).

d. Government Expenditures in the Irrigation Sector

In Armenia, agriculture is strongly dependent on irrigation, since the majority of crop production requires watering. Therefore, water for irrigation purposes remains the number one water demand in Armenia. The importance of irrigation infrastructure in the agricultural sector, and in turn, for rural employment, necessitates an immediate intervention to stop rising poverty. Effective development of processing, marketing, and agribusiness is the key to future agriculture sector development in Armenia. Increasing the competitiveness of domestically produced agricultural products and their share on the international market, leveraging specialty products, low cost labor and production, will bring jobs to Armenian farmers and agribusinesses. High-end, wild-harvested, niche products give Armenia a comparative advantage.

While Government has taken swift action to privatize and liberalize most aspects of the agricultural production, irrigation related issues remain prominent among the primary issues facing the sector, and among those that proved to be most difficult to address under the current circumstances. Three issues, in particular, require urgent attention. First, the high cost of water delivery resulting from heavy reliance on energy intensive pumping led to high subsidies and questioned the profitability of irrigated agriculture. Second, the lack of an effective cost recovery policy and of an operational mechanism for adequate funding and timely execution of Operation and Maintenance (O&M) activities led to continuous deterioration of the infrastructure. Third, the lack of clarity in the allocation of responsibilities and in the guidelines for accountability prevented water users from sufficient participation in the management of the irrigation system and resulted in wasteful irrigation practices and a high rate of water losses at all levels of the water transportation infrastructure.

To address these issues, the Government has embarked on an ambitious program to rehabilitate the country's irrigation system and to give users a stake in its management. While significant progress has been made in implementing emergency interventions aimed at

keeping the system operational and slowing the rate of its deterioration, progress to-date on the other two issues has not been sufficient. Although Government has developed a program for pump-to-gravity conversion, where such conversion is feasible and economic, its implementation is in an early stage. Only recently is the Government moving to substantially improve the mechanism for funding O&M activities, and to create the full set of enabling conditions for effective participatory irrigation management.

Within the framework of the projects implemented by different international financial institutions, the Government of Armenia made a contribution of about US\$11.69 million or € 7.8 million in the irrigation sector of the country.

Impact of International Investments in Irrigation Sector on Economic and Social Development

The projects implemented in the irrigation sector had so far positive impact on the country's economic and social development. Namely they caused improvement of infrastructure, improvement of core public sector functions and efficiency of water use. The projects also contributed to the objectives of the 2001 Country Assistance Strategy (CAS) in terms of improved governance and public services and creating jobs through private sector development. Agricultural output grew by 14% in 2004, as a result of increased domestic consumption and a combination of technical factors, among which enhancements in the irrigation system is probably the greatest. The projects also contributed to promoting fiscal discipline by being instrumental in reducing the dependence of the irrigation system on Government budget.

The interventions of international financial institutions stimulate both temporary (in construction through rehabilitation activities) and permanent (in agriculture through

restoration of irrigated lands) employment, acting as a direct and immediate benefit for rural areas. This is anticipated to prevent potentially sharp rises in poverty that are particularly pronounced in the rural areas.

Because GDP composition of agricultural sector comprises 16.7% of the economy, therefore the investments in irrigation sector will have positive impact on the economy of Armenia (The World Factbook). According to the estimates of MCC, The Irrigated Agriculture Project (MCC) will benefit approximately 250,000 farmer households. The Infrastructure Activity improvements will extend irrigation to an additional 46,000 hectares (114,000 acres) of new and recovered farmland, expanding the total area under irrigated production by more than 40%. Technical support provided under the Water-to- Market Activity will enable over 60,000 participating farmers to increase their average net incomes by approximately 25% through the adoption of improved on-farm water management techniques and the cultivation of higher-value agriculture. The Water-to-Market Activity will also boost the development of small- and medium-sized agribusinesses by expanding rural access to credit and providing training in post-harvest processing and marketing. For the Water-to-Market Activity, quantified benefits include additional income from newly irrigated land, the increase in high value-added crop cultivation, higher yields, lower production costs, and energy and water savings. The economic rates of return of each of the activities were compared to a benchmark of 12.5%, the average real growth rate for the past three years. The economic rate of return of the Water-to-Market Activity is estimated at 15.5% (Millennium Challenge Corporation, 2006).

According to World Bank estimations, the Irrigation Development Project aims to benefit about 30,000 private farming households who will be able to increase the productivity of their irrigated agriculture, directly as a result of project interventions. In addition, the project will enable about 5,000 households, currently depending on costly and unreliable pump

irrigation, to continue to practice irrigated agriculture, instead of abandoning farming altogether, and either shifting to very low productivity rain-fed farming, or migrating to urban areas in search of employment (The World Bank, 2007).

Interview Analysis

The interviews were held with the following incumbents:

1. Areg Barseghyan, Senior Coordination Officer of Asian Development Bank,
2. Andranik Khachanyan, Project Assistant of KfW,
3. Zara Tokhmakhyan, Senior Country Coordination Officer of World Bank, and
4. Hrair Yesayan, Head of Division on Water Programs, Department of Water Programs in the Department of Public Program, Deputy Head of Department of the RA Ministry of Finance.

Interview questionnaires are appended to this paper (Appendix 1).

The purpose of interviews was to gather some specific information that was unavailable for public sources and to get the overall understanding of the situation in the water supply and irrigation sectors in the country.

As a result of the conducted interviews the following conclusions can be made:

- The level of investment in a given sector is identified on the basis of the country's priorities identified by the Government and the urgency and scope of the assistance required. The needs assessment hence is carried out by the Government ("State Water Committee") to summarize the overall investment needs in the sector and particularly identify the areas that need immediate attention. The financial and economic analysis and

appraisal is carried out with an aim to identify expected economic benefits of the proposed initiative;

- The needs of the drinking water sector are significant. According to World Bank, the Bank's comparative advantage in Yerevan is the experience gained during successful implementation of the first water project. This experience, together with Armenia's need for support from all interested international financial institutions, suggests World Bank should continue to have an important role in improving country's water and wastewater services. According to the Ministry of Finance, the investments enhance the capacity of the Government to rehabilitate water supply and irrigation sectors. However, according to the rest of the interviewers, there is no rationale of taking loans from international financing institutions for financing the sectors. If the taken loans do not justify themselves, that is to say they do not meet the expected results, there is no more rationale to take any loans.
- The needs for capital investments in the sector in general are extremely high. Until Armenia's average per capita incomes reach a significantly higher level (multiple times of the current), capital expenditures captured by higher utility tariffs will continue to be unaffordable for the population, leaving the necessity for government subsidy.
- The benefits of the projects in water supply sector are increased water supply duration and healthy environment, in irrigation- improved economic conditions of the country due to improved agriculture. The objectives are water for all, without limitation. The risks of the projects are the following: water tariffs fail to achieve the level of financial sustainability and water supply companies become unable to reach full cost recovery of the water and wastewater sector; water supply companies' revenues stay lower than required to cover expenses, because sales or collections are less than projected; GOAM

does not continue to support increased private sector participation in the water and wastewater sector; etc.

- With the help of the investments the population has better access to basic infrastructure services, which in its turn leads to health improvement. Besides, the projects stimulate employment in construction through rehabilitation activities and in agriculture through restoration of irrigated lands, which reduces poverty level in the country.
- According to interview with the World Bank representative, over the next two decades at least US\$150 million will be required for rehabilitation of Yerevan's water and wastewater systems; replacement and renewal of all existing assets would be much more expensive. A bigger investment program ultimately will be required for the rest of the country. Investment is required in sewage collection and small pumping stations in the country. Some assistance should be directed towards Aeratsia treatment plant, which is currently in non-operational state and has fallen into dereliction. Beyond the urban areas mostly covered by 5 major water utilities, there are about 600 rural communities in Armenia that are self-served and not covered by current IFI-financed drinking water projects. There is an urgent need to design a strategy and find a way to help rehabilitate rural community drinking water infrastructure. According to ADB interview, the Bank will continue investments in infrastructure sector and water sector investments are being discussed. KfW plans to continue Water Supply and Wastewater Systems Rehabilitation in Armavir, Lori and Shirak provinces; the project in Vanadzor is at the stage of negotiations.
- All interviewees thought that that investments in the water supply and irrigation sectors stimulated economic development of the country. They stimulated creation of jobs, continued improvement of Armenia's economy, reduced unemployment and increased average wagesimproved economic efficiency and better financial flows of the water

utilities. Investments also reduced operating costs of the water utilities through system efficiency improvements (specifically, reduced energy costs) and increased service levels to minimize costs to consumers.

Findings and Analysis

1. The obvious solution to fund the reconstruction and improvement of the water infrastructure would be through higher tariffs. But this is proving politically difficult in an economic environment where even under low tariffs, many low-income households find it hard to pay their utility bills in full and on time. In Armenia water tariffs are still unsustainably low, and the payment record is unreliable. Effective tariffs (that is, tariffs regulated for payment levels) will have to be adjusted considering services improvement. Affordability problems caused by higher, market-orientated tariffs are likely to get worse before they get better. This poses potential social problems. Therefore a need to mitigate the effects of tariff reform especially on low-income customers clearly exists. One of the options could be introduction of multiple-tier tariffs with different tariffs for different amounts of consumed water. The GOAM is currently looking for innovative mechanisms for financing the sector, which are establishment of water and sanitation revolving fund, issuance of corporate bonds, introduction of the municipal bonds practice and multiple tier tariffs that will help to attract capital in the sector.

2. The Government of Armenia has taken serious steps to rehabilitate and reform the water supply and sanitation sector, with the support of international donors. In order to provide a basis for better water services the legal framework - including but not limited to Water Code, Law on Condominiums, Law on Local Self-Government, National Water Program, On the

Water User Associations and Unions of Water User Associations, a number of Government decrees - have been passed. The water sector strategy has identified three segments for investments: the capital of the country, medium and small-sized cities, and rural settlements. Currently, the Government is reforming water subsidies and revising water tariffs to ensure the sustainability of WSS services. The Government is planning to phase out water supply subsidies in Yerevan (end of 2006) and the rest of the country (end of 2008).

The Government has started a program to rehabilitate the country's irrigation system and to give users a stake in its management by establishing WUAs and unions of WUAs. Significant progress has been made in implementing emergency interventions aimed at keeping the system operational and slowing the rate of its deterioration. Although Government has developed a program for pump-to-gravity conversion, where such conversion is feasible and economic, its implementation is in an early stage. Only recently is the Government moving to substantially improve the mechanism for funding O&M activities, and to create the full set of enabling conditions for effective participatory irrigation management.

3. Water utilities in Armenia use two management models: centralized and decentralized. The centralized model of management is based on 100% state ownership of the assets, while decentralized model considers 51% of state ownership and 49% of the municipal ownership for the operating system. In both cases the government took the approach of inviting private international operators to manage operation and maintenance of the systems.

The centralized model is applied for “Yerevan Djur” CJSC (Yerevan Water) and Armenian Water and Sewerage Company. The largest water company in Armenia, “Yerevan Djur” operates based on a lease contract with the French company Veolia. The company serves the capital city, Yerevan and the nearby rural communities. The second largest water supply company “Armenian Water and Sewerage” CJSC which serves about 40 towns and

300 rural communities, is managed by the French company SAUR, based on a management contract.

The decentralized model of partnerships was applied in three provinces of Armenia: Armavir, Lori and Shirak for water companies named Lori, Shirak and Nor Akunq.

Outside these two models there are approximately 550-600 villages and a few towns that provide their water supply and sanitation services independently through a municipal company or local government directly. Even though being aware of the situation the Government of Armenia has not made any decision and adopted any strategy in order to address the issue. The main reason is absence of resources to improve the situation and that rural water supply and sanitation are higher priority for the government.

For water supply services in Yerevan, three factors made the Government to turn to a private operator: the need for capital infusion, a lack of existing utility capacity for efficient service delivery, and urgency to improve water services. The Government believed a private water operator, one with extensive experience, could work urgently and effectively at one of its greatest problems: the estimated 72% unaccounted-for-water. Part of the problem would be solved by capital investments, specifically widespread metering and pipe replacements, the rest by an effective billing and collections system. Overall, the private sector offered greater flexibility in terms of creating better incentive structures, hiring practices, and quicker procurement, among other advantages that are all helpful to increasing performance and efficiency.

4. The Law on National Water Policy (RA Law on National Water Policy, 2005) ensures the availability of water resources in adequate quantities, qualities and regimes for current and future human health, socio-economic development of the country, as well as to meet economic and environmental needs. However, it does not directly refer to the policies for, or priority activities in, the water supply and sanitation sectors. According to National Water

Program Article 16 and Article 17 (Water Code of the Republic Of Armenia, 2002), it only mentions that nature protection payment privileges shall be specified by the law, and nature utilization privileges – by the Government of the Republic of Armenia.

The amount of resources required to fully develop the drinking water, irrigation and wastewater sectors of Armenia is not known with any precision. This is due in part to the underlying uncertainty regarding future prices, including the costs of capital, energy, and labor; and due to the underlying uncertainty surrounding the size of the task at hand. What systems need to be repaired, renovated, or replaced? What capacities should they have? What technologies should be adopted?

Within the past few years, there have been several attempts to estimate the costs necessary to meet differing WSS stabilization and development targets. Some of these efforts used the Feasible Spreadsheet Model to help construct the estimates based on generic cost functions driven by local indicator variables. Two of these efforts focused on nineteen urban water service areas. The first, published in 2004, was jointly produced by the State Committee for Water Economy (SCWE) and the Ministry of Finance and Economics (MoFE). That report was updated for the nineteen urban service areas by the Institute for Urban Economics (IUE) and published in 2007. In 2008, TME (Institute for Applied Environmental Economics) produced a report that used sample survey data on rural water and wastewater services to estimate the cost of upgrading the water services of rural communities throughout Armenia.

5. The major donors involved in implementation of reforms in water and irrigation sectors are the World Bank (water supply and irrigation), KfW Entwicklungsbank (water supply), Asian Development Bank (water supply), USAID (water supply and irrigation, legal and institutional reforms), EBRD (rehabilitation of water treatment plants around Lake Sevan) and the Millennium Challenge Corporation (irrigation). The involvement of these institutions

was/is through providing consultancy services to the relevant government authority on amending legislation, setting up new tariff regimes or preparing a systematic investment plan for the water and irrigation sectors. In total, the financial institutions mentioned above invested \$466.794 million in both irrigation and potable water sectors, namely, \$293.474 million in irrigation and \$173.32 million in potable water sector from the year 2001 to present (see Table 1).

Table 1: Investments in Water and Irrigation Sectors by International Financial Institutions (2001-present)

	Irrigation Sector	Drinking Water Sector
International Financial Institution	Amount of investment (US Dollar million)	Amount of investment (US Dollar million)
World Bank	\$91.3	\$93
Millennium Challenge Corporation	\$146	
EBRD	\$19.8	
International Fund for Agricultural Development	\$15.3	
USAID	\$13.6	\$3.16
United States Department of Agriculture	\$6.9	
Food and Agriculture Organization (FAO)	\$0.574	
KfW Entwicklungsbank		\$41.16
Asian Development Bank		\$36.0
Subtotal	\$293.474	\$173.32
Total	\$466.794	

5. Armenia is a country in transition, so it is eligible for receiving concessional loans from international financial institutions. This means that the terms of providing the capital are the following: the interest rate of 0.75%-1% per annum, with maturity 20/40 year and 5/10 years of grace period.

Table 2: Terms of providing capital to Government of Armenia by IFIs

IFI	Maturity	Grace Period	Interest Rate
World Bank	40 years	10 years	0.75%

KfW Entwicklungsbank	40 years	10 years	0.75%
Asian Development Bank	15 years	5 years	1%

The Armenian economy's capacity to borrow non-concessional resources and repay its loans will gradually strengthen with economic growth, a favorable macroeconomic outlook, improved creditworthiness and emerging investment opportunities. The level of concessionality of new external borrowing is expected to decline in the future, as Armenia's national income per capita rises. However, the global financial crisis had a negative impact on the economic growth in Armenia. Based on the 2006 review of its creditworthiness by the International Monetary Fund, the country may become eligible for non-concessional borrowing from 2008. International Development Association (IDA) repayment terms are envisaged to harden as per capita income is expected to exceed the IDA eligibility threshold for 2 consecutive years. For operational and analytical purposes, The World Bank's worked out main criterion for classifying economies is gross national income (GNI) per capita. Based on its GNI per capita, every economy is classified as low income, middle income (subdivided into lower middle and upper middle), or high income. The Bank's analytical income categories (low, middle, high income) are based on the Bank's operational lending categories (civil works preferences, IDA eligibility, etc.). Classifications and data reported for geographic regions are for low-income and middle-income economies only. Low-income and middle-income economies are sometimes referred to as developing economies. Classification by income does not necessarily reflect development status. Economies are divided according to 2008 GNI per capita. The groups are: low income, \$975 or less; lower middle income, \$976 - \$3,855; upper middle income, \$3,856 - \$11,905; and high income, \$11,906 or more. IDA countries are those that had a per capita income in 2008 of less than \$1,135 and lack the financial ability to borrow from IBRD. IDA loans are deeply concessional— low interest

loans and grants for programs aimed at boosting economic growth and improving living conditions. IBRD loans are noncessional. Blend countries are eligible for IDA loans because of their low per capita incomes but are also eligible for IBRD loans because they are financially creditworthy. According to these categories, Armenia is classified as a lower-middle-income country, which means it is eligible for IBRD and IDA loans, that is to say it is a blend country (Country Classification, World Bank).

7. The investments of the mentioned international organizations had positive impact on both economic and social development of the country. They promoted improvement of infrastructure, improvement of core public sector functions and efficiency of water use. They also contributed to promoting fiscal discipline by being instrumental in reducing the dependence of the irrigation system on Government budget. The projects also contributed to the improvement of governance and public services and creating jobs through private sector development (Appendix 2, Table 5). Due to the financial assistance on behalf of the international organizations the following projections have been done by the GOAM concerning the subsidies to the irrigation sector. According to the Government Decision N 188-N, February 8, 2007 “General Provisions of the Amendments to the State Financial Support to the Water Consuming Companies and about the Approval of the Norms for the Supplied Irrigation Water Losses”, the government subsidies to the irrigation sector from 2007 till 2011 decrease from 5,549.1 million drams in 2007 to 3,667.5 million drams in 2011. This gives less dependence of the irrigation sector on the government subsidies.

Investments in the water sector brought about improvement of water supply duration from an average of 2-6 hours per day to an average of 18.4 hours per day in Yerevan and, energy consumption reduction by about 50%. Water meters were installed in the apartments, and once the quantity of installed water meters drastically increased, water consumption per capita per/day was reduced by more than 7 times (due to the elimination of leakages and

unaccounted-for-water), and fee collections for water supply services have been increased by 3-4 times. However, across regions the supply duration is still low. In about half of Armenia's urban communities the supply duration is less than 12 hours a day, and in 6 towns it does not exceed 4 hours. Another big issue is that there are still about 560 villages that are not covered by specialized service companies.

The projects in irrigation sector had direct and immediate benefit for the rural areas, as agriculture remains a dominant sector in the economy of Armenia. The projects benefited approximately 290,000 farmer households, they extended irrigation to an additional 46,000 hectares (114,000 acres) of new and recovered farmland, expanding the total area under irrigated production by more than 40%. Technical support enabled over 60,000 participating farmers to increase their average net incomes by approximately 25% through the adoption of improved on-farm water management techniques and the cultivation of higher-value agriculture. All the activities provided by different projects prevented or slowed down potentially sharp rises in poverty that were particularly pronounced in the rural areas.

8. Only some users are fully aware of the roles and responsibilities of the various parties involved in the delivery and use of potable water and water for irrigation. This unawareness could undermine future relationships between water users, water supply companies and the Government of Armenia (GOA). These could block the potential gains for Government and for water users from decentralized irrigation management by water user associations.

9. There are several financing instruments, which could be used to immediately fund investment in the water sector. The new financing mechanisms may include use of domestic commercial loans, establishment of revolving funds or issuance of corporate and municipal bonds. The terms of borrowing of bonds and revolving funds differ from each other: revolving fund considers low interest rates for the companies but accelerated payment schedule for principal. On the other hand, bonds mature in the end of the period and consider

annual interest payment. From the perspective of cash outflows during the whole maturity period bonds impose lower burden on the companies, but assume pay back of a lump sum in the end of the maturity period which may create additional costs and risks.

10. After independence Armenia inherited deteriorated and obsolete infrastructure in both water/sanitation and irrigation sectors due to a number of reasons. After the collapse of the Soviet Union Armenia faced tremendous economic difficulties. Poor coordination among various government agencies responsible for maintaining and operating water systems led to further system deterioration, increased water losses and eventually brought the entire system to collapse. In order to rehabilitate and reform water and irrigation systems huge capital investments were required along with radical legal and institutional changes to make the system economically and financially viable under the new market economy conditions. With the support of international donors, the Government has invested in capacity building, institution building, upgrading of infrastructure, improvement of management and revision of the tariff system.

To sum up, the investments of the international financial institutions have positive impact on the economic performance of the country: employment rates increased, fiscal discipline among water supply companies improved and poverty level reduced. It is anticipated that all these factors will boost the national economy, enhancing ultimately the ability of the government to repay the loans, which is done from tax collections and from user charges collected from the users.

Conclusions and Recommendations

Investments done through international financial institutions had significantly contributed to the improvement in accessibility, supply duration and safety of drinking water, increase of

water availability and improvement of the physiological and microbiological quality of water supplied to consumers, which led to a reduction of the water-borne diseases and a general improvement in public health. Due to structural and management reforms of the irrigation sector, introduction and strengthening of participatory management in the last years improved irrigation indicators of the country. There has been a significant decrease of the size of the areas that are not irrigated due to the lack of access to water. The irrigated land had increased by 15 000 ha by the end of 2008. Armenia has achieved substantial progress in preventing deterioration of the irrigation and drainage system and in establishing a basis for sustainable management of irrigation and drainage (I&D) infrastructure. The improvement of the irrigation sector has a great impact on rural employment and on people's living conditions. Thus, irrigated agriculture contributes to maintaining of rural employment and economic growth in Armenia, because more than 80 percent of the agricultural Gross Domestic Product (GDP) is produced on irrigated areas. Besides, investments in irrigated agriculture create incentives to introduce progressive soil- and water related agricultural practices.

However, there are numerous challenges ahead to be met in both sectors:

1. Drinking water tariffs are still low and do not ensure full cost recovery of the system, which means that government will continue to subsidize the system in the nearest future
2. water supply coverage in rural areas still has a huge gap
3. wastewater treatment is still an area where investments continue to be postponed due to shortage of funds, investments in this area are also of a different magnitude of order
4. the obsolescence of infrastructure continues to remain a major challenge,
5. major sections of the irrigation water delivery system remain highly deteriorated,
6. high energy consumption and inefficient management of irrigation systems, due to which only 70 percent of farmland is irrigated.

Taking into consideration the specificities of water and irrigation sector in Armenia, the investments by international financial institutions and the result of interviews that were conducted with different representatives from the field **the following recommendations are made for the improvement of the sectors' efficiency:**

1. Tariffs for drinking and irrigation water should take into account affordability of utilities in Yerevan and regions; consider introduction of multiple-tier tariffs with incrementally growing rates and provision of subsidies to low-income families. This solution includes the opportunity of differentiating prices according to different levels of income. Multiple-tier tariffs will allow people to regulate use of water; the more water is used the higher the water tariff and vice versa.
2. In spite of the fact that several studies have been conducted by some international organizations to estimate the costs necessary to meet differing WSS stabilization and development targets, still there is no clear projection how much investments are needed for the water sector and the government has not built up its priority list for the investments. Government should identify its investment priorities among water supply, wastewater treatment and irrigation systems both in Yerevan and in marzes.
3. The Government of Armenia gives priority to water supply over sanitation in the country due to the fact that the issue of the access to water is more vividly expressed in many regions of the country than the sanitation issues. However, the problem of the access to sanitation does exist in Armenia and only 60% of the population has access to improved sanitation. This means that more attention should be paid to sanitation issues. Investment is required in sewage collection in the country. Some assistance should be directed towards Aeratsia treatment plant, which is currently in non-operational state and has fallen into dereliction.

4. In this respect the Government of Armenia should review its policies, identify the scope and urgency of the assistance for revival of water supply, wastewater treatment and irrigation systems. Afterwards, the Government of Armenia should elaborate project proposals and consider their funding jointly with donor organizations. The government should also carry out the financial and economic analysis and appraisal in order to identify expected economic benefits of the proposed initiatives.
5. Along with assessing investment needs across the country it is important to decide on the strategy and innovative financing mechanisms for funding capital expenditures in these systems. Continued borrowing from IFIs is not a sustainable practice. Some innovative financing mechanisms may include use of domestic commercial loans, establishment of revolving funds or issuance of corporate and municipal bonds. These methods will reduce the dependence of the Government on international financing. Revolving fund may be an appropriate mechanism for long-term financing of water system development because it is most flexible: it does not exclude the option of further use of international loans or, in a longer term, issuance of bonds by the revolving fund.
6. Gradually shift to full cost recovery of all water supply systems (irrigation, drinking water, sanitation) and enhance creditworthiness of water supply companies in order to be able to borrow and repay and ensure financial stability of water supply companies. There is a need to shift water supply companies to self-financed system, which will allow the Government to reduce its dependence on international loans, which in its turn will reduce further growth of the national debt of the country.
7. Make decision-making process on tariff setting fully transparent and participatory; tariffs ideally should incorporate capital investments; information should be made available to all water users through water user associations. GOA should support repeated widespread

dissemination of clear information to water user associations on water user fees and the role and responsibilities of various parties in fee collection and use.

8. There are about 600 rural communities in Armenia that are self-served. There is an urgent need of investments that would help rehabilitate rural community drinking water infrastructure. The Government of Armenia is recommended to carry out a comprehensive study aiming at prioritizing the communities that need investments for water sector revival. Based on the results of the study the Government of Armenia should elaborate a project proposal for the correspond regions and apply to donor organization for financial support.

Appendix 1. Questionnaire for Interviewing Representatives of International Financial Institutions and Government Officials

1. What defines the level of investment in the sector and needs for capital? Who makes the needs assessment and financial appraisal of projects?
2. What is the conditionality for providing capital for the water and irrigation sectors in Armenia by IFIs?
3. What is the rationale of financing water and/or irrigation sectors in Armenia through IFIs?
4. Are there any alternatives to borrowing from IFIs and contributing to further increase of the national debt?
5. What are the terms in providing capital for the water and/or irrigation sectors? (maturity, interest rate, grace period). How these terms are expected to change over time?
6. What are/were the objectives, benefits and risks of the projects in irrigation and/or water sectors?
7. Please, appraise the overall efficiency of projects implemented in the sector in comparison with the expected outcomes.

Irrigation Sector

Drinking Water Sector

1. How do investments in these sectors help to reduce poverty?
9. What are the plans for financing the sector in the next 5 years?
10. How do investments in this sector stimulate economic development?

Appendix 2. Tables

Table 3: Armenia. Household access to drinking water, comparison between 1998/99 and 2004 - 2006 (% of the population)

Main source of drinking water	Population total			Urban population			Rural population		
	1998/99	2004	2006	1998/99	2004	2006	1998/99	2004	2006
Centralized supply	83.7	88.9	91.3	96.2	96.5	98.1	64.7	74.0	78.0
Less than 1 hour	16.3	1.6	0.5	4.1	1.6	0.6	35.0	1.6	0.1
1-5 hours	43.2	39.5	35.9	56.4	40.9	37.2	23.1	36.0	32.8
6-12 hours	15.8	21.5	25.9	19.6	22.5	25.9	9.9	19.0	25.9
13-23 hours	4.1	4.5	4.3	4.9	5.2	4.9	2.8	2.8	2.9
24 hours	20.6	32.9	33.4	15.0	29.8	31.4	29.2	40.6	38.3
Well, spring	5.9	3.8	3.9	1.2	0.9	1.4	13.0	9.4	8.9
Local source	2.0	2.6	3.3	0.4	0.2	0.1	4.4	7.3	9.5
Carried water	8.3	4.5	1.4	2.1	2.3	0.3	17.8	9.0	3.6
Other sources	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.3	0.0

Source: RA NSS, Household Survey, 1998/99, 2004 - 2006

Table 4: Main target indicators for irrigation sector

		Baseline	2012	2015	2018	2021
Reform index	EBRD Transition indicators	2.33 (2007)	2.67	3.00	3.33	4.00
Irrigable areas	Thousand ha	123 (2006)	160	180	180	180
Current cost-recovery level	%	40% (2006)	75%	85%	100%	120%
Public investment level, % of GDP	Annual average 3 previous years	0.05% (2007)	0.2%	0.2%	0.2%	0.2%

Table 5: Development Coordination

Sector/Thematic/Area	Development Partners' Strategy/Activities
Agriculture and Natural Resources	<p>World Bank: Irrigation Development Project (\$24.9 million) aims to enhance the profitability and sustainability of irrigated agriculture, providing the basis for stabilizing irrigated agriculture as a predominant source of productive employment.</p> <p>Irrigation Rehabilitation Emergency Project (30.00 million) The Project Development Objectives (PDOs) are: (i) to improve water use efficiency in two selected irrigation schemes; and (ii) to foster immediate rural employment. These objectives can be achieved by rehabilitating irrigation canals to reduce water losses in two selected schemes, and at the same time by providing some limited assistance to strengthen institutions managing the irrigation infrastructure.</p> <p>Natural Resource Management Project (\$8.3 million) aims to adopt sustainable natural resource management practices and alleviate rural poverty in mountainous areas where environmental degradation is now reaching a critical point. The project will help avert further deterioration of natural resources (soil, water, forest, fishery, and biodiversity) and stabilize incomes in the local communities.</p> <p>Irrigation Dam Safety Projects (I and II) (\$26.6 million and \$6.8 million) aim to protect the population and the socioeconomic infrastructure downstream of the dams facing the highest risk of failure.</p> <p>Rural Enterprise and Small-Scale Commercial Agriculture Development Project (\$20.0 million) aims to help targeted farmers and rural entrepreneurs have a better link with markets, increase their income from rural activities, and increase employment opportunities in rural areas.</p> <p>International Fund for Agricultural Development: The Rural Areas Economic Development Program (\$15.3 million) aims to increase sustainable employment of rural communities in mountain areas and stimulate economic growth in rural areas.</p> <p>United States Agency for International Development (USAID): Agribusiness Small and Medium Enterprise Development Project (\$13.6 million) aims to strengthen the capacity of SMEs, agricultural support organizations, and financial institutions.</p> <p>United States Department of Agriculture: Marketing Assistance Project (\$6.9 million) assists farmers and agribusinesses in production, marketing, and exporting food and related products to increase incomes, create jobs, and raise the standard of living of Armenian workers.</p> <p>Food and Agriculture Organization (FAO): Support for the preparation</p>

Water Supply,
Sanitation, and Waste
Management

and implementation of land consolidation and improved land management schemes (\$0.32 million). The project will contribute to a viable and sustainable agricultural structure, and strengthen rural and regional development.

Millennium Challenge Corporation (MCC): Provide a \$146 million project to increase the productivity of approximately 250,000 farm households (34% of which are headed by women) through improved water supply, higher yields, higher value crops, and a more competitive agricultural sector. This project consists of two components: (i) an **infrastructure** component that aims to increase the amount of land under irrigation by 40% and will improve efficiency by converting from pump to gravity-fed irrigation, reducing water losses and improving drainage; and (ii) a **water-to-market** component that will improve the efficiency of water delivery to farmers and boost farm productivity and profitability through technical assistance (TA) and credit support.

German development cooperation through KfW: Communal infrastructure: water and sanitation was initiated in 1998 (€29 million) and aims to ensure continual drinking water supply in the program region (cities of Armavir and Metsamor).

USAID: A water management program works to improve the national framework for water quantity and quality monitoring, support local level efforts to develop market-based approaches to improving water quality, and strengthen the institutional and financial sustainability and operations of water supply entities.

World Bank: Municipal Development Project (\$30.0 million) aims to make emergency improvements in Yerevan's water supply system; improve the efficiency, management, operation, and delivery of water and wastewater services for the Yerevan service area; and lay the groundwork for the sustainable involvement of the private sector in the overall management of these services in Armenia. The project components include an immediate investment program, management contract, operating investment fund, capital investments, housing, and TA.

Municipal Water & Wastewater Project (\$23.0 million) aims to improve the quality of water and wastewater services in the Armenia Water and Sanitation Company service area by providing efficient and sustainable water and wastewater services and strengthening the capacity and sustainability of the Armenia Water and Sanitation Company. The project will support a key country assistance strategy objective—financial and technical rehabilitation of Armenia's water and wastewater systems—by improving utility financial discipline with better cash generation and expenditure management, improving water & wastewater services, and rehabilitation of sector infrastructure.

Yerevan Water & Wastewater Project (\$20.0 million) has helped the Government to prepare a new project to improve Yerevan's water and

wastewater system by continuing and expanding accomplishments achieved under the World Bank-financed Municipal Development Project

Additional Financing for the Municipal Water and Wastewater Program, would provide additional financing in an amount of SDR 12.8 million (US\$20 million equivalent) to the Republic of Armenia for the Armenia Municipal Water and Wastewater Project (MWSSP). The additional financing would support the scaling up of the previous program of water system rehabilitation and improvements, including extension of the ongoing management contract between the Armenia Water and Wastewater Company (AWSC), the water utility in charge of the project, and an international water supply utility operator. The proposed additional financing is aimed to help enhance the sustainability, impact and development effectiveness of the ongoing project, maximize its development outcomes as well as continue with the institutional and financial capacity building of AWSC.

Asian Development Bank: Water Supply and Sanitation Sector project was approved in June 2008 (ADB loan: \$36.0 million). The Project will help the Government provide the required institutional and management support to the AWSC and local municipal governments to enable them to be more self-disciplined in financial, managerial, and technical aspects. The outcome of the Project is improved access to safe, reliable, and sustainable water supply and sanitation services managed on commercial principles and environmentally sound practices.

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