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**Towards Performance Based Utility Sector in Armenia:
Case of Drinking Water Supply Services**

By

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Abstract

Collapse of the old administrative system and subsequent economic crisis in Armenia led to the entire deterioration of water supply system in the country. Institutional, legislative and regulatory reforms commenced from the beginning of 2001 aimed at rehabilitation of the collapsed water supply system and implementation of efficient national water policies enabled private sector involvement and water sector commercialization. Management of the key players in the national water supply sector was strengthened by granting contracts to international companies and by making investments in the companies. Managing water utilities in accordance with performance-based contracts brought in new skills and competencies. Introduction of performance management has led to the continuing improvement of water supply services provided to the population. Therefore, it is believed that with introduction of performance based contracts Armenia has set a good example in managing utilities for other FSU countries. However, the contribution of performance management to overall quality and reliability of services has been so far limited. Despite reporting progress and success by the water supply companies, in many localities service quality and reliability remains poor and the country still lags behind the required level of efficiency and effectiveness of the services provided to population.

The research investigates how introduction of performance management increased efficiency, effectiveness and overall quality of the water supply services provided to population in Armenia. The research overviews the current situation in the water supply sector of the country, analysis current performance oriented practices used by water utilities and how input, activity level, output and outcome targets are used, identifies existing gaps in the coverage and implementation of performance management. The research also includes citizen feedback on performance of water supply services with regard to their perception of services and satisfaction with services' qualitative, quantitative and other dimensions.

The research shows that the selection of performance indicators has been one of the major factors that contributed to the implementation of result based management of the key players in the national water supply system. However, improving performance of water utilities is a long process requiring considerable investments and expertise. To further improve meeting consumers' expectations and promote continuous improvement of management and operation, the water supply companies need to increase the number of indicators related to drinking water quality control. The research proposes to properly work out, approve, and publish national performance standards so that users can evaluate the services and be aware what they can reasonably expect from providers. The research also proposes to take into consideration qualitative indicators that increase employee motivation and enhance performance, including such matters as adequacy of staff compensation packages and reward systems. The water supply companies need to deal with issues of external transparency and accountability to public and better build trust and relationships with customers through improving focus on public information process and building customers' awareness, making citizens known the physical conditions of infrastructure and facilities, providing with information about their rights and responsibilities and the real cost of the services delivered. In addition, the research proposes a number of initiatives that will reinforce the need for the water supply companies to better use its resources and treat citizens as clients/customers to improve their satisfaction with service delivery.

1. Introduction

Drinking water supply services have significant position in the services provided by utilities sector and important role in ensuring a good quality of life for citizens. Collapse of the old administrative system

and subsequent economic crisis in Armenia led to the entire deterioration of water supply system, covering the demands of households, commercial, industrial enterprises and institutional consumers. Institutional, legislative and regulatory reforms commenced in the beginning of 2001 were aimed at rehabilitation of the collapsed water supply system in the country, implementation of efficient national water policies and also matched broad public management reforms implemented in the country. Subsequent decentralization, devolution of responsibilities and privatization, separation of regulatory, standard setting and operational functions enabled private sector involvement and water sector commercialization. Management of the key players in the national water supply sector was strengthened by granting contracts to international companies with long international experience in the countries, where water supply was challenging issue, and by making new investments in the companies. Managing water utilities by foreign private companies in accordance with performance-based contracts brought in new skills and competencies in managing water utilities.

The goal of this research is to investigate how performance oriented practices increased efficiency, effectiveness and overall quality of the water supply services provided to population in Armenia. The research overviews the current situation in the water supply sector of the country, analysis current performance oriented practices used by water supply companies (hereafter, WSCs) and how input, activity level, output and outcome targets are used, identifies existing gaps in the coverage and implementation of performance oriented practices.

Since direct citizens' experience with service provision, makes their assessment of public services valuable in providing information about areas of service delivery improvement, therefore, the project has gathered and analyzed citizen feedback on performance of water supply services with regard to citizens' perception of services and satisfaction with their qualitative, quantitative and other dimensions as well as citizens' expectation met. Some good and bad practices having local and/or national policy concerns are identified and examined.

The research uses the following methods of research: documentary analysis, non-standardized interviews, a survey, focus group discussions and actual observation. The documentary analysis is used to review secondary sources of information, including legal acts and guidelines, various programs' documents and reports, analytical, informational and statistical materials, the results of previous surveys and media information. Non-standardized interviews are conducted with managers of service providing companies to reveal their concern with performance and exposure to performance assessment. In addition, the survey of households, focus group discussions, and actual observations is carried out to gather primary empirical evidence with regard to the indication of the extent to which citizen expectations are met.

The research paper consists of abstract, introduction and three chapters. Introduction outlines the context of the problem and presents methodology. Chapter 2 overviews the current situation in the water supply sector in Armenia. Chapter 3 presents and analysis performance management practices implemented in WSCs. Chapter 4 analysis citizen feedback on performance of water supply services in three poorest regions of the country and their perception of and satisfaction with services provided. Chapter 5 gives summary of major findings. Chapter 6 concludes and recommends.

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2. Overview of Water Supply Services: Context Information

2.1. Description of current situation

Armenia is a mountainous landlocked country in the South Caucasus with a population of about 3.2 million, with nearly 1.3 million residing in the capital city, Yerevan. The country in general is rich in potable water resources. However, water resources are not equally distributed on the territory of the country and are scarce in densely populated areas such as Yerevan and in the south and northwest.

Drinking water supply services have significant position in the services provided by utilities sector and cover the demands of households, commercial and industrial enterprises and institutional consumers. In the former Soviet Union, “drinking water supply services had been provided to citizens by public sector organizations at very low prices (relative to the cost of supply). The gap between service revenues and costs of provision was made up from the government budget or more directly from turnover taxes on local enterprises”.¹ Collapse of the old administrative system and subsequent economic crisis in Armenia, coincided with consequences of the first reforms and led to the deterioration of water supply system accompanied by huge drinking water losses in the network and low tariff rates that haven't even covered the costs of electricity for the supplied water. Both urban and rural consumers faced serious problems with shortage, intermittent supply, low pressure due to leakages in both system and end-users' side and poor quality of drinking water. On the supply side of these services was technological backwardness of the mechanical and electrical equipment with high energy and spare part consumption, an old and worn infrastructure as well as outdated system designs and standards. On the demand side was extremely low wages and pensions of the population.

Though “the average water supply service coverage across Armenia was equal to 92%”² (80% in rural areas and 99% in urban areas³), however, in 2002 the availability of supplied water ranged from 2 to 8 hours per day. Even within these short hours of water availability the interruptions in the supply were usual things. “Unaccounted-for-water was between 40% and 90%. Low collection efficiency estimated at 15%”⁴ aggravated the situation.

Initial reforms were aimed at separation of regulatory, standard setting and operational functions. To rehabilitate, improve and enlarge the entirely collapsed water supply system the RA Government adopted Decree #92 “On Reforms of Water System Management” in the beginning of 2001 providing the basis for the implementation of the reforms. The decree stipulated establishment of the State Committee of Water System (hereinafter, SCWS) under the RA Government to implement national water policies by optimizing the management of water resources and increasing the effectiveness of reforms in the water supply sector, as well as improving tariff policy.

Adoption of the new Water Code in 2002 enabled creation of a new institutional framework to ensure effective management of water resources in Armenia. The tariff setting functions were transferred to independent body - Public Services Regulatory Commission (hereinafter, PSRC) of the RA responsible for the regulation of the public utilities. Improvement of the existing legislation provided the basis for planning of the integrated water resources management, and solving problems in the water supply sector through “establishing legal base for private sector involvement and water sector commercialization”⁵. Further implementation of the reforms involved decentralization and privatization, development of the investments policies and implementation of the radical changes in the sphere of social security through introduction of family allowance system. Developed National Water Policies enabled involvement of all relevant stakeholders, “development of bodies for cross-sector participation and increasing human capacities in water management”⁶.

The Law on Local Self-government adopted in 1996 defined drinking water supply service provision as mandatory responsibility of local governments. In accordance with the law, water supply enterprises and distribution network within administrative boundaries of municipalities were transferred in 1997 to the ownership of respective municipalities. The decree of the Government #149-N issued in 1999 stipulated the transfer of the majority of municipal water supply and removal services outside the capital city Yerevan to Armenian Water and Sewerage CJSC (hereinafter, AWSC).

All water resources in Armenia belong to the state. The Water Resources Management Agency (WRMA) created in 2002 issues the Water Use Permit and monitors the compliance with its requirements. Bulk water is delivered by established WSCs through the transmission mains, which also belongs to the state. Local governments either buy bulk water from the WSCs and manage the distribution networks themselves, or enter into an agreement with the companies to manage the water supply systems and collect the water tariff directly from individual consumers.

Numerous community water supply projects aimed at restoration of water supply services were financed by international donor organizations with “the objectives to sustain services essential for the population and development of local economy and to help implement regulatory, institutional, technical and financial improvements”⁷. All these rehabilitation measures taken together contributed to commercial viability of service providers and gradually diminished their dependence on subsidies.

Currently, two subsystems of drinking water supply are used in the country - centralized and decentralized. Nearly 80% of population in Armenia⁸ receives water supply services through the centralized subsystem including state owned or private water supply companies. Management of these companies is carried out by employment or contracting of private operators. The Public-Private Partnerships (hereafter, PPPs) allow “the government to retain the ownership of assets ensuring capital injection and technical expertise through private sector involvement in the water supply system”⁹. The decentralized subsystem of water supply is that from community water sources that are predominantly rural and include water springs, wells and open sources.

A) Centralized Supply.

At present, five WSCs provide the centralized water supply services in Armenia:

- Yerevan-Jur CJSC (hereafter, YWSC);
- Armenian Water and Sewerage CJSC (hereafter, AWSC);
- Shirak Water and Sewage CJSC (hereinafter, SWSC);
- Lori Water and Sewage CJSC (hereinafter, LWSC);
- Nor Akunk CJSC.

YWSC is the largest company in Armenia, which supplies water to the population of Yerevan and neighboring 32 rural communities with more than 1,3 million inhabitants, accounting for the half of the total water supply in the country. A 4-year Management Contract (afterwards extended to 5 years) was awarded in 2000 to Italian Company belonging to the ACEA Group – A. Utility. In 2006 a 10-year lease contract was awarded to the French company “Generale des Eaux”, Veolia Water. The investment projects are financed in the framework of loans provided by the WB and French Government.

In Yerevan, nearly half of the water produced is pumped from groundwater sources, which brings to the company’s high operating expenses and high energy consumption. Moreover, elevation differences exist throughout the city. Therefore, to gradually increase efficiency, ensure uninterrupted water supply and

greater service continuity, the distribution system is divided into pressure zones. Implementation of water supply zoning in Yerevan is planned to finish in 2011. Zoning of the service network includes creation of small and independent distribution networks enabling regulation of water pressure and more rapid revealing of leakages and, thus, contributing to the efficiency and greater continuity of services rendered to population. However, still “80% of water is lost due to leakages and low efficiency of the network”¹⁰. The box below illustrates condition of the water supply in the central district of Yerevan.

Box1
Decreased Duration of Supply in the Capital City.

Through the past years the YWSC received nearly USD 150 million to finance improvements in its operations adding receipts from the sale of water, with the promise to improve the consistency of supply and reduce operating costs. Though this huge amount of money has been spent and the cost of water keeps going up, however, the consistency continues to be a problem. In response to economic crisis the water problem has raised again due to the company’s expenses for electricity to drive the pumps. Water delivery has recently been cut from 16 hours to 8 hours each day in the central district of Yerevan. Large low-pressure source pumps deliver five times more water into water system of the city every day than is actually needed, which is lost, together with the millions of dollars in pumping costs. The system of localized high-pressure ‘booster pumps’ to deliver the water to the upper floors of the city’s thousands of high-rise apartment buildings is still inefficient and unreliable. In 2000 there were 795 booster pumps, but in 2005, after A. Utilities had completed its 5-year contract the number had been reduced to 550. A. Utilities reportedly replaced 240 of them with new and more efficient units. In January 2007, Veolia Water was into the second year of its contract and the General Director Mr. Popov announced he was to install another 500 new and efficient booster pumps. However, those new pumps were not installed.

Source: Media information

AWSC (with 100% state shareholding) delivers services in the marzes (regions) to 37 urban and 264 rural communities and accounts for nearly 22% of the total water supply. The company is managed by the French company SAUR based on management contract and renders services to 264,000 households covering around 700 000 inhabitants in all 10 marzes of the country. Investment project are financed in the framework of loans and grants provided by the WB, EBRD, ADB, USAID.

SWSC serves the population of Shirak marz totaling to more than 280,000 (rendering services to 35,000 of rural inhabitants). LWSC render services to the population of the corresponding marz with a total population more than 280,000 (including 20,000 rural inhabitants Nor Akunk CJSC (New Source) serves 3 urban and several rural communities in Armavir marz with a total population of 100,000 (including, 30,000 rural inhabitants). These three companies are managed in the framework of partnership agreement between the state and German KfW government-owned development bank. The first project began in Armavir marz in 2002 and the second project began in 2004 in Lori and Shirak marzes. It is worth mentioning that “the state owns 51% of the shares of those companies and 49% belong to the respective communities”¹¹ and all three companies have the same management structure. It is planned to decrease the share of state and increase the share of private sector (corresponding communities).

B) Municipal Supply/Rural Areas

The study implemented by the JICA and the OECD enabled classification of the existing water supply of rural population in Armenia in three categories¹²:

1. Rural settlements served by one of the existing WSCs serving in total about 45% of the rural population or 1/3 of total rural settlements;
2. Rural settlements without the services provided by WSCs, but with piped water supply (thereafter, PWS) managed by rural communities (about 50% of rural population);
3. Rural settlements that lack PWS (about 40 000 inhabitants).

At present, there are large technical, financial and organizational differences between the rural settlements with and without centralized WSCs. Settlements served by WSCs are, in most cases, supplied through a regional network of transmission mains connected to a few water sources. This nationwide network also serves most urban settlements in Armenia. WSCs increasingly manage to collect user charges.

The settlements outside the service areas of WSCs have to take care of all aspects (technical, financial, managerial) of the water supply themselves and lack institutional set up in water supply services. Thus, around 600 villages operate their water supply services independently. Some rural settlements, especially those with nearby water source manage their own water supply. The rest share water sources with one or more other settlements. Low user charge rates, low collection efficiency, or no regular charges for water supply characterize the settlements with PWS outside the service areas of WSCs (only in 20% of those rural settlements user charges are collected). Local budgets in rural settlements are generally very small and, therefore, available funds from local revenues as well as fiscal transfers from upper levels of the budgetary system are insufficient. In order to “find investments and start reforms for those poorly served communities the SCWS negotiates with the donor organizations”¹³.

Nearly 30% of the rural population lack access to safe potable water. The research implemented by IFAD in 2006 indicates that “only 2 percent of rural communities have the infrastructure of sufficient condition”¹⁴. Nearly 50% of the existing network needs radical renewal¹⁵. Thus, services provided are far from being efficient and effective due to low water pressure, insufficient duration and schedule of supply. The service quality is low since in many localities water it is not being filtered or does not undergo corresponding treatment.

European standards anticipate water supply per capita per day around 110-170 liters. However, in rural Armenia, the average water production equals to 400 liters per capita per day (thereafter, lcd). This figure shows highly oversized infrastructure in rural locations, high level of losses and inefficient use of drinking water produced. Rural settlements are characterized by small size and low population density that makes individual household connection pipes longer and water intake more expensive. Besides, in many cases transmission mains lie on long distances for relatively smaller amount of water. Moreover, unserved markets are not commercially attractive since they are associated with neighborhoods with low-income households, and remote communities. Therefore, creation of water supply systems in rural locations is more problematic than in urban areas.

2.2. National Policy Dialog on Financing Strategy for Rural Water Supply.

Implementation of National Policy Dialog in Armenia in 2007 enabled setting up realistic targets and a policy package that covers both improvement of the rural water supply system (hereafter, WSS) infrastructure (increased reliability of service delivery, renovation and extension of network, developing “Minimal Water Supply Standard” for rural settlements) and financing thereof (introducing user charges in places where these do not currently exist, allocating sufficient budgetary resources, acquiring international loans and grants, etc.).

Two development policy scenarios were considered acceptable to be implemented in Armenia taking into account their affordability for the poorest part of population and burden for the state budget - “Minimal Water Supply Standard” (hereinafter, MWSS) and “Policy Scenario”. Elaborated MWSS aimed to ensure the basic water supply to all rural population in Armenia. “Policy Scenario”, combined the MWSS and targets set in the country’s PRSP, anticipating 75% on-plot supply (in-house and yard tap) in rural settlements. Moreover, implementation of water supply by a small number of larger companies serving a variety of settlements and applying a uniform tariff across the served territory had been considered as an approach guaranteeing economies of scale and cross-subsidization compared to small companies each serving only one rural municipality. Furthermore, given approach would enable better administrative and technical capacity building of the companies rendering services to rural population in Armenia. Therefore, it was deemed necessary to implement institutional reforms for establishing larger water companies or expanding service areas of the existing ones.

The developed concept of MWSS could serve as a guarantee to the population of Armenia for sufficient water supply of acceptable quality and could be interpreted as a **right of the consumers** to water supply of at least a minimal standard. Achievement of the following performance indicators of MWSS had been seen as technically and financially feasible for rural Armenia:

- All rural inhabitants should have regular access to quality drinking water via centralized water supply systems, or from individual sources (protected wells, springs, boreholes and surface water or water tankers);
- Regularity of at least eight hours per day (for PWS);
- The minimal amount of water should be 50 lcd;
- The distance between the water supply system and the consumer’s dwelling should not exceed 100 meters;
- Acceptable water quality.

Thus, the key elements of the elaborated MWSS included the following:

1. Water quantity – volume, in lcd;
2. Distance – distance to the water source, availability of in-house or yard tap, or water delivered from distant sources by tanker-trucks;
3. Quality – physical, chemical and biological contamination, taste, color, odor, etc).
4. Service quality – pressure, duration of water supply/schedule of water supply.

On average from 50 to 60 lcd of water have been considered as the minimal amount of water needed to meet the minimal personal needs of a human being (hygiene requirements, washing, cooking and drinking). The distance equaling to 100 meters has been considered as a reasonable solution according to the standards used in the former Soviet Union¹⁵. For those settlements to which it would be technically or economically impossible to construct a WSS near the house, protected sources of safe water anticipating regular checking the quality of water has to be ensured. The issue of protection of water sources is very important since in rural localities pollutants are spilled in the nearness of water sources and animals enter water sources’ zones.

The MWSS is planned to achieve by 2015 through the increase of the share of centralized regular water supply of currently non publicly supplied rural communities up to 70% with the support provided by donor organizations in the framework of EUWI. The MDG have set targets aimed at halving the proportion of people without safe and sustainable access to an improved water sources. However, the Government of RA has set more ambitious targets to achieve the MWSS to the whole rural population of the country. Achieving those targets will require implementation of the financing strategy and corresponding legislative actions to address institutional and organizational challenges. Consequently, the

SCWS has updated the sector strategy for providing safe and reliable water supply to the population in three stages:

1. For poor rural communities in remote areas, which are not covered by existing service providers, the target is to provide a basic lifeline supply of 50 lcd through public standpipes located not more than 100 meters from the house.
2. For towns and villages, where safe drinking water can be supplied by the local water company, the target for 2012 is PWS for at least 12 hours per day with cost recovery through the tariff sufficient to cover operation and maintenance costs.
3. The ultimate target for 2020 is to provide 24-hour water supply.

The size of the unserved rural settlements in Armenia is small (on average nearly 1 100 inhabitants per community). Low public revenues or their absence as well as lack of fiscal transfers from upper levels of the budgetary system have brought to very weak fiscal position of rural settlements. Therefore, the adoption of the legislation on Inter Community Unions (hereafter, ICUs) is deemed necessary to establish for them a sustainable financial, administrative and technical framework. The solution of the problem of unserved markets is viewed not only in establishing larger water companies and expanding the existing ones but also in the transfer of the obligation to provide water supply to ICUs. This approach will enable development and maintenance of infrastructure and involvement of better and skilled specialists in the service provision and, consequently, **meet expectations** of those inhabitants who are willing to pay for the services and demand them.

3. Performance Management in Water Supply Services

A central feature of the public management reforms is performance management or result based management, which has an ultimate purpose to improve the quality of services provided to the public. Performance management involves definition of performance objectives and targets as well as measurement and reporting actual performance. Setting out performance management system increases efficiency, effectiveness and overall quality of services provided to population and makes monitoring and evaluation more precise and objective.

Major factors that contributed to the implementation of result based management of the key players in the national water supply system were the following¹⁷:

- Better defined contractors' selection criteria.
- Proper assessment of the utilities' pre-contractual performance, defining the service area, asset revaluation, determining accurate baseline data and selection of realistic performance indicators.

Performance indicators are “effective management tools facilitating result based management and effective use of public resources”¹⁸. If properly designed and used, performance indicators enable managers to conduct “self-assessment of the performance, to identify areas for improvement and to adopt realistic benchmarks and working targets”¹⁹. Moreover, they serve as effective tool for all relevant stakeholders allowing customer groups and NGOs to exercise their voice in a more informed manner.

Different organizations (the WB, International Water Association, etc) have developed Performance Indicators (hereafter, PIs) that serve as basis for water supply service providers to develop their own list of PIs taking into consideration their specific purposes (different objectives and priorities) and local

contexts for monitoring and benchmarking purposes. Categories of key PIs are being identified on the basis of specific needs of the water supply sector and are usually subdivided in the following categories: physical, service quality, financial, operational, personnel and environmental.

On September 28, 2005 the PSRC of RA adopted a list of PIs and order of their monitoring for companies providing water supply services in Armenia. The order obliges companies to provide services of certain quality in correspondence with the basic PIs and ensure publicity of their monitoring.

3.1. Performance Indicators in YWSC

Initially, the selection process of management contractor for YWSC was based on the sole criterion of price which led to the selection of a company with limited international experience in countries facing serious water supply problems (Italian contractor from the ACEA Group - A. Utilities). Over the period of contract the following performance indicators were reached²⁰:

- Water supply had been improved from an average of 2-6 hours per day to an average of 18.4 hours per day.
- Energy consumption had been reduced by about 50%.
- 90% of the city drinking water consumers installed water meters.
- Water consumption per capita per/day was reduced more than 7 times (due to the elimination of leakages and decreased amount of unaccounted-for-water).
- Fee collections for water supply services have been increased from 3 to 4 times and comprised nearly 79%.

According to subsequent lease contract awarded to General des Eaux, Véolia Water, France, the operator has created a separate private company having full right of economical operation of the leased property, responsible for management, operation and maintenance of the whole system, and taken the responsibility for implementation of the investment financing provided by different donor organizations with fully tariff cost recovery on the level of operational costs. The company is obliged to pay a fee equaling to the amount of the credit debts' service.

The lease contract of YWSC provides for the following objectives:

- Improvement of water supply duration;
- Improvement of water quality;
- Increased responsiveness to consumer complaints.

Performance targets proposed and used by for the lease contract are the following²¹:

Performance Indicator	Completion of Lease Contract (2016)
Average duration of water supply	22.8 hours
Coverage	95%
Energy consumption	25 million KWh
Metered connections	100%
Unaccounted-for-water	46%
User fee collection efficiency	93%
Reaction to major breakdowns	1.39 hours by year 1
Response to written complaints and inquiries	5.82 days by year 1

Within the first two and a half years of operations under ten year lease contract, YWSC has achieved considerable performance improvements having detected and eliminated about 5,000 illegal connections, improving collection efficiency and increasing number of subscribers with metered connections. Nearly 37% of subscribers are receiving 24 hour water supply. To ensure proper control and monitoring over supplied water quality the company has set up special laboratory equipped with all necessary facilities. Comparative data on key performance indicators of the company before and after establishing the PPP is presented in table 1.

Comparative Data on Performance of YWSC

table 1

Performance Indicator	Before Private Sector Involvement	At the End of the Management Contract with ACEA – A. Utilities	After 2.5 Years of Lease Contract with “Generale des Eaux”, Véolia Water
Average duration of water supply	4-6 hours	18.4 hours	20.35 hours
Energy consumption	240.3 mln kWh	124.2 mln kWh	115.3 mln kWh
Installed water meters	3 856	379 580	401 100
Average water consumption	By norm 250 lcd Actual 797 lcd	110 lcd	87.3 lcd
User fee collection rate	20.9%	79%	90.3%

Source: SCWS

During the implementation of the first contract with A. Utilities the parties faced difficulties connected with definition of the clear base year data for performance indicators and too large number of PIs defined by contract (125 PTs had to be monitored and calculation of “performance incentive compensation” [bonus payment] was based on 11 PIs). The definition of the indicators was not sufficiently precise that led to conflicts between the contractor and the authorities. In the subsequent lease contract “the number of PIs was decreased that allowed to implement better monitoring of the company’ performance”²².

3.2. Performance Indicators in AWSC

AWSC’s management contract was awarded in 2004 for five years and was extended till October 2010. Under the management contract the bulk of the commercial risk and all capital and investment risks remain with the government, the authorities appoint a private contractor to manage all or part of the company’s operations. The contractor is paid a fixed fee, on a monthly basis, out of the WB loan. Besides, bonus payment can be granted according to the level of achieved performance. The basic investment strategy has to be coordinated with and approved by the WB. Management contractor of the company has been selected on the basis of both price and technical experience (including international experience in the countries, where water supply and sanitation were challenging issues). To ensure the smoother monitoring of contract implementation the performance of the AWSC contractor is assessed on the basis of a limited number of indicators (25) and only four of them are actually used for the calculation of the bonus payment:

- *service quality* level for the customers (average duration of water supply, average water bacteriological safety compliance);
- *financial performance* (user fee collection rate);
- *operational performance* (electricity consumption).

The objectives of the contractor of the company for the first five years of operation have been reached despite of low tariffs, efficiency, high water losses and inappropriate level of state subsidies. Key performance targets of the company are the following:

Performance Indicator	Anticipated in Management Contract (2008)
Average duration of water supply	12.1 hours
Metered connections	76%
User fee collection efficiency	75.9 %
Energy consumption	0.29kWh/m ³
Average water consumption lcd	to decrease
Water billed	to increase
Water bacteriological safety compliance	96.6%

Due to continuous construction and rehabilitation works AWSC has managed to increase operation quality and efficiency and the company reports that all currently used 22 PIs (out of 25) are making progress. Thus, within the first five years of operation AWSC has also achieved performance improvements. Comparative data on key performance indicators of the company before and after establishing the PPP is presented in table 2.

Comparative Data on Performance of AWSC

table 2

Performance Indicator	Before Private Sector Involvement, (2004)	After 5 years of Management Contract with SAUR
Average duration of water supply	6.0 hours	12.20 hours
Energy consumption	0.43 kWh/m ³	0.29 kWh/m ³
Installed water meters	40.0% of subscribers	65.0% of subscribers
Average water consumption, lcd	Not used	Not used
User fee collection rate	47.95%	78.2%
Number of customers paying	53,000	115,000
Average water bacteriological safety compliance	61.0%	92.0%

Source: SCWS

The financial health of the company has been improved through increasing collection level and decreasing expenses. Implementing investments (WB, ADB, EBRD, USAID, RA Government funds and company funds) enabled to procure operations and maintenance equipment and repair, rehabilitate and modernize the facilities and infrastructure. However, not all targets of the management montract for 2008 have been reached yet. According to information provided by AWSC, in order to reduce figures on water consumption to figures closer to EU figures it is needed to renew and optimize more than 60% of infrastructure serving rural settlements.

The company has managed implementation of performance monitoring by a qualified Project Implementation Unit and reports that at the places of water outlet quality of drinking water is satisfactory in all water sources. However, in the course of water transmission from the source to consumer, reliability of water quality decreases severely, since it is impossible to ensure quality of supplied water in

conformity with sanitary requirements set with the existing technical means. Contaminated surface water penetrates into water supply systems due to the supply systems' hermeticity failure. Negative water pressure in case of discontinuous water supply facilitates penetration of drainage water into WSS. On the other hand some systems are constructed with violation of design and construction norms or are exploited with violation of current operation rules (without eliminating clogs in drainage systems) and frequent damages of the network. Not all water reservoirs are cleaned properly.

Low user fee collection rate, which is related also to the culture of non-payment and the poverty of the population is a real challenge faced by the operator. A large number of illegal connections becomes a particularly acute issue during the irrigation period. Identification of these illegal connections remains a priority for the company. For example, in the second quarter of 2007, around 1 200 illegal connections were identified representing an AMD 12.5 million loss. Due to low collection rate the operator faces the significant operational deficit. To protect the contractor from a low tariff collection rate and to allow sufficient maintenance works on the networks and facilities the contract stipulates provision of compensation to the company. To decrease commercial losses and increase collection level, the company has implemented several pilot projects placing individual meters in special locked meter junctions situated outside the areas of private houses. Other projects are under way, however, these is connected with high expenses that is currently rather burdensome for the company.

Objectives of the management contract for 2009/2010 include continuing the following:

- a) increasing the indicators of the AWSC in order to reach a correct level of quality of services;
- b) increasing consumer willingness to pay through higher quality and more consumer responsive services;
- c) attracting external fund in order to put the facilities and the equipment of the AWSC on a good quality level;
- d) increasing the trust of the AWSC customers through advertizing campaign.

3.3. Performance Indicators of SWSC

The SWSC as well as other two companies managed in the framework of partnership agreement between the state and the KfW are jointly owned by the SCWS and the urban and rural communities in the respective marzes. As soon as the companies become fully operational and financially self reliable, the SCWS will pass its shares to the communities, which will subsequently become the sole shareholders of the companies. The projects are implemented within KfW loan and grant project 2000-2010, which provides for implementation of two additional phases for the next 6 years.

User fee collection rate for SWSC comprised 66.3% in 2007. Other data on PIs of the company is shown in table 3.

Data on Foreseen Change of Performance Indicators of SWSC

table 3

Performance Indicator	Project Area
Average duration of water supply	Reconstructed areas -24h; other areas - extension for at least 1h, 2h, 3h daily per corresponding year of the project compared to the base year.
Compliance to water quality standards	Maximum 6 tests p.a. do not comply with standards in 2 nd and 3 rd years
Water losses	1 st year - max. 80%

	2 nd year - new network: <35%; old network: max.75% 3 rd year - new network: <30%; old network: max.70%
Improvement of user fee collection rate	1 st year ≥ 70% 2 nd year ≥ 80% 3 rd year ≥ 90%

Source: SCWS

4. Citizens Expectations Met by Service Provision?: Monitoring Progress

Citizens as recipients of public services assume different roles in their relation with public administration: taxpayers, voters, customers/clients and suppliers. Citizens' assessment of public services delivered is based on their roles, their rights and obligations to the state. When citizens act as customers or clients of the government "they are acting on individual basis seeking personal advantage"²³. By regarding citizens as customers or clients service providers "assume willingness to be more responsive to their constituents' needs and demands"²⁴.

Performance management contribute to the improvement of public services "by focusing on results valued by citizens and by involving them in decision making process"²⁵. Improving drinking water supply services in terms of duration, timeliness (schedule), responsiveness, availability, accessibility, reliability and convenience can be achieved only if success is valued by citizens and measured in terms of citizens' satisfaction. Moreover, due to direct citizens' experience expressed in terms of service quality, accessibility, reliability, etc. their "assessment of public services can provide valuable information for improving service delivery"²⁶. Therefore, to gather citizen feedback on performance of water supply services a survey covering 296 households in 37 communities and 3 focus groups (in those communities where service provision quality have been assessed by citizens as insufficient) were conducted in three poorest regions of Armenia (Shirak, Gegharkunik and Kotayk marzes with estimated 42.5%, 36.8% and 34.5% poverty level accordingly) with regard to citizens' perception of drinking water supply services and satisfaction with their qualitative, quantitative and other dimensions. The survey and focus group discussions were conducted during the three months period from June to September of 2009.

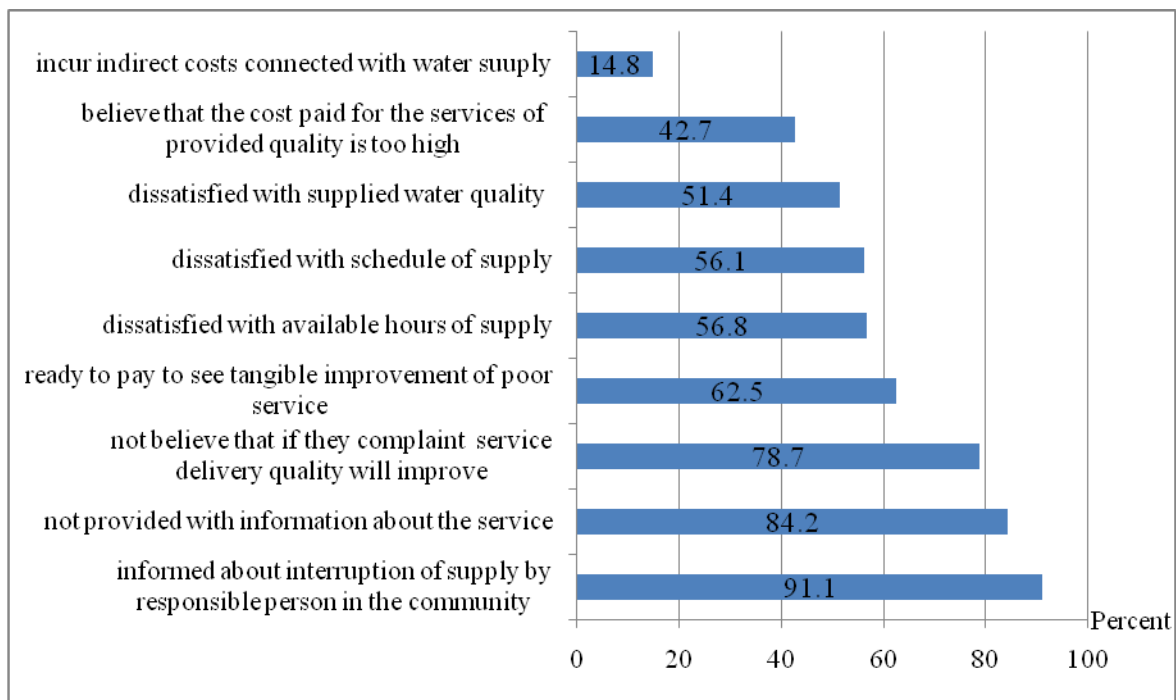
Pre-selection of households for survey was made using the random sampling technique. The designated respondent in each household was the owner of household paying for services and regularly contacting with the personnel of the corresponding WSC. If the designated respondent was not at home, the interviews in rural areas were scheduled for later time of the same day. In urban areas, the interviews were scheduled for other time in the field work period. A questionnaire (Appendix 2) was developed by the author and distributed during the survey. The questionnaire included 29 questions designed to monitor citizen satisfaction with services provided and define citizens' perception of the quality of services based on the following evaluation criteria: *access to information, transparency and accountability, accessibility, timeliness* (improved schedule and increased duration of supply), *availability*²⁷, *affordability*²⁸, *value for money, redress, responsiveness and courtesy, and conformation to standards*.

The purpose of conducting focus group discussions was to obtain a better understanding of the reasons (other than infrastructural constraints and lack of financing) that limit the provision of qualitative services in poorly served communities and to make recommendations that will eliminate or at least reduce their negative impact. Particularly, the impact of various types of mismanagement practices limiting

accessibility and reliability and overall quality of services provided to rural households. Focus group members have been selected during the interviews of households from those citizens showing eager activity and readiness to share their opinions and discuss problems with the interviewer. Thus, citizens (from 6 to 9 people) from poorly served communities in the surveyed marzes have been invited to participate in focus groups to get useful information. The invitation for participation has included proposed agenda, session time and the list of questions to be discussed.

Most respondents agreed that service information (particularly, their water supply schedule, planned works and removal of breakdowns in the network) is important for them. However, the survey revealed insufficient citizens' access to information about the quality of water supply service they receive. In many localities citizens expressed dissatisfaction with water quality, schedule, available hours of supply and additional expenses connected with installation and exploitation of individual/collective in yard water pumps. In some localities citizens stressed that they incur additional expenses to change meters often getting out of order since supplied water contains physical and biological contaminations (sand, silt, worms, etc). Moreover, considerable number of people believes, that paying in accordance with tariffs set, they are not provided with services of relevant quality. The respondents perceive the services as costly and insist that first services should have been improved and only afterwards the tariffs raised.

Figure 1.
Citizens Expectations Met by Service Provision?



Source: Survey of households in three Armenian marzes.

The majority of rural citizens while identifying service delivery as being insufficient and problematic did not believe that in case of their complaints anything will change in service delivery quality and expressed their willingness to pay to see tangible improvements in service provision quality. On the other hand, year by year people get accustomed to the conditions of poor service delivery. Thus, in 33.34% of cases people having very limited access to potable water (even up to one hour per day) stated that they are satisfied with services and that the amount of collected water is enough for their needs. As a rule people do not

complain about courtesy of personnel and presence of corrupt practices in water supply services. However, several cases were identified (for example, in Abovyan and Hrazdan towns of Kotayk marz) when consumers were highly dissatisfied with responsiveness of local subdivision of AWSC to their inquiries. In a whole, respondents from rural communities served by WSCs were more satisfied with services than respondents served by local government service providers. The survey also revealed that that nearly 24% of respondents served by YWSC were aware of their rights. The same figures for clients served by AWSC and SWSC or local governments' service provider organizations were less and comprised correspondingly 16.7%, 13.7% and 11%.

Thus, the survey of households and focus group discussions showed that actual water supply services' quality is still a key issue for governance in Armenia and ensuring citizen access to better services remains challenging. Overall quality of services provided to public is limited not only by lack of financing and poor infrastructure but also by managerial inefficiency. For example, 57.1% of respondents in town Hrazdan of Kotayk marz answered that the schedule of water supply is inconvenient for working people since water is provided during working hours and on coming home they do not have any opportunity to collect water. Mismanagement practices bring to the situation when some parts of the same localities do not receive water at all, other parts receive an intermittent supply, and other areas enjoy privileged accessibility to water. Illustrative examples of such practices obtained during the focus group sessions in Tzaghkadgor, and Dzoraghbjur communities of Kotayk marz are provided below:

Box 2

Privileged Accessibility to Water

In some localities designated as resort areas and for recreation purposes owners of numerous newly erected modern houses equipped with all modern conveniences (including swimming pools) use old infrastructure, which has not been anticipated for such sharp increase in water consumption. Available water is pumped by those consumers, therefore, local inhabitants encounter sharp decline in water quantity during summer time. Such practices have been identified in Tzaghkadgor, and Dzoraghbjur communities of Kotayk marz. Thus, 85.7 % of respondents in Tzaghkadgor answered that the duration of supply worsens dramatically during summer. In case of availability of drinking water in Dzoraghbjur community, local administration sales water to surrounding suburban houses, while 71.4% of respondents - the inhabitants of Dghoraghbjur village stated that they do not have access to safe potable water.

Source: Observations of the

author

5. Summary of Findings.

Management of the key players in the national water supply sector was strengthened by establishing different forms of the PPPs in accordance with performance-based contracts. The quality of the contracts launched was gradually improved that helped to properly establish the rights and responsibilities of each contractual party and better define contractual objectives of the companies. Focus on commercial performance of service providers helped to attract significant external financing from international donor organizations. Moreover, "involvement of management culture enabled providers to concentrate on service quality, increase administrative efficiency and payment discipline, insure policy clarity and sustainability"³¹, and to operate the rehabilitated schemes in line with modern efficiency requirements. Furthermore, implementation of performance-based contracts contributed to commercial vitality of service providers and gradually diminished their dependence on state subsidies. However, the contribution of performance management to overall quality and reliability of services has been so far

limited. Despite reporting progress and success by the water supply companies, in many localities service quality and reliability remains poor and the county still lags behind the required level of efficiency and effectiveness of the services provided to population. Actual water supply services' quality is still a key issue for governance in Armenia and ensuring citizen access to better services remains challenging. Overall quality of services provided to public is limited not only by lack of financing and poor infrastructure but also by managerial inefficiency.

The water utilities are managed by different companies, have different level of service delivery efficiency and use different performance targets. Performance targets are identified on the basis of their importance, practicality in implementation and the willingness of the service providers in implementing specific indicators. It is worth mentioning that performance targets of AWSC and SWSC are not strictly quantified as it is in case of YWSC. However, monitoring units of both companies focus on their success to meet the targets and report their continuous progress. A combination of foreseen outputs and outcome targets are defined on the level of implemented community projects. Expenditures are defined and specifically linked to each output or outcome targets and sectoral strategic goals. Table 4 summarizes the results of introduction of performance management on project and organizational level.

Results of Introduction of Performance Management in WSCs table 4

	Objectives	Characteristics	Results on Project level	Results on Organizational level
1.	Efficiency and effectiveness of WSCs and internal control and/or accountability	Focus on outputs and outcomes (results and effects); availability of performance information	Recovery of operation and maintenance for all projected urban and rural communities; improved access to safe, reliable and sustainable water supply; improved duration of supply	Improved technical, financial, and managerial capacity and operating efficiency of WSCs; rehabilitated, replaced, and/or extended WSS; optimized operation of the existing infrastructure; constructed new infrastructure; improved personnel working conditions; some increase in salaries; limited public satisfaction with the quality of water
2.	Improved decision making in the budget process, and/or allocation of resources and external accountability	Focus on performance budgeting	Improved decision making in the budget process and internal allocation of resources	Commercially-oriented operations; increased financial autonomy; meters installed to all bulk and domestic consumers; increased tariff collection efficiency; reduced non-revenue water

3.	Improved external transparency and accountability to higher administrative levels and public	Focus on the public availability of information	Insufficient public access to information	Citizens' discontent with public access to information
4.	Savings	Focus on input side of operations	Technical and financial management training provided to personnel of WSCs and communities covered and not covered by WSCs	Enhanced workforce skills; decreased number of employees

Source: Prepared by author on the basis of the ADB. (2007) Report and Recommendation of the President to the Board of Directors. *Proposed Loan. Republic of Armenia: Water Supply and Sanitation Sector Project*; OECD (1997) In *Search of Results: Performance Management Practices*; as well as Nakrošis V. (2008) *Reforming Performance Management in Lithuania: Towards Result - based Government*. In: Peters B. G., ed. *Mixes, Matches, and Mistakes. New Public Management in Russia and the Former Soviet Republics*. Budapest, OSI/LGI.

Analysis of the used PIs has shown that the majority of the used indicators is well defined, measurable, achievable, and can be implemented with minimum cost in the Armenian context. These PIs are monitored and periodically updated to ensure corresponding level of the performance of the WSCs. Some PIs have been reached by the companies; others have shown continuous improvement over the period of the contracts. Used PIs include policy level indicators (improved accessibility to water and average consumption of water supply), indicators linked to the financial performance (e.g. collection efficiency, working ratio, growth of the total collected revenue, % of subscribers with more than 4 months debt), efficiency of operations (e.g. unaccounted-for-water, water billed per meter readings, pipe breaks), and operating performance (average duration of supply, coverage of population served, minimal daily hours of services). Important output/outcome indicators include average duration of water supply, metering levels, unaccounted for water (UfW), quality of water, etc.

Indicators for measurement of service improvement/decline such as pipe breaks per km per year as well as such indicators as reaction to major breakdowns (hours per year), response to written complaints and inquiries (days) also measure the output/outcome of the service provision. These indicators are not included in the list of performance targets of the AWSC and SWSC. Their absence gives mixed quality of evaluation and could be attributed to the fact that “lack of investments in infrastructure and operation and lack of qualified specialists hinder expansion of networks”²⁹ and that quality improvement of the services rendered to inhabitants of urban and rural communities is bound to the implementation of community projects having different local contexts. To better meet consumers' expectations existing PIs require further improvement, particularly, the indicators promoting continuous improvements of management and operation of the WSCs and indicators related to drinking water quality control. Besides, some qualitative indicators that increase employee motivation and enhance performance such as adequacy of staff compensation packages and reward systems are not sufficiently worked out. Moreover, used PIs are not

supported by performance standards defined by relevant legislation. Therefore, users are not able to evaluate properly the level and quality of services they can expect from providers.

The research has shown that the local government service provider organizations are less sensitive to the performance assessment and quite reluctant to express their opinions on the subject. Insufficient technical and managerial capacity including limited monitoring (requiring additional knowledge and expertise) skills hinder their ability to implement appropriate performance management.

The research has also revealed insufficient citizens' access to information, still insufficient level of transparency and accountability to public, and absence of redress mechanisms. Citizens have demonstrated lack of understanding that their complaints matter, and inability to demand better services from the relevant agencies. In a whole population of rural areas revealed less expectation, less awareness and courage to assert their rights. Lack of citizen initiative, fear of possible adverse consequences and underdeveloped participation mechanisms prevent citizens to stand in the position of claimants for better services even in case of evident administrative abuses, and "limits the agencies responsiveness to the public needs and their motivation to improve services even within the limit of available resources"³².

5. Conclusion

The research has shown that the PPPs have revealed real concern over their performance and exposure to performance assessment. Selection of realistic (achievable) performance indicators was one of the major factors that contributed to the implementation of result based management of the key players in the national water supply system. The local government service provider organizations are less inclined to proper performance assessment since insufficient technical and managerial capacity, including limited monitoring skills hinders their ability to implement appropriate performance management.

To better meet consumers' expectations and promote continuous improvements for the WSCs in terms of management and operation:

- the number of indicators related to drinking water quality control should be increased;
- national performance standards must be worked out, defined by relevant legislation and published so that users can know what they can reasonably expect from providers;
- qualitative indicators that increase employee motivation and enhance performance (including adequacy of staff compensation packages and reward systems) must be sufficiently worked out and included.

Continuous improvement of service quality, reliability and consumer-responsiveness will inevitably contribute to changing mentality of consumers, making consumers aware of their responsibilities and enabling to assert their rights, increase their willingness to pay and, therefore, financial performance of companies. However, improving performance is a long process. Accordingly, building consumers' receptivity to the needs for facilities upgrading and rehabilitation becomes an easier task when the physical conditions (aging and deterioration level) of infrastructure and facilities are made known to them. Since the real cost of the service provision is hardly ever voiced by relevant agencies in Armenia, it may be highly advantageous to ascertain the real cost of delivering benefits to the Armenian communities (outcomes) and agency goods and services (outputs). Therefore, the WSCs need to deal with issues of external transparency and accountability to public and better build trust and relationships with customers through improving focus on public information process and building customers' awareness. Consequently,

- Information accessibility in marzes through Media to guarantee access to information should be

increased;

- Information leaflets should be designed in plain clear language to explain rights and responsibilities of service providers and consumers;
- Call centers for companies not having relevant facilities should be designed and established.
- Initiatives aimed at cultivating performance and accountability culture i.e. holding persons/organizations responsible at every level of service provision should be undertaken; citizens should be able to complain and those in position of authority should listen to citizens' concerns.

These initiatives will reinforce the need for the WSCs to better use its resources and treat its citizens as clients/customers to improve their satisfaction with service delivery.

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²⁷ The water companies report large availability of water. AWSC produces, on average, over 600 lcd in rural areas, Lori WSC about 400 lcd, Shirak WSC about 500 lcd. Nor Akunq is an exceptional case and produces only 30 lcd. However, due to infrastructure leakages large part of the water produced is lost and does not reach consumers. Besides, in the localities where meters are not installed drinking water is used for irrigation purpose. Therefore, availability itself in most cases is not a problem. The question of availability relates to the availability of PWS and its reliability.

²⁸ Affordability²⁹ implies that monthly meter bills should not impose undue economic hardship on low or fixed income households in the service area. Water bills should be low enough that low income households do not need to displace other essential services (e.g. medical, care, food, or energy) to pay their water bills. The general pricing approach is to keep (uniform) water tariffs at a level that is affordable for all. However, this limits the ability of water utilities to raise enough revenues through user charges. The affordability analysis implemented by the EAP Task Force³⁰ shows that applying a 3% threshold to the water bill as a share of household income, does not lead to any major affordability

problems for rural households. The analysis still anticipates that some part of the poorest population will need some sort of limited social support.

Current potable water supply retail tariff for subscribers of YWSC equals 181.0 AMD/m³; for subscribers of AWSC is 179.78 AMD/m³; and for subscribers of SWSC comprises 120.14 AMD/m³. Local governments responsible for water supply in their jurisdictions provide services at lower prices. The unit costs of water supply vary substantially across rural settlements: the ratio of the highest costs to the lowest costs amounts to 10-20. In rural settlements not served by water companies there is a complete disconnection between unit costs and the finance available. In rural settlements not served by WSCs, the population with access to PWS either pays low tariffs or do not pay at all (some 55% of the population in such settlements). While the collection of tariffs set by local water supply companies is generally poor, varying from as low as 15% to reasonably good 85%, depending on rural settlement.

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APPENDIX 1

List of Abbreviations

ADB – Asian Development Bank
AMD – Armenian Dram
AWSC - Armenian Water Supply Company
CEE - Central and Eastern Europe
EECCA - Eastern Europe, Caucasus and Central Asia
EU - European Union
EUWI - European Union Water Initiative
FSU - Former Soviet Union
JICA - Japan International Cooperation Agency
IDA - International Development Association of the World Bank Group
IFAD - International Fund for Agricultural Development
MDG - Millennium Development Goals
NGO - Non-governmental organization
OECD - Organization for Economic Co-operation and Development
PWS – Piped Water Supply
PRSP - Poverty Reduction Strategy Paper
PSRC - Public Services Regulatory Commission
SCWS - State Committee of Water System
SWSC – Shirak Water Supply Company
USAID - US Agency for International Development

USD - US Dollar
 WB - World Bank
 WSC - Water Supply Company
 WSS - Water Supply System
 YWSC - Yerevan Water Supply Company

Exchange rates

In the conversion of financial data presented in this research, the following annual average exchange rates were used:

Table A1.
 Exchange Rates, Yearly Average

Year	2005	2006	2007	2008	2009 (first two quarters)
AMD/USD	457.8	416.0	342.1	306.0	348.0

APPENDIX 2

Household Survey
 June-September 2009

1. **Date of interview** _____

2. **Marz**

1. Gegharquniq

2. Kotayq

3. Shirak

3. **City/Town/Village of Current Residence in Armenia**

4. **Urban/Rural Residence**

1. Urban

2. Rural

5. **Record Time (using 24 hour clock) Interview began** _____:_____

6. **Language of interview**

1. Armenian

2. Russian

Beginning of the sampling procedure:

After arriving at the pre-selected house or apartment using the random sampling technique, the interviewer introduces oneself, explains the purpose of the survey and asks the interviewee's first name and name.

First name, name

7. Respondent identification number

8. Sampling Unit

The interviewer assures the interviewee that answers to the survey will be strictly confidential, according to international research standards.

Q1. What is the number of persons in your household?

Q2. If piped water is available.

1. Yes. 2. No.

Q3. What is the type of connection?

1. In-house tap 2. Yard tap 3. Standpipe?

In case of standpipe, is it available within 100 m from house?

1. Yes 2. No

Q4. What is the regularity of water supply?

1. In summer time 2. In winter time

Q5. How many hours per day?

1. In summer time 2. In winter time

Q6. Are you satisfied with the schedule of supply?

1. Yes 2. No

Q7. Please, estimate the daily amount of water available (m³/day).

Q8. Are you satisfied with available water amount?

1. Yes 2. No

Q9. Are you satisfied with water quality?

1. Yes 2. No

Q10. What is the user fee for supply?

Q11. How do you assess the user fee rate for the service delivered?

1. Too high 2. Satisfactory 3. Low

Q12. What company supplies water?

1. YWSC 2. AWSC 3. SWSC 4. Local government service provider

Q13. Does the household pay for the water supply?

1. Yes 2. No.

Q14. If yes, how do people pay for water supply?

1. Monthly money fee. 2. Annual money fee. 3. Other way of money payment method.

Q15. How is the fee calculated?

1. Water use, measured by meter 2. Fixed fee. 3. Other.

