EAP Task Force

Group on Urban Water Sector Reform in Eastern Europe, Caucasus and Central Asia

DEMONSTRATION PROJECT

CONSUMER PROTECTION IN URBAN WATER SECTOR REFORMS IN ARMENIA: ABILITY TO PAY AND SOCIAL PROTECTION OF LOW INCOME HOUSEHOLDS

Final Report

Prepared by a group of OECD experts in collaboration with the State Committee on Water Resources, Ministry of Finance and Economy, and Ministry of Social Security of the Republic of Armenia

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EXECUTIVE SUMMARY

Background

This policy report focuses on social aspects of the ongoing Armenian urban water sector reforms, conclusions, and recommendations prepared within the Demonstration Project "Consumer Protection in Urban Water Sector Reforms in Armenia: Ability to Pay and Social Protection of Low Income Households." The project was implemented between May and November 2003 at the request of the Group of Senior Officials on Urban Water Sector Reform in the EECCA under the EAP Task Force / OECD.

The proposed recommendations are based on the analysis of the current situation in the area of water and wastewater services, official statistics, information prepared by Armenian experts and specialists, and results of a special sample household survey conducted in two Armenian cities – Yerevan and Vanadzor – in June 2003.

The given executive summary presents major conclusions and recommendations.

Current Status and Government Policy for Reforming the Armenian Water/Wastewater Sector

Technical Access, Quality and Prices of the Services

According to official statistics, 100 percent of Yerevan residents and 93 percent to 95 percent of urban residents in other parts of the country receive centralized water supply service.[1] But coverage by centralized wastewater services is significantly lower: in most Armenian cities it ranges from 40 percent to 60 percent.

Water is supplied mainly on a scheduled basis – averaging between two and eight hours per day. Only 13 percent to 15 percent of Armenian households enjoyed round-the-clock water service in 2002. Customers have expressed growing discontent with water quality recently.

Current tariffs[2] do not recover operating costs of water/wastewater utilities and include no provision for capital repairs and depreciation. In recent years, the rate of payment collection from residential customers has been very low. In the year of 2002, it was 17.5 percent and 39.3 percent at YerevanVodokanal and ArmVodokanal, respectively.

Government Support and Policy for the Sector Reform

The level of budget funding of the water/wastewater sector has remained relatively high in recent years. Actual budget expenditures for the water sector stood at 3.4 percent of total budget expenditures in 2002 and has reached four percent in 2003. However, major investments in the water and wastewater sector come through credits – primarily from the World Bank and German KFW bank. Currently, approximately USD 51.1 million worth credit programs are being implemented.

Armenia has developed and continues to improve the legislative and regulatory framework for successful operation of the water and wastewater sector. Armenia has passed a Water Code and other laws regulating contractual relations between service customers and providers. At the same time, Armenia does not have a government-approved procedure for pricing

[1] In Armenia, both customers connected to piped water supply systems and those using water from street standpipes count when calculating the "provision of the population with centralized water supply services" indicator.

[2] Today, YerevanVodokanal charges AMD 56.0 ($0.1) per m^3 for its services. The average weighted tariff for ArmVodokanal services is AMD 52.9 (roughly $ 0.09) per m^3.

centralized water and wastewater services that would include the tariff calculation methodology and tariff setting procedure.

The passage of the Law on Restructuring Indebtedness in November 2002 greatly contributed to improvement of the situation. Significant results were achieved due to implementation of this Law, namely:

- All water and wastewater service customers in Armenia were re-registered and the list of residential customers was updated;
- Most residential customers (83 percent of YerevanVodokanal and 92 percent of ArmVodokanal's customers) concluded debt restructuring contracts;
- 28.5 percent and 76.4 percent of ArmVodokanal and YerevanVodokanal residential customers, respectively, installed individual water meters as of November 1, 2003;
- The payment collection rate (the ratio of actually collected to billed amount) improved significantly, ranging from 80 percent to 140 percent in Yerevan in March through September 2003 including debt repayments under the Law on Restructuring Indebtedness.
- A plan for phased introduction of round-the-clock water service in Yerevan is being implemented. According to this plan 90 percent of Yerevan residents will enjoy round-the-clock water supply services by late 2004.

A Need in Pricing Reform

Armenia has made significant progress in water metering, establishing contractual relationships between consumers and water/wastewater utilities, settling huge accounts receivables, and finally, overcoming the crisis of residential customer's confidence in water/wastewater utilities. The latter is evidenced by the sharp increase in collection rates. However, revenues of water utilities are continuing to decline due to wide-spread metering. In fact, actual consumption appears to be much lower than was assumed in the "consumption norm" previously used for billing customers. Proposed tariff increases for 2004 which would result in doubling of actual tariffs will mostly cover the current operational expenses of water utilities. These increases will also not increase annual user charges. However, in order to significantly improve the quality of services additional tariff increases are needed that would cover the enterprises' capital expenses. The major constraint for further tariff increases is constituted by customers' ability and willingness to pay. This report focuses on the latter issues, as well as on the social protection measures that can help to protect the poor.

Economic Affordability of Services to the Population

Assessment of the Current Ability to Pay

The current customers' ability to pay was assessed at two levels: (1) for the country population as a whole (*macroaffordability*); and (2) for residential customers in two Armenian cities – Yerevan and Vanadzor (*microaffordability*).

Macroaffordability estimates suggest that the average Armenian household spent 3.1 percent of its budget on the water and wastewater services in 2002. This indicates that the *country's population on average* was able to pay water bills at the 2002 tariffs and consumption standards.[3]

However, one should neither judge service affordability among needy households based on this national average nor conclude on its regional differentiation. This

[3] This study uses four percent of household consumer expenditures as a service affordability criterion.

information may be obtained through the *microaffordability analysis* which, in our case, was made in two Armenian cities – Yerevan and Vanadzor. Its results show that residents of both cities faced the service affordability problem in 2002: 40 percent of households spent more than four percent of their budget for water/wastewater services. So high proportion of expenses coupled with the poor quality of the services were certainly the major reason for household unwillingness to pay water bills.

The situation had improved radically by mid 2003. Due to installation of meters and ensuing switching to payment for water based on actual rather than on normative consumption the average burden of water charges fell from 3.96 percent to 2.48 percent in Yerevan and from 4.19 percent to 2.45 percent in Vanadzor. The percentage of households above the "four percent threshold" halved. Nevertheless, roughly one fifth of all households (21 percent in Yerevan and 18 percent in Vanadzor) still experience difficulties in paying service bills which necessitates taking social protection measures for those who are not able to pay service bills.

Projections of Customers' Ability to Pay for 2004 and 2005

In view of the inevitable increase in tariffs, it is important to find out whether proposed changes are realistic and evaluate consequences of these changes from the standpoint of the service affordability to the population. To this end, two scenarios were developed to project water/wastewater customers' ability to pay in Yerevan and Vanadzor. Both scenarios were based on the assumption that tariffs for the water/wastewater services would double in 2004 with a further 50% increase in 2005. The only difference was that the Scenario 2 assumed smaller values of water consumption indicators – by 40 liters/person/day.

Projections made under *Scenario 1* revealed that doubling of the tariffs in **2004** would not deteriorate Yerevan and Vanadzor residents' ability to pay due to expected growth of people's real income and universal installation of water meters. Approximately 14 percent of households will find themselves above the "four percent affordability threshold" in both cities.

The situation will exacerbate noticeably in **2005** when tariffs are increased by another 50 percent: the water and wastewater services will become practically unaffordable to half the customers in both cities. Therefore, if the actual situation in the country does develop according to this scenario, then the tariff increase in 2005 (with an ensuing need to provide social protection to half the service customers) will not be feasible from both economic and social perspectives.

The assumption about smaller water consumption made under *Scenario 2* improves projections of residential customers' ability to pay in both cities, thus, making a further 50% increase of tariffs in 2005 possible. However, one should keep in mind that drastic decrease in sales of services by water/wastewater utilities may negatively affect their financial situation, thus, bringing expected benefits of the tariff increase to nothing.

Customers' Willingness to Pay More for Better Services

Households' willingness to pay was assessed based on the results of a face-to-face customer survey in order to find out what percentage of households is willing to pay more and for what service quality characteristics. In so doing, respondents were invited to choose among six scenarios for service improvement linked to corresponding tariff increases.

The results show that every third household in Yerevan and every eighth household in Vanadzor refuse to choose any scenario and almost half the households agree only to a ten percent increase

to preserve current service quality. At the same time, 16.5 percent of households in Yerevan and 36.0 percent of households in Vanadzor are ready to pay 50 percent higher tariffs. A very small percentage (1 to 2.7 percent) of the surveyed households would pay twice as much or 1.5 time more for improved services.

Therefore, 40 percent of Vanadzor residents and every fifth household in Yerevan admit they would pay considerably more (by 50% to 150%) but only for substantial improvement in the quality of services.

Social Protection of Service Customers

Possible social tensions or a worsening of the economic situation of the most needy customers because of growing tariffs can be avoided by implementing an effective program providing social protection to those who cannot afford paying service bills.

Possible options of social protection of water/wastewater customers in Armenia include:

- Rendering assistance within the framework of the existing family poverty benefits program;
- Tariff methods of social protection;
- Implementing a separate program of assistance in payment for services.

Each option has its cons and pros.

Family Poverty Benefits Program

The family poverty benefits program, which has been operating in Armenia for five years, currently covers approximately 20 percent of households. The program is rather flexible and mobile, easily adjustable to changes in the social situation in society and budget funding capability. Implementation of assistance in payment for services within the framework of this program will minimize implementation costs due to employment of mechanisms that are already in place (determining households eligible for assistance; means testing and verification; payment of assigned benefits).

However, the means-testing procedure is complicated and non-transparent; all eligible households receive the same benefits; and the program is insufficiently targeted because a number of means-testing scoring criteria capture general household categories, which include both poor and well-off families.

Tariff Methods of Social Protection

Tariff measures may be taken through the following schemes: (1) a low tariff for low-income customers for minimal guaranteed water consumption and a higher tariff for other customers; (2) increasing block tariffs: minimal tariff for all customers for the minimal guaranteed consumption and higher tariffs for higher levels of consumption.

Under the first approach, the means-testing procedure incorporated in the family benefits program could be used. This will require cooperating with social security offices and synchronizing databases maintained by vodokanals and social protection offices. At the same time, using tariff methods for protecting low income customers will put additional burden on water/wastewater utilities which will have to perform unusual functions of a social agency.

Application of increasing block tariffs is not feasible in Armenia because they are primarily advantageous to small households, typically not among the most needy.

Special Program of Assistance in Payment for Water/Wastewater Services

Implementing a special program of assistance in payment for water/wastewater services will not be economically feasible because given the relatively small water benefit, administration, organizational and technical costs of the program may well exceed the cost of benefits themselves. However, such program could be feasible if the assistance is granted for all communal services including electricity, gas, and district heating.

What Should Be Done to Improve the Current Situation: Recommendations to the Government

Reforms in the water/wastewater sector in Armenia aim at restoring high-quality services to all residential customers and to reverse the chronic loss-making pattern of Armenian water/wastewater utilities, as well as at restoring the confidence of the public in their utilities and at increasing payment compliance. In this connection, implementation of measures and recommendations proposed below presents an urgent and challenging task.

Tariff Increase Is Inevitable

In order to recover losses of water and wastewater enterprises resultant from widespread installation of water meters and consequent reduction of sales, the tariff for 1 m^3 of water has to be at least doubled at the beginning of 2004. As evidenced by the study of population's ability to pay, customers will be quite able to afford such an increase.

Achievement of full recovery of operational and capital expenditures requires a three-fold tariff increase – this will be possible only upon demonstration of positive effects of the reform and implementation of a supplementary assistance program for low-income households.

Complete the Program to Install Water Meters

As the program to install individual meters is completed, particular attention should be paid to low-income households receiving family benefits. The water meter is the best tool to allow poor customers to protect themselves from the full impact of rising tariffs because it allows customers to control their expenses for services. The Government should consider partial payment of meter purchase and installation costs by the state for families receiving Poverty Family Benefits. State budget or international donors' funds could be used for this purpose.

Implement Social Protection Measures Simultaneously with a Tariff Increase

Since increased tariff will enable the government to reduce budget funding for vodokanals, a portion of saved funds can be allocated to targeted assistance in payment for water and wastewater bill for low-income households. Such a program will help mitigate social tension and allow for keeping up a high compliance rate.

Assistance to low-income customers have to equal the cost of guaranteed minimal consumption, envisaged at 50 liters per person per day.

Develop Contractual Relationship with Collective Customers

Contracts between water/wastewater utilities and individual customers put the relationship on a clear commercial basis and is an important prerequisite for increasing compliance. Once all apartments are equipped with meters and contractual relations established with collective consumers (through condominiums or other forms of association of apartment building residents), water/wastewater charges should be based on block meter readings, with the difference between the block meter readings and the sum of readings of individual meters charged to general building expenditures and pro-rated among individuals.

Develop and Legislate the Methodology for Tariff Calculation and Setting

It is necessary to develop and approve at the national level a proper regulatory framework, particularly, the procedure for pricing centralized water and wastewater services that would include the methodology for calculating tariffs and the procedure for their approval.

It is of particular importance to develop the methodology for calculating and applying the two-part tariffs comprised of a fixed component to be paid on a monthly basis by all customers irrespective of water consumption and a variable part depending on the consumption volume.

Institute a Clear, Balanced, and Consistent Policy toward Non-Payers

A balanced system of sanctions for nonpayment or late payment needs to be developed in order to keep the collection rate high and stable. Such sanctions may include disconnection of debtors from the services, charging penalties and fines for late payment, collection of debts through the courts and even eviction of persistent non-payers. Generally, it will not be necessary to resort to sanctions extensively since the very fact that they are provided by law and may be applied is a sufficient incentive for consumers to pay on time.

Encourage Public Participation in Decision Making Related to the Tariff Policy

Effective communication with consumers is an important task of service providers that should be fully supported by central and local governments. Central authorities, local governments and water/wastewater utilities must provide accurate and plausible information on the sector reform progress, on the service provider financial situation and technical condition, on the tariff levels and the tariff-setting rules, as well as have to inform people of any planned changes in the tariffs well in advance. The public needs to be involved in tariff policy making as well as in decision making on such issues as contractual relations, payment collection practices, and consumer liability for noncompliance in payment for services consumed.

Make Affordability Analysis an Integral Part of Tariff Setting

This will ensure that public authorities have an access to information on actual customers' ability to pay and willingness to pay which can substantiate tariff revision and ensure transparency of the decision making process. Besides, public presentation of the outcomes of such estimates will facilitate improvement of public awareness, and will help overcome opposition of certain political forces.

Results of ability to pay and willingness to pay analyses should be used as the basis for designing social protection measures and criteria of eligibility for social assistance.

The Responsibility for Assessing Water Affordability

The responsibility for assessing *macroaffordability* can be placed upon the State Water Sector Committee, and later – upon the executive authority that will be empowered with setting tariffs (the Natural Monopoly Regulatory Commission.)

Macroaffordability should be assessed *annually* in order to track the course of reforms in the sector and mitigate the issue of service affordability in the country. The official National Statistical Service data and the data from the State Water Sector Committee are adequate to carry out this analysis.

The *microaffordability* analysis requires conducting a special (targeted) survey of water/wastewater service customers. In view of this, microaffordability analysis should be made only on the eve of a significant tariff increase or a large investment project implementation.

The water and wastewater service pricing procedure should envisage a *mandatory requirement* for vodokanals applying for new tariff approval with respect to justification of the level of proposed tariffs in terms of customers' ability to pay. Since vodokanals cannot, on their own,

perform such analysis, it is feasible to contract it out to consulting companies and research institutes.

Armenia Should Set an Affordability Criterion

Donors and international financial institutions frequently use 4% of household income as a water/wastewater service affordability criterion in EECCA countries. This criterion is used for the purposes of this study and can be further recommended for Armenian authorities as a guidance at the *current stage* of water and wastewater sector reforms.

In the future, considering that the affordability criterion depends on a number of historical, economic, political and social factors its value needs to be reviewed from time to time by the executive power body which is responsible for tariff approval.

The Tariff Setting Authority Should Also Analyze Willingness to Pay

In addition to affordability analysis, authorities may envisage conduction willingness-to-pay (WTP) analysis on an ad hoc basis. It should be noted that WTP is not a constant parameter. It is possible to influence the willingness-to-pay of water users through policy measures. For instance, an increase of the quality of water services usually results in an increased willingness to pay.

Supplementary Assistance to Water/Wastewater Service Customers Should Be Provided within the Existing Social Protection Program

The analysis results suggest that it is feasible to provide supplementary assistance to low-income households for payment for water/wastewater services within the current *Family Benefits Program*. This will allow for making full use of the program capacity (organizational structure, staff of skilled social workers in Regional Social Service Agencies, automation tools and databases, and existing mechanisms of means-testing, data verification and benefit payment).

Ensure Better Targeting of the Poverty Family Benefits Program

To ensure the maximum effectiveness and efficiency of social assistance, the Family Benefits Program should be better targeted. This could be achieved by allowing for additional factors (specifically, total household income); differentiating the amount of benefits according to the household income or neediness score; and improving and developing means-testing procedures.

Use of more severe sanctions against households that fail to provide or conceal information on their economic circumstances when applying for benefits may become important for ensuring the objectivity of *means testing*. The Government of Armenia should consider implementing a system requiring return of double the unlawfully-received benefits and disqualification from receiving further social assistance for a period of one year.

Social Protection Should be Contingent on Timely Payment for Water Services

Granting of the additional benefits must be made conditional on *timely payment for water/wastewater services* and existence of *a debt restructuring agreement*. If beneficiaries are two months behind the payment schedule, the utility should notify the social protection office which would immediately suspend payment of additional benefits after providing legal notice. The benefits may be renewed if the debt is repaid within one month.

Eligibility for the Social Assistance on Water and Wastewater Services May Be Extended

Obviously, if assistance is provided through the current Family Poverty Benefits Program, then all program participants will become claimants for the additional benefits. These potential recipients, however, may be *extended* to include households that failed to enroll in the Family Poverty Benefits Program because their score was slightly below 36 points.

Developing a more precise definition of the criterion of the eligibility for supplementary assistance to water/wastewater service customers will involve further study of the database of the Ministry of Social Security on family benefit recipients.

INTRODUCTION

This policy report has been prepared within the Demonstration Project "Consumer Protection in Urban Water Sector Reforms in Armenia: Ability to Pay and Social Protection of Low Income Households." This project was implemented between May and November 2003 at the request of the Group of Senior Officials on Urban Water Sector Reform in the EECCA under the EAP Task Force / OECD.

Objectives of the Project

The project has two objectives:

1. To study the current economic affordability of water/wastewater services to the population and estimate the impact of expected price increases for water/wastewater services on residential customers; and
2. To study the need for social protection for low-income water customers and prepare recommendations for the Government on developing effective measures to providing this social assistance to those customers unable to afford tariff increases.

The results and recommendations are intended to assist the Government of Armenia to identify socially vulnerable groups of water/wastewater service customers, to set appropriate tariffs, and to design and implement the best mechanisms for providing social assistance to poor consumers. The results are also intended to present new information to experts from international financial institutions, multi- and bi-lateral technical assistance programs, and civil society.

Project Management

A Supervisory Council was set up to manage project activities including representatives of key participants/counterparts, namely, the OECD/EAP Task Force Secretariat, State Water Sector Committee, Ministry of Social Security and Ministry of Finance and Economy of Armenia. Besides, the Supervisory Council included officials from the Ministry of Urban Development, National Statistics Service, YerevanVodokanal and ArmVodokanal joint stock companies, Yerevan and Vanadzor municipalities, public and international financial institutions. An *Expert Task Force* composed of Armenian and international experts was set up to carry out works under the project.

G. Aivazyan, the Deputy Chairman of the State Water Sector Committee, and *A. Petrosyan*, the Deputy Minister of Social Security, were assigned Co-Chairmen of the Supervisory Council on the part of Armenia. *Lilian Saade Hazin*, OECD/EAP Task Force managed the project on the part of the OECD together with *Peter Börkey* who is the Manager of the EAP Task Force Water Team.

Alexander Kucherenko, PADCO/Ukraine, managed a group of international experts responsible for implementing the project. The direct responsibility of accomplishing individual components of the project rested with *Olga Romanyuk* (assessment of the economic affordability of the services) and *Anton Levitsky* (study and development of social protection measures), experts of the international consulting firm PADCO. Important assistance in preparing the project workplan and drafting the final report was provided by *D-r Roger Vaughan*, PADCO/Armenia.

A group of staff members of the Armenian National Statistics Service led by Mr. *Hrachya Petrosyan* actively participated in preparation and conducting of the sample survey of water/wastewater customers in Yerevan and Vanadzor. The responsibility for processing the survey data rested with *Vladimir Sariohlo* and his team of specialists from the Statistics Research Institute within the State Statistics Committee of Ukraine.

Mira Antonyan, who represented the Yerevan State University, was in charge of preparing and conducting focus groups as well as reviewing results and presenting the final report.

Alexander Martusyevich (OECD) provided valuable assistance in implementing the project, preparing major conclusions and recommendations.

Hasmik Ghukasyan, PADCO/Armenia, coordinated activities under the project in Armenia.

Outline of the Report

Structurally, the report consists of four chapters. *Chapter 1* addresses issues associated with the current status of the Armenian water/wastewater sector and specific aspects of the government policy of reforming the water/wastewater sector. *Chapter 2* is devoted to the problem of service affordability for residential customers and includes results of an ad hoc survey of service customers conducted in Yerevan and Vanadzor in June 2003 as well as estimates of population's ability to pay and willingness to pay for better services. *Chapter 3* describes existing mechanisms for social protection of the needy in Armenia and deals with the analysis and evaluation of alternative social protection mechanisms within the tariff reform. Each of these chapters ends with brief conclusions summarizing major ideas, considerations, and outcomes presented.

Chapter 4 provides recommendations to the Government based on the project outcomes. They include general advice and concrete recommendations on conducting affordability analyses and providing effective social assistance to low income customers in Armenia.

The report includes a number of *annexes* which complement and develop ideas and concepts identified in its principal part.

NOTE: The results and recommendations from this study apply only to the issues surrounding the impacts of increases in water tariffs and do not take into account possible tariff increases for other services in Armenia. Although a package of tariff increases would necessitate a different level of social protection, the methodology outlined in this report used to determine macro- and micro-affordability can be applied to the larger issues posed by a package of tariff increases.

CHAPTER 1. CURRENT STATUS AND STATE POLICY FOR REFORMING THE WATER/WASTEWATER SECTOR IN ARMENIA

1.1 Brief Overview of the Armenian Water/Wastewater Sector

Geographic location. The Republic of Armenia is located beyond the Caucasian Ridge in the North-Eastern part of the Armenian Highland. The country is landlocked, with distance to the Black Sea, the Caspian Sea, the Mediterranean and the Persian Gulf standing at 163 km, 193 km, 750 km and 1,000 km, respectively. Total territory, which is largely mountainous, is 29,740 square km. Average elevation is 1,800 m above sea level, peaking at 4,090 m in the highest point (Mount Aragats) and down to 390 m at the lowest point.

The **population** totals 3,002,600 persons according to the Census as of October 10, 2001[4] and is spread across 10 regions (marzes) (Aragatsotn, Ararat, Armavir, Gegharkunik, Lory, Kotayk, Shirak, Syunik, Vayots Dzor and Tavush) and the capital city of Yerevan. The density of the population is 108 persons per square km.

Water resources. The Republic of Armenia is average in terms of available water resources among countries of the Eurasia continent. The country has 9,479 rivers with average annual flow of 7.2 billion cubic meters. 9,100 rivers are 10 or less km long, 318 rivers range from 10 km to 25 km, 57 from 25 km to 100 km, and the four largest rivers (Akhurian, Debed, Razdan, Vorotan) stretch for 100-200 km. The largest natural water reservoir is Lake Sevan (surface area 1,246 square km, volume 34 billion cubic meters) situated at 1,916 m above sea level. The country has dozens of large, medium and small-size artificial water reservoirs, the largest of them on the Akhurian, Aparan and Azat Rivers.

Aggregate annual water intake in Armenia totals 1,725 million cubic meters, of which approximately 730 million cubic meters are lost during transportation. Annual water consumption by sector is as follows:

Industry – 93.9 million cubic meters
Irrigation - 744.6 million cubic meters
Agriculture (cattle breeding) – 57.7 million cubic meters
Housing and utilities – 100.8 million cubic meters.

Organizational Structure and Management System

Currently, water and wastewater services are provided by YerevanVodokanal and ArmVodokanal, both constituted as closed joint stock companies. The operation of these enterprises is regulated by the State Water Sector Committee within the Government of Armenia. Prior to setting up the State Water Sector Committee, the water/wastewater sector had been subject to regulation by a number of government agencies and local governments (Ministry of Urban Development, Yerevan City Administration, and communities).

In order to improve the financial and operational performance of the water/wastewater utilities, improvement of service quality and implementation of reforms, the State Water Sector Committee within the Government of Armenia was set up following Government Resolution # 92, February 9, 2001. The results of the industry condition analysis made by the State Water Sector Committee proved an urgent need in reforms. Major tasks associated with revival and development of water/wastewater utilities were identified as follows:

1. Developing proper legislative and regulatory frameworks;

[4] This figure represents the actual number of residents based on the 2001 Armenian census results. According to the census, de jure permanent population stands at 3,213,100 persons

2. Reorganizing the management structure;
3. Switching to the market relationship;
4. Improving methods for carrying out economic activities;
5. Improving the quality of services;
6. Raising funds for capital investments.

During its 30 months of existence, the State Water Sector Committee has drafted a number of laws and resolutions that have been passed which aimed at radical improvement of water/wastewater utilities operation. The Armenian Water Code and the Law on Establishing Privileges in Repayment of Debt for Water and Wastewater Services, Sewerage Treatment and Irrigation (further Law on Restructuring Indebtedness) were passed in July and November, 2002, respectively.

Major regulations in the Armenian water sector include: Decrees of the Armenian Government # 440 dated May 17, 2001 "On Measures to Implement the Program for Improving the Operation and Cash Flows of Water/Wastewater Utilities for 2001 through 2005" and # 690-A dated May 23, 2002, "On Cash Flows and Measures to Improve YerevanVodokanal Operation in 2002 through 2005".

YerevanVodokanal provides water and wastewater services in the city of Yerevan and ensures operation and technical maintenance of water/wastewater system in 52 villages in the Yerevan region. ArmVodokanal is responsible for operation and technical maintenance of water/wastewater systems in 47 cities and 250 villages, in most of which ArmVodokanal also operates distribution networks under contracts with local governments. In approximately 640 villages local governments are responsible for providing water service.

According to the Government Decree # 33 dated January 21, 1999, "On Measures to Implement Structural Reforms in Local Water/Wastewater Systems in the Republic of Armenia", all ArmVodokanal branches merged into ArmVodokanal. Following the same Decree, all community-owned water/wastewater systems were included in ArmVodokanal.

For the first time, the private sector was involved in the Armenian water sector in 1999. A private operator was selected though an international tender and awarded a contract for managing YerevanVodokanal for four years. In the year of 2001, ArmVodokanal stock was transferred to the State Water Sector Committee. At the end of the same year YerevanVodokanal stock was also transferred to the State Water Sector Committee.

1.2 Residential Customers' Access to Water/Wastewater Services

Coverage by water supply services. Majority of Armenians use centralized water supply service which includes both tap water and water from street standpipes. According to vodokanals' data, 100 percent of Yerevan population and between 93 percent to 95 percent of the rest of Armenian urban population are provided with water from centralized sources. Almost all residential and other customers in the city of Yerevan are provided with potable water in full except for at most 0.3 percent of all customers in private individual houses who use public street standpipes.There are few localities where individual households consume water from their own sources. However, the number of these households has little effect on the general coverage figure.

Coverage by wastewater services is much less extensive than that by the water supply services. Practically all cities but only 22 percent of villages are connected to wastewater systems. The extent of centralized wastewater system coverage stands at approximately 40 to 60 percent in most cities, with Yerevan enjoying a 95-percent coverage and Vanadzor – 70 percent. The more

villages are in a service area of ArmVodokanal branches, the lower coverage by wastewater services is. In some localities, particularly in the private housing residential areas which are not connected to wastewater systems, people rely on cesspits or septic tanks. There are few microraions in Yerevan which do not have local wastewater systems or are still not connected to the city system. Efforts to connect these microraions to the wastewater system were suspended in 1991 because of lack of funding.

1.3 Quality of Services

Quality of water services. The country has 107 functioning drinking water intakes with a total production capacity of 570 mln m^3 per annum. A distinctive feature of water service in Armenia is that 95.5 percent of water comes from stable underground sources and is of appropriate quality. In general, drinking water in Armenia is characterized by low mineral content, softness, stable chemical composition but with low content of fluorine and its compounds.

Practically all cities and most villages receive water on a scheduled basis, with households enjoying water 2 to 8 hours per day despite sufficient water resources and intake sites. In 2002 only 13 to 15 percent of Armenian households enjoyed a round-the-clock water service[5]. In the city of Yerevan, water service was available on average four hours per day while on the territory covered by ArmVodokanal the average weighted time of water supply ranged at 5.5-6 hours per day. In June 2003 in Vanadzor, 81 percent of customers received water once in two days[6]. Water service interruption results in additional problems on water networks:

- Water is left standing in the distribution network;
- Network operating life is reduced due to the accelerated corrosion caused by intermittent flows;
- Increased wear-and-tear of water mains and stop valves due to fluctuating water pressure;
- Formation of low pressure zones in pipelines (leading to suction of subterranean and other waters and, consequently, secondary pollution.)

Due to the chronic and critical shortage of funds, scheduled network replacement, repairs and other necessary actions have been cancelled or postponed which undermines the condition of both water distribution networks and pumping equipment. Approximately 50 percent of water networks and pipelines, built over twenty years ago, are now in critical condition. The lack of funds for capital repair and maintenance of water networks and pipelines and for capital investments for reconstruction have resulted in an increased number of accidents, leakages, and deteriorated water quality. There have been numerous cases of direct water supply from wells or pumping stations leading to unsustainable and uneconomical water service and, consequently, poor service.

Quality of wastewater service. Chronic under-financing has resulted in the failure to perform scheduled repairs and replacement of the distribution network and of pumping equipment, wastewater treatment facilities, etc.

The Republic has 20 wastewater treatment facilities with installed capacity of 350 million cubic meters of water per annum. However, 15 facilities are not currently operational while the other 5 perform only mechanical treatment of wastewater which results on poor quality of wastewater

[5] Indicative Survey of Operational and Financial Performance of Armenian Utilities. OECD, Yerevan, October 2003.

[6] According to June 2003 sample polling of water and wastewater customers in the cities of Yerevan and Vanadzor (see Section 2)

after treatment that does not meet the requirements. It is imperative to restore operations in order to protect public health and safety. Unless action is taken quickly, facilities will deteriorate to the point of no return. This will result in great losses, pollution of adjacent rivers and of Lake Sevan.

All sewerage from residential areas equipped with wastewater systems is discharged into surface water, except for those that have bio-ponds. Sewerage is collected into centralized wastewater systems and, thanks to the landscape profile, makes its way to treatment facilities mainly by gravity. However, no biological wastewater treatment is performed and mechanical treatment is incomplete. In other cases, sewerage is dumped into water collectors either through emergency outputs detouring treatment facilities or after going through a production process without treatment. Besides, all treatment facilities were built before 1990 and their technologies do not meet current requirements. These technologies are based on low fuel costs and are not compatible with today's realities.

Sanitary and hygiene condition of the sector. Therefore, water supplied through a centralized water systems frequently fails to meet microbiologic and other standards -- further evidence of serious problems in the system for distributing drinking water from source and/or water preparation station to customer. It is contaminated by infiltration of subterranean water, atmospheric precipitation, and wastewater (from deteriorated wastewater pipelines) into the water distribution pipelines.

Water quality further deteriorates as the distance from water preparation facilities increases – especially in large cities. As already been stated, the major reason behind this is an unsatisfactory condition of the water network – significant deterioration of pipes. For instance, 98-99 percent of tests that fail the Drinking Water Standard requirements in terms of microbiologic indicators are in the distribution networks, pointing to secondary water pollution in the networks. The sanitary and hygienic condition of water pipelines has been steadily deteriorating: in 1990, the number of water pipelines failing to comply with sanitary standards stood at 21 percent; in 1993 – 39.3 percent, in 2000 – 57 percent. The share of water intake points that do not meet microbiologic standards rose from 9.4 percent in 1990 to 11 percent in 2000. As a result, outbreaks of waterborne intestinal infections -- rare in Armenia before 1992, have become frequent[7].

Obviously, replacement of a small portion of pipes that are in a critical condition and restoration of round-the-clock water service will help improve water quality significantly and, therefore, meet requirements of the most demanding customers.

1.4 Financing of the Water Sector

1.4.1 Financial Condition of Vodokanals[8]

CJSC YerevanVodokanal

In the first six months of 2003, YerevanVodokanal delivered 200 m^3 of drinking water into the network, with 52.3 m^3 being sold to customers: 36.2 m^3 (69 percent) was consumed by households, 3.0 m^3 (6.0 percent) by budget-funded organizations, and 13.1 m^3 (25 percent) by other customers.

Revenues from sales amounted to AMD 2,002.3 mln (VAT excluded), while operating costs stood at AMD 3,139.8 mln (VAT excluded), i.e. actual losses from the core activity amounted

[7] For more details see: Annex 3 in the document Financial Strategy for the Large and Medium Armenian Cities' Water Disposal and Wastewater Treatment Sector. Basic Scenario. OECD / Ministry of Finance and Economy of RA, Yerevan, June 2003

[8] Actual data and estimates presented in this section are provided by experts of the Armenian State Water Sector Committee

to AMD 1,137.5 mln. Thus, the cost of delivering 1m^3 was AMD 60, while revenues were AMD 38.3. Thus, the current tariff (AMD 56 per 1m^3, VAT included) recovers only 64 percent of company's operating costs.

It should be kept in mind that the operating costs for the first six months of 2003 do not include any allowance for depreciation that, due to fix asset revaluation in 2002, had actually increased ten-fold. Including the full cost of depreciation for the first 6 months of 2003 would have increased operating costs by AMD 1,155.0 mln, and actual operating costs would have amounted to AMD 4,294.8 mln, with the cost of 1 m^3 equaling AMD 82.00.

Thus, in the opinion of experts of the State Water Sector Committee, based on actual data for the first half of 2003 and adding a 10 percent profit margin and 20 percent VAT, calculated tariff should be AMD 108.00 versus current AMD 56 per 1 m^3.

Since expenditures on repairs are only 0.8 percent of total operating expenditures (or AMD 24 mln for 6 months in 2003), it is obvious that the tariff fully recovering operating costs should be significantly higher that the calculated AMD 108.00.

This is confirmed by the study conducted in November 2002 by advisors of the Italian company "LaboratoRI SpA" and British company WRC at the request of YerevanVodokanal[9]. This analysed the cost structure of the company and options of cost recovery during 2004-2012 and found five tariff policy scenarios for two tariff structures: a uniform volumetric tariff and a two-part tariff. The tariffs for all customer groups (residential, budget, and commercial) are set at the same level. According to the study, the 2004-2006 tariff fully covering operating costs, capital expenditures, and depreciation should be set at AMD 184.00 per 1 m^3 of water – assuming a 90 percent payment collection rate. Excluding depreciation, the tariff should be AMD 112.00 per 1 m^3.

CJSC ArmVodokanal

In the first six months of 2003, CJSC ArmVodokanal sold 29.6 mln m^3 of drinking water and collected 19.5 mln m^3 of wastewater, and received total revenues of AMD 1,456.2 mln. The collections for services delivered amounted to AMD 905.3 mln or 62.2 percent of the cost of services sold versus 53.5 percent a year earlier. Households consumed 82.1 percent of sold water and budget-funded and commercial organizations the remaining 17.9 percent. The payment collection rate rose by 8.6 percent year-on-year, i. e. AMD 30.62 was collected for 1 m^3 of water sold versus AMD 26.82 a year before.

In 2003, the average retail price of water services supplied by CJSC ArmVodokanal is AMD 42.14 for 1m^3 and, for wastewater services, AMD 10.77 1m^3. These revenues fail to cover the cost of services. Thus, the company operated at a loss in 2002 of AMD 597.7 and is projected to lose AMD 772 mln in the first half of 2003.

In the opinion of experts of the State Water Sector Committee, water and wastewater service tariffs that would fully recover costs and provide for an adequate profit margin would be at least AMD 130-140 per 1m^3 for drinking water and AMD 30-35 per 1m^3 for wastewater – based on a payment collection rate of at least 90 percent.

1.4.2 Budget Financing

The types of financial support extended by the State Budget to communal services companies have undergone major changes. For instance, gas suppliers no longer receive subsidies because

[9] Tariff Study - Revised Tariff for Yerevan Water and Sewerage Company. LaboratoRI SpA & WRC, Yerevan, November 2002

they have been privatized. The same applies to utilities that provide services under contracts with communities.

The level of subsidies provided to water and wastewater enterprises is determined on the basis of financial assessment of the cash flow of each utility in the current year. Based on vodokanals' cash flow projections, amounts are earmarked in the national budget and distributed according to an established procedure. In 2002, the government allocated AMD 1,500 mln to cover the financial deficits of two vodokanals -- 0.57 percent of the total state budget expenditures. The 2003 budget allocations for this purpose are AMD 2,745 mln, or 0.82 percent of budget expenditures. Out of this amount, AMD 810 mln is earmarked for recovery of current costs of ArmVodokanal and AMD 1,935 mln for YerevanVodokanal. According to the latest information provided by Ministry of Finance budget subsidies will be gradually phased in amounting to a total of AMD 1,348 mln for both vodokanals in 2004 and zero in 2005.)

With a separate account for capital financing for targeted water and wastewater programs (including credit facilities of the World Bank and the KFW bank along with co-financing by the GOA), the Ministry of Finance of the Republic of Armenia reported actual budget expenditures for the water and wastewater sector at 3.4 percent of total budget expenditures in 2002 and four percent in 2003 (see Table 1.1).

Communities may provide budget subsidies to vodokanals to offset declining national budget subsidies as stipulated by Article 3600 of the budget. However, analysis shows that local communities allocate only about 0.3 percent of total community budgets for water and wastewater services. Companies' losses resultant from privileges to certain residential customer groups in payment for water and wastewater services is handled within the framework of cash flow planning.

Table 1.1. Financing of Water and Wastewater Sector Expenditures from the National Budget of the Republic of Armenia in 2000 - 2005 (AMD mln)

Title	*2000*	*2001*	*2002*	*Program*	*Projection*	
				2003	*2004*	*2005*
Total budget expenditures, including:	222900	249400	263900	334300	330400	357700
1. Subsidies to cover financial deficit and reimburse costs of W&W sector	1277	787	1499	2745	1348	0
Percentage of total budget expenditures	*0.57*	*0.32*	*0.57*	*0.82*	*0.4*	*0.0*
CJSC ArmVodokanal	721	560	1229	810	592	0
CJSC YerevanVodokanal	556	227	270	1935	756	0
2. Financing capital expenditures, including targeted programs in the water sector, total	3239.1	4073.2	7557.2	10511.2	5122.7	3337.9
Percentage of total budget expenditures	*1.45*	*1.63*	*2.86*	*3.14*	*1.55*	*0.93*
3. Total budget allocations for the W&W sector	4516.1	4860.2	9056.2	13256.2	6470.7	3337.9
Percentage of total budget expenditures	*2.03*	*1.95*	*3.43*	*3.96*	*1.96*	*0.93*

Source: Ministry of Finance and Economy of the RA

1.4.3 Other Sources of Financing

Currently, mid- and long-term capital investments are planned through a mid-term expenditure program -- a required part of the budgeting process. Major investments in the system are

financed from credit programs primarily funded by the World Bank and the German KFW bank. Currently, the following credit programs are financing investments:

a) Yerevan municipal development program has a total of USD 35.5 mln. The projected cost of stage two stands at USD 55 million;

b) Prepayment for developing a community water and wastewater program (the ArmVodokanal system) is financed through a credit for USD 1.355 mln. The value of the first stage of this program is USD 30.0 mln. The second stage of the program envisages spending approximately USD 35 mln;

c) Credit program to improve the water and wastewater system in Armavir marz -- DM 25.0 mln or EUR 15.2 mln; and

d) Currently, the credit program to improve water service in cities of Gyumri, Vanadzor and some adjacent villages is being developed. According to preliminary projections, the credit will total EUR 26.4 mln.

Yerevan Municipal Development Program (to be implemented between 2000 and 2004) is financed through the USD 30 mln loan under a Loan Agreement between the Republic of Armenia and the World Bank of June 19, 1998, and an additional USD 5.5 mln from the Government of the Republic of Armenia (the grace period is 10 years, the maturity date is 12/15/32, loan servicing costs are 0.75 percent, and the interest on principal is 0.25 percent).

As of July 1, 2003, USD 16.7 mln (55.6 percent) of the USD 30 mln loan had been used for developing the water sector in the city of Yerevan. The first credit program is primarily aimed at tackling priority tasks including: reducing water losses; reducing operating costs, (particularly, electric power costs); repairing deteriorated distribution pipes; and improving the collection rate for water and wastewater services. Addressing these priorities is anticipated to result in an enhanced efficiency of water and wastewater systems in Yerevan and increased profitability of YerevanVodokanal operations. However, sustaining the improvements and ensuring efficient operation of the system in the future will require resolving problems related to reconstruction and repair of fixed assets, as well as network zoning, whose financing is not stipulated in the first stage of the credit program. These issues are expected to be addressed through a second credit facility of USD 55 mln.

Community Water and Wastewater Program (ArmVodokanal System)

Research and feasibility study for the two-stage, USD 65 million project have been performed on the preparatory stage of the community water and wastewater program implemented by the Government of Armenia in cooperation with the World Bank. French-based company ICEA performed the study on the territory serviced by ArmVodokanal branches and a number of autonomous vodokanals. The scope of the future project encompasses the entire system of municipal water and wastewater system in the country excluding cities of Yerevan, Armavir, Vanadzor, and Gyumri. The loan agreement is expected to be signed in 2004 following the tender-based selection of a private operator for a new company.

Credit Program to Improve the Water and Wastewater System in Armavir Marz

On November 5, 1997, negotiations in Bonn on financial and technical cooperation between the Federal Republic of Germany and the Republic of Armenia resulted in signing a DM 5 mln loan agreement for a communal infrastructure improvement program. On March 27, 1998, the Ministry of Finance of the RA and the German Development Bank KFW had signed the first agreement on “Inspection and Specialist Training” for DM 1.5 mln. The condition of communal services sector (water and wastewater services) in the cities of Armavir, Gyumri and Vanadzor had been inspected within the framework of this agreement.

PRAK recommendations focused on one part of the Armavir marz. Later, a two-stage credit facility was arranged by request of the Armenia Government for DM 5 mln and 20 mln. The program to improve water and wastewater services in the Armavir marz was signed. The total value of the program stands at EUR 15.2 mln, with EUR 1.3 mln allocated by the Government of the RA and EUR 1.1 mln coming from the beneficiary communities.

As of today, the work performed under the program included inspecting systems, digging new wells, meter installation and repairing water service networks. The program is expected to be completed in 2004.

Rehabilitation of Water and Wastewater Systems in Lori and Shirak Marzes

Starting from 2002, the GITEC consulting firm, contracted through the KFW-led tender, began research in Lori and Shirak marzes aimed at preparing a new EUR 26.4 mln credit facility for restorating water and wastewater systems in Lori (city of Vanadzor) and Shirak (city of Gyumri). GITEC consultants are examining water and wastewater systems in Vanadzor and 16 villages using water from the central mainline in the Lori marz, and in the city of Gyumri and 32 villages in the Shirak marz. Conclusions will be presented upon completion of work.

1.4.4 Tariff Policies

Residential water and wastewater service tariffs in the Republic of Armenia were not revised for a number of years – the current structure and level of tariffs were established by the Government Decision # 256 dated July 9, 1997. Effective tariffs at YerevanVodokanal were introduced on January 1, 1998. For the majority of residential customers the water service tariff is set at AMD 46 and for wastewater AMD 10 per 1 m^3. Subject to exception are residential areas serviced by ArmVodokanal that receive water from the Yerevan network (retail price for these customers is AMD 30 per 1 m^3). These tariffs had been approved jointly by the Yerevan City Administration and the Ministry of Finance and Economy of the RA. The average weighted tariff in the YerevanVodokanal system is AMD 45.65 for water service and AMD 9.35 for wastewater service, a total of AMD 55 per 1 m^3.

Tariffs for services rendered by ArmVodokanal units servicing residential areas of the republic were set prior to April 1, 1999, when municipal networks had been transferred under the management of a joint stock company ArmVodokanal for 10 years. Currently, these municipality-approved tariffs remain effective for most Armenian cities. Tariff levels vary among residential areas -- ranging from AMD 42 per 1 m^3 in Vardenis to AMD 66 in Sevan. Particularly, in Vanadzor, the tariff stands at AMD 50 per 1 m^3 of water and AMD 10 per 1 m^3 of wastewater. The average weighted tariff at ArmVodokanal for water services stands at AMD 42.14 per 1 m^3, for wastewater service AMD 10.77 per 1 m^3, totaling AMD 52.91.

Like other CIS countries, Armenia uses a unified volumetric tariff for water and wastewater services with payment made at a fixed rate per unit of volume (1 m^3 of water). If consumption is not metered, charges are calculated based on a consumption standard -- in Yerevan 7.5 m^3 per person per month (or 250 litres per person per day) and in the ArmVodokanal system 6 m^3 (200 litres per person per day) subject to connection to centralized water service and 1.5 m^3 (50 litres per person per day) if water is taken from street standpipes. Customers with meters pay for the water they actually consume. Charges for services in unoccupied residential premises (the so-called “closed door” problem) still needs to be set. According to some estimates, up to a quarter of Armenia’s population currently does not reside in the republic, leaving some dwellings unoccupied and paying nothing toward the fixed costs associated with maintenance and development of the network and company management. This problem could be addressed through a two-part tariff consisting of a fixed part that has to be paid by all customers on a

monthly basis irrespective of the consumption volume as well as the metered consumption charge.

Currently, there are no special rules and procedures for setting tariffs. It has been only stipulated that any tariff changes are subject to preliminary agreement with the State Water Sector Committee. Tariffs at both vodokanals are set separately for water and wastewater services and envisage equality of tariffs for all end-users. However, the final bill, normally, contains the total amount due without specifying components of water and wastewater services. In view of this, a total tariff for water and wastewater service shall be meant in the course of further discussion.

Water and wastewater service tariffs do not include depreciation costs. Including these would have resulted in an increase in current tariffs. Presumably, the established tariffs cover current costs and envisage a certain profit. In reality, however, the low rate of payment collection results in large losses to vodokanals. Water utilities can initiate tariff changes, in coordination with the State Water Sector Committee, if they consider such changes necessary and validated.

The Water Code of the Republic of Armenia introduces the concept of a regulated tariff and envisages transferring responsibility for setting tariffs for water and wastewater services to an independent agency, currently, the Natural Monopolies' Regulation Commission. This agency regulated natural gas and electric power tariffs in the past, and will assume the additional function to regulate water and wastewater service tariffs. Creating a unified regulator for energy and communal services will require developing a legal framework for the procedure of calculating, setting, and approving water/wastewater service tariffs.

Under the World Bank PPIAF grant, an international consulting company has been selected to develop the aforementioned legislation package. Based on the international experience and Armenian regulatory practices, the consulting company will present a draft organization chart of the unified regulator, assess the required number and qualifications of its personnel, assess its annual operating budget, and identify the agency's sources of funding. Draft legislation and regulation packages are to be present at the end of 2003. It is expected that, following the discussions among the interested parties, these will be passed by the National Assembly of the Republic of Armenia. Meanwhile, the regulator is actively preparing to perform its functions and it will decide on an intended tariff increase in 2004.

1.4.5 Payment Collection

Prior to 2002, all vodokanals in the republic suffered a low rate of bill collection. According to the Staqte Water Sector Committee data, in 2002 YerevanVodokanal collected only 47.7 percent of its charged bills – 17.5 percent for residential customers, 135.6 percent for industrial enterprises, and 102.3 percent for budget-funded organizations. ArmVodokanal enjoyed a better payment collection rate: 53 percent overall, 39.3 percent for residential customers, 122.4 percent for industrial enterprises, and 141.6 percent for budget-funded organizations (payments included settling outstanding bills from earlier periods).

In recent years, the lowest collection rate was among residential customers, reflecting their inability or unwillingness to pay. Data collected under the Financial Strategy[10] project found no evidence of a link between household income and payment rates in sample cities. In 2001, Yerevan households had the lowest payment rate -- 10 percent compared with a country average of 15 percent -- while enjoying above average personal income. The following factors resulted in a nonobligatory attitude with regard to paying for water and wastewater services: vodokanals' weak efforts to enforce compliance and the absence of sanctions for nonpayment similar to the

[10] Financial Strategy for the Large and Medium Armenian Cities' Water Disposal and Wastewater Treatment Sector Basic scenario. OECD / Ministry of Finance and Economy of RA, Yerevan, June 2003.

sanctions imposed by electricity distributors, and the unwillingness of a customer to pay for poor quality services that effectively were not provided (in many cases water did not reach the top floors of numerous multistoried apartment buildings.) Apparently, the Soviet tradition of treating water and wastewater services as a government responsibility also played its role.

Starting in mid-2002, the collection rate from residential customers began improving noticeably in Yerevan – rising from 30 percent to 40 percent by the end of the year. Drastic changes in payment discipline of customers occurred after December 2002 when the President of Armenia had signed the Law on Restructuring Indebtedness (the residential customers' service bill payment trend in 2003 will be described in Section 1.6.3).

1.5 Experience with Private Sector Participation

YerevanVodokanal

The first attempt to introduce private management of a state-owned water service company occurred in 1999 when YerevanVodokanal was transferred to a private operator for four years. The Italian ACEA & Company Armenian Utility S.C.A.R.L. won the international tender, offering the lowest "Fixed Management Fee" (USD 2,925,000.) On February 14, 2000, the Yerevan City Administration and ACEA signed a four-year contract under which CJSC "YerevanVodokanal" was transferred into private management, operation and maintenance until May 1, 2004 (currently, this contract is considered to be extended for one year until May 1, 2005).

The purpose of bringing in a private manager is to improve water service efficiency, increase payment collection, improve customer services and public relations, maintain the integrity of surface water sources, enhance management and administration control over water and wastewater systems, as well as apply international experience of private management.

The management contract specifies activity indicators for the private operator to meet (improved collection rate, reduced losses, extended water supply, etc.). Under the contract, the operator must realize 97 types of services over four years encompassing all aspects of the company's activities: 11 indicators are benchmarks for calculating bonuses. This is one of the major incentives in operator's work. Meeting the indicators, assessed on a three-point scale, is intended to ensure achievement of goals of the first credit program to improve operation of the water and wastewater system in the city of Yerevan.

According to experts with the State Water Sector Committee, the existing contract made it possible to achieve significant improvements in the legal framework, regulations of water services to customers living in apartment buildings, and in payment collection. In the second year of the contract, the company achieved significant improvement of its operation indicators, particularly, in those related to financial conditions and quality of services. Progress has continued in the third year of the contract, particularly, with regard to payment collection from residential customers. This indicates that bringing a private operator into the water system is yielding significant positive results. The government of Armenia intends to expand private sector participation in the public services sector, particularly through trustee management, rent and concession contracts in accordance with the Water Code of the Republic of Armenia.

On June 1, 2002, the Mashtots branch of YerevanVodokanal was transferred into private management by a local company for five years (CJSC "Zapadny Vodokanal.") The first results of company's activity show that this branch ranks higher by all indicators than other branches. It plans to ensure round-the-clock water service to all customers by November 2003.

CJSC Nor-Akunk

Joint stock company Nor-Akunk was set up in 2002 under the program to improve water and wastewater services in the Armavir marz under the credit agreement between the governments of Armenia and Germany. The government owns a 34-percent stake in the newly created company while 11 communities of the Armavir marz, including the city of Armavir, own the remaining 66-percent stake with an option to sell a portion of stock to private bidders to raise additional investment funds. An experienced executive director was selected through an international tender to execute the credit program. Currently, the entity is repairing networks, improving the water supply system and enhancing financial indicators. Currently, Armavir has the highest water and wastewater tariff in Armenia, AMD 100 per 1 m^3 and a high payment collection rate, while the percentage of water meter installation significantly exceeds the ArmVodokanal average.

Other Examples of Private Sector Participation

Similarly, a vodokanal restructuring scheme is planned in Lori (city of Vanadzor) and Shirak (city of Gyumri). Here too, local vodokanals will become joint stock companies under the KFW credit program, with the government stake of 51 percent and the remaining shares allocated among the city and adjacent villages. A management contract will be entered into with the operator to be selected by tender. In the future, a portion of shares may be sold to the private sector.

In October 2003 a tender was announced for a management contract to be signed with a private operator at ArmVodokanal within the World Bank operated Community Water and Wastewater Program. Decision on tender results is expected in early 2004 for the program to start the same year.

1.6 Government Sector Reform Policies

1.6.1 Water and Wastewater Reform in Light of Millennium Development Goals

In 2000, the United Nations adopted a set of Millennium Development Goals. One of these goals deals specifically with water service – decreasing by half the population that has no sustainable access to save drinking water and basic sanitation (see Box 1).

With at least 96 percent of its urban population and 65% of its rural population (and an overall average of 85%)[11] already enjoying access to improved central water supplies, meeting the millennium target of halving the number without access will mean that Armenia will have to extend its centralized water supplies to an additional 120-130,000 households by 2015.[12] Armenia's Poverty Reduction Strategy Paper approved by the Order of the GOA # 994-N on August 8, 2003 estimates that this extension will require USD 200–220 million investments – which will amount to 55-60% of total investments expected to be done in the network.

The economic crisis Armenia faced in 1990s and insufficient funding of the communal service sector during long time caused deterioration and ruining of the existing infrastructure as well as worsening of the quality of services. As a result, even those customers who had an access to centralized water and wastewater systems received water on a scheduled basis. In so doing, tap water could not be considered safe any longer because of frequent pipeline breakdowns and outbreaks of infectious diseases caused by secondary contamination of water. Under assistance of international donors, the Government of Armenia took every effort possible to overcome the

[11] Social Snapshot and Poverty in Armenia. Statistical Analytical Report, Yerevan, 2002, p.120

[12] See *Poverty Reduction Strategy Paper*, Yerevan, 2003, p.135

crisis and provide residential customers with better quality water and wastewater services. As witnessed by the analysis of recent government's policy and 2003 sector development statistics, impressive results were attained within a very short time. The rapid progress in the important areas of metering and management improvement documented elsewhere in this report indicate that the Government of Armenia is committed to making the reforms necessary to meet targets.

The *Poverty Reduction Strategy Paper* acknowledges the need to move beyond the broad UN goal of halving the number of people without "access to improved water supplies" and to improve the quality of water supply services – increasing the hours of service, reducing leaks in the distribution system, improving the targeting of utility subsidies to poor people, enhancing the efficiency of the management of water and wastewater companies, and installing meters. Priority will have to be given to restoring non-operational wastewater treatment plants to effective primary and secondary treatment of effluent – particularly in urban areas.

Box 1. UN Millennium Development Goals and Definitions of 'Access' used by WHO/UNICEF

Target: "*Halve by 2015 the proportion of people without sustainable access to safe drinking water and basic sanitation"*

Access to an improved water source:

- Reasonable access to an adequate amount of safe water (including treated surface water and untreated but uncontaminated water, such as from springs, sanitary wells, and protected boreholes).
- In urban areas, the source may be a public fountain or standpipe located not more than 200 metres away.
- In rural areas the definition implies that members of the household do not have to spend a disproportionate part of the day fetching water.
- An adequate amount of water is that needed to satisfy metabolic, hygienic and domestic requirements, usually about 20 litres of safe water a person a day.

In 2000, 1.2 billion people still lacked access to an improved water source, 40 percent of them in East Asia and Pacific and 25 percent in Sub-Saharan Africa. Meeting the Millennium Development Goals will require providing about 1.5 billion people with access to safe water between 2000 and 2015.

Access to sanitation:

- Adequate disposal facilities that effectively prevent human, animal, and insect contact with excreta.
- Suitable facilities range from simple, but protected, pit latrines to flush toilets with sewerage.
- To be effective, all facilities must be correctly constructed and properly maintained.

In 2000, about 2.4 billion people, 80 of them in Asia, still lacked access to improved sanitation. The gap between rural and urban areas remains extremely wide, especially in Eastern and South-central Asia, where coverage in rural areas is only about one quarter of the population, while urban coverage is 70 per cent. Halving the proportion of the world's population without improved sanitation by 2015 will require reaching an additional 1.7 billion people, a challenge for greater financing and more effective sanitation programs.

Source: OECD (2003), based on WHO/UNICEF (2000), and UN 2003.

The other goals for the water sector specified in the *Poverty Reduction Strategy Paper* include:

- Tariffs that allow for enhanced cost-recovery that accurately reflect operational and capital costs of the system.
- Suspension of subsidies from the state budget to water utilities and creation of subsidies targeted at low income households.

- Management reforms in water companies – measured by improved collection rates, increased operational levels, and reduced electricity consumption per unit of output.
- Installation of water meters to enable consumers to reduce inefficient use of water.

In order to ensure efficient control over implementation, these goals can be presented in a system of indicators that may (but not limited to) include: a full cost recovery schedule; increase of customers with the round-the-clock access to water service; reduction of accidents; targeted assistance to low-income households; monitoring of public opinion on water and wastewater service quality and cost. Quantified targets will provide policymakers with a benchmark against which to measure success (as well as to provide a rapid warning in the event of problems).

1.6.2 Government Decisions in 2002

To expedite implementation of the comprehensive water resource reform program set up under Government Resolution # 149 dated March 13, 1999, Resolution # 55 was passed in January 2002. This established the rules of using the water and wastewater system envisaging installation of water meters and transition to international accounting standards. This Resolution stipulated completion of water meter installation by 2006 (including, in the city of Yerevan, in entrances to apartment buildings by July 2003 and in each apartment by 2006). However, there had been little progress in meter installation by the end of 2002.

In May 2002, the Government adopted the Program to Improve Activity and Financial Flow Projecting at CJSC Yerevan Vodokanal for 2002 through 2005. Beginning in June 2002, there has been significant improvements in collecting payments from residential customers for water and wastewater services in the city of Yerevan.

To a large extent, this progress reflects the active position of the State Water Sector Committee and Ministry of Finance and Economy in stimulating YerevanVodokanal into more active work with debtor-customers and initiating the education campaign in the mass media. This campaign included publication of materials, articles and brochures explaining that round-the-clock service will be possible only though increased water conservation and regular water and wastewater bill payment.

The Law on Condominiums and the Law on Block Management, passed by the National Assembly on May 7, 2002, have been the fundamental legislative acts facilitating settlement of relations between service providers and customers.

1.6.3 Law on Restructuring Indebtedness

The turning point in sector reforms was the passage of the Law on Establishing Privileges in Repayment of Debt for Water, Wastewater Services, Sewerage Treatment and Irrigation (hereinafter – the Law on Restructuring Indebtedness) by the National Assembly on November 6, 2002. This established the conditions for repayment of the household debt estimated at AMD 23 billion and restructuring of the remaining debt conditional to meeting requirements set by the law.

Under the law, households, city and village communities, condominiums, cooperatives, and other water and wastewater service customers are exempted from debt for services consumed prior to January 1, 2000, conditional on signing an agreement to restructure debts incurred between 2000 and 2002, and repaying between 30 and 50 percent of these debts -- depending on the water supply schedule. If water was supplied round-the-clock, a household has to repay half its debt within six months of signing a debt restructuring agreement. If the water supply remained intermittent, the household must repay 30 percent of debt over the same period. Households receiving family benefits must repay 30 and 15 percent of their debts, respectively. The prerequisite for debt forgiveness and restructuring is the installation of water meters at

customer's expense within 6 months of the agreement signing date. At the request of the customer, the cost of water meter purchase and installation can be paid in installments over six months. Low-income households receiving family assistance may receive loans for up to five years.

The law was signed by the President and took effect on December 9, 2002. It sets forth the following schedule: by April 9, 2003, all customers must sign debt restructuring agreements and fulfill all obligations stipulated by the law within six months. Thus, the final date for meter installation and restructuring debts was October 9, 2003.

In October 2003, the National Assembly passed amendments to this Law extending the period for restructuring agreement signing by April 1, 2004, with the deadline for meter installation being set for July 1, 2004.

1.6.4 Outcomes of Implementing the Law on Restructuring Indebtedness

1.6.4.1 Re-registration of Customers and Installation of Water Meters

YerevanVodokanal

To implement the law, in January 2003 eight branches of YerevanVodokanal set up 34 sections, each servicing between 8,000 to 12,000 customers. After re-registration of customers, the total number of household customers increased from 268,294 to 296,735. As of November 1, 2003, debt restructuring agreements had been signed with 245,613 customers -- 83 percent of the total registered customers. The remaining 51,000 customers represent, apparently, so-called "closed doors", i.e. residents who actually do not live in their apartments.

The process of meter installation has been very intensive in Yerevan. The number of customers with water meters rose from 18,427 on January 1 to 123,616 on July 1 and to 226,840 on November 1, 2003. The latter is 76.4 percent of all registered customers or 92 percent of customers who entered into restructuring agreements. Before adoption of new amendments the YerevanVodokanal management expected to complete the meter installation process by the end of 2003, but since the deadline is extended by the law it is anticipated to reach almost 100 percent coverage by July 1, 2004.

At the same time as installing meters, YerevanVodokanal has been working on improving water metering at all stages of the production and distribution process. All apartment buildings, budget-funded organizations, and commercial customers are to be 100-percent equipped with water meters by early in 2004. Agreements have been signed with 74 condominium associations that include 885 separate apartment buildings. Dwelling units that are included in condominium associations include 43,106 registered customers -- 14.7 percent of all units. As of May 1, 2002, YerevanVodokanal had only 123 registered customers in rural areas. By May 1, 2003, this number had jumped to 11,000 customers – 7,101 of which had signed the restructuring agreement. 4,840 water meters have been installed in rural communities.

YerevanVodokanal views metering as a simultaneous process of installing individual meters (in individual apartment) and block meters (in apartment blocks or buildings). In the first stage, with partial apartment meter installation in a building, bills to individual customers without meters are based on the difference of the building meter reading and a sum total of apartment meter readings. The amount payable by such customers is usually higher than the standard which encourages such households to installing water meters. In the second stage, when all apartments are equipped with individual water meters, the vodokanal will enter into contractual relations with all collective customers (condominiums or other forms of union of apartment

building residents). It is expected that payment for vodokanal services will be based on readings of building meters, while the difference between building meter readings and a sum total of apartment meter readings will be charged to all-building costs and allocated among all customers by the condominium association.

Signing agreements between the vodokanal and individual customers has facilitated the development of customer – provider relations on commercial grounds and is an important precondition for improving customer payment discipline. Establishing contractual relations with residential customers has made it possible to introduce a cashless payment collection system in Yerevan as of May 1, 2003.

Armenia Vodokanal

Implementation of the Law on Restructuring Indebtedness continues also rapidly at ArmVodokanal. Inventory of the number of customers using ArmVodokanal's services resulted in a decrease of the registered customers from 258,807 as of January 1, 2003 to 241,526 as of November 1, 2003. 220,682 customers (91 percent) have signed debt restructuring agreements, thus, confirming their desire to install water meters. As of July 1, 2003, 38,420 customers had installed meters -- rising to 69,020 (or 28.5 percent) by August 1. The lower percentage of meter installations at ArmVodokanal is, primarily, explained by customers' lack of funds to purchase meters. However, State Water Sector Committee experts see completion of this process by the end of 2004.

At the same time, some cities have seen a much higher pace of individual meter installation. For instance, Vanadzor had 15,962 installed meters as of November 1, 2003 -- 45 percent of the total number of registered customers. At the same time, there are many closed doors in Vanadzor. Only 61 percent of registered customers have signed debt restructuring agreements with the vodokanal.

1.6.4.2 Installation of Meters for Low-Income Households

The issue of meter installation by low-income households receiving assistance under the family benefit program needs to be considered separately. The Law on Restructuring Indebtedness envisages that low-income households will be provided with water meters by vodokanals, while the cost of their procurement and installation will be reimbursed by customers in equal installments over five years. However, enterprises have lacked the money to extend interest-free loans so the pace of water meter installation for low-income households significantly lags behind other customers. Thus, by November 1, 2003, YerevanVodokanal had installed 33,189 meters for 24,600 low-income households -- 78 percent of the total number of family benefit recipients in Yerevan[13]; while ArmVodokanal had installed only 8,900 meters for low income families -- less than 10 percent of their total number at the territory serviced by Armvodokanal.

As evidenced by service affordability data analysis (see Chapter 2), meters are the best way to protect low-income customers as tariffs increase. Procurement of a water meter (in many case it is necessary to purchase more than one meter) and payment for its installation can become a significant burden upon low-income families. In view of this, it is expedient to consider a possibility of partial compensation, by the government, of expenses for procurement and installation of water meters for families enrolled in the Family Benefit Program. The draft 2004 National Budget earmarks AMD 810 million for procurement and installation of water meters and repair of in-building communications for ArmVodokanal. In its turn, the World Bank is

[13] Some apartments require installation of more than one meter. YerevanVodokanal experience evidences that the number of meters per one customer stands at approximately 1.35 in Yerevan.

willing to consider allocating for this purpose a portion of a USD 1.9 million grant of the Government of Japan provided for facilitating municipal development in the city of Yerevan.

1.6.4.3 Water Consumption by Households with Water Meters

How revenues of water/wastewater utilities are affected by meter installation is illustrated by the following calculation based on ArmVodokanal data.

Table 1.2. Impact of Individual Water Metering by ArmVodokanal Customers upon Financial Indicators of the Company

January 2003			*June 2003*		
Customers Receiving Services	Meters Installed	Total Revenues (AMD mln)	Customers Receiving Services	Meters Installed	Total Revenues (AMD mln)
258,807	12,000	208.6	241,346	35,703	179.2

Source: State Water Sector Committee under the GOA

Table 1.2 shows that a 7.2 percent reduction in the number of customers resulted in a 16.4 percent reduction of company's revenues, or from AMD 806.1 to AMD 742.4 per customer. At the same time, the number of installed meters rose almost three-fold.

It is worth reminding that without the installation of meters, household customers of YerevanVodokanal pay for 7.5 m^3 per person per month, and ArmVodokanal customers pay for 6 m^3 per person per month for centralized water and 1.5 m^3 per person per month for the use of water from collective standpipes regardless of the actual water deliveries. Customers enjoying round-the-clock water supply pay the same as customers receiving water for only one-hour per day.

YerevanVodokanal

A special study of Yerevan households, performed in June 2003 within the scope of this project, evidenced that the average water consumption by households with water meters stands at 2.4 m^3 per person per month (see Section 2.3.2.1). Similar outcomes have been received in the study of two apartment buildings in the Davitishen district (Mashtots branch of YerevanVodokanal). Metered water consumption ranged from 5.5 m^3 to 8.8 m^3 per month per household – about 1.5 m^3 to 2.4 m^3 per person per month.[14]

Until recently, Armenia did not have data on actual water consumption received from a large household database. Because of this, YerevanVodokanal data on water consumption by households with water meters is of great interest (table 1.3.)

Table 1.3. Water Consumption by Households with Meters (March – October 2003)

Month, 2003	*Customers with meters*	*Metered water consumption, m^3*	*Water consumption per customer, m^3/month*	*Water consumption per person, m^3/person/ month*
March	34,283	221,961	6.47	2.09
April	53,678	354,714	6.6	2.13
May	75,728	593,627	7.8	2.52
June	123,616	963,225	7.8	2.52
July	156,702	1,333,132	8.5	2.74
August	186,667	1,768,247	9.47	3.05
September	210,466	1,131,372	10.13	3.27

[14] The average family size according to Mashtots customer database stands at 3.7

October	226,840	2,540,751	11.2	3.61

Source: State Water Sector Committee under the GOA

Table 1.4 shows that water consumption per customer from March through October 2003 has been rising consistently along with a greater number of meter installations. In June 2003, average water consumption per customer stood at 7.8 m^3 or 2.5 m^3/person/month, while in October this figure rose to 11.2 m^3 or 3.6 m^3/person/month (i. e. 120 litres/person/day). This trend confirms the conclusion made at the initial stage of the project – the first to install water meters are households having financial constrains and willing to reduce their water bill on the one hand, and households without full access to water and unwilling to pay for service that they do not consume on the other hand. With increasing coverage by water meters at households with a better water service access, and improved quality of service as reflected by a growing number of water supply hours in Yerevan, the average water consumption by households has been increasing. This has also been facilitated by the fact that, with the tariff remaining unchanged from the times when customers used to pay by the standard of 7.5 m^3/person/month, water charges for households with meters decreased several times, thus, significantly reducing incentives to save water.

Therefore, projected water use by Yerevan residential customers for 2004 and 2005 is assumed to be 120 liters/person/day (3.6 m^3/person/month) and 140 liters/person/day (4.2 m^3/person/month) for households in apartments and private houses, respectively (see Section 2.3.4.2 Scenario 1). These projections are based on discussions with specialists of YerevanVodokanal and the State Water Sector Committee. They are close to levels of consumption projected by international consultants to YerevanVodokanal in their Tariff Study for 2004 through 2012[15], which projected that, by 2005, Yerevan households residing in apartments and private houses would use 120 liters/person/day and 175 liters/person/day, respectively.

An alternative scenario has been developed for lower consumption levels, i.e. 80 litres/person/day for apartments and 100 litres/person/day for detached houses (Section 2.3.4.2 Scenario 2).

Armenia Vodokanal

According to a study performed in Vanadzor in June 2003, actual water consumption by households with water meters (average city-wide – 1.47 m^3/person/month, which is equivalent of approximately 50 litres/person/day), turned out four times lower than the standard (6 m^3/person/month.) We also have results of two studies of water consumption by households with water meters in cities serviced by ArmVodokanal. According to a research company GITEC that performed feasibility study for projects in marzes Lori and Shirak, average metered consumption in Vanadzor ranged from 1 to 1.5 m^3/person/month as of the end of 2002, depending on location of residence.[16] Within the scope of project preparation at ArmVodokanal, French research firm ICEA studied water consumption in 1,000 households from 7 cities. As of August–September 2002, average water consumption stood at 37.1 litres/person/day or 1.1 m^3/person/month.[17]

[15] Tariff Study – Revised Tariff for Yerevan Water and Sewerage Company. LaboratoRI SpA & WRC, Yerevan, November 2002.

[16] Rehabilitation of the water supply and the sewerage disposal systems in the regions Lori (Vanadzor) and Schirak (Gyumri), GITEC, Yerevan, 2003 (Chapter 3)

[17] Management Contract for the Provision of Water and Wastewater Services in the service areas of the Armenia Water Supply Company, Project Information Document, ICEA, May 2003, Yerevan

The low water consumption by Vanadzor households can be explained first by the fact that most city residents do not have access to regular water supplies. However, experts assume that, as water supply improves, per capita water consumption will grow, reaching in 2004 or 2005 an average of 100 liters/person/day (3 m^3/person/month) and 120 liters/person/day (3.6 m^3/person/month) for apartment dwellers and those in private houses, respectively. These figures were used in forecasting Vanadzor customers' ability to pay in 2004 – 2005, the results of which are presented in Item 2.3.4.2 (Scenario 1).

ICEA experts arrived at the same conclusion, having recommended the average consumption of a metered subscriber at 100 litres/person/day or 3 m^3/person/month. Validation of their conclusion reads: «The unit metered consumption observed during some months for the first meters installed cannot be a basis for assessing what will be the future average metered consumption when all meters will be installed. Some months are not sufficient due to transitory factors and seasonal variations and the first installed meters are not representative of the overall average.»[18]

An alternative projection of service affordability in Vanadzor for the lower water consumption of 60 litres/person/day for apartments and 80 litres/person/day for detached houses is presented in Scenario 2 (Section 2.3.4.2).

1.6.4.4 Payment Collection Growth

As already mentioned, the first positive shifts in customers' payment discipline in Yerevan began in mid-2002. The turning point in water and wastewater service payment collection rate occurred in February 2003 following the effective date of the Law on Restructuring Indebtedness. Between March and June of this year, the rate of payment collection from residential customers in Yerevan ranged from 80 percent to 140 percent of the amount billed and this increase has been sustained. Payment collections exceeded 100 percent because of repayment of accumulated debts in accordance with the Law. At the same time, settlement of the current bill by residential customers in the same period stood at an average 85 percent, while the number of customers paying regularly for services has been rising from month to month.

1.6.4.5 Improvement of Service Quality

Not least, this is the outcome of improved quality of services, particularly, the vodokanal's consistent implementation of its policy to bring round-the-clock water supply to all customers in Yerevan. The government has approved the schedule under which round-the-clock water service will be provided to 90 percent of all city residents by the end of 2004 (according to a household poll, only 18 percent of Yerevan residents in June 2003 had a round-the-clock access to water). In December 2003, this will have increased to 40 percent, and, by July 2004, it will have reached at least 75 percent.

Improving the quality of water and wastewater services in Yerevan also requires solving the issue of sustainable water services for dwellers on top floors of apartment building, many of whom have not been receiving water for years. This task cannot be completed without water system zoning, and replacing deteriorated pipes and valves that cannot support the increased pressure in the system necessary to reach upper floors. Without fulfilling this task, there is no way to protect water quality that suffers from standing and secondary pollution in the system.

[18] Management Contract for the Provision of Water and Wastewater Services in the service areas of the Armenia Water Supply Company, Project Information Document, ICEA, May 2003, Yerevan – Appendix C, p.34

1.6.4.6 Enhancement of The Role of Public in the Decision-Making Process

Successful implementation of these tasks cannot be achieved only through solving technical issues and increased funding. Work with customers will play an important role -- including the development of a balanced legislative framework and proper public disclosure of information on on-going reforms. Central government agencies, local governments and vodokanals have to provide true information on the course of reforms, financial and technical condition of service providers, tariffs and rules of their setting, as well as timely information on planned tariff increases. Work with customers has to envisage public participation in the decision making process related to tariff policies, contractual relations with customers, payment collection methods and responsibility of customers for undisciplined payment for services consumed.

CONCLUSIONS TO CHAPTER 1

1. Most Armenian households are served by centralized water service either from in home pipes or from street standpipes. According to the vodokanals, 100 percent of Yerevan residents and 93 – 95 percent of urban residents in other parts of the country receive central water service. But coverage for wastewater services is significantly lower. The republic has centralized sewerage system in all cities and oblast centers, as well as in 22 percent of villages. Centralized wastewater system coverage in the majority of Armenian ranges from 40 to 60 percent, in Yerevan – 95 percent, in Vanadzor – 70%.
2. Practically all cities and most villages receive water on a scheduled basis – averaging between 2 to 8 hours supply per day. In 2002 only 13 to 15 percent of Armenian households enjoyed round-the-clock water service. In Yerevan, water service was available on average for four hours per day. In Vanadzor in June 2003, 81 percent of customers received water only once in two days. Potable water in the Republic of Armenia is provided mainly from underground sources, and is generally characterized by stable content and appropriate quality. However, recently, customers have expressed growing discontent with water quality because long-term under-funding has allowed many pipes to wear out, allowing secondary water pollution through both infiltration during transportation and during periods when water stands still in the system.
3. Current water and wastewater tariffs charged by YerevanVodokanal and ArmVodokanal do not recover operating costs and include no provision for capital repairs and depreciation. In recent years, the rate of payment collection from residential customers has been very low. In 2002, Yerevan residents paid only 17.5 percent of what they were billed, while the collection rate at ArmVodokanal stood at 39.3 percent. This has necessitated high levels of government subsidies. Budget expenditures for the water sector stood at 3.4 percent of total budget expenditures in 2002 and has reached 4 percent in 2003.
4. Major investments in the water and wastewater sector are paid for through credits -- primarily from the World Bank and German KFW bank.Currently, approximately USD 51.1 million worth of credits are being implemented while another USD 122.7 million worth of credits are being readied for implementation.
5. There are several examples of private participation in the water and wastewater sector. In 2002, YerevanVodokanal was transferred to private management by a foreign company. A local company was contracted to operate at one of the branches of YerevanVodokanal. Measures to attract private operators to vodokanals in Armavir, Vanadzor and Gyumri are being taken under the KFW-funded program. A tender announcement has been made to contract a private operator for the ArmVodokanal system within the scope of the Community Water and Wastewater Program implemented by the World Bank.

Armenia has developed and continues to improve the legislative and regulatory framework for successful operation of the water and wastewater sector. Armenia has passed a Water Code and other laws regulating contractual relations between service customers and providers. The Government of Armenia has approved the Poverty Reduction Strategy identifying high priority tasks which need to be accomplished to attain the Millennium Development Goals adopted by the United Nations. Passage of the Law on Restructuring Indebtedness played the most important role in improvement of the situation. The Law enabled the Government to resolve the issue of huge customers' debt accumulated in past years. At the same time, Armenia does not have a government-approved procedure for pricing centralized water and wastewater services that would include the tariff calculation methodology and the procedure for tariff setting.

Significant results have been achieved in the seven months following passage of the Law on Restructuring Indebtedness:

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- Re-registration of all water and wastewater service customer in Armenia and specification of customer lists resulted in growth of YerevanVodokanal residential customers by 28,500 between January 1, and November 1, 2003, and decline of the number of ArmVodokanal's customers by 17,300;
- As of November 1, 2003, 83 percent of YerevanVodokanal residential customers and 92 percent of ArmVodokanal's customers entered into debt restructuring contracts, assuming the obligation to install individual meters;
- Rapid water meter installation – by November 1, 2003, 76.4 percent of residential customers in Yerevan and 28.5 percent of ArmVodokanal residential customers installed individual metering devices. This process is planned to be completed by the middle of 2004 in Yerevan and by the end of 2004 at ArmVodokanal;
- Payments collected from residential customers for water and wastewater services have improved noticeably. In March – September 2003, the payment collection rate ranged from 80 to 140 percent in Yerevan, including debt repayments under the Law on Restructuring Indebtedness;
- Water supplies to Yerevan residents have also improved – the Government approved a plan for staged introduction of round-the-clock water service for all city residents. 40 percent of customers in Yerevan are expected to have this service by the end of 2003 – rising to 90 percent of residents by the end of 2004.

As a result of installing individual meters, revenues collected by water and wastewater services providers have been steadily declining as customers switch from billing based on normatives to billing based on actual consumption. Sample studies of water consumption by households with water meters show that actual water consumption in June 2003 in Yerevan did not exceed 2.4 m^3/person/month, and, in Vanadzor, only 1.5 m^3 /person/month -- three to four times lower than the consumption standard used in calculating water service charges. At the same time, water consumption per customer has been rising along with the increase of water meter installations. In June 2003, average water consumption per one household member in Yerevan stood at 2.5 m^3/person/month (or 80 litres/person/day), while in October this figure was up to 3.6 m^3/person/month (i. e. 120 litres/person/day.) This trend witnesses the fact that the first to install water meters were households having financial constrains and willing to reduce their water bill as well as households without full access to water and unwilling to pay for service that they do not actually consume. With increasing coverage by water meters of households with a better water service access, and improved quality of service as reflected by a growing number of

water supply hours in Yerevan, the average water consumption by households has been increasing.

The pace of water meter installation for low-income customers receiving poverty benefits at ArmVodokanl is lagging behind the similar indicators at YerevanVodokanal. Thus, as of November 1, 2003, YerevanVodokanal installed meters for 78 percent of benefit recipients while ArmVodokanal had installed only 8,900 water meters for less than 10 percent of customers receiving family poverty benefits in the area serviced by the company.

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CHAPTER 2. AFFORDABILITY OF WATER/WASTEWATER SERVICES TO RESIDENTIAL CUSTOMERS

Armenia is the first country in the EECCA region to put in practice the OECD Guidelines on Consumer Protection in Urban Water Sector Reform in Eastern Europe, Caucasus and Central Asia, developed for the Group of Senior Officials on Urban Water Sector Reform in Eastern Europe, Caucasus and Central Asia (EECCA), with the support of the OECD/EAP Task Force Secretariat[19]. This document serves as a comprehensive theoretical and methodological basis for assessing utility services in EECCA countries.

2.1 Theoretical and Methodological Aspects of Assessing Service Affordability

As the other former USSR republics, Armenia did not care about the affordability of water/wastewater service since water was considered as almost a "free good". Charges for water posed little burden on the household budget. Affordability became an issue in mid 1990s following the break up of the USSR and the transition to market relations.

Moving away from centralized planning, eliminating state subsidies and artificial supports for low utility prices had an immediate impact on households' ability to pay for basic services. Liberalized prices skyrocketed -- outpacing by 17.4-fold the increases in prices for other consumer goods and services in 1995 -- while the quality of water/wastewater services deteriorated significantly in Armenia between 1994-1998[20]. Although payments for water/wastewater services are a relatively small percentage of households expenditures, there is a growing concern that residential customers cannot afford paying for the services they consume under widely spread poverty. One can assess the validity of these concerns only by analyzing concrete figures – the subject of this section of the report.

2.1.1 Concept of Service Affordability

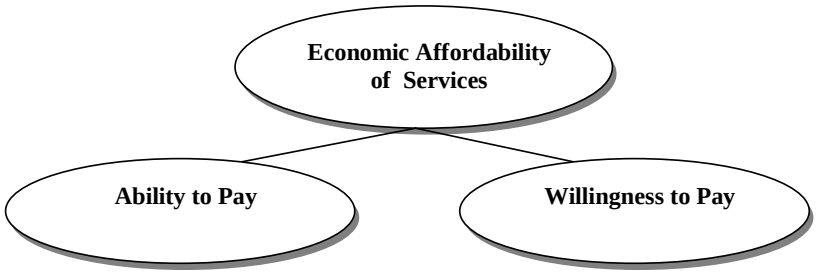
On the whole, the notion of "affordability of water and wastewater services" is vague and covers not only economic but also social and political aspects. This report focuses on economic aspects of affordability that can be measured more precisely than social and political aspects. Economic affordability is interpreted as price that customers can afford to pay without jeopardizing their ability to meet other basic needs.

When assessing economic affordability of water and wastewater services, it is important to distinguish customer's *ability to pay* for services (the customer's solvency) and customer's *willingness to pay* (see Figure 2.1).

[19] Key Issues and Recommendations for Consumer Protection: Affordability, Social Protection, and Public Participation in Urban Water Sector Reform in Eastern Europe, Caucasus and Central Asia // OECD, Paris, 2003. – 150 pp.:

[20] Statistical Bulletin of Southern Caucasian Countries, 2000. – p. 408, 412. Statistical Bulletin of Southern Caucasian Countries, 2002. – p. 345, 350.

Figure 2.1. Components of Economic Affordability of Water and Wastewater Services



Key question: Is a customer *able* to pay?

A *solvency* indicator is designed to give an answer to the question of whether or not household income is sufficient to pay the increased price of water/ wastewater services without serious prejudice for its ability to pay for other vitally important goods and services. A household is considered unable to pay the service price when making this payment requires substantial reduction of expenses for other essential goods and services[21]. The ability to pay analysis is based on statistics and provides rather objective data.

Key question: *Will* a customer pay?

The objective of a *willingness-to-pay* analysis is to estimate the maximum amount a customer would pay for a certain volume of services of certain quality. Besides, the willingness-to-pay analysis allows a researcher to learn by how much *more* households agree to pay for better services (in terms of water chemical composition, taste, color and level of the services). Willingness-to-pay analyses is based on customers' subjective personal judgments of their financial capacities and the service quality and price.

Customers' ability to pay is the main focus as far as affordability is concerned, although water providers ought to be equally interested in assessing the willingness of their customers to pay higher rates for better services. Economic affordability depends on both water price and households' capacity to pay. Services may become more affordable should service costs decline, household's economic situations improve, or both.

Service affordability must be considered at the same time as other key water policy goals such as economic efficiency, social equity, and environment protection. However, there may be contradictions. On the one hand, the lower the residential tariffs, the higher service affordability to the population. On the other hand, low tariffs may not adequately cover utility costs – denying utilities the funding they need for development. Besides, without funding for development and investment in new technologies, utilities will be unable to meet environmental protection goals through investments in wastewater treatment facilities. Therefore, while aiming at ensuring economic affordability of services to the population (in particular, low income households), household interests should not undermine economic sustainability of water/wastewater utilities. In other words, when setting tariffs, policymakers must balance the interests of all stakeholders.

Financial aspects of the service affordability may be measured and assessed.

2.1.2 Methodology for Assessing Economic Affordability of the Services to Households

Two approaches were used to assess the economic affordability of the services in Armenia:

1. Assessing customers' *ability to pay*;
2. Assessing residential customers' *willingness to pay* for better services.

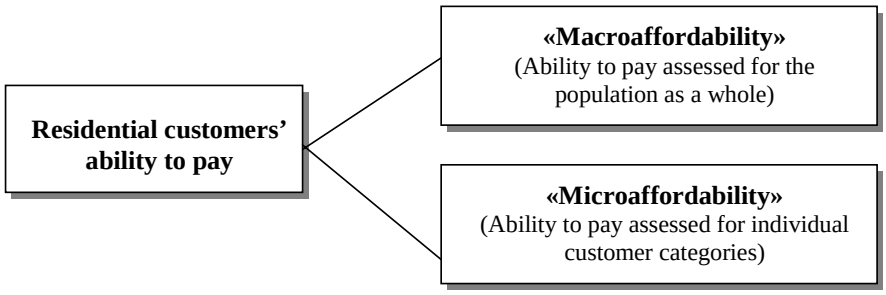
[21] Since there is no single definition of "essential goods and services", it can be used only in the context of a certain country and region. The "substantial reduction" remains undefined either.

2.1.2.1 Assessing Households' Ability to Pay

Households' ability to pay for water and wastewater services was assessed at two levels (Figure 2.2):

- *Macroeconomic*, i.e. assessment of the burden of water charges based on macroeconomic data ("macroaffordability" or the ability to pay assessed for country's population as a whole);
- *Microeconomic*, i.e. assessment of the burden of waters charges based on microeconomic data ("microaffordability" or the ability to pay assessed for groups of customers).

Figure 2.2. Two Level Assessment of Customers' Ability to Pay



The ability to pay is measured principally through relating the burden of charges for water and wastewater to total household expenditures.

Macroaffordability. The most appropriate method assessing the affordability at the macro level or *for a country as a whole* is to determine the percentage of average household income or expenditures devoted to paying charges for water and wastewater services. This is the most frequently used and easy to measure indicator.

Estimates of macroaffordability are important for providing an overview of affordability -- identifying its seriousness and comparing among countries. However, this measure is not sufficient for making concrete decisions in the area of tariff setting or the needs for social protection of population groups.

Microaffordability. The following approaches were used to assess the microaffordability in Armenia:

- Grouping of households by charges for water/wastewater services as a percentage of total household expenditures *(Method 1)*;
- Analysis of the burden of expenses for water services by household quintiles *(Method 2)*.

This methodology makes it possible to identify those households that pay "too much", i.e. whose payments for water/wastewater services exceed the affordability criterion. Estimates help define the extent of the problem and are particularly useful for developing measures on social protection of households who cannot afford water services.

Assessing microaffordability requires detailed and reliable information on households' charges for water/wastewater services and income/expenses. This was obtained from the sample survey of household incomes and expenditures conducted by the Armenian National Statistical Service and from a *special survey* of service customers conducted under this project.

It is important to note that estimates of residential customers' ability to pay were based on the information on charges for water/wastewater services rather than on the amounts actually paid by

households. This avoids the problem caused by outstanding bills and allows to determine how much households "should pay" rather how much they "actually pay" -- improving the accuracy of the affordability estimates.

Criterion for service affordability (residential customers' ability to pay). To judge whether a service is affordable or not, we need to establish an *affordability criterion*. This is set as the maximum share of income that households are able to spend on water/wastewater services without jeopardizing their consumption of other essential goods and services. There is no "universal criterion" acceptable in all countries and regions. In practice, many different criteria are used: for example, some experts from OECD believe that water is affordable when water charges fall below 1.5% of household expenditures and expensive if households have to spend 3% to 5% of their expenditures to pay water bills[22]. The United States Environmental Protection Agency (USEPA) defines the water affordability based on an assumption that water/wastewater charges must not exceed 2% to 2.5% of median household income before taxes[23]. Another frequently-used criterion by international financial institutions including the World Bank and EBRD is that average water/wastewater charges should not exceed 4% of average household income. This is the criterion most often recommended by experts for use in EECCA countries. It was adopted in this study to assess the ability to pay of water/wastewater customers in Yerevan and Vanadzor.

2.1.2.2 Assessment of People's Willingness to Pay

The term "willingness to pay" characterizes customer's preferences with respect to changes in the quality of water/wastewater services and tariffs for these services. Thus, assessing willingness to pay higher tariffs means determining what percentage of customers will pay higher tariffs if they receive better services as a result. Willingness of Armenian residential customers to pay more was assessed by the method of *"stated preferences"*. A specially conducted survey through interviews provided the data for this method.

The survey employed a set of comprehensive scenarios (see the questionnaire form in Annex 1) to show respondents the benefits they would receive as a result of paying hypothetical increases in tariffs. Respondents were asked which tariff increase scenario they would prefer.

This has several advantages. First, it makes the estimates from face-to-face surveys and shows decision makers how many customers are prepared to pay more for better services. Second, this method uncovers if people are willing to pay more for better quality or longer duration of water supply. These details of household demand may be taken into account in preparing technical and financial plans for enterprise development.

2.2 Assessment of Ability to Pay for Country's Population as a Whole ("Macroaffordability")

To assess *macroaffordability* means estimating the aggregate ability to pay or ability to pay of country's population as a whole. Macroaffordability is most often measured by relating household charges for water/wastewater to the total incomes/expenditures of the average household.

$$X = \frac{W_s}{Y} \cdot 100 \ , \qquad (1.1)$$

where:

[22] Report by Henri Smets at the Expert Workshop *Consumer Protection and Public Participation in Reforms of Urban Water Supply and Sanitation in NIS*, Paris, March 4, 2002.

[23] USEPA: Information for States on Developing Affordability Criteria for Drinking Water, February 1998.

X – actual household burden of expenses for water/wastewater services (%);
W_s – average monthly actual expenditures on water/wastewater services (per household); and
Y – average monthly incomes/expenditures per household.

In assessing Armenia's ability to pay, it was important to define the numerator and denominator in this formula correctly. For the denominator, we used "average consumer expenses per household," one of basic living standard indicators that is calculated by the National Statistical Service using results of annual survey of household incomes and expenditures. This indicator reflects disposable incomes of the Armenian population most adequately and serves as a basis for estimating the poverty level in the country.

In view of low compliance, it makes little sense to use available official statistics on actual household expenses on water services in the numerator because it would significantly understate the burden of water charges. When assessing ability to pay, it is important to calculate "how much households *are supposed to pay*" based on the *real costs* of services provides. Therefore, the numerator was defined as household charges for services:

$$W_s^* = tariff \cdot hhsize \cdot norm, \qquad (1.2)$$

where:

W_s^* – average monthly charges to household (AMD/household);
tariff – country-wide average weighted tariff for water/wastewater services to residential customers (AMD/m^3);
hhsize – average household size (number of household members);
norm – country-wide average weighted water/wastewater service consumption standard (*norm*) applied to non-metered households which have to pay for the services according to established standards (m^3/person/month).

Since the number of metered households in Armenia, paying for actual rather than standard water use in 2002, was negligible, the use of the average weighted consumption standard (norm) in calculations was judged reasonable.

Table 2.1 shows baseline data which were used for estimating the Armenia population's ability to pay in 2002.

Table 2.1. Initial Data Used to Estimate the Macroaffordability of Water/Wastewater Services to the Armenian Urban Population (as of 2002)

#	*Indicators*	*YerevanVodokanal*	*ArmVodokanal*
1.	Average weighted tariff (AMD/m^3):		
	• Water	46.0	42.1
	• Wastewater	10.0	10.8
2.	Average weighted service consumption standard:		
	• m^3/person/month	7.5	6.0
	• liters/person/day	250.0	200.0
3.	Number of residential customers (households):		
	• Water	268,294	194,105*
	• Wastewater	254,293	
4.	Average urban household size	4.00	
5.	Average urban household consumer expenditures (AMD/household)	49332	

* Macroaffordability estimates are based solely on those ArmVodokanal customers who have an access to centralized water supply systems (75% of all 258,807 customers ArmVodokanal customers as of January 1, 2003).

Based on this data, it was determined that in 2002 in Armenia:

- Average charges for water and wastewater services were 377.0 AMD/person/month;
- Expenditures for water by an average household stood at 3.10%. A household using centralized water and wastewater services paid AMD 1,508 or 3.1% of its budget for these services on average.

The results are acceptable from the perspective of the 4% affordability criterion (threshold). This indicates that the *country's population as a whole* can afford paying water utility bills. At the same time, serious problems may occur for some population groups even if the macroaffordability criteria seems acceptable. Specifically, for those low income households who fall below the poverty level and do need social assistance from the Government. The country's average affordability measure says nothing about how heavy the burden of water expenses is in certain regions and cities where local water costs or consumption standards may exceed the national average or where household incomes may lag behind the country's average values.

In other words, service affordability for needy households cannot be assessed from the overall average affordability indicator. Nor is it feasible to make conclusions on its regional differentiation for the purpose of developing and implementing effective programs of social assistance to low income households. Instead, one should use data on service microaffordability. For this purpose, this report uses data collected in Yerevan and Vanadzor.

2.3 Assessing Economic Affordability of Services to Yerevan and Vanadzor Residents ("Microaffordability")

A special targeted survey of customers was conducted in Yerevan and Vanadzor to assess affordability of water and wastewater services. The methodology and results of the survey are described below.

2.3.1 Methodology for the Targeted Survey of Service Customers in Yerevan and Vanadzor

2.3.1.1 Household Sample

A sample of households used to study the economic affordability of water and wastewater services in Yerevan and Vanadzor was selected with the following *characteristics*:

- First, the sample was *a sub-sample* of the random sample of households participating in the 2002 national survey of Armenian household incomes and expenditures.[24] This eliminated the need to question households about their incomes since household income data received in one time interviews are less reliable than the data from the national sample. For this reason, it was decided to use in the customers ability-to-pay analysis selected socio-economic and demographic characteristics of the population which could be adequately measured through the sample survey of Armenian household incomes and expenditures;
- Second, only households supplied by centralized water systems were included in the sample. In view of this, the coverage by centralized water and wastewater services in this survey is 100 percent.

[24] The survey of household incomes and expenditures is conducted by the Armenian National Statistical Service on a yearly basis. This survey is a unique source of information on household socio-economic and demographic characteristics. A two-stage stratified sample based on a list of household residential addresses is used for the purposes of this survey

Yerevan. 1,404 households residing in the city of Yerevan participated in the 2002 survey of Armenian household incomes and expenditures. Among these, 1,397 households (99.5 percent) had an access to the centralized water supply system. 1,000 households were selected under a systematized procedure out of 1,397 addresses (i.e. households) to study water/wastewater service affordability. These constituted the *core* sample. The selection ratio was 1/278. In other words, each 278th household in the city of Yerevan was surveyed. The remaining 397 addresses formed a *reserve* sample of households. They were expected to participate as substitutes if households from the core sample could not be interviewed.

Vanadzor. The 2002 survey of Armenian household incomes and expenditures covered 216 Vanadzor households, among whom 214 (99.1 percent) received centralized water. For the survey of water and wastewater services, 200 households were selected, constituting the *core* list of addresses with a *reserve* sample of 14 households.

In view of the fact that the sample for the national income and expenditure survey was distributed among regions in proportion to the regional population and that the national census data on the city of Vanadzor were not available at the time of preparing this report, we assumed that the household selection ratio in Vanadzor is similar to that of Yerevan.

2.3.1.2 Questionnaire

A questionnaire was developed including 40 questions related to the degree of respondents' satisfaction with the quality of public utilities; their position on the level of tariffs and feasibility of applying sanctions to non-payers and penalizing late payers; self-assessment of the household economic situation; receipt of privileges and social assistance under the Household Benefit Program; indebtedness for public utilities and reasons for it; their attitude towards reforms under implementation, and their willingness to pay more for better services.

2.3.1.3 Conducting the Survey

22 regular survey administrators conducted the survey (18 in Yerevan, 4 in Vanadzor). They were trained in using the questionnaire and the instructions on June 7, 2003.

Yerevan. The survey was conducted between the 10th and 20th of June, 2003. 1,000 households were interviewed including 22 households from the reserve sample. A so-called "closed door" was the major reason for using substitutes (15 instances); in five cases other people resided at given addresses because former owners had sold the apartments; in one case a respondent had passed away; and one household refused to participate. Each survey administrator interviewed an average of 55.6 households.

Vanadzor. The survey was conducted during ten days between June 11, 2003 and June 21, 2003. Altogether, 200 households were interviewed -- nine from the reserve list. As in Yerevan, most substitutions (seven out of nine) were necessitated by a "closed door" (potential respondents were out). Two respondents were deceased. No respondents refused to participate. Each survey administrator interviewed an average of 50 households.

2.3.1.4 Data Processing Stages

Data received from the survey were processed in three stages:

- Entering data. Initial data were entered by four operators in the National Statistical Service central office;
- Checking data. Checking included: (1) a visual check of completed questionnaire forms; (2) arithmetic and logical data check during data entry (10 percent of all forms); (3) arithmetic, logical, and statistical check of data in the array; and (4) check of calculated values of indicators;

- Refining data. Refining consisted in correcting errors and inconsistencies detected during checking.

When processing information, only missing data on the volume of water consumed by metered households were imputed. A procedure of statistical weighting was not used since the system of statistical weights has not been developed for the survey of Armenian household incomes and expenditures, preventing the calculation of information on probabilities of including households with certain characteristics. Very few households refused to participate in the survey. Reliability characteristics were calculated for estimates of major indicators in the data analysis process (see Annex 3).

2.3.2 Results of the Targeted Survey of Service Customers (June 2003)

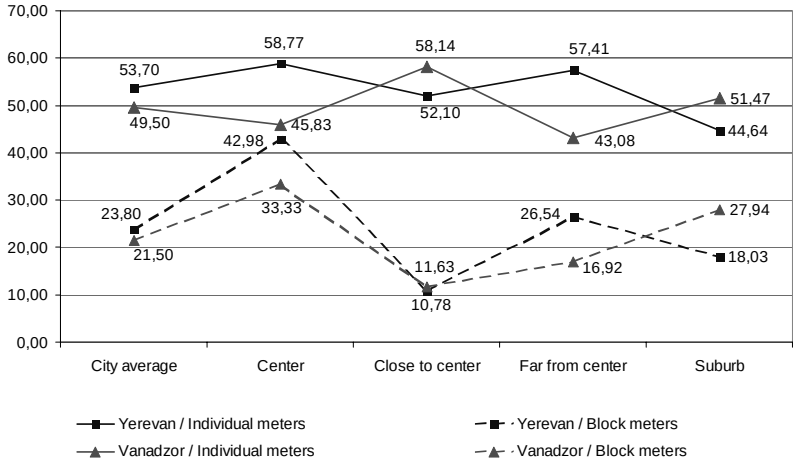
2.3.2.1 Volume and Specifics of Water Consumption

Only households enjoying an access to the centralized water supply services were surveyed. 97.2 percent in Yerevan and 99.5 percent in Vanadzor had access to centralized wastewater treatment services. The percentage of metered households was relatively high: 53.7 percent and 49.5 percent of all households used individual meters (either house or apartment) in Yerevan and Vanadzor, respectively, as of June 1, 2003[25]. At the same time, this averaged indicator varies by geographical location of houses/apartments (see Figure 2.3):

- From 44.64 percent in the suburbs to 58.77 percent in downtown Yerevan;
- From 43.08 percent far from the center to 58.14 percent close to downtown Vanadzor.

Almost one quarter of Yerevan households and one fifth of Vanadzor's claimed that their building or block was equipped with a block water meter.

Figure 2.3. Equipment of the Residential Housing Stock with Water Meters (Percentage of Surveyed Households)



Yerevan. Analysis of water consumption by metered households shows that the actual per capita consumption by metered households in Yerevan is only about one third as much as the normative

[25] According to the Armenian State Water Sector Committee, 153,000 individual water meters were installed or, in other words, 54 percent of all residential customers were metered as of August 1, 2003. According to Vanadzor Vodokanal, 11,324 individual meters were installed (32 percent of all Vanadzor residential customers were metered) as of August 6, 2003.

consumption (2.40 m^3/person/month, or 80 liters/person/day, as compared to 7.5 m^3/person/month -- see Table 2.2). According to experts, this does not reflect reduced water consumption due to metering. It merely evidences that, in reality, people use less water than the established consumption standards ("normative").

Vanadzor. According to the survey data, actual water use by metered households was 1.47 m^3/person/month on average -- about 50 liters/person/day. This is only one fourth as much as the normative consumption level (6 m^3/person/month) and 63 percent lower than in Yerevan (see Table 2.2)[26]. The low water consumption by Vanadzor households can be explained first of all by the fact that most city residents do not have access to regular water supplies.

Table 2.2. Actual Water Consumption by Metered Households, June 1, 2003

Type of housing	*Water Consumption*					
	m^3/household/month		*m^3/person/month*		*liters/person/day*	
	Yerevan	*Vanadzor*	*Yerevan*	*Vanadzor*	*Yerevan*	*Vanadzor*
Private houses	11.42	5.95	2.81	1.83	93.80	60.96
Apartments	8.26	4.62	2.23	1.39	74.30	46.30
City average	9.16	4.87	2.40	1.47	79.89	49.11

The survey showed that:

- On average, water consumption is higher in private houses than in apartment buildings. This difference is 26 percent and 32 percent in Yerevan and Vanadzor, respectively[27].
- Analyzing household water use by income quintile (Table 2.3), in Yerevan households in the highest income quintile used an average of 1.88 m^3/person/month, 1.4 times the amount used by households in the poorest quintile. In Vanadzor, the ratio was 2.8 (0.84 m^3/person/month in the first quintile vs. 2.35 m^3/person/month in the fifth quintile).

Table 2.3. Actual Water Consumption by Household Income Quintiles (m^3/person/month)

Indicators	*Quintiles*					*City Average*
	1st	*2nd*	*3rd*	*4th*	*5th*	
Yerevan						
Apartment buildings	1.67	1.91	2.26	2.92	2.29	2.23
Private houses	2.38	2.07	2.46	3.73	3.72	2.81
Quintile average	1.88	1.97	2.31	3.16	2.59	2.40
Vanadzor						
Apartment buildings	0.83	1.33	1.13	1.53	2.37	1.39
Private houses	1.02	1.23	1.63	1.98	2.32	1.83
Quintile average	0.84	1.31	1.20	1.61	2.35	1.47

Projections of the effective residential demand for 2004 and 2005 included these differences by quintiles (see Section 2.3.4.2). A regression model for per capita consumption of potable water by Yerevan households was developed[28], estimating the influence of household income and size on the consumption level. The survey results suggest that a single person household in Yerevan in the first or second income quintile consumes 4.0 m^3 of water per month. A typical single person household in the third quintile consumes by 0.46 m^3 more of water per month; a similar

[26] Similar data proving a low level of water consumption by Vanadzor households were obtained under studies conducted by GITEC, a German consulting firm. German researchers state that Vanadzor households consume 34 to 54 liters/person/day on average.

[27] 27.6 percent and 14 percent of participating households reside in private houses in Yerevan and Vanadzor, respectively.

[28] In view of the small size of the household sample a similar model for Vanadzor could not be developed.

household in the fourth quintile consumes by 0.87 m^3/month more than households in the first and second quintiles. At the same time, per capita water consumption is less for larger households. For example, holding other conditions constant, per capita water consumption in two-person households is by 1.38 m^3/month smaller than that in single person households. Three-person households consume by 2.21 m^3/person/month less than single person households. Annex 2 includes a general description of the model, detailed interpretation of the regression coefficients, and measures of the reliability of estimates.

2.3.2.2 Degree of Household Satisfaction with Water/Wastewater Services

The survey results show that most respondents are not happy with the quality of their water service. For example, 38 percent of the surveyed households are not satisfied or satisfied only partially with Yerevan Vodokanal services. The percentage of not satisfied customers is somewhat lower in Vanadzor (26 percent). At the same time, every fourth household in Yerevan and 18 percent of households in Vanadzor state they are "fully satisfied" with their water service.

Water supply schedule. Few Armenian households enjoy round-the-clock supply of potable water. The water supply schedule is rather tough in Armenia (see Table 2.4). For example, only 18 percent of Yerevan households received water 24 hours a day -- most (53.3 percent) received water twice a day for a total of up to five hours.

Table 2.4. Schedule of the Potable Water Supply (Percentage of the Surveyed Households)

Water Supply Schedule	*Yerevan*	*Vanadzor*
Round-the-clock	18.1	1.0
Twice a day (up to 5 hours in total)	53.3	3.0
Twice a day (over 5 hours in total)	19.1	2.5
Every other day (up to 5 hours)	6.0	36.7
Every other day (over 5 hours)	0.1	44.7
Other (irregular water supply)	3.5	12.1

Vanadzor suffers a less frequent water supply schedule. Only one percent of the surveyed households enjoy round-the-clock potable water[29], 3 percent are supplied twice a day (up to a total of 5 hours), and another 2.5 percent receive water twice a day over five hours. Therefore, only 6.5 percent of all surveyed households are supplied with water on a daily basis. The vast majority of Vanadzor households (81.4 percent) receive water every other day, of which 36.7 percent – not more than for 5 hours.

Three percent and 1.5 percent of respondents in Yerevan and Vanadzor, respectively, complain that water does not reach their floor because of a low pressure in the water supply system.

Some respondents are concerned that:

- Scheduled water supply is violated "regularly" (22.5 percent of the respondents in Yerevan and 10.5 percent in Vanadzor);
- Water pressure is "almost always" low (25 percent in Yerevan and 17.5 percent in Vanadzor);
- Water is shut off for several days "quite often" (17 percent in Yerevan and 11 percent in Vanadzor).

[29] According to the GITEC survey, five percent of Vanadzor households enjoy an access to water supply services 24 hours a day.

Water quality. Survey results disagree somewhat with common statements about the relatively good quality of water in Yerevan. In particular, 38 percent of households in Yerevan and 33.1 percent of households in Vanadzor complain of receiving poor quality water "practically always" or "often". At the same time, every fourth household claims never to receive poor quality water. Almost one third of respondents in both cities assess water clarity as unsatisfactory. Roughly one quarter complain that potable water had "bad" or "very bad" color. As far as other characteristics of potable water are concerned, Yerevan households turned out to be more critical than Vanadzor households. Specifically, they gave "bad" and "very bad" marks to:

	Yerevan	*Vanadzor*
• Water taste	39.7%	14.1%
• Water smell	29.8%	18.5%
• Mineral content causing sediment and scale as a result of boiling	42.0%	15.6%

However, most respondents drink tap water and, in doing so, do not boil it, use it for cooking, and never use filters or other purification devices (see Table 2.5).

Table 2.5. Individual Characteristics of the Use of Potable Water by Residential Customers (Percentage of the Surveyed Households)

Yerevan	*Vanadzor*
• Drink tap water	
98%	94%
• Drink tap water because they have to do so	
19%	6%
• Use tap water for cooking purposes	
99%	98%
• Never use filters or other purification devices	
80%	87%
• Never use water from alternative sources	
98%	84%

Yerevan and Vanadzor households give low marks to their water quality for several reasons. Historically, the Armenians have been proud of the quality of water, which comes primarily from underground sources. However, as indicated in Charter 1, insufficient funding of the water sector during a long time has led to deterioration of water-pipes which, in turn, has caused secondary contamination of water. Hence, people complain about water quality even though they still use the water for cooking and only rarely filter it.

Box 2. Service and Water Quality
(Opinion of Participants in Focus Groups)

Most participants in focus groups in both cities assessed the level of services as "somewhat improved recently but still poor." Customers complain about water supply interruptions, insufficient pressure in the network (which results in water "never reaching or reaching for 30 to 60 minutes" top floors in apartment buildings.)

"Water is of very poor quality with a touch of sand. Its natural specifications are mainly good but the quality continually deteriorates due to bad piping" (an employee with a budget-funded organization, Yerevan.)

"Our water is very good in terms of both taste and color. Our water comes from Garni" (Yerevan)

"Water is of very poor quality, has sediments, is of yellow color; in order to drink water you have to let it run for a long time" (a recipient of poverty benefits, Yerevan.)

"Water has a touch of sand and rust."

"The Sanitary and Epidemic Service fails to perform its duties properly because water is not clean. We boil water before giving it to children" (a representative of the budget-funded sphere, Vanadzor.)

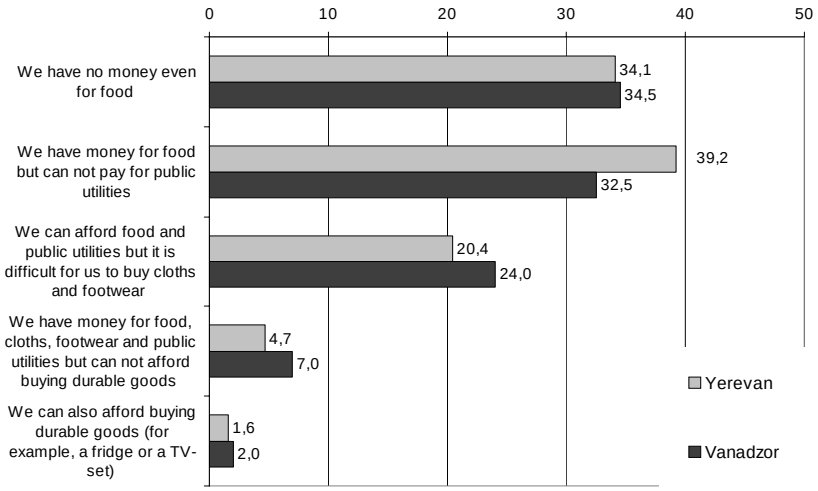
Source: Focus Group Report (August 2003, Yerevan - Vanadzor)

2.3.2.3 Self-Assessment by Households of Their Economic Situation

Yerevan and Vanadzor households were analyzed according to how they *self-assess* their economic situation, shown in Figure 2.4. More than one third of all surveyed households in both cities (slightly over 34 percent) characterized themselves as "lacking money even for food". Practically the same percentage (32.5 percent in Vanadzor and almost 40 percent in Yerevan) stated that they had sufficient funds for food but found it difficult to pay communal service bills.

Therefore, most households in both cities claim they "lack money to pay for utility services" – with a higher percentage in Vanadzor (33.0 percent compared with 26.7 percent in Yerevan).

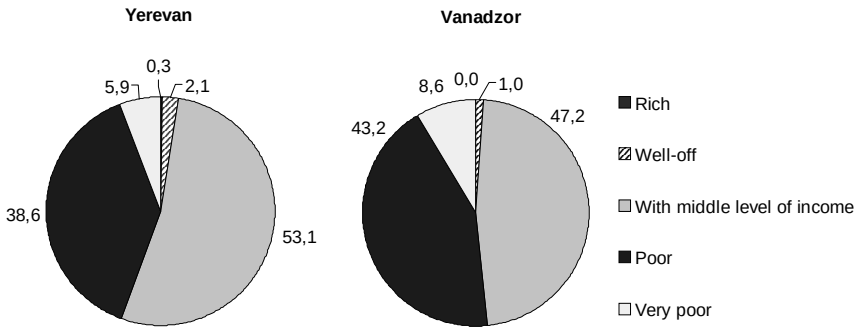
Figure 2.4. Self-Assessment by Households of Their Economic Situation (Percentage of the Surveyed Households)



Yerevan. Six percent of the respondents consider themselves very poor, almost 40 percent called themselves poor, and slightly over half the households (53.1 percent) characterize themselves as of average income (see Figure 2.5). Only three out of 1,000 surveyed households (0.3 percent) believe they are "rich" and 21 (two percent) refer to themselves as "well off".

Vanadzor. Compared to Yerevan, Vanadzor residents feel their economic situation is worse. Over half call themselves "poor" or "very poor" (43.2 percent and 8.6 percent, respectively). None called itself "rich" and only two (one percent) characterized themselves as "well-off" (see Figure 2.5).

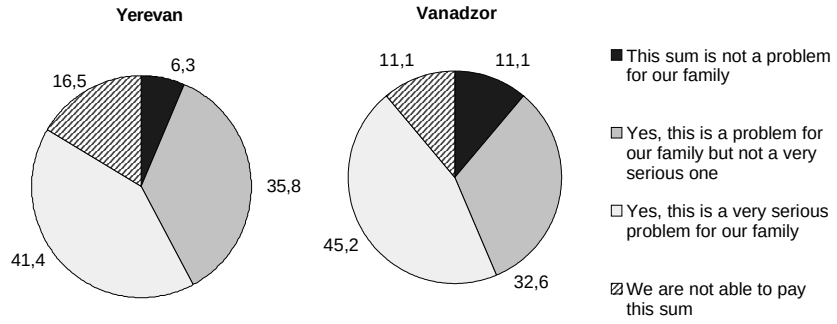
Figure 2.5. How Do Households Assess Their Economic Situation? (Percentage of the Surveyed Households)



Low incomes -- cash and in kind -- coupled with having to spend most income on food (63.1 percent and 68.8 percent of the total household expenditures in Yerevan and Vanadzor on average) cause difficulties with paying public utility bills. Few households (6 percent in Yerevan and 11 percent in Vanadzor) answered that "it was not a problem for them to pay such charges" (see Figure 2.6). Other households in both cities confessed that paying water/wastewater service bills was problematic under their current household budget constraints. This problem was not that serious for two thirds and very serious for 41 percent to 45 percent of the surveyed households. Every sixth households in Yerevan and every ninth household in Vanadzor believes it cannot afford paying the utility bills at all.

Vanadzor customers demonstrate better payment discipline even though their incomes are lower than those of Yerevan customers[30]. For instance, 11.1 percent of Vanadzor households (as compared to 16.5 percent in Yerevan) said they were unable to pay for water services. At the same time, 11.1 percent of respondents in Vanadzor (versus 6.3 percent in Yerevan) claimed paying utilities bills was not a problem for them.

Figure 2.6. How Large Are Charges for Water/Wastewater Services?
(Self-Assessment by Households, Percentage of the Surveyed Households)



The survey results show that:

- Five percent of Yerevan households and 1.5 percent of Vanadzor households enjoy privileges for utility services;

[30] According to the 2002 household income and expenditure survey, conducted by the National Statistical Service, average per capita monthly consumer expenses were AMD 13,591.7 in Vanadzor and AMD 16,744.3 in Yerevan (the 23 percent difference)

- Every sixth (Yerevan) and every fourth (Vanadzor) household receives social assistance under the Family Benefit Program.

Box 3. Is Payment for Water and Wastewater Services a Problem for Focus Group Participants?

Financial difficulties in paying for services are shown by responses of budget-funded employees, pensioners, recipients of poverty benefits: "Our salary covers only water, phone and electric power bills", "Water and wastewater bill accounts for 15 to 20 percent of the monthly salary, add phone and electric power bills on top of that and you have 80 to 100 percent of the salary. Is it possible to pay under such circumstances?", "It is impossible to find the way out of the existing situation without increasing pensions and benefits."

At the same time, representatives of small and mid-size businesses believe that "service charges are quite affordable," "the middle class is in a position to pay for services."

Source: Focus Group Report (August 2003, Yerevan - Vanadzor)

How poor are recipients of social assistance? When self-assessing their economic situation, over half the recipients of social assistance under the Family Benefit Program (51.2 percent in Yerevan and 57 percent in Vanadzor) stated they "lacked money even for food"; every third (Yerevan) and every fourth (Vanadzor) household found it difficult to pay utility bills. However, the quintile distribution of these household by per capita consumer expenditures (Table 2.6) indicates that many of them (32.1 percent in Yerevan and 40.8 percent in Vanadzor) belong to the 4th and 5th quintiles and, as such, should be considered relatively well-off.

Table 2.6. Quintile Distribution of Family Benefit Recipients (according to June 2003 survey)

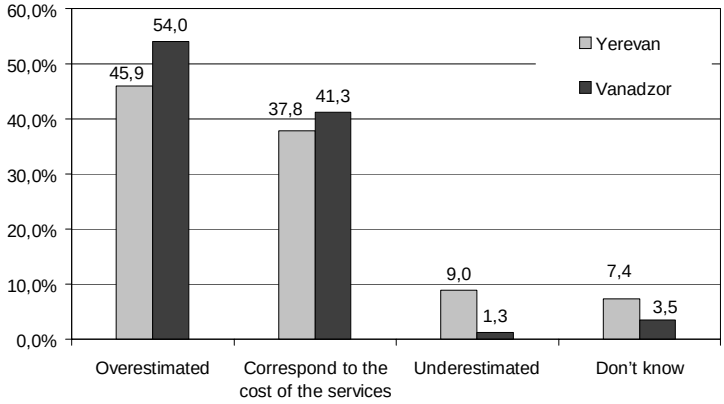
	Per Capita Consumer Expenditure Quintile					*Total*
	1st	*2nd*	*3rd*	*4th*	*5th*	
Yerevan						
Percentage of households in each quintile	26.5	27.8	13.6	19.8	12.3	100.0
Vanadzor						
Percentage of households in each quintile	18.4	24.5	16.3	28.6	12.2	100.0

The percentage of family benefit recipients that have installed individual water meters is below the average for the population as a whole. The difference is large in Yerevan (33.3 percent vs. 53.7 percent) and smaller in Vanadzor (44.9 percent vs. 49.5 percent).

2.3.2.4 Public Attitude toward the Level of Tariffs

Today, residential customers pay AMD 56 per m^3 for water/wastewater services (including AMD 46 per m^3 for water and AMD 10 per m^3 for wastewater) in Yerevan and AMD 60 per m^3 in Vanadzor. Does this tariff accurately reflect the cost of providing water from customers' perspective? Many households in both cities (46 percent in Yerevan and 54 percent in Vanadzor) consider vodokanal rates overstated. 40 percent of households believe that the current tariffs are adequate to the service costs (Figure 2.7).

Figure 2.7. Public Attitude towards the Level of Tariffs for Water/Wastewater Services (Percentage of the Survey Households)



These answers reflect, generally, the lack of communications with the public by vodokanals on their real economic situation, tariff structure, and service costs[31]. This suggestion is confirmed by focus group participants (Box 3).

Box 4. To What Extent Should the Public be Informed of the Actual Cost of Services?

Focus groups show how little customers know about the basis of tariffs and the true costs of delivering water. This ignorance leads to a widespread opinions that tariffs are too high.

"The customer has to understand what he/she pays for, i. e. the process of fund use should be transparent", according to an opinion of a business representative in Yerevan.

"We need to understand where AMD 56 comes from, what components go into a tariff, why the tariff has to be raised and which components such a raise will recover" (Yerevan.)

"The pricing mechanism has to be transparent and clear – it is necessary to explain how amount A is formed and then why amount B has to be added" (Vanadzor.)

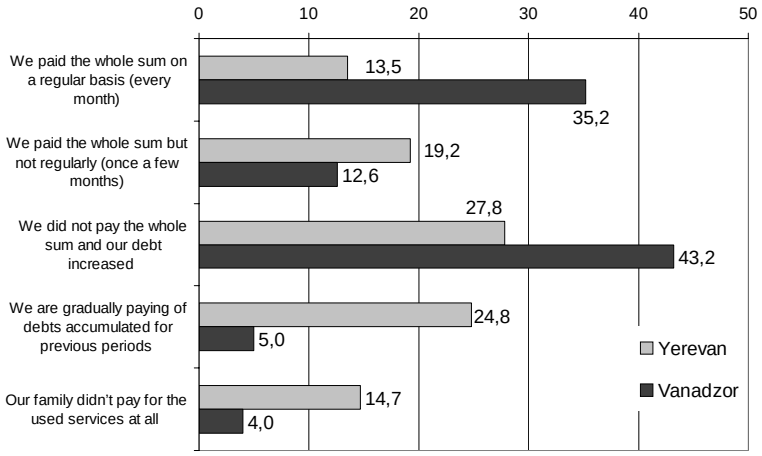
Source: Focus Group Report (August 2003, Yerevan - Vanadzor)

2.3.2.5 Residential Indebtedness for Water/Wastewater Services

Widespread poverty, low compliance of residential customers, the habit of "not paying for the services", and the failure to punish indebted households are among the major reasons for accumulation of arrears of payments for utility services. Answers to the question about timing of bill payment differed between Yerevan and Vanadzor (Figure 2.8). For example, in Yerevan only 13.5 percent of households pay for the services in full and regularly whereas in Vanadzor the percentage of law abiding households is almost 2.5 times as large (35.2 percent). Every fifth Yerevan household pay in full but irregularly (once in several months); this category is smaller in Vanadzor (12.6 percent). Many households (27.8 percent in Yerevan and 43.2 percent in Vanadzor) pay for services partially, thus, increasing their current indebtedness. Almost 15 percent of YerevanVodokanal customers and 4 percent of Vanadzor customers confessed they did not pay for the services at all. As a result, over half the surveyed households (55.5 percent in Yerevan and 60 percent in Vanadzor) were in debt to their local vodokanals in June 1, 2003.

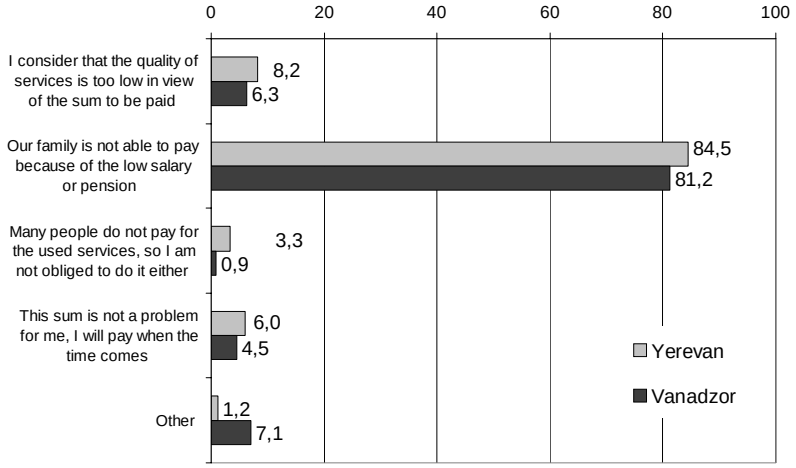
[31] Suggestions to improve public awareness and enhance the role of communities in the decision-making process are considered in Section 1.6.4.6 of this document.

Figure 2.8. Patterns of Household Payment for Vodokanal Services in Vanadzor (Percentage of Respondents)



Reasons for Residential Indebtedness. The primary reason for indebtedness of most households' (over 80 percent in both cities) is low cash incomes (Figure 2.9). Six to eight percent of indebted households are not willing to pay because of the poor quality of the services. There are also some customers who state that paying bills is not a problem and they will pay "when the time comes" (four to six percent) or who do not pay because other households do not pay (three percent of all debtors in Yerevan).

Figure 2.9. Reasons for Residential Indebtedness for Water/Wastewater Services (Percentage of All Indebted Households)



Box 5. Who and Why They Do Not Pay for Water/Wastewater Services

According to opinions expressed in focus groups, non-payers are unable to pay. "We are all willing to pay but it does not depend on us because we have no money, no income", "People will not be able not to pay if their incomes are adequate" – stated representatives from the budget sphere and pensioners.

At the same time, some believe that debts reflect a habit of non-payment developed by some population

strata. "Those who cannot pay, do not pay… As well as those who can pay." People have become used to the fact that non-payment goes unpunished. "There is a fear of losing electric power supply, not water", "I do not pay because nobody demands it from me", "If everybody else does not pay, why should I pay?" were typical responses.

Besides, one reason for debts named by focus group participants was unwillingness "to pay for water that was actually not used." "There are families that consumed water 24 hours per day, while I had water service only 2 hours per day -- but every customer has to pay AMD 420 per household member. This is not fair" (Yerevan, budget-sphere). It is also considered unfair to apply the same service tariffs with respect to residents of top floors – "What should I pay for if I never got any water or received it for half an hour per day at best?"

Special discontent is caused by the situation of households that did not live in the country for many years and, consequently, have not been using any service. They are forced into paying for what they never used. Since, such households usually refuse to pay, vodokanals suffer rising debts.

Source: Focus Group Report (August 2003, Yerevan - Vanadzor)

Sanctions and penalties. Surprisingly, respondents turned out to be practically unanimous in regard to sanctions and penalties. 96 percent and 91 percent of respondents in Yerevan and Vanadzor, respectively, strongly object to *penalizing* households falling behind their payment schedule. When answering the question on feasible *sanctions* to non-payers for vodokanal services, households in two cities gave different answers. In Yerevan, most respondents (92.5 percent) said that "no sanctions should be applied". Only three percent supported an idea of disconnecting debtors. Only one out of the one thousand participating households supported such sanctions as eviction with further sale of the apartment and repayment of the debt from the proceeds from the sale. *None* supported seizure and sale of debtors' property. Unlike in Yerevan, Vanadzor households express stronger views about what to do about non-payers: 15.5 percent mention disconnection for indebtedness wherever feasible. However, 71.5 percent still oppose any sanctions. Therefore, most residential customers today are not ready to be held liable for failing to pay their bills.

Compliance with the Law on Restructuring Indebtedness. The extremely low level of residential compliance adversely affects Vodokanal's financial performance and its technical indicators. To overcome this problem, the Armenian National Assembly passed a law allowing indebted households to write off a portion of their water debts and to restructure the remainder if they met a number of conditions (see Chapter 1). Customers actively support the Government Initiative: according to the survey data, 89 percent of the surveyed households in Yerevan and 80 percent in Vanadzor signed new contracts with vodokanals. However, 10 percent of Yerevan customers and 17 percent of Vanadzor households had not concluded such contracts by June 1, 2003 despite they were aware of the Law. At the same time, few households (0.9 percent in Yerevan and three percent in Vanadzor) had heard nothing about the debt restructuring initiative.

Box 6. Debt Forgiveness or Admission by the Government of its Guilt? (Opinions of Focus Group Participants on the Law on Restructuring Indebtedness)

Readiness of the government to forgive residential customers' debt is considered by participants in focus groups as the admission by the government that the cost of services is unjustifiably high rather than a generous forgiveness of debt. "It is nothing but admitting a mistake". "Huge debts have been accumulated for water that had been not received in past years." "If top floors did not get water, what are they forgiven for?" (budget-funded employees, business persons.)

Participants pointed to drawbacks in the education campaign on the details of sanctions and of entering into contracts with vodokanals; most customers signed contracts without fully understanding the law. "Everyone else was signing, so we did as well", "I did not know that the amount can be extended for five years and I was forced into paying within six months." Some households never heard anything about this campaign – "We do not know that debts are forgiven."

Source: Focus Group Report (August 2003, Yerevan - Vanadzor)

2.3.3 Study of Household Willingness to Pay More for Better Services

The study of household willingness to pay as an integral component of the service affordability could be divided into two stages. In the first stage, respondents were just asked the following general question: "Are you willing to pay more if the service quality is improved (for example, if water is supplied round the clock, water pressure is high, the quality of water is improved)?" The majority of respondents (84.6 percent in Yerevan and 70 percent in Vanadzor) replied that they were not.

Only 14.3 percent of Yerevan households stated they were prepared to accept an increase in the tariffs. In Vanadzor the percentage was almost twice as large (27 percent). Therefore, the immediate customers' reaction to possible tariff increase was negative. The survey revealed that willingness to pay depended more on the following factors:

- Household income (the better off households, the more willing they are to pay more), see Figure 2.10;
- Presence of pensioners in a household (deteriorates willingness to pay more), see Figure 2.11;
- Presence of children under three in a household (unlike Yerevan and other cities in EECCA countries, in Vanadzor this factor negatively affects household willingness to pay at higher rates), see Figure 2.11.

Willingness to pay more among recipients of family benefits is significantly below the city average (8 percent in Yerevan and 18.4 percent in Vanadzor).

Figure 2.10. Willingness to Pay More Depending on Household Income

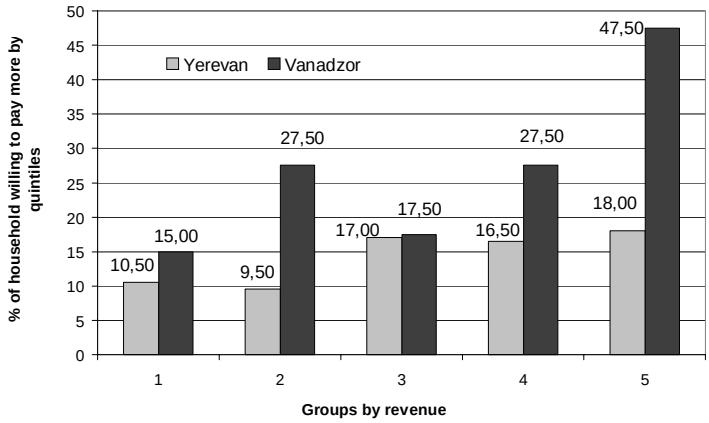
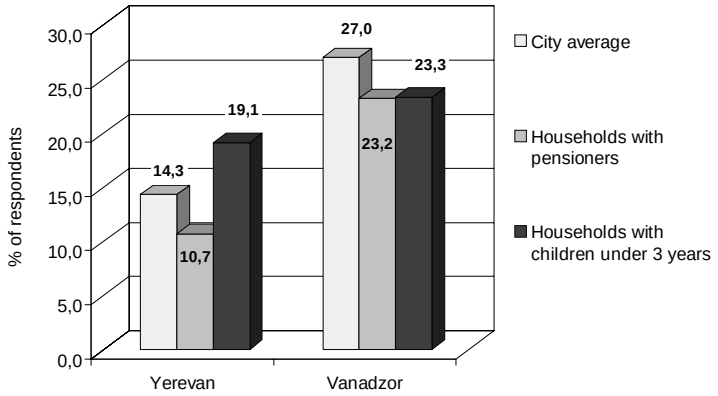


Figure 2.11. Dependence of the Willingness to Pay More on a Type of a Household (Percentage of Respondents)

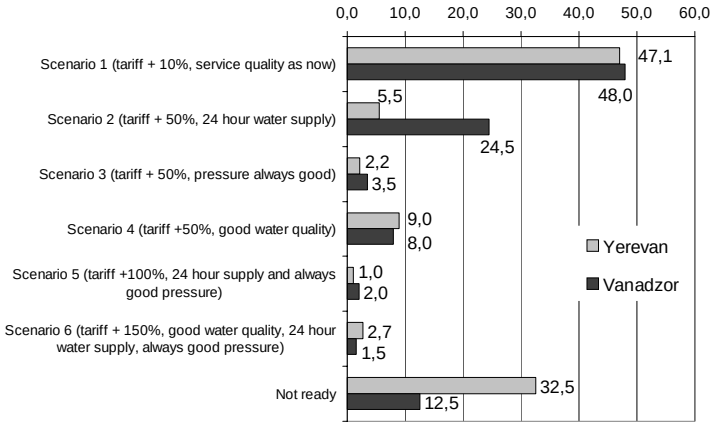


These are the results of asking households about their willingness to pay. Next, to estimate willingness to pay more objectively, six scenarios were proposed to respondents in which specific service quality improvements were linked to corresponding tariff increases. For example, the first scenario envisaged a ten percent increase in the tariffs to maintain the current level of services. Under the second, third, and fourth scenarios, improved individual characteristics of the service quality (water supply schedule, water quality and pressure) were linked to a 50 percent tariff increase. The fifth and sixth scenarios envisaged the 100 percent and 150 percent tariff increases with radical improvements in service quality.

Results in Figure 2.12 show that:

- Every third household in Yerevan and every eighth household in Vanadzor refused to choose any scenario, most probably, because they are unwilling to pay more under any circumstances;
- Almost every other household agreed only to a ten percent increase to maintain current service quality;
- 16.5 percent of households in Yerevan and 36.0 percent of households in Vanadzor are ready to pay 50 percent higher tariffs. More than half Yerevan households in this category would pay 50 percent more only if water is always of perfect quality, whereas two thirds of Vanadzor household would pay more to ensure round-the-clock water supply;
- Only one to two percent of the surveyed households would accept doubling of tariffs on the condition that water is supplied 24 hours a day and the pressure is sufficient to supply water to all floors;
- Practically the same share of households (1.5 percent and 2.7 percent) do not oppose a 150% increase in tariffs if all parameters (water quality, pressure, supply schedule) are improved significantly.

Figure 2.12. Households' Willingness to Pay for Better Services Depending on by How Much the Tariff will Be Raised



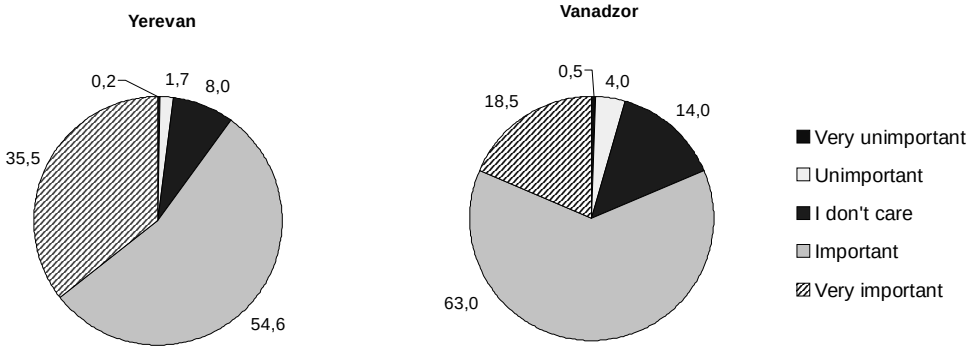
Therefore, despite only a moderate willingness of the population as a whole to pay more, Vanadzor households are more willing to pay for better services than Yerevan households. In view of lower household incomes in Vanadzor as compared to Yerevan this fact evidences that household willingness to pay depends not so much on the income level as on the current quality of services. 40 percent of the Vanadzor residents admit they would pay 50% to 150% more if the quality and level of services are really improved.

When asked what specific improvements in water/wastewater services are the most important, respondents referred to those listed below as "important" or "extremely important"(see Figure 2.13):

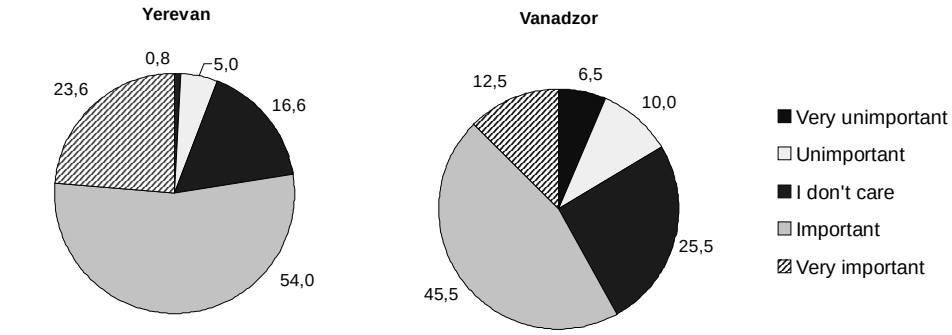
Possible Improvements in the Service Quality	*Yerevan*	*Vanadzor*
• Improving the water quality (including elimination of smell)	90.1%	81.5%
• Ensuring the pressure which would be sufficient to supply water to all floors	78.3%	62.5%
• Ensuring round-the-clock water supply	77.6%	58.0%

Figure 2.13. Importance of Improving Individual Characteristics of Water/Wastewater Service Quality (Percentage of Respondents)

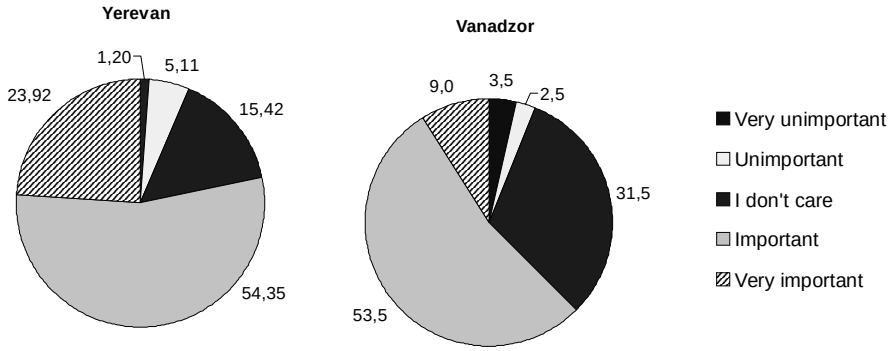
Improving the Quality of Water Supplied



Ensuring Round-the-Clock Water Supply



Ensuring Adequate Water Pressure on a Continuous Basis



Box 7. Are Focus Group Participants Willing to Pay More?

Opinions on this issue varied. Business representatives were mainly ready to tariff increases conditionally to water quality improvement. "I am willing to pay 50 percent more if water is available round-the-clock" (Yerevan, entrepreneur).

The majority of the present opposed paying higher tariffs.

"I am against a water tariff increase."

"If we entered into the agreement and installed the meter, why should the water charge be revised now? This is not fair."

"With current tariffs, I am willing to pay 100 percent of the service bill. At the same time, having entered into the contract with the vodokanal I believe that tariff increase is unfair and illogical. This is fraud and breach of government's promise" (budget-funded employees, pensioners.)

"We have no trust. First, I want quality service, then I will pay for it" (entrepreneur.)

There are sufficient grounds to assume that such conclusions are a direct consequence of poor education campaign on peculiarities of the law. The majority of customers were led to mistakenly believe that, upon entering into a contract with a vodokanal and repaying debt, service tariff would not be increased.

Source: Focus Group Report (August 2003, Yerevan - Vanadzor)

2.3.4 Assessing Customers' Ability to Pay

2.3.4.1 The Current Situation (in 2002 and as of June 1, 2003)

Assumptions and Scenarios. In view of rapid reforms in the Armenian water/wastewater sector, it was decided to assess the *current* household ability to pay based on the 2002 data and as of June 1, 2003. Shown below are considerations based on which charges to each household in the sample were calculated for the services consumed in 2002 and as of June 2003.

Assumptions used in assessment of the ability to pay based on the 2002 data.

In 2002, Armenia was on the eve of actual changes in water and wastewater service delivery – an appropriate base year for measuring customers' ability to pay. It was assumed that the percentage of metered households in both cities was zero and that all households had to pay based on consumption standards (Table 2.7) -- AMD 420 and AMD 360 per person per month in Yerevan and in Vanadzor, respectively.

Table 2.7. The 2002 and 2003 Tariffs for Water/Wastewater Services and Service Consumption Standards

Indicators	*Yerevan*	*Vanadzor*
Current total tariff (AMD/m^3)	56.0	60.0
Service consumption standards (m^3/person/month)	7.5	6.0
Charges for the services calculated based on the service consumption standards (AMD/person/month)	420.0	360.0

Assumptions used in assessment of the ability to pay as of June 1, 2003

The situation changed significantly in the first half of 2003 during which over half the households in Yerevan (53.7 percent) and practically half the households in Vanadzor (49.5 percent) installed individual water meters -- paying for actual rather than normative use[32]. This means that charges for water to these households were calculated based on the effective tariff and actual consumption (m^3/month). That information was provided by each metered household during the interview. Charges for unmetered households were calculated in the same way as charges for 2002 i.e. based on the effective tariff and consumption standard (Table 2.7). As Figures 2.14 and 2.15 show, installation of water meters led to dramatic changes in household distribution by their water charges burden.

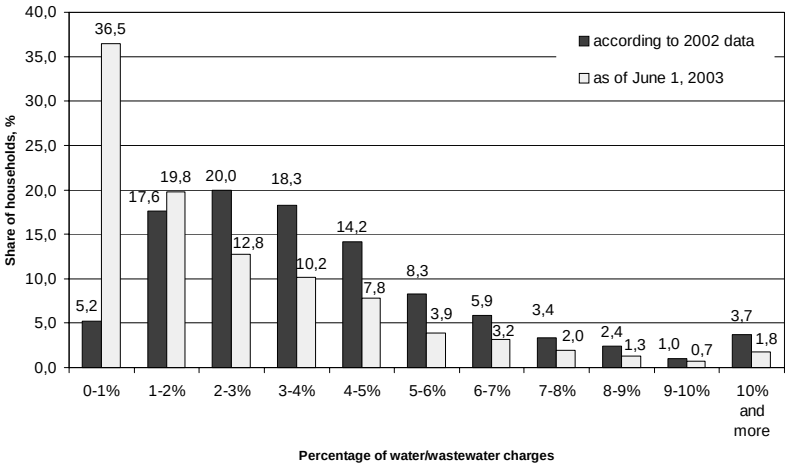
Results. Provided below are the estimates of the current customer ability to pay in Yerevan and Vanadzor, calculated by the two methods recommended for EECCA countries.

Method 1: Household distribution by household charges for water and wastewater services as a percentage of household consumer expenditures

As the calculation results show, the current situations in Yerevan and Vanadzor are similar. For example, according to 2002 data, charges for water/wastewater services in Yerevan did not exceed one percent of consumer expenses for only every twentieth household (Figure 2.14). At the same time, almost 40 percent of households had to spend more than four percent of their budget for these services – exceeding the criterion of affordability. But by June 2003 (Figure 2.14), most households (56.3 percent) reduced their expenditures for the service to below two percent of their consumer expenditures. Only 20.7 percent of households still exceed the four percent criterion.

[32] The data on the actual water consumption by Yerevan and Vanadzor households which installed individual meters are shown in Table 2.2.

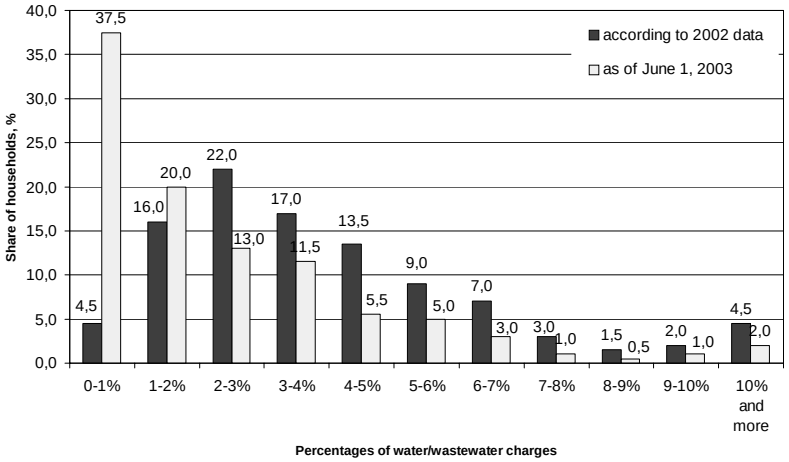
Figure 2.14. Charges to Yerevan Households for Water/Wastewater Services as a Percentage of Household Consumer Expenditures (Current Situation)



The 2002 ability to pay in Vanadzor is almost identical to that in Yerevan. Few households (4.5 percent) paid less than one percent (Figure 2.15) while 40.5 percent of households spent more than the four percent threshold – showing that Vanadzor, like Yerevan, faced a serious problem of service affordability.

Again, the installation of water meters improved the picture by June 1, 2003 (Figure 2.15). As in Yerevan, most households (57.2 percent) reduced their expenses for services below two percent of their total expenditures. However, charges for water/wastewater services to 18 percent of households exceeded the four percent threshold.

Figure 2.15. Charges to Vanadzor Households for Water/Wastewater Services as a Percentage of Household Consumer Expenditures (Current Situation)



By June 1, 2003, in both Yerevan and Vanadzor :

- A percentage of household above the “four percent threshold” has halved since 2002;

- Despite this significant reduction in service charges, roughly one fifth of all households still face difficulties in paying for water.

On the other hand, in view of reportedly very low levels of consumption by Vanadzor households (caused, primarily, by irregular water supply schedules preventing households from consuming as much water as they want), in reality, the affordability problem in Vanadzor is even more serious than what was found out through calculations.

Method 2: Analysis of the burden of water charges by household quintiles

For the purpose of this method households were grouped in quintiles by per capita consumer expenditures. The results of the analysis are shown in Table 2.8.

Table 2.8. Household Expenses for Water/Wastewater Services as a Percentage of Household Consumer Expenditures (by Per Capita Expenditure Quintiles)

	Per Capita Expenditure Quintiles					*City as a whole*
	1st	*2nd*	*3rd*	*4th*	*5th*	
Yerevan						
2002	8.14	4.65	3.38	2.37	1.27	3.96
June 1, 2003	5.00	2.88	2.12	1.64	0.78	2.48
Vanadzor						
2002	9.09	4.69	3.38	2.40	1.40	4.19
June 1, 2003	4.74	2.61	2.35	1.63	0.93	2.45

The relative water charges burden varies significantly by income quintiles with lower income quintiles spending a much higher share of their incomes. As the 2002 statistics show:

- The average *Yerevan* household spent 3.96 of expenditures on water, the poorest spent 8.14 percent and the richest 1.27 percent. The ratio of the burden for households in the poorest quintile (8.14 percent) to the city average (3.96 percent) was 2.1;
- In 2002, the relative burden for the average household in Vanadzor was slightly higher than in Yerevan, 4.19 percent -- exceeding the four percent threshold. As in Yerevan, the burden on the poorest households, 9.09 percent, was 6.5 times higher as that on the richest households (1.4 percent). The ratio of water/wastewater burden for households in the poorest quintile to the average was 2.2.

Meter installation alleviated burdens in both cities by June 1, 2003. In particular:

- In Yerevan, the relative burden of water charges fell 1.74 times compared to 2002. While the city average was 2.48 percent, households in the poorest quintile paid only five percent of their budgets (down from 8.14 percent in 2002) whereas well off households i.e. those belonging to the 5th quintile paid 0.78 percent (in comparison with 1.27 percent). However, the ratio of the burden in the first quintile to that in the fifth quintile was still 6.4.
- In Vanadzor, the average burden of water charges fell to 2.45 percent -- acceptable from the perspective of the four percent threshold. All quintiles experienced a decline. Today, households with the lowest income pay only 4.74 percent of their household budget (down from 9.09 percent in 2002), whereas the well off households, i.e. those in the fifth decile, pay 0.93 percent (vs. 1.4 percent). Water charges as a percentage of household expenditures in the first quintile are five times as large as those in the fifth quintile.

The situation on June 1, 2003 is much better than in the preceding year and can be considered as acceptable from the standpoint of customers' ability to pay. However, there are households in

each city which need assistance -- the 20 percent of households in the poorest quintile paying more than four percent.

The reduction of utilities revenues resulting from large scale installation of water meters will require further tariff increases in order to allow cost recovery. The calculations in the subsequent section assess the effect of projected tariff increases on customers' ability to pay.

2.3.4.2 Projections of Customers' Ability to Pay for 2004 and 2005

Under this project, two scenarios (Scenario 1 and Scenario 2) have been developed to project residential customers' ability to pay for water and wastewater services in 2004 and 2005. The major difference between the two projected scenarios comes down to different assumptions of actual water consumption by metered households.

Assumptions

Projections were developed based on the following *assumptions*:

1) *Tariffs* for the water and wastewater services will be raised:

- By 100% in 2004;
- By 50% in 2005

2) Real population's *income* will grow as follows[33]:

- By 12 percent in 2003;
- By 6 percent in 2004;
- By 6 percent in 2005

This means that population's real income will have grown by 18.72 percent in 2004 and by 25.84 percent in 2005 in comparison to 2002.

3) All households will install water meters. The 2004 and 2005 actual residential *water consumption* will be as follows (liters/person/day)[34]:

Housing	***Scenario 1***		***Scenario 2***	
	Yerevan	*Vanadzor*	*Yerevan*	*Vanadzor*
Private houses	140	120	100	80
Apartments in apartment buildings	120	100	80	60

Therefore, Scenario 2 assumes smaller water consumption: it is easy to notice, that it is reduced by 40 liter/person/day as compared to Scenario 1, accordingly[35].

The projections allow for differentiation of the average consumption level by household quintiles. In other words, the consumption level was "assigned" to each quintile based on the proportion calculated through the analysis of actual water consumption by metered households as of June 1, 2003 rather than based on city average indicators (see Table 2.3.) The ability to pay estimates were developed with the same two methods which were used in the preceding section.

Projection Results under Scenario 1

[33] According to the Ministry of Finance and Economy of the Republic of Armenia

[34] For details see Section 1.6.4.3

[35] The assumption that actual water consumption by metered Armenian households will be significantly smaller than that under Scenario 1 is strongly supported by experts of some international organizations (in particular, the World Bank).

Projections for Yerevan and Vanadzor are provided *separately*.

Projected Ability to Pay of YerevanVodokanal Customers (Under Scenario 1)

Table 2.9 shows indicators assumed when projecting the ability to pay of Yerevan households.

Table 2.9. Indicators Used to Project Yerevan Households' Ability to Pay (Scenario 1)

Projection period	*Type of housing*	*Tariff (AMD/ m^3)*	*Average Consumption*		*Charges (AMD/person/ month)*	*Growth of Real Income (as compared to 2002)*
			litters/ person/ day	*m^3/person/ month*		
2004	Private house	112	140	4.20	470.4	1.1872
	Apartment		120	3.60	403.2	
2005	Private house	168	140	4.20	705.6	1.2584
	Apartment		120	3.60	604.8	

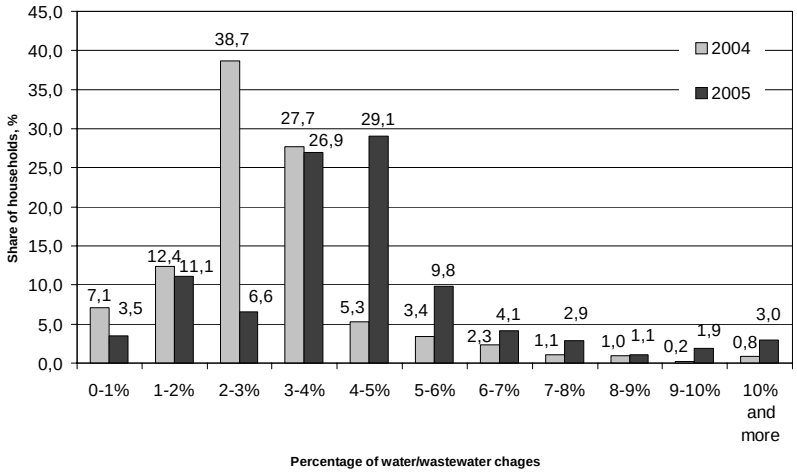
In view of projected tariff increases and changes in per capita water consumption, charges for YerevanVodokanal services to private houses are projected to be AMD 470.4 person/month in 2004 and AMD 705.6 person/month in 2005. Households in apartments will have to pay AMD 403.2 person/month in 2004 and AMD 604.8 person/month in 2005[36]. How burdensome will these charges be to households?

<u>Method 1</u>: *Projected household distribution by household charges for water and wastewater services as a percentage of household consumer expenditures*

Only 14 percent of households using YerevanVodokanal services will exceed the "four percent threshold" even after the 100 percent tariff increase in 2004 (see Figure 2.16). Around seven percent will spend less than one percent of their budget; every eighth household will do between one percent and two percent.

[36] In the year of 2002, the monthly per capita charges were AMD 420 in Yerevan.

Figure 2.16. Distribution of Yerevan Households by Expenses for Water/Wastewater Services as a Percentage of Household Consumer Expenditures, 2004 and 2005 Projections (Scenario 1)



As regards the 2005 projection, the situation is more complicated: almost every second household (52 percent) will exceed the four percent threshold (Figure 2.16).

Method 2: *Analysis of the water charges burden by household income quintile, 2004 and 2005 projections*

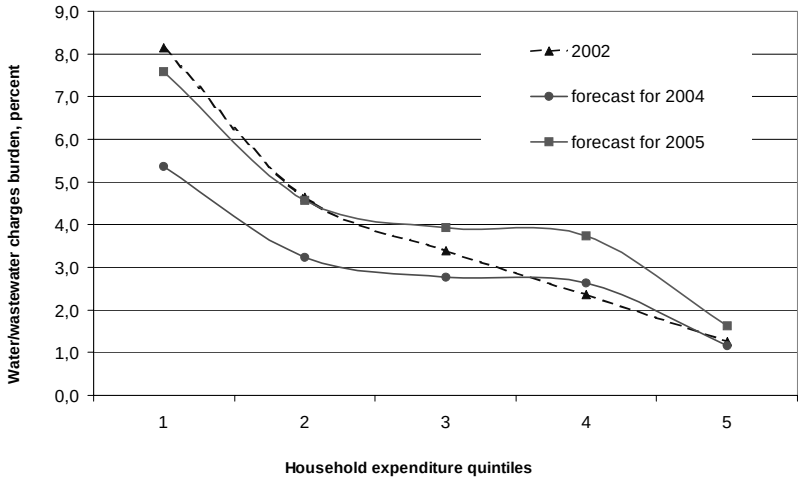
According to projections for the year of 2004, the relative burden of water charges in Yerevan will be 3.03 percent on average, substantially lower than in the base year 2002 (3.96 percent). The affordability problem arises for households in the first quintile who will have to pay 5.37 percent of their budget, on average (Table 2.10).

Table 2.10. Comparative Analysis of Household Expenditures for Water/Wastewater Services as a Percentage of Household Consumer Expenditures in Yerevan by Quintiles (Scenario 1)

	Per capita expenditure quintiles					*City as a whole*
	1st	*2nd*	*3rd*	*4th*	*5th*	
2002	8.14	4.65	3.38	2.37	1.27	3.96
2004	5.37	3.23	2.77	2.63	1.15	3.03
2005	7.60	4.57	3.93	3.73	1.63	4.29

Under the 2005 projection, it will be more difficult for the population to pay for public utilities: the burden of water charges will exceed the threshold four percent for the average household (4.29 percent) as well as for households in the two poorest quintiles paying respectively 7.60 percent and 4.57 percent of their household budget. Figure 2.17 shows the results of comparing the burden of water charges on Yerevan households across quintiles in the basic year of 2002 with projected burdens for the years 2004 and 2005.

Figure 2.17. Burden of Water Charges on Yerevan Households by Quintiles (Percentage of Household Consumer Expenditures) Scenario 1



How will the situation in Yerevan change as compared to the year of 2002 (under Scenario 1)?

In 2004, as a result of the projected substantial growth of population's income (by 18.72 percent from 2002) and 100 percent coverage by water meters, only the poorest quintile will exceed the four percent affordability criterion. The situation will improve significantly for all households except for households in the fourth quintile (their burden of water charges will be slightly increased).

Therefore, thanks to the expected personal income growth and widespread installation of water meters, a two-fold tariff rise in 2004 will have no negative impact upon Yerevan populations' ability to pay in general.

But the situation will deteriorate in 2005 when all households in the first and second quintiles will exceed the four percent threshold and even households in the third quintile will approach this level – making many of them need government social assistance. Therefore, under conditions of the expected tariff increase in 2004 and 2005:

- Relatively well-to-do households i.e. those in the fourth and fifth deciles will see their burden of water charges increase. However, the percentage of their household budgets spent for water and wastewater services will not exceed four percent;
- Low income households i.e. those in the first decile will be somewhat better off as metering becomes more widespread for this group – but will still exceed the threshold of four percent.

Projections of Vanadzor Households' Ability to Pay (Under Scenario 1)

Table 2.11 shows patterns of indicators which were taken into regard when projecting the ability to pay of Vanadzor households.

Table 2.11. Indicators Used to Project Vanadzor Households' Ability to Pay (Scenario 1)

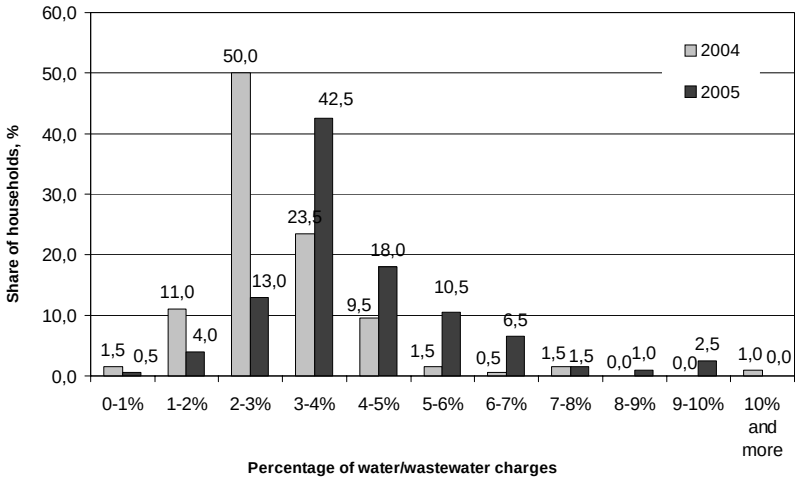
Projection period	*Type of housing*	*Tariff (AMD/ m^3)*	*Average Consumption*		*Charges (AMD/person/ month)*	*Growth of real Income (as compared to 2002)*
			liters/ person/ day	*m^3/person/ month*		
2004	Private house	120	120	3.60	432.0	1.1872
	Apartment		100	3.00	360.0	
2005	Private house	180	120	3.60	648.0	1.2584
	Apartment		100	3.00	540.0	

The projected increase in tariffs to AMD 120 per m^3 in 2004 and AMD 180 per m^3 in 2005 and reduction of per capita consumption to 3,0 to 3.6 m^3/month will result in the following average monthly charges: (1) AMD 432.0 in 2004 and AMD 648.0 in 2005 for households residing in private houses; and (2) AMD 360.0 in 2004 and AMD 540.0 in 2005 for households residing in apartment buildings[37]. How burdensome will these charges be to households?

<u>Method 1</u>: *Projected household distribution by household charges for water and wastewater services as a percentage of household consumer expenditures*

As in Yerevan, only 14 percent of Vanadzor households may find themselves above the "four percent threshold" after the 100 percent tariff increase in 2004 (see Figure 2.18). Few households (12.5 percent) will spend less than two percent and every other household will pay between two percent and three percent.

Figure 2.18. Distribution of Vanadzor Households by Expenses for Water/Wastewater Services as a Percentage of Household Consumer Expenditures, 2004 and 2005 Projections (Scenario 1)



In 2005, the situation becomes more complex: the tariff increase will put 40% of Vanadzor households above the four percent threshold (Figure 2.18), slightly less than in Yerevan (50 percent) as a result of lower water consumption levels projected for Vanadzor.

[37] In the year of 2002, the monthly per capita charges were AMD 360 in Vanadzor.

Method 2: Analysis of water charges burden by household income quintiles, 2004 and 2005 Projections

Under projections for 2004, the relative water charge burden in Vanadzor will be 2.99 percent on average, significantly below the base year 2002 (4.19 percent). This is acceptable for the city as a whole. Only households in the poorest quintile will exceed the affordability threshold, spending 4.59 percent of their budgets for the water/wastewater services (Table 2.12).

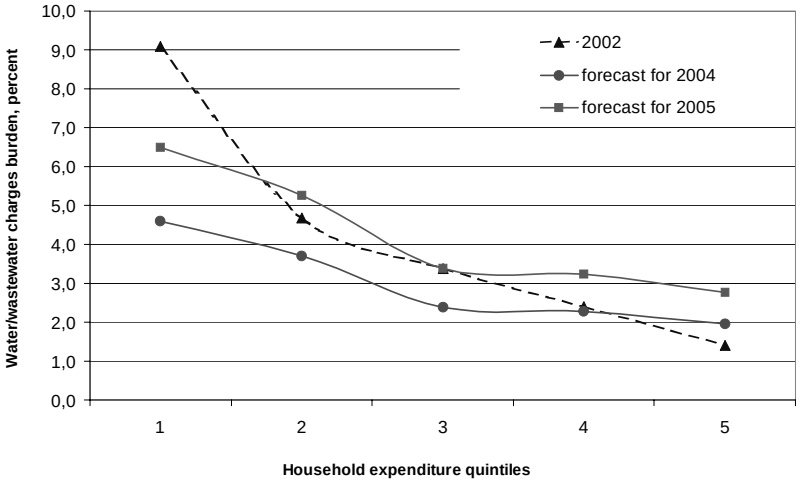
In 2005, it will be more difficult for the population to pay for water: the burden will exceed the threshold four percent for the average household (4.22 percent) as well as for households in the two poorest quintiles (6.49 percent and 5.25 percent of household budgets, respectively).

Table 2.12. Comparative Analysis of Household Expenses for Water/Wastewater Services as a Percentage of Household Consumer Expenditures in Vanadzor (Scenario 1)

	Per capita expenditure quintiles					*City as a whole*
	1st	*2nd*	*3rd*	*4th*	*5th*	
2002	9.09	4.69	3.38	2.40	1.40	4.19
2004	4.59	3.71	2.39	2.28	1.96	2.99
2005	6.49	5.25	3.38	3.23	2.78	4.22

Figure 2.19 compares the household burden of charges for the water and wastewater services across quintiles in the base year 2002 with projected burdens for the years of 2004 and 2005.

Figure 2.19. Burden of Water Charges on Vanadzor Households by Quintiles (Percentage of Household Consumer Expenditures) Scenario 1



How will the situation in Vanadzor change from the year of 2002 under Scenario 1?

Patterns in Vanadzor patterns are similar to those in Yerevan. In 2004, only low-income households (i.e. those in the lowest decile) will be above the 4 percent threshold – but the burden of their water charges will be only half as large as it was in 2002. On the whole, the situation will improve for a vast majority (80 percent) of households, with a slight increase in the burden of water charges only for those in the fifth decile (expected however at a level below two percent). Therefore, due to the expected growth of population's income and universal installation of water meters, doubling of the tariffs in 2004 will not adversely affect the Vanadzor population

as a whole. Only 14 percent of households (the most needy) may be eligible for government social assistance.

One should expect worsening of the situation in 2005 when, according to the projections, all households in the first and second quintiles (40 percent of all households) will be above the four percent affordability threshold. Compared to the base 2002 year, the increase in the burden of water charges will be typical not only for households in the second quintile but also for relatively better off households in the fourth and fifth quintiles. Therefore, the projected tariff increases in 2004 and 2005 and accompanying increase in metering will lead to:

- A significantly improved ability to pay among low income households belonging to the first quintile. The percentage of budgets spent for water and wastewater is projected to fall from 9.09 percent in 2002 to 4.59 percent in 2004 and 6.49 percent in 2005;
- Better off households in the fourth and fifth quintiles will see their burden of water charges increase without exceeding the affordability threshold, though.

Projection Results under Scenario 2

As it was mentioned, projections under Scenario 2 were made with the assumption that metered households would consume water at the minimal level.

Projected Ability to Pay of YerevanVodokanal Customers (under Scenario 2)

Considering the projected tariff increases, the cost of services of Yerevan Vodokanal for customers residing in private sector will stand at AMD 336.0 person/month in 2004 and AMD 505.0 person/month in 2005 (Table 2.13). Residents of apartment buildings will have to pay an average monthly amount of AMD 268.8 in 2004 and AMD 403.2 per person.[38]

Table 2.13. Indicators Used in Developing Forecast of Residential Customers' Ability to Pay in Yerevan (Scenario 2)

Forecast period	*Housing type*	*Tariff, AMD/m³*	*Average consumption*		*Cost of services, AMD/p/m*	*Real Income (compared to 2002)*
			l/p/d	*m³/p/m*		
2004	Private sector	112	100	3.00	336.0	1.1872
	Apartment		80	2.40	268.8	
2005	Private sector	168	100	3.00	505.0	1.2584
	Apartment		80	2.40	403.2	

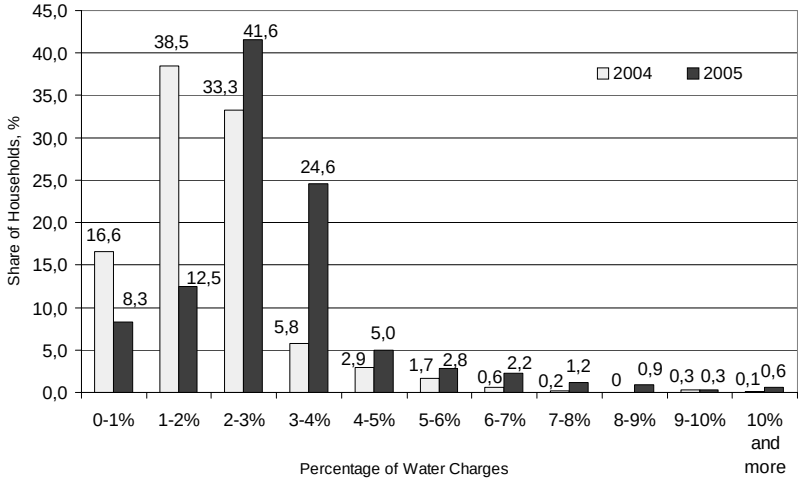
Method 1: Household distribution by the share of expenditures for water and wastewater services in household's consumer expenditures.

According to the results received:

- in 2004, only 5.8 percent of Yerevan Vodokanal customers
- in 2005, 13 percent of households will end up beyond the "four-percent affordability threshold" (Figure 2.20).

[38] It should be reminded that in 2002 the monthly cost of services per person stood at AMD 420 in Yerevan.

Figure 2.20 Yerevan: Projected Distribution of Households by Share of Expenses for Water/Wastewater Services in Consumer Expenditures, 2004 and 2005 (Scenario 2)



Method 2: Analysis of the burden of expenses for water by household quintiles

In 2004, the relative burden of expenses for water will average 2.07 percent in Yerevan which is noticeably lower than in 2002 (3.96 percent.) Problems associated with the ability to pay may only arise among a certain portion of households in the first, low-income, quintile group (Table 2.14)

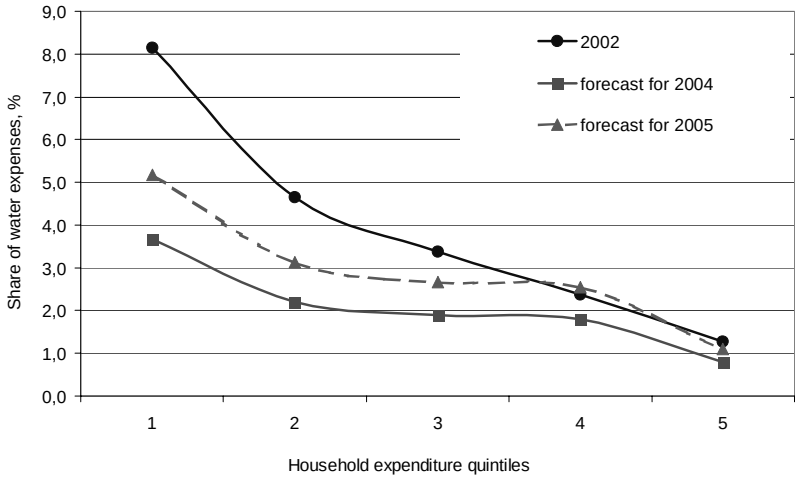
Table 2.14. Yerevan: Comparative Analysis of Expenses for Water/Wastewater Services as a Percentage of Household Consumer Expenditures (Scenario 2)

Year	*Quintile groups by level of average per capita expenditures*					*City average*
	1	*2*	*3*	*4*	*5*	
2002	8.14	4.65	3.38	2.37	1.27	3.96
2004	3.66	2.20	1.89	1.80	0.78	2.07
2005	5.18	3.12	2.67	2.54	1.11	2.93

In 2005, the burden of expenditures for water will exceed the threshold 4 percent in households falling into the first quintile group (the portion of income that they have to spend on water and wastewater services will reach 5.18 percent.)

Figure 2.21 contains the results of comparing the portion of expenditures for water by each quintile group of households in Yerevan in 2002 and estimates of these indicators for 2004 and 2005.

Figure 2.21. Yerevan: The Share of Household Water Expenses by Quintile Groups (as Percentage of Household Consumer Expenditures) Scenario 2



Conclusion: With a view for expected tariff increases in 2004 – 2005 and conditional to the minimal water consumption, the burden of expenditures for water will ease both in all households and practically every quintile group. Exceeding of the 4-percent affordability threshold will happen only in 2005 in households falling into the first quintile group (5.18 percent.)

Projected Service Customers' Ability to Pay in Vanadzor (under Scenario 2)

With a view for an expected tariff increase to AMD 120 m^3 in 2004 and AMD 180 m^3 in 2005, as well as a decrease of average per capita consumption to 1.8-2.4 m^3/person/month, the monthly cost of services per person will stand at: 1) for private sector residents – AMD 288.0 in 2004 and AMD 432.0 in 2005; 2) for apartment residents – AMD 216.0 and 324.0 respectively[39] (Table 2.15)

Table 2.15. Indicators Used in Developing Forecast of Residential Customers' Ability to Pay in Vanadzor (Scenario 2)

Period	*Housing Type*	*Tariff, AMD/m^3*	*Average Consumption*		*Cost of Service, AMD/p/m*	*Real Income (compared to 2002)*
			l/p/d	*m^3/p/m*		
2004	Private sector	120	80	2.40	288.0	1.1872
	Apartment		60	1.80	216.0	
2005	Private sector	180	80	2.40	432.0	1.2584
	Apartment		60	1.80	324.0	

Method 1: Household distribution by the share of expenditures for water and wastewater services in household's consumer expenditures.

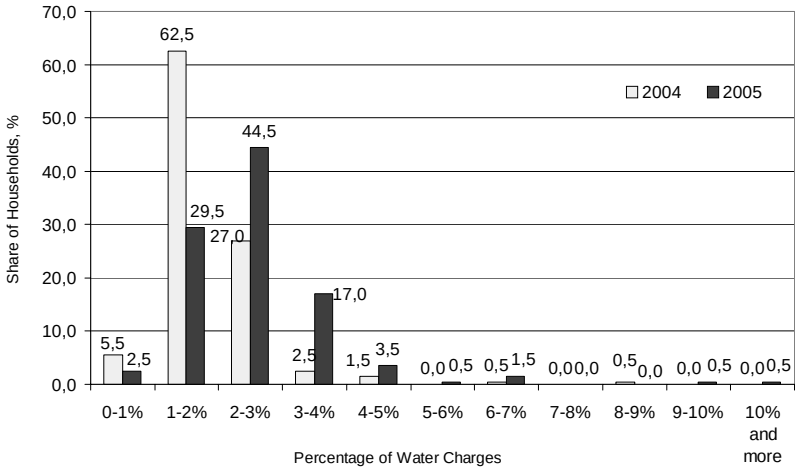
According to the results received:

[39] It should be reminded that in 2002 the monthly cost of services per person stood at AMD 360 in Vanadzor.

- in 2004, only 3.0 percent of water and wastewater customers
- in 2005, 6.5 percent of households

will end up beyond the "four-percent affordability threshold" in the city of Vanadzor (Figure 2.22).

Figure 2.22. Vanadzor: Projected Distribution of Households by Share of Expenses for Water/Wastewater Services in Consumer Expenditures, 2004 and 2005 (Scenario 2)



Method 2: Analysis of the burden of expenses for water by household quintiles

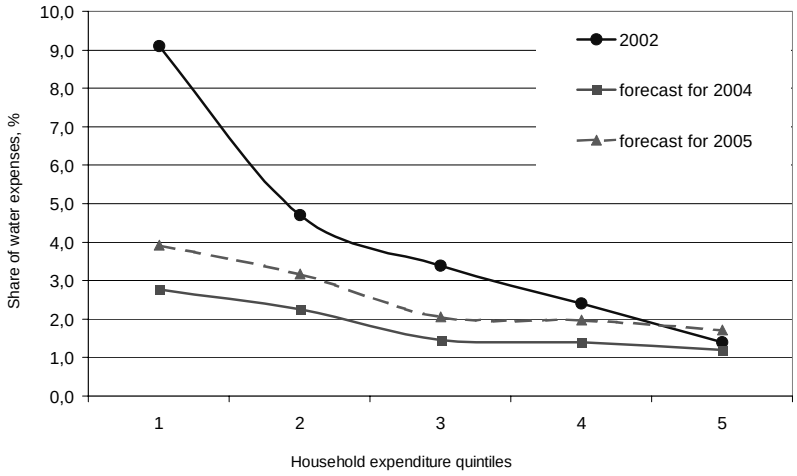
In 2004, the relative burden of expenses for water will average 1.82 percent in Vanadzor (2.57 percent in 2005) which is noticeably lower than in 2002 (4.19 percent.) Neither quintile group will see the burden of expenditures exceed the 4-percent threshold (Table 2.16)

Table 2.16. Vanadzor: Comparative Analysis of Expenses for Water/Wastewater Services as a Percentage of Household Consumer Expenditures (Scenario 2)

Year	*Quintile groups by level of average per capita expenditures*					*City Average*
	1	*2*	*3*	*4*	*5*	
2002	9.09	4.69	3.38	2.40	1.40	4.19
2004	2.77	2.25	1.45	1.39	1.21	1.82
2005	3.92	3.19	2.05	1.97	1.71	2.57

Figure 2.23 presents the results of a comparison of the share of expenditures for water and wastewater services by each household quintile group in 2002 and projections for 2004 and 2005 conditional to minimal water consumption.

Figure 2.23. Vanadzor: The Share of Household Water Expenses by Quintile Groups (as Percentage of Household Consumer Expenditures) Scenario 2



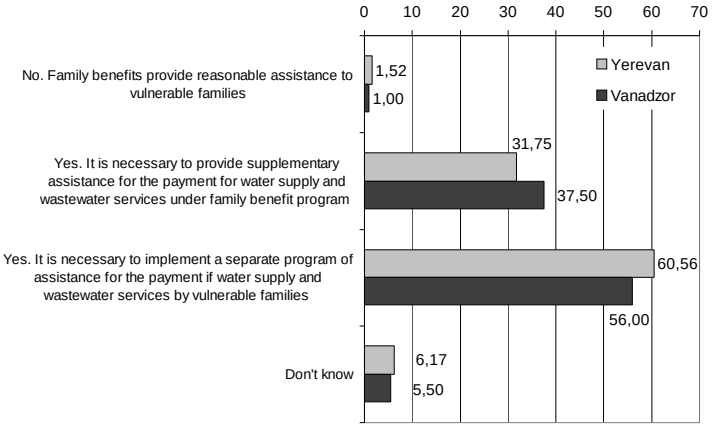
Conclusion: With a view for expected tariff increases in 2004 – 2005 and conditional to the minimal water consumption, the burden of expenditures for water will ease both in all households and practically every quintile group. None of quintile groups will experience exceeding the 4% affordability threshold.

Therefore, service affordability to residential customers increases notably as actual water consumption level goes down. Annex 4 focuses on the relationship between water consumption by the population and service affordability revealed by the analysis.

2.4 What Social Protection Measures Do Respondents Support?

When respondents were asked whether the social protection of the needy households needed to be improved, they were almost unanimous: over 90 percent agreeing, and a large majority supported the development of a *special social protection program* for public utility customers (see Figure 2.24).

Figure 2.24. Is There a Need in Improving Social Protection of Public Utility Customers? (Percentage of the Surveyed Households)



CONCLUSIONS TO CHAPTER 2

Methodology

1. Two approaches were used to assess the affordability of the water/wastewater services:
   - Methods for assessing customers' *ability to pay* for the country as a whole ("macroaffordability") and for assessing the ability of individual categories of customers to pay ("microaffordability");-
   - Methods for assessing residential customers' *willingness* to pay more for better services.
2. The ability to pay of the population as a whole (*macroaffordability*) was measured as the ratio of charges for services for an average household to its monthly *consumer* expenditures.
3. Two approaches were used to assess *microaffordability* levels:
   - Grouping of households by the ratio of charges for water/wastewater services to total household consumer expenditures (Method 1);
   - Analysis of the burden of expenses for water/wastewater services by household income quintiles (Method 2)

   This made it possible to identify households that must pay "too much" for water, i.e. whose payments for water/wastewater services exceed the established affordability criterion.
4. *Criterion of service affordability* is defined as the maximum percentage of the income a household can spend on water/wastewater services without jeopardizing its ability to purchase other essential goods and services. When assessing customers' ability to pay in Armenia, the percentage was assumed to be four percent of households' average total consumer expenditures. (This criterion is usually used by international financial institutions including the World Bank and the EBRD in their studies of population's ability to pay in EECCA countries.)
5. The method of *stated* preferences was used to assess customers' willingness to pay more. This is based on the results of face-to-face surveys and aims at finding out what percentage of households is willing to pay more and for what particular service quality characteristics.

Results of the Targeted Survey

The data were obtained from a special survey of water/wastewater service customers conducted under this project in June 2003 and provided the basis for assessing service affordability in Yerevan and Vanadzor. The outcomes of the study show that:

- The percentage of households that have installed individual water meters is high, particularly in comparison with other EECCA countries. In June 2003, 53.7 percent and 49.5 percent of households in Yerevan and Vanadzor, respectively, had installed meters.
- Metered per capita water consumption is only one third of the standard (normative) consumption in Yerevan (2.40 m^3/month vs. 7.5 m^3/month) and one fourth in Vanadzor (1.45 m^3/month vs. 6 m^3/month);
- Many respondents (38 percent in Yerevan and 26 percent in Vanadzor) are neither fully or partially satisfied with the service quality. At the same time, every fourth household in Yerevan and 18 percent of households in Vanadzor stated that they were "fully satisfied" with the service they consumed.
- Only 18 percent of Yerevan households and one percent of Vanadzor households have access to water 24 hours a day.
- 38 percent of the surveyed households in Yerevan and 33.1 percent of those in Vanadzor receive bad quality water "practically continuously" or "often".
- Over one third of respondents in both cities characterize themselves as "lacking money even for food". Around half the respondents (46 percent in Yerevan and 53 percent in Vanadzor) call themselves "poor" or "very poor". Only six percent in Yerevan and 11 percent in Vanadzor stated that paying their utility bills was not a problem.
- A majority of respondents in both cities (46 percent in Yerevan and 54 percent in Vanadzor) believe that vodokanal tariffs are too high;
- Most indebted households in both cities (over 80 percent) refer to a low income as the primary reason for their arrears of payments for water services;
- Almost all surveyed households (96 percent in Yerevan and 91 percent in Vanadzor) strongly oppose fines on those who do not pay for the services on time. 92.5 percent and 71.5 percent of respondents in Yerevan and Vanadzor, respectively, oppose other penalty sanctions. Most residential customers are not yet ready to be liable for low compliance.

Assessment of the Willingness to Pay

The study of household willingness to pay more could be divided into two stages. First, respondents were just asked whether they were willing to pay more if services are improved. The majority (84.6 percent in Yerevan and 70 percent in Vanadzor) replied that they were not. To obtain more objective estimates of willingness to pay, respondents were invited to choose among six scenarios for service improvement linked to corresponding tariff increases. The results were:

- Every third household in Yerevan and every eighth household in Vanadzor refuses to choose any scenario;
- Almost half of the households agrees only to a ten percent increase to preserve current service quality;

- 16.5 percent of households in Yerevan and 36.0 percent of households in Vanadzor are ready to pay 50 percent higher tariffs;
- A very small percentage (one to two percent) of the surveyed households would pay twice as much for improved services and
- a similar percentage (1.5 – 2.7 percent) of the surveyed households would not oppose a 150% increase in tariffs.

Vanadzor households are more willing to pay for better services than Yerevan households – perhaps because their services are of poorer quality today: 40 percent of the Vanadzor residents admit they would pay considerably more (by 50% to 150%) but only for substantial improvement in the quality of services.

Assessment of the Current Ability to Pay

1. *Macroaffordability* estimates suggest that the average Armenian household spent 3.1 percent of its budget on the water and wastewater services in 2002. This value is acceptable from the perspective of a criterion that states that payments should not exceed four percent. It indicates that the *country's population as a whole* could afford paying water bills at the 2002 tariffs and consumption standards.

However, one should not judge service affordability among needy households based on this national average nor conclude on its regional differentiation. Instead, service *microaffordability* should also be examined.

2. *Microaffordability* in Yerevan and Vanadzor was assessed based on the 2002 data (according to consumption standards) and as of June 1, 2003 (assuming charges to metered households are based on actual consumption rather than on standards). For example, according to the year 2002 data, 40 percent of households spend more than four percent of their budget for water services. The situation had improved radically by installation of meters by June 2003:

- The average burden of water charges fell from 3.96 percent to 2.48 percent in Yerevan and from 4.19 percent to 2.45 percent in Vanadzor.
- The percentage of household above the "four percent threshold" halved as compare to 2002;
- Despite significant reduction of service charges, roughly one fifth of all households (21 percent in Yerevan and 18 percent in Vanadzor) still faced difficulties in paying service bills.

Projections of Customers' Ability to Pay for 2004 and 2005

Assumptions. In order to make projections of customers' ability to pay two scenarios (Scenario 1 and Scenario 2) were developed which were based on the assumption that tariffs for the water/wastewater services would double in 2004 with a further 50% increase in 2005. It was also assumed that:

- The year-to-year growth of real income would be 12 percent in 2003, 6 percent in 2004, and 6 percent in 2005;
- All residential customers would install water meters by 2004 and pay for the water based on actual consumption rather than on consumption standards;

The two scenarios differed by the only indicator, namely, the level of actual water consumption. Specifically:

- Scenario 1 assumed that in 2004 and 2005 actual water consumption would be 140 liters/person/day and 120 liters/person/day for Yerevan households residing in private houses and apartment buildings, respectively, and 120 liters/person/day and 100 liters/person/day for Vanadzor households residing in private houses and apartment buildings, respectively;
- Scenario 2 envisaged that water consumption would be smaller by 40 liters/person/day accordingly as compared to Scenario 1.

Projection results under Scenario 1. Based on the above assumptions, doubling tariffs in **2004** results in:

- A reduction in the burden of charges for the water/wastewater services from 3.96 percent down to 3.03 percent in Yerevan and from 4.19 percent down to 2.99 percent in Vanadzor for the average household;
- Approximately 14 percent of households in both cities will find themselves paying more than four percent of total expenditures.

Therefore, thanks to expected personal income growth and widespread water meter installation, a two-fold tariff increase in 2004 will have no negative impact on Yerevan and Vanadzor population's ability to pay.

The situation will exacerbate noticeably in **2005** when tariffs increase by another 50 percent. Specifically,

- The average burden of water charges will rise to 4.29 percent in Yerevan and 4.22 percent in Vanadzor and will surpass the 2004 and 2002 levels;
- Every other household (52 percent) in Yerevan and 40 percent of households in Vanadzor will exceed the four percent affordability threshold.

If the situation in the country will be developing in accordance with assumptions presented in this projection, then the 50-percent tariff increase for water and wastewater services in 2005 will make these services unaffordable to half the customers in both cities.

Therefore, the tariff increase in 2005 with ensuing need to enroll half the service customers in social assistance programs would not be feasible from either economic or social perspective. It would add to social tension, worsen payment compliance, and, consequently, deteriorate the financial situation of water/wastewater utilities.

Projection results under Scenario 2. The assumed lower level of actual water consumption improves projected ability to pay of residential customers in both cities significantly.

In particular, after tariffs have been doubled in **2004** households will pay for water and wastewater services on average 2.07% and 1.82% of their budgets in Yerevan and Vanadzor, respectively. The percentage of households above the "four percent affordability threshold" will be quite small – 6% in Yerevan and 2.5% in Vanadzor.

The next 50% increase of tariffs in **2005** under Scenario 2 will to some extent worsen populations' ability to pay. However, these changes will not be critical. The average burden of charges for water/wastewater services will not exceed 3% of total household expenditures. At most 13% of Yerevan households and twice as little (6.5%) of Vanadzor households will find themselves above the "four percent affordability threshold".

Therefore, if the actual service consumption by residential customers drops to the level assumed under Scenario 2, then projections of population's ability to pay are favorable for the 50% tariff increase in both cities. However, one should keep in mind that drastic decrease in sales of

services by water/wastewater utilities may negatively affect their financial situation, thus, bringing expected benefits of the tariff increase to nothing.

Summary results of projections under Scenarios 1 and 2 are presented in the table 2.17.

Table 2.17: Comparative Analysis of Water/Wastewater Customers' Ability to Pay in Yerevan and Vanadzor under Scenarios 1, 2 (the Years of 2004 and 2005)

Ability to Pay Indicators	*City*	*2002*	*Scenario 1*		*Scenario 2*	
			2004	*2005*	*2004*	*2005*
Burden of charges for water/wastewater services (as percentage of household budget)	Yerevan	3.96	3.03	4.29	2.07	2.93
	Vanadzor	4.19	2.99	4.22	1.82	2.57
Percentage of households above the "four percent affordability threshold"	Yerevan	38.9	14.1	51.9	5.8	13.0
	Vanadzor	40.5	14.0	40.0	2.5	6.5

CHAPTER 3. SOCIAL PROTECTION OF WATER/WASTEWATER SERVICE CUSTOMERS

3.1 Social Protection of Water/Wastewater Service Customers: Principles and Forms

3.1.1 Principles of Social Protection of Water/Wastewater Service Customers

Social protection measures aim at assisting socially vulnerable groups of the population to ensure them access to basic goods and services that provide an acceptable minimum living standard. The primary objective of social protection measures in the area of water and wastewater services is to satisfy people's basic needs in potable water, wastewater collection and treatment regardless of their economic situation.

Armenia's reforms in the water/wastewater sector envisage raising tariffs for water – threatening to make water/wastewater services less accessible to low income households. Although the accompanying metering allow households to mitigate the impacts of some tariff increases, the analysis in the previous section showed that there will be a need for additional protection to low-income households to ensure public support for and successful implementation of reforms and to ensure that basic water needs can be purchased by all households.

Following OECD recommendations[40], these measures should meet the following conditions:

- Ensure equal access to water so that customers are able to satisfy their vital physiological and hygienic needs regardless of their economic situation;
- Support access by the most needy households (targeting);
- Ensure that low income households can afford to purchase a basic minimum level of water services;
- Create conditions that encourage customers to conserve water;
- Provide social assistance that reflects the availability of budget funds;
- Be simple and effective to administer and monitor;
- Avoid negative side effects.

To develop effective measures to protect water/wastewater service customers, it is necessary to assess the current social protection system and determine whether it adheres to these basic principles of social protection.

3.1.2 Forms of Social Protection of Water/Wastewater Service Customers

There are two ways to improve affordability of water and wastewater services for low-income customers: by decreasing the cost of service (i. e. service bill) and by increasing purchasing capacity of customers (i. e. increasing their income). Respectively, protection measures can be divided into two major groups:

- Measures to decrease tariff, or tariff measures, and
- Measures to increase income of low-income households.

[40] Key Issues and Recommendations for Consumer Protection: Affordability, Social Protection, and Public Participation in Urban Water Sector Reform in Eastern Europe, Caucasus and Central Asia // OECD, Paris, 2003. – p.13

Measures aimed at decreasing prices of water and wastewater services include budget funding of enterprises, cross-subsidizing services for residential customers at the expense of other customer groups, tariff measures to facilitate economical water consumption.

Measures aimed at increasing households' ability to pay include targeted assistance to low-income households. Privileges in payment of housing and communal service bill, traditional to the former Soviet Union, and more recent developments -- housing subsidies and targeted assistance, are among the most widespread forms of targeted assistance in the EECCA region.

In some EECCA countries “universal” subsidies to all customers have been replaced with targeted subsidies for low-income population. Belarus, Kazakhstan, Kyrgyzstan, Russia and Ukraine have developed and implemented *housing subsidy programs*. Under a housing subsidy program, the state compensates a portion of households’ expenditures for housing and communal services (including water and wastewater services) if such expenditures exceed a certain percentage of household aggregate income (e. g. in Belarus this percentage stands at 15 percent, Ukraine – 15 to 20 percent, Kyrgystan – 25 percent, Kazakhstan – 30 percent.)

Housing subsidies – as a form of targeted social assistance to low-income households in payment for housing and communal services, including water and wastewater services – made it possible to achieve significant savings of budget funds. Since assistance under the program has been provided to most needy customers, service providers have been able to maintain a relative stability in the environment of growing prices and reduced government funding. However, there still remain issues pertaining to the targeting of subsidies and stimulating customers into economical water consumption. Particularly, noncash assistance from budgets to water service providers does not facilitate households into reducing their expenditures for communal services.

Armenia and Uzbekistan, recently joined by Ukraine and Kazakhstan, have been implementing *family income support programs* based on the means testing. These programs are intended to increase income of households in general as opposed to providing funds for paying water, wastewater and other service bills. Poverty reduction programs are a better option compared to housing subsidies when service bills do not account for a significant portion of households’ expenditures. However, such programs may be somewhat ineffective if there are plans to execute a large-scale reform of tariffs for housing and communal services with no mechanisms to protect low-income customers from price hikes. For instance, countries expecting a sharp increase in water service prices may see their low-income households left without effective assistance in payment for water/wastewater services under the existing targeted social assistance programs. In such cases, the government should consider a possibility of developing an additional social assistance program for low-income customers of water/wastewater services.

3.2 Existing Social Protection Mechanisms for Low-Income Water/Wastewater Service Customers in Armenia

The Republic of Armenia has several social protection programs for low-income households. They include: family poverty assistance program, privileges in payment for housing and communal services, and local government programs of assistance to low-income households. The government-funded family poverty assistance program is the most significant one. The program is based on special means-testing system, or the PAROS system. These are discussed below.

3.2.1 Family Poverty Assistance Program

Family benefits are granted based on a means-testing score system. Families applying for benefits must fill out a “Family Passport” and provide certain documents (certificates of family composition, incomes, whether there are pensioners, invalids, single mothers in the family, etc.).

The score for a family is calculated based on these documents. To become eligible, the family must score at least 36 points.

Means-testing is performed on the basis of a large number of parameters reflecting the social status and material condition of the family. The following factors are used:

- Belonging of individual family members in a household to any socially unprotected category (e. g., an orphan, physically disabled individual, pensioner, unemployed, student, etc.)
- Averaged need category of the household in general
- Number of disabled members in a household
- Place of residence
- Housing conditions
- Vehicle ownership
- Involvement in business or entrepreneurial activity
- Report of local government authorities, social service offices on social and economic condition of a family
- Aggregate family income

Belonging to socially unprotected groups is the decisive factor, while the rest are used for specification or adjustment purposes. Additional filtering or screening systems are used to eliminate families from eligibility. Based on these factors, the score is calculated to determine eligibility for assistance.

The amount of benefits (conditional to eligibility to such assistance) does not depend on the score and, prior to 2002, had been calculated under the formula:

$$A = 3500 + 1300 \cdot N \text{ (AMD)},$$

where, A – amount of benefits, N – number of family members.

Faced with the budget requirement to reduce the caseload in 2002, the Ministry of Social Security conducted an analysis that showed that families with many children were the most needy category. Therefore, the means testing approach was modified and, starting from 2003, a new algorithm to calculate the amount of benefits was introduced:

$$A = 4000 + 1500 \cdot N_i \text{ (AMD)},$$

where, N_i – the number of family members under 18 years old.

Starting from July 2003, AMD 2,000 addition for each under-aged family member has been established.

The country has a system to audit the accuracy of data submitted by applicants. Benefits are granted only after a data check against databases of the tax service, real estate and vehicle registration offices, as well as on the basis of indirect assessment of family income and expenditures by using data from the telephone company (international phone bill), electric power supplier, and other service providers. To check information, social workers visit families applying for benefits to inspect their living conditions.

Special Social Protection Councils have been set up by local governments where people denied benefits may appeal the decision. These councils are empowered to grant one-time assistance (within 5 percent of the local family benefit budget) to households with a means-testing score

below the eligibility level. The Social Protection Council is comprised of representatives of local self-governments (the employment service, pension department, juvenile delinquency office) and community organizations.

Table 3.1 presents data on benefit recipients for the past four years. As of July 2003, a total of 214,263 households (with 725,197 people) applied for assistance while 160,387 households consisting of 543,711 people had been granted benefits.

Table 3.1. Household Enrollment in Family Benefit Program (2000-2003)

	2000		*2001*		*2002*		*2003 (as of July 1, 2003)*	
The number of registered FBP participants (benefit applicants)	*Households*	*Individuals*	*Households*	*Individuals*	*Households*	*Individuals*	*Households*	*Individuals*
Armenia	319,745	1,140,945	274,108	949,440	234,187	800,840	214,263	725,197
Yerevan	79,636	272,275	66,118	215,034	55,590	175,232	48,823	150,762
Vanadzor (Lori)*	24,259	79,024	20,973	66,636	18,698	58,752	17,459	54,362
The number of beneficiaries								
Armenia	225,178	765,605	200,694	682,359	166,810	567,154	160,387	543,711
Yerevan	58,137	180,224	47,036	145,811	38,998	120,893	36,335	113,008
Vanadzor (Lori)*	16,562	52,998	15,255	48,816	12,691	40,611	12,595	40,429

* Data for Lori Marz, with the city of Vanadzor its administrative center

Source: The Ministry of Social Security of the Republic of Armenia

The table above includes data on permanent family benefit recipients and on those families who scored below the eligibility level and had been granted a temporary (monthly, quarterly) assistance being subject to further application review. The number of permanent family benefit recipients as of July 2003 was 140,127 households, including 31,358 in Yerevan. These data are further used to calculate the estimated cost of the additional social protection program for service consumers.

Table 3.2 shows the ratio of the number of households applying for assistance and receiving benefits in the total number of households in Armenia in 2000-2003.

Table 3.2. Armenian Household Enrollment in the Family Poverty Assistance Program (Percentage of All Armenian Households)

	01.01.2000	*01.01.2001*	*01.01.2002*	*01.01.2003*
The share of households registered with the FAP, percentage of total households in Armenia	52.85	43.99	38.61	38.61
The share of households receiving benefits in the total number of households in Armenia	26.70	24.06	21.18	19.25
The share of households receiving benefits in the total number of household-applicants for assistance	50.52	54.70	54.86	67.84

Source: The Ministry of Social Security of the Republic of Armenia

According to the Ministry of Social Security data, during the past three years:

- The share of all Armenian households applying for poverty benefits declined from 52.85 percent in January 2000, to 38.61 percent in January 2003;
- The share of families receiving benefits also declined -- from 26.7 percent at the beginning of 2000 to 19.25 percent at the beginning of 2003;
- By January 2003, every third household applying for benefits was rejected. This is quite a high rate and may reflect the excessive complexity and lack of transparency in determining the need for assistance.

Table 3.3 shows the ratio of individuals in households receiving benefits in the total population.

Table 3.3. The Share of Citizens Receiving Assistance in the Total Population as of January 1, 2002 (percentage)

	The share of individuals registered with the FBP	*The share of individuals receiving benefits*
Armenia	24.86	14.01
Yerevan	17.17	9.13
Vanadzor (Lori)*	34.86	21.57

* - Data for marz Lori, with the city of Vanadzor being its administrative center

Source: Social Snapshot and Poverty of the Republic of Armenia. Statistical Analytical Report. Yerevan 2002, p.157

The statistics show that:

- In Vanadzor, 21.57 percent of individuals live in households receiving benefits – above the national average of 14 percent and the 9 percent in Yerevan;
- Since a smaller share of citizens than households receive benefits (14 percent and 21.18 percent, respectively, as of January 1, 2002), small families and single individuals predominate in the program.

Program funding fell between 2000 and 2003 (Table 3.4). The 2004 draft budget, however, envisages an increase in funding the family assistance program to AMD 16 billion.

Table 3.4. Budget Funding of the Family Benefit Program (AMD million)

	2000	*2001*	*2002*	*2003 (plan)*
Armenia	19,205.4	16,705.9	12,250.2	12,745.2
Yerevan	4,732.0	3,715.0	2,700.4	2,682.9
Vanadzor	1,380.3	1,223.7	901.2	958.5

Source: The Ministry of Social Security of the Republic of Armenia

Average monthly benefits per household are presented in Table 3.5 and also show a downward tend. But 2003 is expected to see an increase in per household benefits.

Table 3.5. Average Amounts of Benefits (AMD per Month per Family)

	2000	*2001*	*2002*	*2003* (plan)
Armenia	7,107.5	6,936.7	6,119.8	6,622.1
Yerevan	6,782.8	6,581.8	5,770.3	6,153.3
Vanadzor	6,945.3	6,684.8	5,917.5	6,342.1

Source: Authors' calculation based on the data of the Ministry of Social Security of the Republic of Armenia

Poverty benefits are significant in the material security of Armenian low-income households. Table 3.6 presents average per capita income of households receiving family assistance (assistance itself not included)

Table 3.6. Average Per Capita Income of Assistance Recipients (AMD/person/month)

	01.01.2000	*01.01.2001*	*01.01.2002*	*01.07.2003*
Armenia	1,709.8	1,843.1	2,023.4	2,030.0
Yerevan	,684.4	1,907.2	2,124.1	2,126.0
Vanadzor/Lori	1,490.3/1,726.5	1,682.6/1,834.9	1,797.2/1,893.4	--- /2,011.0

Source: Social Snapshot and Poverty of the Republic of Armenia. Statistical Analytical Report. Yerevan 2002, pp.159, 165

Based on Table 3.5 and with an account for the average size of family-recipients of assistance, we can determine that the average amount of benefits per person in the city of Yerevan stands at AMD 1,978.4, in Vanadzor – AMD 1,975. Thus, on average poverty benefits almost double the cash income of low-income households.

3.2.2 Housing and Communal Service Subsidy Program in the city of Charentsavan

The existing family assistance program is not aimed at assisting in payments for communal services. The Government has kept water and wastewater service charges low by subsidizing the water/wastewater sector. However, Armenia has one example of implementing a social protection program aimed at subsidizing communal services. From 1997 until recently, the city of Charentsavan developed and ran a local targeted assistance program for low-income families in payment for communal service – the Housing and Communal Subsidies Program. The primary goals of the program were:

- To reduce social tensions;
- To implement an effective program of targeted assistance for payment of communal services by low-income families;
- To increase payment compliance;
- To substitute subsidies for families in need for subsidies for service providers and to reduce budget expenditures.

Housing and communal subsidies are a reimbursement to low-income families of a portion of their housing and communal service payments. Subsidies for key services (housing maintenance, water and wastewater, heating, waste collection) were assigned to all families whose total service bill exceeded 15 percent of total family income (for families consisting of two pensioners – 8 percent, for single pensioners – 5 percent). To receive the assistance the family was required to pay its share of the service bill. 24.3 percent of city residents participated in the program at the beginning; later the number declined to 15 percent. The funding mechanism envisaged the interest of service providers in increasing the payment collection rate. For instance, if the collection rate was 45 percent of charges, the municipal budget would compensate 45 percent of the value of granted assistance. The average subsidy stood at approximately 50 percent of total payments for services.

Every family receiving a housing subsidy was given a coupon that could be used to pay for services. Coupons were distributed publicly in the city hall. This was intended to screen applicants – well-off families did not want such publicity – and to establish a link between local self-government bodies and low-income families. By assisting in paying for services, the housing and communal subsidy program played an important role in reducing social tension in

the city, improving the economic condition of service providers, and increasing quality of services.

In January 1999, the Government assigned the Urban Development Ministry and the Ministry of Social Security to study the Housing and Communal Subsidies Program and submit proposals on its implementation in other regions. However, in January 2003, the Housing and Communal Subsidies Program in Charentsavan was discontinued due to the lack of funding.

3.2.3 Other Forms of Social Protection

Local Assistance Programs

As already mentioned, subsidies to water and wastewater service providers can be paid from local government budgets to compensate for subsidies from the national budget of the Republic of Armenia. The communities determine how much to allocate, and how to make the allocation. In 2002, the Vanadzor municipal community budget provided assistance in paying for water and wastewater service debts to 5,000 low-income families. AMD 1,000 – 3,000 assistance was extended to families enrolled into family benefit program with the highest means-testing score. Besides, budget funds were provided to repair internal networks in the buildings housing the largest number of low-income residents.

Assistance in Electric Power Bill Payment

Armenia has shown it can promptly respond to critical social issues pertaining to reforms in the housing and communal sector within the existing social protection system. Between 1996 and 1999, Armenia provided low-income families with help paying for electric power. Under the "Winter 96–97" program, families enrolled in the PAROS program received coupons for payment of the minimal electric power consumption of 250-300 kWh. The coupons were given to families whose poverty level was lower than the established minimum or families consisting of individuals belonging to certain social categories. In 1997 – 1998, families in need had been given coupons for repayment of the electric power debt for AMD 7,500.

In 1999, families that came close (33.7 though 36.0) to the "eligibility" score for family benefits were paid monthly compensation for consumed electric power in the amount of AMD 1,450.

Privileges in Payment for Housing and Communal Services

Privileges for payments for housing and communal services date back to the Soviet Union times but most were cancelled in Armenia in 1997. Only privileges to certain population categories have been kept:

- Great Patriotic War veterans, families of the lost in action, individuals bestowed with a Great Patriotic War veteran status (participants in military operations in other countries);
- Armenia defense veterans and families of those lost in action;
- Families of former personal pensioners.

The total number of privileged families is 28,420 -- 1 percent of the total population. They pay only 50 percent of the price of water and wastewater services. Costs associated with privileges incurred by water/wastewater providers are virtually not funded. Results of research performed by this project in June 2003 show that approximately 5 percent of households enjoy privileges in the city of Yerevan and 1.5 percent in Vanadzor (see Section 2.3.2).

Thus, Armenia has a rather effective system of social protection, possesses certain experience in providing low-income families with assistance in payment for communal services, including electric power, water and wastewater services. Most forms of assistance to low-income families

are based on methods and criteria of means-testing. However, the poverty family benefit system is not fully using the potential of targeting.

3.3 Water and Wastewater Sector Reform and Social Protection of Low-Income Individuals

3.3.1 Issues Pertaining to Water and Wastewater System Reform

Water and wastewater service tariffs have not been revised for five years and fail to cover a significant portion of service providers' costs. The government annually earmarks funds for the housing and communal sector's costs in the national budget. For instance, it has been planned to direct AMD 2.745 billion for funding current expenses of the water and wastewater sector in 2003. However, the government has indicated that it intends to cancel direct subsidies to water/wastewater enterprises.

Low incomes in Armenia pose a significant barrier to increasing tariffs to an acceptable level. At the same time, lack of funding in combination with serious deterioration of water networks create huge water losses in distribution networks, irregular water supply, and threaten the health of the population due to poor water quality and untreated sewerage. It is imperative to break this vicious circle. Actions taken by the Government of the Republic of Armenia to restructure debts and install water meters made it possible to improve payment collection and to reform drastically the water and wastewater sector.

Existing water/wastewater enterprise subsidies suffer significant deficiencies: they are not targeted, fail to encourage customers to conserve water, and offer no incentives for enterprises to improve service quality and reduce losses. With such a system in place, well-off households consume more water and, due to low tariffs, enjoy large implicit subsidies for doing so.

To successfully implement the reforms, to build public support, and to ensure a socially acceptable water consumption level it is necessary to improve ways of providing social protection and to implement additional social assistance actions for low-income households with consideration to water and wastewater reform tasks.

Obviously, the social protection for water customers require additional budget expenditures on social programs. At the same time, we must consider the impact of reforms upon the financial condition of vodokanals. Particularly, it is expected that:

1) Payment compliance by customers will increase significantly. In 2004, it is expected to reach at least 90 percent of charges, allowing for the possible tariff rise;
2) Enterprises' costs will decrease due to water meter installation and decreased water consumption;
3) Direct budget funding of water and wastewater service providers will fall, allowing the allocation of a portion of the savings to pay for social programs.

First outcomes of the water/wastewater sector reform in Armenia allow to make some preliminary assessments and recommendations as for the future need in social protection measures for service consumers.

3.3.2 Who Needs Assistance in Payment for Water and Wastewater Services?

To ensure effectiveness of social policies aimed at protection of service customers the primary objective is to define the range of potential recipients of such assistance. There are two approaches to this.

Approach 1: Provide assistance only to recipients of family benefits. According to the Ministry of Social Security, 21.18 percent of all households (14.01 percent of people) received benefits in

2002 – including 9.1 percent of residents in the city of Yerevan and 21.6 percent in Vanadzor (see Table 3.3 above). By July 1, 2003, a total of 140,127 households in Armenia, including 31,358 households in Yerevan, were receiving benefits (see Section 3.2.1). The range of potential recipients can be expanded by households falling into the "boundary zone", i. e. those that came close to the 36.00 eligibility score[41].

Approach 2: Apply the "4 percent of income" water/wastewater affordability criterion. According to the affordability assessment (see Section 2), in 2002 service charges exceeded the 4 percent threshold for 40 percent of households in Yerevan and Vanadzor. However, according to outcomes of the sample study of household income and expenditures in 2001, Armenian households paid significantly lower amounts for water and wastewater services. For instance, expenditures for payment of all communal services stood at 5.8 percent of household expenditures, with electricity accounting for 4.9 percent, and water/wastewater payments – 0.9 percent[42]. The reason for this discrepancy is that water and wastewater enterprises in Armenia in 2001 collected only 15 percent of their charges[43].

In 2003, following the implementation of the Law on Restructuring Indebtedness the situation changed significantly as households installed water meters and charges sharply declined. Charges for water and wastewater service exceeded 4 percent of consumer expenditures for only 20.7 percent households in Yerevan and 18 percent in Vanadzor as of June 1, 2003. According to forecast Scenario 1, presented in Chapter 2, in 2004 only 14 percent of households in both cities will exceed the 4-percent affordability threshold, while in 2005 the burden of expenses will exceed the threshold in 51.9 percent households in Yerevan and 40 percent in Vanadzor (Table 3.7).

Table 3.7. The Share of Households with Water/Wastewater Service Burden Exceeding Four Percent of Consumer Expenditures (Percent)

	2002	*2003*	*2004*	*2005*
Yerevan	40.0	20.7	14.1	51.9
Vanadzor	40.5	18.0	14.0	40.0

Source: Author's estimates

It should be noted that from the standpoint of the efficient use of budget resources allocated for social assistance purposes, providing such assistance to half the population would not be feasible because the cost of the program can well exceed benefits from price increase. The program cost to benefit ratio is a crucial factor which predetermines a choice of one or another social protection scheme.

3.3.3 Form of Assistance Payment

There are several different ways of delivering the social assistance:

- Assistance amounts can be transferred directly to vodokanals;
- Coupons can be allocated to eligible households and used to pay a portion of the household water charges;
- Assistance can be granted as cash supplements to existing poverty benefits.

[41] As a reminder: In 1999 households that were not covered by the family assistance program but scored between 33.7 and 36.0 on means-testing were paid monthly compensation for consumed electric power in the amount of AMD 1,450.

[42] Social Snapshot and Poverty of the Republic of Armenia. Statistical Analytical Report. Yerevan, 2002. - p. 126

[43] Financial Strategy for the Large and Medium Armenian Cities' Water Disposal and Wastewater Treatment Sector. Basic Scenario. OECD / Ministry of Finance and Economy of RA, Yerevan, June 2003 - p. 20.

The *first (cashless)* form of paying assistance suffers several problems:

1) Lack of incentives for benefit recipients to conserve water below the normative amount;
2) Complexity of record-keeping by vodokanals;
3) Possible increase in budget arrears;
4) Lack of guarantees that the recipients of cashless assistance will pay their share of the water bill.

The *second* form is cumbersome and complex and is used only to ensure timely payment for services. The cost of coupons may be high due to the need of protection against forgery.

The *third form* implies that all responsibility for payment for services is borne by customers. Social protection offices would have to guarantee timeliness of assistance and ensure control of service bill payment. Such control could be no more than running regular reconciliation of vodokanals' service customer databases and, upon identification of non-payments for services, sending out notification on assistance suspension and then discontinuation.

In the past, the payment discipline of water and wastewater service customers was very weak. But recent reforms have greatly improved the situation. Most important has been the government's serious stance on the non-payment issue. Comprehensive efforts are required, including influence measures to undisciplined customers. In view of this, timely payment for service and timely termination of assistance in case of arrears are important conditions for granting assistance.

3.4 Alternative Mechanisms of Social Protection Implementation within the Scope of Tariff Reform in Armenia

3.4.1 Possible Forms of Implementing Social Protection Measures and Criteria of their Evaluation

Considering the basic principles of social protection measures and available practices of providing assistance to low income households in the Republic of Armenian, this Chapter examines the following options:

- Rendering assistance through the existing family poverty benefits program;
- Developing and implementing tariff methods of social protection (lifeline and progressive tariff);
- Implementing a special program of assistance in payment for services.

While analyzing alternative social protection measures the following assessment criteria were used:

Coverage and targeting. The range of assistance recipients should be limited only to those who really need assistance in payment for water/wastewater services, namely, low income service customers.

Effectiveness. The amount of assistance should be based on the minimal required consumption level.

Financial realism. The cost of assistance should reflect the availability of budget funds.

Simplicity and cost-effectiveness. The system should ensure administrative simplicity and low administration costs

Water saving. The mechanism should provide incentives for households to use water economically.

Side effects. The system should facilitate alleviation of social tension, free enterprises of their non-intrinsic functions, envisage coordination between assistance granting and timely service bill payment.

To determine the best way to target assistance form, we analyzed advantages and disadvantages of each approach -- determining the range of prospective assistance recipients, as well as assessed costs of assistance granting. The following calculations are based on the analysis of statistics on the existing family poverty benefits program, outcomes of sample research of Armenian households' income and expenses, data on the number of customers of YerevanVodokanal and ArmVodokanal. Results of the comparative analysis are presented below.

3.4.2 Providing Assistance in Payment for Service within the Framework of the Current Family Poverty Benefit Program

We will examine the possibility of rendering additional assistance in payment for water and wastewater services within the framework of the current family poverty benefit program. What are advantages and disadvantages of such an approach?

Advantages

The advantages of developing and implementing targeted assistance through the current family poverty assistance program are evident. This program currently covers approximately 20 percent of the most vulnerable households, it has demonstrated its flexibility and responsiveness to changes in the social situation in society, it is fiscally feasible, and it is familiar to low income households. It is also clear that implementing assistance in this way would have low administrative costs due to existing mechanisms of:

- Determining households eligible for assistance (with necessary improvements);
- Means-testing control and inspection;
- Payment of assigned benefits.

Disadvantages

At the same time, analysis of the family poverty benefit program together with the sample studies of households and polling public opinion point to a need to improve the means-testing procedure in order to screen out better-off households from receiving benefits. Scoring depends heavily on the number of family members belonging to certain social categories, the number of able-bodied family members, and the type of residence. For instance, additional points are given to families with young children, students, a child from divorced parents etc., as well as families residing in earthquake zones even though these categories may include well-off families.

The poor targeting of the family poverty assistance program is shown by data of the target customer study in Yerevan and Vanadzor in June 2003 (Chapter 2, Section 2.3.2.3) and the outcomes of 2002 NSS sample study of household income and expenses (Table 3.8).

Table 3.8. Decile Distribution of Family Poverty Benefit Recipients

Indicators	*Decile groups by average per capita consumer expenditures*										*Total*
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	
Households receiving family benefits	79	75	79	66	65	48	53	53	42	35	595
Share of family benefit recipients in decile, % of total recipients	13.3	12.6	13.3	11.1	10.9	8.1	8.9	8.9	7.1	5.8	100.0

Share of the amount of benefits in decile, % of total amount of benefits	15.2	13.3	14.3	11.5	9.7	7.9	9.2	8.3	5.8	4.9	100.0

Source: National Statistics Service of the Republic of Armenia

Statistics show that recipients of family poverty benefits are represented in each decile group: the ratio of those falling into the lowest five deciles to those falling into the highest five deciles stands at 61.2 percent versus 38.8, while the portion of budget funds spent for them stands at respective 64 percent versus 36 percent. Almost every third household-recipient of family benefits (30.7%) are in 7^{th} – 10^{th} (rather well-off) decile group. The share of budget funds allocated to support rather well-off households in the four top deciles is also rather significant – 28.2 percent. (For details, see Annex 5.)

In all fairness, it should be pointed out that poor targeting of the family poverty benefit program in Armenia is caused by a number of objective reasons related primarily to the large grey sector of the economy and imperfection of the population's income record keeping system. It was this factor which became decisive when choosing a social protection scheme which is based on a categorical principle of means-testing and which uses the family income as a supplementary characteristic to identify family's vulnerability rather than a major criterion. In the future, when the system for keeping records of population's income becomes more transparent as a result of the tax, pension, and accounting reforms, it will be possible to implement a targeted social assistance program employing the total income of a family as the major eligibility criterion.

Another disadvantage is that the amount of poverty benefits is currently not subject to differentiation depending on family income or the score. This results in a significant gap between welfare of poor families that received assistance and those who were refused such assistance. Reduction of benefits to households with the lowest eligible score will make it possible to increase benefits to the most needy households as well as to facilitate a decrease in the number of relatively well-off families applying for benefits.

Box 8. Distribution of Benefit Recipients Based on the Score

Analysis of distribution of households receiving benefits depending on the PAROS-based scoring in 2003 shows that 93,488 out of 140,127 regular benefit recipients (or two thirds) scored between 36.01 and 41.0, with only 5,511 (some four percent) households scoring over 50 points. However, 24,656 households (practically every sixth household) scored between 34 and 36 and did not receive benefits.

Therefore, 118,144 households (accounting for 84.3 percent of all applicants) fall into the 34–41 scoring range. Benefit granting sharply separates this group of households with approximately equal material condition, significantly increasing income of those who received benefits.

Source: Ministry of Social Security of the RA

Among organizational aspects of the family poverty benefit program, it is worth mentioning that under current Armenia legislation, the Ministry of Social Security is not authorized to control activities of regional social security agencies. They are subordinated to local governments and are subject to control only by the Control and Inspection Department of the Ministry of Finance and Economy. This body mainly controls the use of budget funds while the appropriateness of benefit granting to individual households, the benefit calculation accuracy, normally, fall out of control, producing a negative impact on the targeting of the program.

How to Enhance Targeting of Poverty Benefits?

Targeting the family assistance program could be strengthened through:

1) Considering additional factors (particularly, aggregate household income);
2) Making the benefit proportional to the family income or score;

3) Improving and developing the means-testing procedure.

Improving targeting should, first of all, be based on considering additional factors influencing the means-testing score of households, particularly:

- Assistance from relatives abroad;
- Indicators of the condition of household property;
- Rental income from property;
- Income from production and distribution of farm produce;
- Income from entrepreneurial activity (based on the level of tax payments); and
- Income from other sources.

Simply recording income cannot improve targeting. A more comprehensive approach – including using indirect methods of assessing income and welfare already employed in the poverty family benefits system must be used. Such methods must use the score or should make the amount of assistance depend on aggregate household income (including income from entrepreneurial activity, production and distribution of farm produce, and other sources). The most difficult task is to allow for income transfers in the form of aid from relatives from abroad (frequently, as evidenced by the sample household income and expenditure survey of the RA NSS, this is the most significant kind of income among those that are hard to control and reliably assess).

Establishment of the amount of benefits depending on the means-testing score will enable the state to:

- Eliminate the gap between income of households receiving assistance and households that failed to achieve the eligibility score;
- Increase the amount of benefits for the most needy;
- Reduce the number of relatively well-off families applying for assistance.

A series of organizational measures should strengthen targeting of poverty benefits. The Ministry of Social Security should be empowered with control over local social assistance offices' as concerns their compliance with existing procedures for granting and calculating poverty benefits. For this purpose, it is expedient to introduce dual subordination of social security offices: both to local governments and the Ministry of Social Security of the RA. It is necessary to introduce regular checks of social security offices' activities regarding accuracy of family benefit granting. These can be sample checks covering, for instance, five percent of all cases, or comprehensive inspections performed once in several years.

Objectively assessing need can be strengthened by applying sanctions to households that fail to provide full and accurate information when applying for assistance. Under current regulations, if a household is found having supplied false information, it must return assistance received and is illegible for any further social assistance for one year. It would be possible to impose an additional penalty repayment on the household to encourage households to adopt a more conscientious attitude to government social programs. This would probably increase the perceived fairness of social programs.

Calculation of Benefits and Budget Funds for Program Implementation

The amount of assistance must cover payment for a basic level of water supply. If average consumption is between 100 and 140 l/person/day, the value of assistance should be calculated as the cost of minimal consumption, specifically 50 l/person/day. Another option is based on consumption of 75 l per household along with additional 25 l per each household member. To

illustrate this approach, we will calculate assistance for projected tariffs conditional to assistance granting based on social consumption standard: 50 l/person/day which translates into 1.5 m^3/person/month. If assistance is granted to recipients of family benefits, the projected assistance will be calculated under the formula:

$$A_h = T \cdot V \cdot L,$$

where:

A_h - The amount of assistance per household, AMD;

T - Projected tariff, AMD/m^3;

V - Proposed social water consumption standard, m^3/person/month;

L - Average size of a household, persons.

Currently, the tariff for water and wastewater service in Yerevan is AMD 56 per m^3 and, in Vanadzor, AMD 60 per m^3, while the average weighted tariff in Armenia (according to authors' calculation) is AMD 54.9 per m^3.

Table 3.9 shows estimates of the value of assistance per person and per household in 2004 and 2005. Sizes of households receiving family benefits are determined as a ratio of the number of individuals to the number of households receiving family benefits in 2003 for each city and Armenia on the whole. Tariffs are assumed to increase by 100 percent in 2004 and 50 percent in 2005 (see Chapter 2 above).

Table 3.9. Projected Social Assistance in Payment for Water and Wastewater Services in 2004 – 2005

	Projected tariff, AMD m^3	*Social standard, m^3/person/ month*	*Assistance amount, AMD/person*	*Average household size, persons*	*Assistance amount, AMD/ household*
2004					
Armenia	109.8	1.5	164.7	3.4	560.0
Yerevan	112.0	1.5	168.0	3.1	520.8
Vanadzor	120.0	1.5	180.0	3.2	576.0
2005					
Armenia	164.7	1.5	247.05	3.4	840.0
Yerevan	168.0	1.5	252.0	3.1	781.2
Vanadzor	180.0	1.5	270.0	3.2	864.0

As can be seen, the Armenia-wide average monthly assistance per household will be AMD 560 in 2004 and AMD 840 in 2005. Providing assistance in paying for water services to recipients of family benefits will raise the cost of program:

In 2004 - S_1 = AMD 560.0 x 140,127 x 12 = AMD 941,653,440 per annum

In 2005 - S_2 = AMD 840.0 x 140,127 x 12 = AMD 1,412,480,160 per annum

In addition, the cost of family assistance program will rise due to necessary expenditures for implementation of changes to the legislation, organizational and technical support of the program and the public information campaign. Depending on the scope of proposed changes and innovations, these costs are projected to amount to 20 percent of the total assistance in the first year of program implementation and 10 percent in the second year. With consideration for these expenditures, the cost of the program will reach:

2004 - AMD 1,129,984,1 per annum

2005 - AMD 1,553,728,2 per annum

Thus, providing assistance for paying water and wastewater services within the framework of the existing family assistance program will require minimal organizational and administrative costs and will allow rapid implementation.

3.4.3 Tariff Methods of Social Protection

Installing water meters for all Armenian households makes it possible to apply tariff methods of social protection (social tariff for minimal consumption or block tariff). Such measures ensure access to a basic amount of water while encouraging conservation of water for amounts in excess of this minimum. However, the experience of OECD member-countries is that, frequently, tariff measures are not sufficient and additional benefits must be paid to low-income households.

There are two possible schemes for implementing tariff measures:

1) A low tariff for low-income customers for minimal guaranteed water consumption and a higher tariff for other customers;
2) Block tariff: low tariff for all customers for the minimal guaranteed consumption and higher tariffs for higher consumption.

In the first scheme, discounts to low-income customers can be reimbursed to the service provider from the national budget or recovered by increased charges to other customers. Under the second scheme, reduced tariff for lower blocks is cross-subsidized by consumers in higher blocks.

If tariff measures are applied only to low-income customers, then either a new means-testing procedure or one existing within the social security system will need to be introduced or used. Any such tariff measure will require cooperation with social security agencies and synchronization of databases maintained by utility companies and social protection offices. Today, vodokanals and regional social security agencies share information on family benefit recipients who are eligible for discounted water meter installation and debt restructuring. Adoption of a scheme to provide assistance to low income customers of water/wastewater services through lowering charges for services with allowance for established social consumption standards will require development of special software tools to streamline the data sharing process. This does not represent a real challenge in view of current extensive automation of local social security offices and vodokanals in Armenia. However, using tariff methods for protecting low income customers will put additional burden on water/wastewater utilities which will have to perform unusual social agency's functions.

The advantage of applying social tariff is that discounts are given only on actual water consumption. Customers receive bills with a discount incorporated, while the difference has to be recovered from the budget.

Disadvantages of tariff methods are:

- Lack of interest, on the part of discount holders, to save less than 100 l per person per month;
- Dependence on budget funding;
- Additional costs incurred by vodokanals for metering of water consumption by low-income customers; cost validation to receive budget compensation; and data exchange with social security offices.

Applying block tariffs in Armenia is not feasible due to a several reasons. Firstly, they primarily are advantageous to small households while, as evidenced by sample study of household income and expenses by the National Statistics Service of the RA (see Annex 5), these households are better off than larger families. Besides, block tariffs significantly complicate control over accuracy of settlements for water consumed. Water consumption metering and settlements for

services become extremely non-transparent, further complicating the already tense social situation in the country, inevitably leading to a decline in the payment collection rate.

The present study does not focus on tariff measures of social protection associated with two-part tariff, such as, reduction or elimination of fixed charges since the two-partr tariff structure is not used in Armenia. Implementation of this structure will be a time consuming exercise because of a need in developing, testing, and approving relevant methodologies.

Calculation of Assistance and Budget Funds for Implementing the Program

We will look at the scheme under which discounts are provided to low-income customers and the value of the discounts are covered by transfers from the state budget. Obviously, vodokanals can use only data on eligible low-income households that are made available by Regional Social Service Agencies -- i. e. giving discounts only to participants in family assistance program. Calculation of assistance will be based on the following conditions:

- Similar to the scheme proposed in the Tariff Study for YerevanVodokanal[44], we assume that the volume subject to privileged tariff (social standard of consumption) is 100 liters/person/day (3 m^3/person/month);
- Tariffs will rise by 100 percent in 2004 and a further 50 percent in 2005;
- 50 percent compensation is provided on the established water consumption to recipients of poverty benefits (equivalent of 50 liters of water free of charge.)

With a 50-percent reduction of the cost of the established water consumption, projected discounts for water and wastewater services in 2004 and 2005 coincide with amounts of assistance in payment for water and wastewater services proposed in Section 3.4.2 (see Table 3.9).

The cost of the program of tariff social protection measures must be calculated separately for each vodokanal since the cost compensation from the budget will be paid directly to vodokanals. The number of discount holders is equal to the number of recipients of benefits in Yerevan and in other regions of Armenia. According to the State Water Sector Committee, the number of benefit recipients among ArmVodokanal customers stands at 85,697, customers of other vodokanals outside the city of Yerevan – 8,593. The total number of customers-recipients of benefits outside Yerevan stands at 94,290. The average family size is taken from the database of family benefit recipients.

Calculation of the cost of program of tariff measures of social protection (S) is performed under the formula:

$$S = T \cdot V \cdot 0.5 \cdot L \cdot N \cdot 12,$$

where:

T - Projected tariff, AMD/m^3;
V - Proposed water consumption volume subject to a discount, m^3/person/month;
0.5 - Discount
L - Average household size, persons;
N - Number of discount holders, persons.

2004

S_{Y1}=112.0 x 3.0 x 0.5 x 3.1 x 31,358 x 12 = AMD 195,974,957 (Yerevan)

S_{A1}=106.0 x 3.0 x 0.5 x 3.4 x 94,290 x12 = AMD 611,678,088 (other Armenian cities)

[44] Tariff Study - Revised Tariff for Yerevan Water and Sewerage Company. LaboratoRI SpA & WRC, Yerevan, November 2002

$S_1 = S_{Y1} + S_{A1}$ = AMD 807,653,045 per annum

2005

S_{Y2}=168.0 x 3.0 x 0.5 x 3.1x 31,358 x 12 = AMD 293,962,435 (Yerevan)

S_{A2}=159.0 x 3.0 x 0.5 x 3.4 x 94,290 x 12 = AMD 917,517,132 (other Armenian cities)

$S_2 = S_{Y2} + S_{A2}$ = AMD 1,211,479,567 per annum

Thus, the cost of implementing tariff measures of social protection of waste/wastewater services will amount to:

2004 – AMD 807,653,000 per annum

2005 – AMD 1,211,479,600 per annum

3.4.4 Special Program of Social Assistance in Payment for Water and Wastewater Services

There is another theoretical approach to the provision of supplementary assistance in payments for water/wastewater services. It involves introduction of a so-called special social assistance program similar to housing subsidy programs which are successfully implemented in many EECCA countries. Since there is no such program in Armenia at the moment, preparing for implementing the new program will require accomplishment of the following tasks:

- Developing legislative and regulatory frameworks;
- Forming staff of specialists and creating an infrastructure for delivering targeted assistance;
- Designing mechanisms for granting and distributing assistance;
- Designing a means-testing and control system;
- Developing and implementing automated system for registering assistance applications and assignations.

Therefore, designing such a program will lead to duplication of numerous functions that have already been successfully realized in the family benefit program, thus, complicating the social protection system through introduction of one more assistance program.

Mandatory full and reliable record-keeping of households' income, a great challenge at the current stage of Armenia's development, is a prerequisite for successful implementation of such program. Given the relatively small water benefits, administration, organizational and technical costs of the program may well exceed the cost of benefits themselves. For this effect, introduction of a special program of assistance in payment of water/wastewater services can hardly be economically feasible.

At the same time, implementation of the alternative assistance program for water/wastewater customers may be feasible should it cover all communal services. If in foreseeable future the Armenians gain access to the full range of communal services including natural gas and district heating in addition to electricity, water, wastewater, and house maintenance services, then there may arise a need in implementing a social assistance program similar to the housing subsidy program described in Section 3.1.2.

In view of authors' disbelief in feasibility of a special program of assistance to water/wastewater customers at the current stage of the Armenian water/wastewater sector reform, no estimates of benefits and budget cost of the program have been made.

3.4.5 Which Approach is the Most Cost Effective?

Table 3.10 presents a summary of costs associated with implementation of two considered schemes for providing assistance to water/wastewater service customers, namely, the costs of a supplementary assistance within the framework of family poverty benefits program and tariff measures of social protection. Beside the implementation costs, the table shows adequacy of the proposed solutions based on the criteria identified in Section 3.4.1

The projected costs of the proposed measures indicate that *tariff measures* of social protection will be the least expensive. These relative savings reflect the fact that all administrative costs will be in fact borne by vodokanals. Service providers will have to perform functions which are not characteristic to them and find themselves dependent on budget transfers to cover the tariff difference. Besides, our calculations show that under the tariff discount approach the recipient population will be limited to vodokanal customers whereas the supplementary assistance within the family benefit program will also reach low income families in rural areas using their own water sources or imported water. The authors believe that precluding the latter from receiving the assistance would be unfair.

Table 3.10. Projected Costs and Qualitative Assessment of Alternative Measures of Social Protection for Water/Wastewater Customers in Armenia

	Family Poverty Benefits Program	*Tariff Measures of Social Protection*
Projected implementation costs, AMD'000		
2004	1,129,984.1	807,653.0
2005	1,553,728.2	1,211,479.6
Coverage and targeting	+	+
Effectiveness	+	+
Financial realism	++	++
Simplicity	+	+
Water saving	+	-
Side effects	++	+-

The following arguments have been taken into consideration in assessing proposed measures:

1. Coverage and targeting: Both program feature the same potential for improving eligibility criteria;
2. Effectiveness: The share of assistance in household expenditures for services is roughly equal;
3. Being realistic: Accurate estimates of budget costs can be prepared for both programs;
4. Administrative simplicity: Both proposed mechanisms for providing assistance are inexpensive to implement;
5. Water conservation: Payment of assistance under the family benefit program in cash better encourages water conservation by low income customers
6. Side effects: Both solutions ensure alleviation of social tension. However, tariff measures will put additional burden on vodokanals which will have to perform social protection functions.

Comparison of advantages of these programs and costs associated with their implementation indicates that the additional assistance program within the framework of the *existing family*

poverty benefits program is preferable. Implementing this program simultaneously with raising tariffs will allow vodokanals to increase revenues and avoid sharp decrease of water consumption by low income customers facing objective difficulties in paying for water. Unlike tariff measures of social protection, this program will clearly segregate vodokanals' responsibilities for providing services of good quality from government commitments to provide all citizens equal opportunities to satisfy their basic needs. Implementation of such a program will become a vivid indication of the consistent policy of the Government of Armenia aimed at improving quality of life and fighting poverty.

If we consider that the 2003 national budget allocations for direct subsidies to cover financial deficit and recover water/wastewater service providers' costs stand at AMD 2.745 billion, then reduced direct budget subsidies enable the government to pay for the assistance program for low-income households.

3.4.6 Comparison of Water Service Costs Before and After Implementing the Targeted Assistance Program

Table 3.11 presents the calculated average cost of water/wastewater services in Yerevan and Vanadzor per household before meter installation when calculations were based on established consumption standards.

Table 3.11. Average Cost of Water Service in Yerevan and Vanadzor for Families Receiving Family Poverty Benefits (2002)

	Current tariff, AMD/m^3	*Consumption Standard, m^3/person/ month*	*Average household size, persons*	*Service charges, AMD/hh/month*
Yerevan	56	7.5	3.1	1,302
Vanadzor	60	6.0	3.2	1,152

After introduction of assistance in payment for water/wastewater services, with consideration for actual consumption upon availability of meters and projected tariff increases, actual expenses of average household receiving such assistance will equal:

$$E = T \cdot V_i \cdot L - A,$$

where

- E - Actual households' expenses for water service consumption, AMD;
- T - Projected tariff, AMD/m^3;
- V_i - Projected water consumption per person, m^3/person/month;
- L - Average household size, persons;
- A - Calculated amount of assistance per household, AMD.

Calculated actual expenses of households eligible for assistance in payment for water/wastewater services in 2004 and 2005 are presented in Table 3.12.

Table 3.12. Calculated Actual Expenses of Households Receiving Assistance in Payment for Water/Wastewater Services (2004-2005)

	Projected tariff, AMD/m^3	*Projected consumption, m^3/person/ month**	*Average household size, persons*	*Total service costs, AMD/month*	*Assistance per household, AMD/month*	*Service charges, AMD/month*
2004						
Yerevan	112	3.8	3.1	1,319.4	520.8	798.6
Vanadzor	120	3.1	3.2	1,190.4	576.0	614.4
2005						

Yerevan	168	3.8	3.1	1,979.0	781.2	1,197.8
Vanadzor	180	3.1	3.2	1,785.6	864.0	921.6

* Projected consumption by each of cities is determined as an average weighted value of projected consumption by households residing in the private sector and apartments (based on target study of service customers in Yerevan and Vanadzor in June 2003.)

Therefore, even in 2005 when tariffs are tripled as compared to 2003, the actual cost of water consumption by households receiving social assistance will not exceed calculated cost of water service prior to the effective date of the Law on Restructuring Indebtedness.

3.4.7. Financial Implications of Industry Reforms: Cost Benefit Analysis (case of the Yerevan Water Utility)

The purpose of calculations provided further was to compare *YerevanVodokanal revenues* projected for 2004 due to doubling of tariff for services and *expenditures of the National Budget of the Republic of Armenia* for social assistance to low-income customers within the existing family poverty benefits program[45].

The analysis consisted of several stages, each aimed at getting an answer to a specific question.

1. *How will the doubling of tariffs for water and wastewater services impact revenues of the service provider?*

Table 3.13 shows average data on charges and actual revenues of YerevanVodokanal for the services to residential customers for 2002 and projected revenues for December 2003 and December 2004.

The analysis has been based on the assumption that the two-fold tariff increase will be implemented in April 2004, resulting in a two-fold increase of service charges, 20-percent water consumption reduction, and a decrease of the compliance rate from 90 percent to 80 percent.

Table 3.13. Comparative Analysis of Yerevan Vodokanal's Revenues from Residential Customers' Payments (2002 through 2004)

Indicators	*2002 (average per month)*	*December 2003*	*December 2004*
Current tariff	56 AMD/m^3	56 AMD/m^3	112 AMD/m^3
Possible consumption reduction due to tariff increase	x	x	20 percent
Service charges (2002 – real data; 2003-2004 - according to YVK projections but with a consideration for about 75% of the residential customers' share)	371.5 million AMD	180 million AMD	288 million AMD
Compliance rate (2002 – real data; 2003-2004 – projection data)	26 percent	90 percent	80 percent
YVK revenues from residential customers (per month)	95.2 million AMD	162 million AMD	230.4 million AMD

[45] The authors have not made the costs and benefits analysis for 2005 for the following considerations. First, the authors do believe that the 50 percent increase in tariff in 2005 for YerevanVodokanal services is not feasible. Second, even if the tariffs are increased, today it is extremely hard to project the 2005 patterns of actual water consumption and payment collection (i.e. key indicators which are used in the costs and benefits analysis).

Therefore, due to the doubling of the tariffs for water/wastewater services the company's revenues from residential customers' payments in December 2004 will be increased:

- By 42.2% or by AMD 68.4 million per month as compared to the year 2003;
- Almost 2.5 times or by AMD 135.2 million per month as compared to the year of 2002;

2. *How much should be allocated from the state budget to cover the value of social assistance to low-income customers of YerevanVodokanal?*

A tariff increase will create difficulties for a certain portion of households in paying service bill and such households will claim a government social protection.

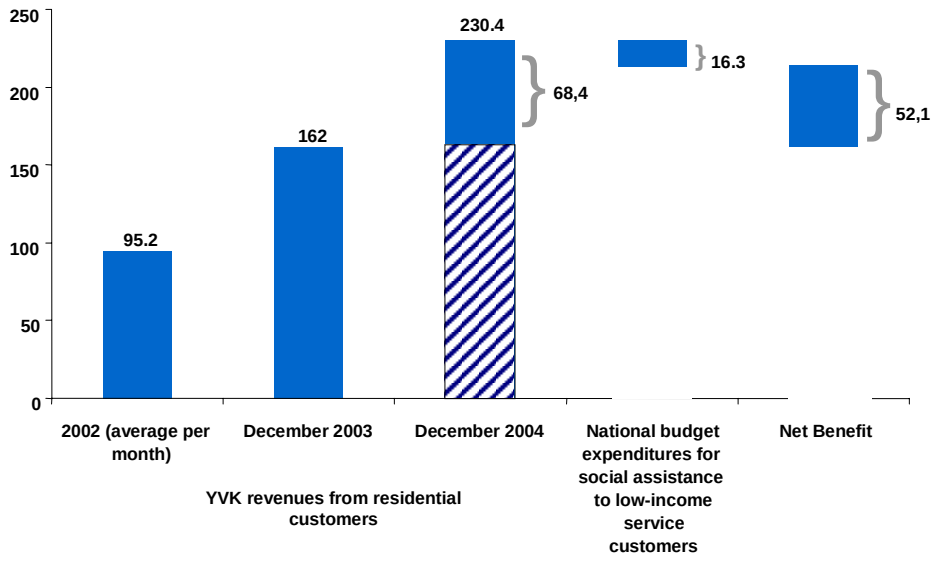
Based on calculations in Section 3.4.2:

- 31,358 customers of YerevanVodokanal are likely to claim social assistance;
- The amount of social assistance will stand at AMD 520.8 person/month;
- The total amount of government funds required for social assistance to low-income households will reach AMD 16.33 million.

3. *Relation between additional benefits of the water utility and additional expenditures of the national budget*

Based on our calculations, additional revenues of YerevanVodokanal (AMD 68,4 million per month) will be about four times over the amount required for social assistance to low-income customers (AMD 16.33 million).

Figure 3.1. Financial Implications of a Two-Fold Increase of Water/Wastewater Tariff in Yerevan Water Utility from a Standpoint of Society in General (AMD million, month)



Therefore, from a standpoint of society in general, the net benefit amounts to AMD 52.1 million per month.

At the same time the combination of a two-fold tariff increase with the implementation of a targeted assistance program for low income service consumers would provide for alleviation of social tension, preserving the stable compliance rate, and would make it possible in prospective for a further tariff increase.

CONCLUSIONS TO CHAPTER 3

1. This chapter reviewed the following options of social protection of water/wastewater customers:
   - Rendering assistance within the framework of the existing family poverty benefits program;
   - Developing and implementing the tariff methods of social protection.
   - Implementing a separate program of assistance in payment for services;
2. The family poverty benefits program, which has been operating in Armenia for five years, currently covers approximately 20 percent of the most vulnerable households. Experience suggests the program is rather flexible and mobile, easily adjustable to changes in the social situation in society and budget funding capability. Implementation of assistance in payment for services within the framework of this existing program will minimize implementation costs associated with:
   - Determining households eligible for assistance;
   - Means testing and auditing;
   - Payment of granted benefits.

   At the same time, the following drawbacks have been identified in the current means-testing procedure under the family benefits program:
   - The program is insufficiently targeted because a number of means-testing scoring criteria capture general household categories, which include both poor and well-off families;
   - All eligible households receive the same benefit. This means that a small change in family circumstances results in large change in benefits;
   - The means-testing procedure is complicated and non-transparent.
3. Installation of water meters in dwellings of all Armenian households makes it possible to apply tariff methods of social protection. The possible tariff measures include:
   - A low tariff for low-income customers for minimal guaranteed water consumption and a higher tariff for other customers;
   - Increasing block tariffs: minimal tariff for all customers for the minimal guaranteed consumption and higher tariffs for higher levels of consumption.

   The scheme under which discounts for services are granted to low-income customers and the value of the discounts is covered through budget transfers to service providers is preferable. This scheme may employ the means-testing procedure incorporated in the family benefits program. Using this form of tariff measure will require cooperating with social security offices and synchronizing databases maintained by vodokanals and social protection offices. At the same time, using tariff methods for protecting low income customers will put additional burden on water/wastewater utilities which will have to perform unusual social agency's functions.

   Application of increasing block tariffs is not feasible in Armenia because they are primarily advantageous to small households, typically not among the most needy. Moreover, increasing block tariffs significantly complicate control over accuracy of billing and paying

for water. Water consumption metering and settlements for services would be non-transparent and difficult to understand, which may reduce the collection rate.

4. There is another theoretical approach to provision of supplementary assistance in payments for water/wastewater services. It involves introduction of a so-called special social assistance program similar to housing subsidy programs which are successfully implemented in many EECCA countries. Given the relatively small water benefits, administration, organizational and technical costs of the program may well exceed the cost of benefits themselves. For this effect, introduction of a special program of assistance in payment of water/wastewater services can hardly be economically feasible. At the same time, implementation of the alternative assistance program may be feasible should it cover all communal services including electricity, gas, and district heating.

5. Projected costs of proposed solutions show that *tariff measures* are the least expensive means of providing social protection. In this case, all costs of administering the program are borne by water/wastewater utilities. However, utility companies become dependent on allocation of budget funds to cover the difference in tariffs.

   Provision of supplementary assistance in payment for water/wastewater services within the framework of *the existing family benefit program* is optimal in terms of the program characteristics and relatively low administration costs. If improved based on the recommendations below, this program may become a reliable tool to alleviate social tension in the process of reforming the Armenian water/wastewater sector.

6. The analysis of benefits from tariff increase and costs associated with a need to provide social assistance to low income service customers accomplished for YerevanVodokanal indicate that doubling the residential tariffs in 2004 is feasible from both economic and social perspectives. According to the projections, the vodokanal revenues from residential customers' payments will reach AMD 230.4 million in December 2004 – almost 2.5 times as much as average monthly revenues in 2002 and 1.5 times as much as total payments collected from the population in December 2003. In other words, the December 2004 revenues are expected to exceed those of December 2003 by AMD 68.4 million. The monthly cost of additional social assistance within the existing family assistance program (AMD 16.3 million) suggests that the financial benefits from raising the residential tariffs will be four times as large as the cost of assistance to low income customers.

CHAPTER 4. RECOMMENDATIONS

Reforms in the water/wastewater sector in Armenia aim at restoring high-quality services to all residential customers and to reverse the chronic loss-making pattern of Armenian water/wastewater utilities, as well as at restoring the confidence of the public in their utilities and at increasing payment compliance.

Armenia has made significant progress in water metering, establishing contractual relations between consumers and water/wastewater utilities, settling huge accounts receivables accumulated over several years, and finally, overcoming the crisis of residential customer's confidence in water/wastewater utilities. The latter is evidenced by the sharp increase in collection rates.

However, revenues of water utilities are declining because households are cutting consumption after installing meters. This, combined with the failure to set tariffs at the true cost of providing water and wastewater services (tariffs have not been reviewed for five years), necessitates an increase in unit consumption tariffs. Since the increased tariffs threatens the ability to pay of the poorest Armenian households, it must be accompanied by a well-considered and well-prepared system of social protection. This should be based on an affordability analysis to estimate the impacts of tariff increases on the well-being of different population groups. Results from such analyses should be used as the basis for permitting tariff increases and for designing social protection measures for vulnerable groups to mitigate the price rise effects. In view of this, we propose the following recommendations on the basis of the performed analysis.

4.1. General Recommendations

Tariff Increase is Inevitable

In order to recover losses of water and wastewater enterprises resultant from widespread installation of water meters and consequent reduction of sales, the tariff for 1 m^3 of water has to be increased at least two-fold at the beginning of 2004. As evidenced by the study of population's ability to pay, customers will be quite able to afford such an increase.

Achievement of full recovery of operational and capital expenditures requires a three-fold tariff increase – this will be possible only upon positive effects of reforms and implementation of an additional assistance program for low-income households.

Complete the Program to Install Water Meters

As the program to install individual meters is completed, particular attention should be paid to low-income households receiving family benefits. The water meter is the best tool to allow poor customers to protect themselves from the full impact of rising tariffs. However, poor families may not be able to afford to buy and install water meters (in many cases more than one meter is required for a residence), even if they may pay in installments. The Government should, therefore, consider partial payment of these costs by the state for families receiving Poverty Family Benefits. Money from the $1.9 million Japanese Government municipal development grant administered by the WB could be used for this purpose.

Implement Social Protection Measures Along with a Tariff Increase

A set of social protection measures have to be implemented simultaneously with the increase of the tariff for water and wastewater services in the country. Since increased tariffs will enable the government to reduce budget funding for vodokanals, a portion of save funds can be allocated to targeted assistance in payment for water and wastewater bill for low-income households. Such a program will help mitigate social tension and allow for keeping up a high compliance rate.

Assistance to low-income customers have to equal the cost of guaranteed minimal consumption, envisaged at 50 litres per person per day.

Continue to Define and Strengthen Contractual Relations between Supliers and Customers

Contract between water/wastewater utilities and their customers puts the relationship on a clear commercial basis -- and is an important prerequisite for increasing compliance. Once all apartments are equipped with meters and contractual relations established with collective consumers (through condominiums or other forms of association of apartment house residents), water/wastewater charges should be based on house meter readings, with the difference between the house meter readings and the sum of readings of individual meters charged to general house expenditures and pro-rated among individuals.

Improve and Put into Legislation the Methodology for Tariff Calculation and Setting

It is necessary to complete the process of organizational development of the Natural Monopoly Regulating Commission empowered with functions of a single regulatory body in the area of water and wastewater services. Particularly, it is necessary to establish the required number and qualifications of its personnel, determine annual operating budget and identify the agency's sources of funding. It is necessary to develop and approve at the national level a respective regulatory framework, particularly, the procedure for pricing centralized water and wastewater services that would include the methodology for calculating tariffs and the procedure their approval.

With individual water meter installations expanding, it is of particular importance to develop the methodology for calculating and applying the two-part tariffs comprised of a fixed component to be paid on a monthly basis by all customers irrespective of water consumption and a variable part depending on the consumption volume.

Institute Reasonable and Enforceable Sanctions Against Non-Payers

Water and wastewater utilities cannot survive financially and provide high quality services unless their customers pay on time. Though Armenia has achieved significant progress in the water tariff collection over recent months, a balanced system of sanctions for nonpayment or late payment needs to be developed in order to keep the collection rate high and stable in the future. Such sanctions may include disconnection of debtors from the services, charging fines for late payment, collection of debts through the courts and even eviction of hard-core non-payers. Generally, it will not be necessary to resort to sanctions extensively. Experience in many countries shows that the very fact that they are provided by law and may be applied is a sufficient incentive for consumers to pay on time.

However, certain constraints on applying severe sanctions to water/wastewater services consumers need to be taken into account. These are:

- Service disconnection should be allowed by law as the last resort against hard-core non-payers -- subject to certain limits. For example, it should be inadmissible to disconnect an apartment house where there are both non-paying and paying consumers. And in case of disconnection from central water supply, the households still need to be provided with a minimum quantity of water necessary to meet basic needs;
- Whereas it is possible to recover through the court the debts of consumers living in private housing by enforced sale of the property, eviction of those who rent apartments of municipal housing stock would have to be accompanied with their relocation to less comfortable dwellings of so-called social housing stock. It must be laid down by law that people not paying for communal services longer than a certain specified period may be evicted from their housing.

Encourage Public Participation in Tariff Setting

Effective communication with consumers is an important task of service providers that should be fully supported by central and local governments. Central authorities, local governments and water/wastewater utilities must provide accurate and plausible information on the sector reform progress, on the service provider financial situation and technical condition, on the tariff levels and the tariff-setting rules, as well as have to inform people of any planned changes in the tariffs well in advance. The public needs to be involved in tariff policy making as well as in decision making on such issues as contractual relations, payment collection practices, long term investment plans, and consumer liability for noncompliance in payment for services consumed.

4.2. Recommendations on Affordability Analysis

Make Affordability Analysis an Integral Part of Tariff Setting

To ensure that the public and political decision makers understand the actual affordability of water charges to residential customers, clear and timely affordability analysis must be an integral part of tariff setting. Estimates of ability to pay and willingness to pay of residential customers must be used as telling arguments during public hearings on proposed tariffs. This will ensure decision making transparency and soundness.

At the same time, public presentation of the outcomes of such estimates will facilitate improvement of public awareness, and will help overcome opposition of certain political forces.

Results of ability to pay and willingness to pay analyses should be used as the basis for designing social protection measures and criteria of eligibility for social assistance.

Methods of Calculation, Sources of Information and Responsibility for Analysis of Population's Ability to Pay (Macroaffordability)

Recommended approach. The best way to analyze the ability to pay of the population as a whole is to determine the average *burden of water/wastewater charges* in the household budget. We recommend using "*monthly average consumer expenditures*" as the measure of "household budgets" because it best represents the disposable resources of Armenians and is a benchmark for poverty measurements.

Sources of information. The official National Statistical Service data on consumer spending and average household size is adequate to carry out a macroaffordability analysis. This data must be supplemented by information from the State Water Sector Committee on average weighted tariffs and average weighted consumption (or average actual consumption by metered households).

Responsibility for performing analysis. Since the procedure for assessing macroaffordability is rather simple and does not require significant time and funds, the responsibility for its performance can be placed upon the StateWater Sector Committee, and later – upon the executive authority that will be empowered with setting tariffs (Natural Monopoly Regulatory Commission.)

Macroaffordability should be assessed *annually* in order to track the course of reforms in the sector and mitigate the issue of service affordability in the country.

Methods of Calculation, Sources of Information and Responsibility for Assessment of Individual Groups of Customers' Ability to Pay (Microaffordability)

Recommended approach. Two approaches are best for analyzing microaffordability in Armenia:

- *Grouping households according to the percentage of water and wastewater charges in total consumer expeditures.* This measures the scale of the problem, showing how many households pay too much relative to an agreed upon affordability criterion.
- *Analyzing the burden of water charges by household quintiles or even deciles, if possible.* This measures the depth of the problem – showing by how much the actual water charges burden exceeds the affordability criterion (both on average and by quintile groups).

Both methods are useful in developing social protection measures for poor households.

Sources of information. These two approaches require conducting a *special survey* of water/wastewater service customers in the city, which will require additional resources. In view of this, microaffordability analysis should be performed only on the eve of significant tariff increase or large investment project implementation (as opposed to annual macroaffordability assessments).

Responsibility for performing analysis. The water and wastewater service pricing procedure should envisage a *mandatory requirement* for vodokanals applying for new tariff approval with respect to justification of the level of proposed tariff in terms of customers' ability to pay. Since vodokanals cannot, on their own, perform such quality analysis, it is expedient to contract consulting companies and research institutes.

Armenia Should Set an Affordability Criterion

At the current stage of water and wastewater sector reforms, it is recommended that Armenia use the affordability criterion at "*four percent of household consumer expenditures*" – the indicator that is recommended by experts of international financial institutions for EECCA region.

Further, considering that the affordability criterion depends on a number of historical, economic, political and social factors its value needs to be reviewed from time to time, taking into account changed conditions. The main tariff setting authority should be responsible for setting a new criterion based on a special analysis of household expenditure structure, consumer price index, level of tariffs for other communal services, etc.

The Tariff Setting Authority Should Also Analyze Willingness to Pay

Analyzing willingness to pay for better services is an important element of the overall affordability analysis. We can recommend the *stated preferences* method, described and used in this document, to analyze the willingness to pay. National and sectorial statistics in Armenia cannot provide information sufficient for determining willingness to pay. Therefore, this can only be estimated based on findings of a *special survey* conducted through interviews.

When almost all consumers have water meters, data will be available on actual water consumption over time. This will allow analysis of *revealed consumer preferences* for water services through calculation of price and income demand elasticities. Today, however, the revealed preferences method cannot be applied due to lack of data.

4.3. Recommendations for Providing Social Protection for Low-Income Households

To protect low-income households from the full impacts of the tariff increases and to encourage full payment compliance, the following social protection scheme offers the best approach ensuring a clear sharing of functions among the state, utilities, and customers:

- The state in its social protection bodies provides assistance to low-income households;
- The utilities provide water and wastewater services; and
- The customers pay for the services they have consumed.

Social Protection for Poor Water/Wastewater Service Customers is Best Provided Through Existing Social Assistance Programs

Based on the analyses of current forms of social protection for low-income Armenian citizens and of options for social protection of water/wastewater customers, it seems most expedient to provide additional assistance to low-income households as payments for water/wastewater services are increased through using the current *Family Benefits Program*. This will allow for making full use of the program capacity (organizational structure, staff of skilled social workers in Regional Social Service Agencies, automation tools and databases, and existing mechanisms of means-testing, data verification and benefit payment).

Improve Targeting of the Poverty Family Benefits Program

To ensure the maximum effectiveness and efficiency of social assistance (to water/wastewater service customers as well as to all poor people in general), the Family Benefits Program should be better targeted. This could be achieved by:

- Taking into account additional factors (specifically, the amount of total household income);
- Granting benefits at an amount that varies according to the household income or neediness score; and
- Improving and developing means-testing procedures.

In the first place, social assistance can be targeted better through *improved record-keeping and qualitative assessment of factors* that have an influence on the extent a household is eligible for a benefit. These factors include:

- Indicators of the household property status;
- Support from relatives living abroad;
- Income from properties leased out;
- Income from production and sale of agricultural produce;
- Income from business activities (based on the level of taxes paid); and
- Income from other sources.

The *indirect means-testing* methods (estimation of incomes from business activities and sale of agricultural produce; possession of real estate, luxuries, expensive household appliances, etc.; verification of information provided by applicant by collation with databases of the tax inspection and registration authorities for real estate and cars) also need to be improved. The current program of spot checks of both data sources and correctness of benefit granting by local RSSAs should be intensified.

It will be very important to make the *benefit amount* dependent on the measure of need. This will eliminate the income gap between those whom a benefit was granted and those who failed to score enough points, and will allow for increasing the benefit amounts for households badly in need of assistance, while reducing the number of comparatively better-off families applying for a benefit.

To improve control over local social security offices' as concerns their compliance with existing procedures for granting and calculating poverty benefits it is expedient to introduce dual subordination of RSSAs: both to local governments and the Ministry of Social Security of the RA. It is necessary to introduce regular checks of social security offices' activities regarding accuracy of family benefit granting.

Use of more severe sanctions against households that withhold or conceal information on their circumstances when applying for benefits may become important for ensuring the objectivity of *means testing*. The Government of Armenia should consider implementing a system requiring return of double the unlawfully-received benefits and disqualification from receiving further social assistance for a period of one year.

Social Protection Should be Contingent on Payment for Water Services

Granting of the additional benefits must be made conditional on *timely payment for water/wastewater services* and existence of *a debt restructuring agreement*. If beneficiaries fail to pay for the services for two or three months, the utility should notify the social protection office which would immediately suspend payment of additional benefits – after providing legal notice. The benefits may be renewed if the debt is repaid within one month.

Eligibility for the Social Assistance on Water and Wastewater Services May Be Extended

Obviously, if assistance is provided through the current Family Benefits Program, then all the program participants will become claimants for the additional benefits.

These potential recipients, however, may be *extended* to include households that failed to score the necessary 36 points to be granted a family benefit (e.g., the households with a score between 33.7 and 36 points, by analogy with compensations for electric power consumed in 1999).

To measure the impacts of alternative eligibility criterion more precisely, the database of the Ministry of Social Security on family benefit recipients should be used as the basis for more detailed analysis.

ANNEXES

ANNEX 1
QUESTIONNAIRE
SURVEY ON AFFORDABILITY OF WATER SUPPLY AND WASTEWATER SERVICES

QUESTIONNAIRE № ☐☐☐☐

Survey on Affordability of Water Supply and Wastewater Services

Town _____ **Town code:** ☐

Code of territorial entity: ☐☐

Household ID number: ☐☐☐☐

Interviewer_____ **Interviewer's ID number** ☐☐

Date of interview: ☐☐ (day) ☐☐ (month) 0 3 **Time:** ☐☐ (hours) ☐☐ (minutes)

1. Do you use the services of the centralized water supply?

Yes 1
No 2 → **Go to question 12**

2. Do you use services of sanitation system?

Yes 1
No 2

3. Please identify the level of your satisfaction with the quality of services?

Type of service	Completely satisfied	Satisfied, but have some remarks	Unsatisfied	Completely unsatisfied	CNA
1. Water supply	4	3	2	1	9
2. Wastewater system	4	3	2	1	9

4. Did the quality of services change within the last year?

	Became considerably better	Became better	Did not changed	Became worse	Became considerably worse	CNA
1. Water supply	5	4	3	2	1	9
2. Wastewater system	5	4	3	2	1	9

5. Please identify your water supply schedule?

Twice a day up to 5 hours ……..	1
Twice a day for more than 5 hours ……	2
On a twenty-four hour basis ……..……	3
No water is available on our flour (house) because of low pressure ……	4

Other ……..	5
CNA ……..	9

6. How often did you have the following problems within the last year?

Problems	Never	Sometimes	Often	Almost always	CNA
1. Disruption of the water delivery schedule	4	3	2	1	9
2. Cutting off the water for a few days	4	3	2	1	9
3. The pressure of water delivery was low.	4	3	2	1	9
4. The water was of low quality.	4	3	2	1	9

7. Please give your perception of the quality of the cold water.

	High quality	Good	Satisfactory	Bad	Very bad	CNA
1. Transparency (presence of admixtures, dredges)	5	4	3	2	1	9
2. Smell	5	4	3	2	1	9
3. Color	5	4	3	2	1	9
4. Taste	5	4	3	2	1	9
5. Content of salts (scale, sediments after boiling)	5	4	3	2	1	9

8. Do you drink water from the tap?

Yes.....	1
Yes, I have to ……	2
No.....	3
CNA ……	9

9. Do you use water from the tap to cook?

Yes	1
No.....	2
CNA ……	9

10. Do you use filter or other means of purification of the cold water?

Yes	1
No.....	2
CNA ……	9

Please ask Question No 11 if the respondent uses means of cold water purification.

11. If yes, please specify the means of purification you use_____

12. Do you use water from other sources?

Yes	1
No.....	2
CNA ……	9

Please ask Question No 13 if the respondent uses water from other sources.

13. If yes, please specify what sources for water you use? *(record all possible sources!)*

Water pumps……...……	1
Artesian wells ……..	2
Well……	3
Imported water ……	4
Other ……	5
CNA ……	6

14. Do you use water heaters in your apartment? (gas heaters, electric heaters, geysers?

Yes.....	1
No, but we plan to	2
No, and don't plan to …..	3
CNA……	9

15. Do you have water-meter?

	Yes	No	CNA
1. At the entrance of your building (for the whole building)	1	2	9
2. In your apartment	1	2	9

Please, ask Question No 16 if the respondent has water-meter in their apartment.

16. What is your monthly water consumption? _____ cub m CNA -1

17. How often did you have system failures within one year in your house…

	Never	Sometimes	Often	Constantly	CNA
1. Water supply	4	3	2	1	9
2. Sewerage system	4	3	2	1	9

18. How would you rate the activities of provision of the population with water supply and sanitation services of….

	Good	Satisfactory	Bad	CNA
1. Water Supply Station	3	2	1	9
2. Local authorities	3	2	1	9

19. What do think are the problems that require urgent solution from the Water Supply Enterprise side? *(please, mention not more than 3 problems)*

Uninterrupted delivery of cold water …….……	1
Improvement of the quality of water ……..	2
Raising the pressure of the water ……	3
Reducing the number of system faults ……	4
Replacement of old pipes ……	5
Better cleaning of drains, foul water……..…….	6
Reducing the cost price of services ……..	7
Installation of meters ……..	8
Other (*specify)* _____	9
CNA _____	10

20. Which of the following statements would best describe your family's financial situation?

We have no money even for food …….....….	1

We have money for food but can not pay for public utilities……	2
We can afford food and public utilities but it is difficult for us to buy cloths and footwear	3
We have money for food, cloths, footwear and public utilities but can not afford buying durable goods ……	4
We can also afford buying durable goods (for example, a fridge or a TV-set) ……	5
CNA ……	9

21. You consider yourself …

Rich …….....…..	1
Well-off. ……..…….. …….	2
With middle level of income ……..……...…..	3
Poor……...	4
Very poor ……..	5
CNA……	9

22. Are you or members of your family eligible and use any privileges on housing and communal services?

Yes.....	1
No.....	2
CNA……..	9

23. Do you receive Poverty Family Benefits?

Yes.....	1
No.....	2
CNA……..	9

24. What do you think, the tariffs on communal services are underestimated or overestimated?

	Underestimated	Correspond to the cost of the services	Overestimated	CNA
1. Water supply	3	2	1	9
2. Wastewater system	3	2	1	9

25. Do you consider that the tariffs for water supply and sanitation system services are very high in view of the current budget of your family?
(please give only one answer!)

This sum is not a problem for our family …….....…	1
Yes, this is a problem for our family but not a very serious one ……	2
Yes, this is a very serious problem for our family ……..….....	3
We are not able to pay this sum ……	4
CNA ……	9

26. How often and in what volume do you usually make payments for water supply and sanitation system services in 2002? *(Please, give only one answer!)*

We paid the whole sum on a regular basis (every month) …….....	1
We paid the whole sum but not regularly (once a few months)	2
We did not pay the whole sum and our debt increased ……	3

We are gradually paying for the debts accumulated for previous periods …….	4
Our family didn't pay for the used services at all …….	5
Other *(mention)*_____	6
CNA ……	9

27. In compliance with the Government Resolution on reconstruction of population's arrears for water supply and sanitation services, the contracts were signed between the users and the Water Supply Stations since December 2002 until April 2003. . Are you aware of this campaign?

Yes, and we signed the contract……	1
Yes, but we didn't sign the contract……	2
No, we haven't heard about it……	3
CNA……..	9

28. Do you have arrears for water supply and wastewater services as of June 1, 2003?

Yes.....	1
No.....	2
CNA……	9

No or CNA – go to question 31

29. If yes, please mention *the amount of the debt* _____ drams CNA -1

30. Why do you have arrears for water supply and wastewater services? *(please, mention all your reasons!)*

I consider that the quality of services is too low in view of the sum to be paid ……	1
Our family is not able to pay because of the low salary or pension ……..	2
Many people do not pay for the used services, so I am not obliged to do it either …….	3
This sum is not a problem for me, I will pay when the time comes ……	4
Other *(mention)* _____…..	5
CNA ……	6

31. What sanctions should be applied to those who do not pay for the used services in your opinion? *(please, mention all your answers)*

To terminate the contract and recover the whole amount of the debt …….	1
Cutting off services to the debtor if possible …….	2
Deduction of debts from the salary (pension) in juridical order ……..	3
Distrainment and sale of the property in juridical order ……..	4
Eviction form the flat, which will be later sold to cover the debts …….	5
No sanctions shall be applied ……..	6
Other *(mention)*_____	7
CNA ……	8

32. Do you think, it is necessary to impose a late payment fee on those who do not pay for the used services in time (regularly)?

Yes.....	1
No.....	2
CNA……	9

33. Do you consider that it is necessary to improve the level of social protection for vulnerable families in case the tariffs for water supply and wastewater services are increased?

No. Family benefits provide reasonable assistance to vulnerable families.....	1
Yes. It is necessary to provide supplementary assistance for the payment for water supply and wastewater services under family benefit program	2
Yes. It is necessary to conduct a separate program of assistance for water supply and wastewater service fees for vulnerable families	3
Difficult to answer.....	4
CNA …….....	9

34. Are you ready to pay more in case the quality of water/wastewater services will improve (for instance, water will be supplied for 24 hours per day, with high pressure and with good quality)?

Yes.....	1
No.....	2
CNA……	9

35. How important are for you the following improvements in water/wastewater services supply?

	Very unimportant	Un-important	Neither	Important	Very important	CNA
1. Improved water quality	1	2	3	4	5	9
2. 24-hour water supply	1	2	3	4	5	9
3. Always good water pressure, which assure the water supply for higher floors too	1	2	3	4	5	9

36. Choose the set of characteristics of the quality of water/wastewater services considering the level of tariff increase, which in your opinion is more suitable for you.

(please, give only one answer!)

1		***2***	
WATER QUALITY: as now		WATER QUALITY: as now	1
SUPPLY: as now		SUPPLY: 24 hours a day	
PRESSURE: as now		PRESSURE: as now	2
COST: PLUS 10%		COST: PLUS 50%	

3		***4***	
WATER QUALITY: as now		WATER QUALITY: no smell, no admixtures, can be used just from the tap	3
SUPPLY: as now		SUPPLY: as now	
PRESSURE: always good pressure		PRESSURE: as now	4
COST: PLUS 50%		COST: PLUS 50%	
			5

5	*6*	
WATER QUALITY: as now	WATER QUALITY: no smell, no admixtures, can be used just from the tap	6
SUPPLY: 24 hours a day	SUPPLY: 24 hours a day	
PRESSURE: always good pressure	PRESSURE: always good pressure	
COST: PLUS 100%	COST: PLUS 150%	

CNA.....9

Questions for interviewers

37. Location in town

In the center	1
Close to the center	2
Far from the center	3
Suburb	4

38. Type of the house

Old house with no conveniences or old private house	1
4-5 –storied house of 60-s with small flats	2
A house built in 20-30s in a good condition	3
A good stone house built in 60-80s	4
Panel 9, 12, 14-storied house with small flats	5
Modern panel or stone house with better flats	6
Private house, cottage with all conveniences	7
Other _____	8

39. What floor is the apartment located on? _____

40. Household is from the basic list (not reserve)

Yes.....	1
No.....	2

Address of the respondent _____

Interviewer _____
(signature)

ANNEX 2
REGRESSION MODEL FOR AVERAGE PER CAPITA WATER CONSUMPTION IN YEREVAN (BASED ON TARGETED SURVEY OF WATER CUSTOMERS OF YEREVAN VODOKANAL, JUNE 2003)

General Form of the Model

Model	*Specifications of model's quality*
$p_n = 4.017 + 0.464 \cdot Kvt\,3 + 0.871 \cdot Kvt\,4 +$ $+ 0.597 \cdot Kvt\,5 - 1.377 \cdot NUM\ 2 - 2.209 \cdot NUM\ 3 -$ $- 2.396 \cdot NUM\ 4 - 2.551 \cdot NUM\ 5$ where p_n - average per capita water consumption, m^3/person/month; $Kvt\,3$, $Kvt\,4$, $Kvt\,5$ - households falling into quintile groups 3, 4, 5 respectively by average per capita consumer expenditures; $NUM\,2$, $NUM\,3$, $NUM\,4$, $NUM\,5$ - households consisting of 2, 3, 4, 5 and more members, respectively.	$R^2 = 0.88$ $F = 20.9$ $F_{крит.} = 2.85$

The following *binary* variables have been used as independent variables:

1. $Kvt\,3$ - a household falls into the third quintile group (1 – yes, 0 – no);
   $Kvt\,4$ - a household falls into the fourth quintile group (1 – yes, 0 – no);
   $Kvt\,5$ - a household falls into the fifth quintile group (1 – yes, 0 – no);
2. $NUM\,2$ - a household consisting of two persons (1 – yes, 0 – no);
   $NUM\,3$ - a household consisting of three persons (1 – yes, 0 – no);
   $NUM\,4$ - a household consisting of four persons (1 – yes, 0 – no);
   $NUM\,5$ - a household consisting of five persons (1 – yes, 0 – no).

Besides these variables that were included in the model, other binary variables were also considered in the process of the study (availability of children, pensioners, employed individuals in a family; location and type of housing, etc.). Their impact upon volumes of average per capita consumption turned out to be relatively insignificant.

Interpretation of Regression Coefficients

Model Parameters	*Value of Parameters*	*Interpretation of Values*
Absolute term	4.017	This is a constant value – average per capita water consumption (m^3/person/month) at zero values of other factor feature (i.e. the volume of average per capita water consumption by households consisting of one member and falling into the first or second quintile group by the income level)
Regression coefficient at $Kvt3$	0.464	For households falling into the third quintile group, subject to other conditions being equal, average water consumption increases by 0.464 m^3/person/month compared to households of the first and second quintile groups.

Regression coefficient at $Kvt4$	0.871	For households falling into the fourth quintile group, subject to other conditions being equal, average water consumption increases by 0.871 m^3/person/month compared to households of the first and second quintile groups.
Regression coefficient at $Kvt5$	0.597	For households falling into the fifth quintile group, subject to other conditions being equal, average water consumption increases by 0.597 m^3/person/month compared to households of the first and second quintile groups.
Regression coefficient at $NUM2$	-1.377	For households consisting of two people, subject to other conditions being equal, average water consumption decreases by 1.377 m^3/person/month compared to households consisting of one person
Regression coefficient at $NUM3$	-2.209	For households consisting of three people, subject to other conditions being equal, average water consumption decreases by 2.209 m^3/person/month compared to households consisting of one person
Regression coefficient at $NUM4$	-2.396	For households consisting of four people, subject to other conditions being equal, average water consumption decreases by 2.396 m^3/person/month compared to households consisting of one person
Regression coefficient at $NUM5$	-2.551	For households consisting of five people, subject to other conditions being equal, average water consumption decreases by 2.551 m^3/person/month compared to households consisting of one person

Model's Quality Indicators

The R^2 determination coefficient and *F*-ratio are the key descriptors of the model's quality.

The R2 determination coefficient reflects the extent of change of the dependent variable (dependent variable dispersion) explained by the model and takes on values between 0 and 1. The closer R^2 is to 1, the better is the approximation of the dependent variable by the linear model.

The F-ratio reflects the extent of correlation between dependent and independent variables. If the calculated value of the F-ratio exceeds the critical Fcr, this is the indication of correlation between the dependent and independent variables.

The indicators of quality of the model presented in the table provide evidence that the correlation between dependent and independent variables is adequately described by the received regression equation.

ANNEX 3
CHARACTERISTICS OF QUALITY OF ESTIMATIONS OF THE MAIN INDICATORS (BASED ON TARGETED SURVEY OF WATER CUSTOMERS IN YEREVAN AND VANADZOR, JUNE 2003)

Characteristics of quality of estimations of the main indicators have been developed while processing data. Some calculation results, separately for Yerevan and Vanadzor, are presented below.

Indicator: "Average per Capita Consumer Expenditure"

Quintile Group	*Average per capita expenditure, AMD*	*Standard Error (SE)*	*Coefficient of Variation CV (percent)*
Yerevan			
1	5,625.87	141.80	2.52
2	9,124.37	91.65	1.00
3	12,528.98	111.50	0.89
4	18,016.41	170.10	0.94
5	38,425.75	1,453.00	3.78
Total	**16,744.28**	**503.94**	**3.01**
Vanadzor			
1	4,566.38	82.72	1.81
2	7,758.99	63.30	0.82
3	10,742.55	130.78	1.22
4	15,210.76	418.75	2.75
5	29,679.94	1,747.48	5.89
Total	**13,591.72**	**986.03**	**7.26**

Indicator: "Average per Capita Water Consumption by Households with Meters"

Quintile Group	*Average per Capita Consumption in Group, m^3*	*Standard Error (SE)*	*Coefficient of Variation CV (percent)*
Yerevan			
1	1.88	0.10	5.11
2	1.97	0.27	13.88
3	2.31	0.18	7.57
4	3.16	0.62	19.53
5	2.59	0.23	8.84
Total	**2.40**	**0.25**	**10.23**
Vanadzor			
1	0.84	0.12	13.90
2	1.31	0.42	31.98
3	1.20	0.15	12.81
4	1.61	0.37	22.67
5	2.35	0.67	28.50
Total	**1.47**	**0.38**	**25.74**

Indicator: "Share of Water Expenses in Consumer Expenditures"
(as of June 1, 2003)

Quintile group	*Share of water expenses, percent*	*Standard error (SE)*	*Coefficient of variation CV (percent)*
Yerevan			
1	5.00	0.23	4.62
2	2.88	0.14	4.68
3	2.12	0.16	7.43
4	1.64	0.10	6.16
5	0.78	0.05	6.53
Total	**2.48**	**0.10**	**4.01**
Vanadzor			
1	4.71	0.34	7.22
2	2.71	0.39	15.06
3	2.20	0.31	13.03
4	1.67	0.08	4.99
5	0.93	0.06	6.30
Total	**2.45**	**0.20**	**8.13**

A coefficient of variation *CV* (relative standard error in the sample) has been used as a characteristic of reliability. The *CV* is calculated under the formula:

$$CV = \frac{SE}{\bar{y}} \cdot 100\%,$$

where *SE* – a standard error in the sample (standard deviation of sample estimations of the $\bar{y}$ indicator).

The value of the coefficient of variation is frequently used as an indicator of data adequacy for analysis. If $CV \leq 10$ percent, then the estimate is considered sufficiently reliable for quantitative calculations; if 10 percent$\leq CV \leq 25$ percent - the estimate is suitable only for qualitative analysis and should be used with discretion (however, there are published data with *CV* reaching 30 and even 40 percent.)

Since the study was performed on the basis of a sample of a complicated design, a replication method of balanced repeated replications (BRR) was used for calculation of quality characteristics. This method is realized in the WesVarPC software package.

Analysis of data quality evidenced that, generally, estimates of the main indicators are sufficiently reliable in the city of Yerevan.

In Vanadzor, the quality of estimates of "Average per Capita Consumer Expenditures" and "Share of Water Expenses in Consumer Expenditures" are also rather reliable. As far as the "Average Water Consumption by Households with Meters" is concerned, its reliability is not good enough. This is explained, particularly, by the fact that the number of households with meters is insignificant (with the Vanadzor sample being generally small, approximately half of the sampled households had water meters installed.)

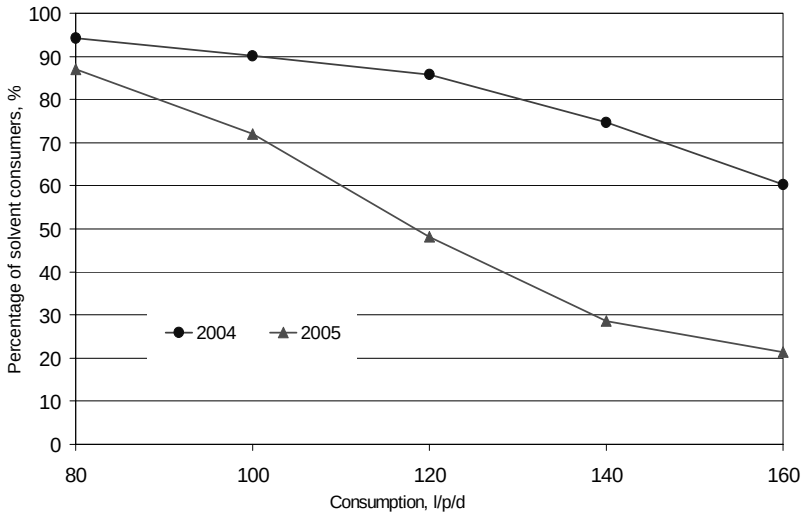
ANNEX 4
DEPENDENCE OF THE SHARE OF SOLVENT CONSUMERS ON THE WATER CONSUMPTION VOLUME

Within the scope of the project, an attempt was made to estimate the interrelation between volumes of actual water consumption and affordability of water and wastewater services. The affordability of services was identified as the share of households whose expenditures for water do not exceed 4 percent of consumer expenditures (so-called "solvent consumers".)

Yerevan

The range of water consumption covered by the analysis fluctuates from 80 to 160 l/p/d. The results of calculations are presented in the following figure and table 4-A.

Figure 4-A. Yerevan: Dependence Of The Share Of Solvent Consumers On The Water Consumption Volume (Forecast, 2004 – 2005)



There is an inverse connection between service affordability and water consumption: the higher the consumption, the lower the share of customers that can painlessly pay the bill.

Particularly, in 2004 after the two-fold tariff increase the share of customers with water expenditures not exceeding 4 percent may reach (Table 4-A):

- 94.2 percent with water consumption at 80 l/p/d;
- and only 60.2 percent with each household member consuming 160 liters of water per day.

In 2005, after the 50 percent tariff increase, the share of solvent consumers will stand at 87.0 percent with average per capita consumption of 80 liters and only 21,4 percent with average per capita water consumption at 160 liters.

Table 4-A. Characteristics of the Dependence of Affordability upon Water Consumption (forecast for Yerevan)

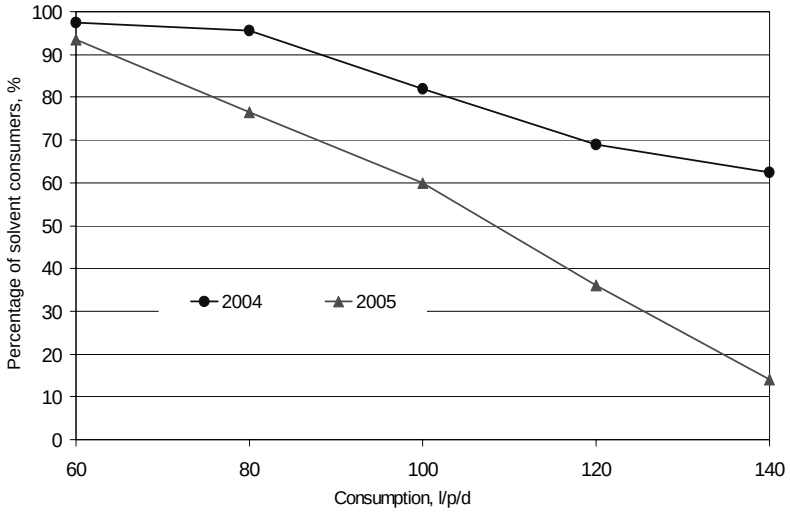
Share of customers whose water bill does not exceed 4 percent of total expenditures (percent)			*A 10-liter water consumption increase leads to a reduction of solvent consumers by … (percent)*		
Water consumption, l/p/d	*2004*	*2005*	*Water consumption range, l/p/d*	*2004*	*2005*
80	94.2	87.0	80-100	-2.05	-7.50
100	90.1	72.0	100-120	-2.10	-11.95
120	85.9	48.1	120-140	-5.60	-9.70
140	74.7	28.7	140-160	-7.25	-3.65
160	60.2	21.4	Average (80-160)	**-4.25**	**-8.20**

Thus, the Yerevan-average increase of per capita water consumption by each 10 liters (in the 80 – 160 l/p/d range) will lead to a reduction of the share of solvent consumers by 4.25 in 2004 and 8.20 percent in 2005.

Vanadzor

The range of water consumption covered by the analysis fluctuates from 60 to 140 l/p/d. The results of calculations are presented in the following figure and table 4-B.

Figure 4-B. Vanadzor: Dependence of the Share of Solvent Consumers on the Water Consumption Volume (forecast, 2004 – 2005)



In 2004 after the two-fold tariff increase the share of customers with water expenditures not exceeding 4 percent may reach (Table 4-B):

- 97.5 percent with water consumption at 60 l/p/d;
- and only 62.5 percent with each household member consuming 140 liters of water per day.

In 2005, after the 50 percent tariff increase, the share of solvent consumers will stand at 93.5 percent with average per capita consumption of 60 liters and only 14 percent with average per capita water consumption at 140 liters.

Table 4-B. Characteristics of the Dependence of Affordability upon Water Consumption (forecast for Vanadzor)

Share of customers whose water bill does not exceed 4 percent of total expenditures (percent)			*A 10-liter water consumption increase leads to a reduction of solvent consumers by … (percent)*		
Water Consumption, l/p/d	*2004*	*2005*	*Water Consumption Range, l/p/d*	*2004*	*2005*
60	97.5	93.5	60-80	-1.0	-8.5
80	95.5	76.5	80-100	-6.8	-8.3
100	82.0	60.0	100-120	-6.5	-12.0
120	69.0	36.0	120-120	-3.3	-11.0
140	62.5	14.0	Average (60-140)	**-4.4**	**-9.9**

Thus, the Vanadzor-average increase of per capita water consumption by each 10 liters (in the 60 – 140 l/p/d range) will lead to a reduction of the share of able to pay customers by 4.4 percent in 2004 and 9.9 percent in 2005.

ANNEX 5

DESCRIPTION OF HOUSEHOLDS ENROLLED IN THE FAMILY BENEFIT PROGRAM (BASED IN A 2002 SAMPLE SURVEY OF ARMENIAN HOUSEHOLDS' INCOME AND EXPENDITURES)

The household income and expenditure sample survey, performed by the National Statistics Service of the Republic of Armenia in 2002, encompassed a total of 4,634 households. 595 households (or 12.8 percent) covered by the study were receiving family benefits.

Analysis of the decile distribution of all 4,634 households provides evidence of certain differences among households falling into different groups. For instance, it is obvious to notice that a family size decrease significantly as we move from the first to the tenth decile, while a ratio of consumer expenditures in the tenth (most well-off) and the first (most needy) decile stands at 12.8 (Table 5-A)

Table 5-A. Decile Distribution of Armenian Households Covered by the 2002 Sample Income and Expenditure Survey

Indicator	*Decile Groups by Average Per Capita Consumer Expenditures*										*Average*
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	
Average Household Size (persons)	4.6	4.5	4.2	4.1	4.0	3.8	3.8	3.5	3.4	3.1	3.9
Average Per Capita Consumer Expenditures (AMD/person/month)	3,370	5,813	7,260	8,588	10,007	11,678	13,786	16,746	22,099	43,291	13,146

General description of benefit recipients. According to the survey results, only about 40 percent of the recipients fall into decile groups one through three, i. e. into the 30 percent the lowest income households (Table 5-B). At the same time, 30.7 percent of households receiving assistance fall into the decile groups seven through ten (or into the 40 percent of the most well-off participants in the survey.)

Table 5-B. Decile Distribution of Households Enrolled into the Family Benefit Program

	Decile Groups by Average Per Capita Consumer Expenditure										*Total*
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	
Number of Households Receiving Family Benefits	*79*	*75*	*79*	*66*	*65*	*48*	*53*	*53*	*42*	*35*	595
Distribution of Family Benefit Recipients by Decile Groups (percentage of all recipients)	13.3	12.6	13.3	11.1	10.9	8.1	8.9	8.9	7.1	5.8	100.0
Share of Households Receiving Family Benefits (percentage of all households in each decile)	17.1	16.2	17.1	14.2	14.0	10.3	11.4	11.4	9.1	7.6	12.8
Average Household Size (person)	4.8	4.3	3.8	3.1	3.4	3.3	3.5	3.1	2.7	2.5	3.6
Average Per Capita Consumer Expenditures	3,460	5,788	7,240	8,552	10,013	11,699	13,594	16,593	22,165	45,436	10,701

	Decile Groups by Average Per Capita Consumer Expenditure										*Total*
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	
of Family Benefit Recipients (AMD/person per month)											
Average Amount of a Family Benefit (AMD/person per month)	1,580	1,616	1,871	2,205	1,718	1,956	1,939	1,990	2,024	2,189	1,839
Share of the Assistance in Average per Capita Expenditures (percent)	45.7	27.9	25.8	25.8	17.2	16.7	14.3	12.0	9.1	4.8	17.2

A targeted survey of water and wastewater service customers, performed within the scope of this project in Yerevan and Vanadzor in 2003, also gives evidence supporting these conclusions: 32 percent of assistance recipients in Yerevan and 41 percent in Vanadzor fall into quintile groups four and five in terms of the level of average per capita expenditures and can be viewed as rather well-off (2.3.2.3.)

At the same time, the share of households receiving family benefits in each decile group is considerable. Particularly, the share of family benefit recipients stand at (Table 5-B):

- 16 - 17 percent of total households in deciles one through three;
- 11 - 14 percent – in deciles four through eight;
- 7.6 and 9 percent – in decile groups nine and ten.

The amount of average monthly poverty benefit stands at AMD 1,839 per recipient, ranging from AMD 1,580 person/month in decile group one to AMD 2,189 person/month in decile group ten (Table 5-B) The share of assistance in average per capita consumer expenditures varies significantly between household decile groups: it is largest in decile one (45.7 percent), ranges from 26 to 28 percent of household consumer expenditures in deciles two through four, and declines to 9.1 in decile nine and 4.8 percent in the tenth decile group.

Thus:

- The most well-off of assistance recipients enjoy the largest amount of benefit (AMD/person/month);
- The most significant (despite being minimal in absolute terms) is the relative amount of assistance for households in decile one.

These results provide evidence that the level of household expenditures (and consequently, household income) has little impact upon the mechanism for selecting households for enrollment into the Family Benefit Program, and confirms the conclusion regarding the *necessity to improve mechanisms for granting family poverty assistance (particularly,the means-testing criteria.)*

Qualitative composition of households receiving family benefits. Families with children prevail in groups with the lowest income (decile groups one through three) – their share stands at 70 to 80 percent of total households in each decile (Table 5-C) while groups with the highest income (deciles eight through ten) see a significant predominance of households consisting of pensioners only (36 to 42 percent.)

Table 5-C. Qualitative Composition of Households Enrolled in the Family Poverty Benefit Program

	Decile Groups by Average Per Capita Consumer Expenditure										*Total*
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	
Households with the underage (percentage of total households in a decile)	81.0	68.0	70.9	54.5	61.5	47.9	64.2	52.8	45.2	45.7	61.7
Households with 3 or more underage children (percentage of total households in a decile)	44.3	30.7	22.8	12.1	21.5	12.5	22.6	20.8	7.1	2.9	22.0
Households consisting of pensioners only (percentage of total households in a decile)	13.9	21.3	24.1	37.9	32.3	31.3	26.4	41.5	35.7	37.1	28.7

According to the statistical data, the number of households with three and more children declines from 44.3 percent in decile one to 2.9 percent in decile ten, while the number of families consisting of pensioners only rises from 13.9 percent to 37.1 percent[46].

One of the major criteria for means testing is belonging of individual household members to a certain socially unprotected category. However, according to a sample survey, the number of families with children and families with children under 2 is approximately equal among both benefit recipients and households that do not receive such assistance. The number of households consisting of pensioners only is three times larger and households with three and more children – two times larger the average among benefit recipients (for comparison, see Table 5-E).

Income structure. The share of salaries, pensions, stipends and benefits in the income structure of family benefit recipients stands at:

- Decile groups one through three – approximately 70 to 80 percent;
- Decile groups four through nine – approximately 50 to 66 percent;
- Decile group ten – 32 percent.

"Assistance from relatives from abroad" – a difficult income item to take account for – is rather significant in deciles eight and ten. Its share in the income structure amounts to 28.3 percent and 36.4 percent respectively (Table 5-D).

It is obvious that, as we move from the first to the tenth decile, the share of pensions in the income structure decreases while the share of relatives' assistance from abroad, despite a clear trend, increases (Table 5-D).

Table 5-D. Income Structure of Poverty Benefit Recipients

	Decile Groups by Average Per Capita Consumer Expenditure

[46] Today, however, there are grounds to believe that the 2003 data will differ from these figures because the 2003 family benefit program was, to a larger extent, focused on providing assistance to families with children.

	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
Income structure (percent):	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
including:										
• Salaries	14.4	19.7	24.9	12.5	26.0	11.8	20.4	10.8	29.1	12.3
• Income from business activity	11.8	9.0	3.4	11.1	6.4	13.2	11.1	13.1	1.7	11.0
• Pensions, stipends	21.5	24.3	20.5	18.7	17.4	20.3	15.0	14.8	17.7	9.1
• Family benefit and other types of social assistance	35.7	35.1	31.5	25.5	23.2	24.3	20.8	17.6	15.7	10.7
• Relatives' assistance from abroad	4.8	1.6	8.7	17.5	2.8	5.4	8.2	28.3	9.5	36.4
• Income from agriculture	4.7	1.8	0.2	2.0	9.0	3.0	1.8	5.5	1.4	2.7
• Other	7.1	8.5	11.0	12.7	15.2	22.0	22.7	9.9	24.9	17.8

Table 5-E contains some comparative characteristics of households receiving family assistance and households that do not receive such assistance.

Table 5-E. Comparative Characteristics of Family Benefit Recipients and Households that Do Not Receive Assistance under the Family Benefit Program

Indicators	*Households*	
	Receiving Family Benefits	*Not Receiving Family Benefits*
Average household size (persons)	3.9	3.6
Average per capita consumer expenditures (AMD/person/month)	13,475	10,701
Average consumer expenditures per household (AMD/month)	52,958	38,360
Share of households with the underage members (percentage of total families)	61.2	61.7
Share of families with 3 and more underage children (percentage of total families)	12.6	22.0
Share of families with children under 2 years old (percentage of total families)	10.3	9.1
Share of families consisting of pensioners only (percentage of total families)	9.0	28.7
Income structure (percent): Including:	100.0	100.0
• Salaries	40.1	18.1
• Income from business activity	15.8	9.2
• Pensions, stipends	8.1	17.7
• Family benefits and other types of social assistance	0.3	23.9
• Relatives' assistance from abroad	15.4	13.0
• Income from rent	0.2	-
• Income from agriculture	6.7	3.2
• Other	13.4	14.9