

**EAP Task Force**



**IMPLEMENTATION OF A NATIONAL FINANCE STRATEGY  
FOR THE WATER SUPPLY AND SANITATION SECTOR  
IN ARMENIA**

**ADVISING THE ARMENIAN WATER AUTHORITIES ON THE DESIGN  
AND MONITORING OF A SOUND TARIFF POLICY (TASK 3)**



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## FOREWORD

In 1993, the Task Force for the Implementation of the Environmental Action Programme for Central and Eastern Europe (EAP Task Force) was created to support the integration of the environment into the broader process of economic and political reform in transition economies. Its secretariat was established in the OECD's Environment Directorate. With the enlargement of the European Union, and since the 1998 Aarhus conference, the EAP Task Force's work has been focused on the countries of Eastern Europe, Caucasus, and Central Asia (EECCA).

Under the aegis of the EAP Task Force and in cooperation with the Danish government, the OECD has developed a methodology to inform policy dialogue on water supply and sanitation sector. In EECCA countries, considerable investments are required to improve the quality of the service and the environmental performance of the sector; clear priorities and targets need to be set to guide both countries' own action programmes and multi-stakeholder partnerships. The methodology entails setting measurable, realistic and time-bound policy targets in the sector, measuring the costs (investment and operation and maintenance) associated with these targets, assessing the financial resources available to cover these costs, and developing scenarios to close the potential cash flow gap (adjusting targets and/or time schedule, or raising additional revenues).

This report documents the implementation of such a project in the Republic of Armenia. It consists of three parts each published in a separate volume: integrating the financial projections into budgetary decision making at the national level (Task 1); increasing the reliability of investment needs assessment, using robust methods to assess, manage and forecast demand for water supply and sanitation services (Task 2); and ensuring that tariff policies are sustainable from an economic and social point of view (Task 3). An overall executive summary draws conclusions on the project as a whole. The main results of each task are presented in distinct executive summaries. The project entailed two additional tasks which are reported separately: disseminating a tool to facilitate financial planning in water utilities (Task 4) and devising a method to collect data to extend the finance strategy to rural areas in Armenia (Task 5).

Xavier Leflaive and Alexandre Martoussevitch (OECD) have managed the project. A consortium was commissioned to implement the project (Tasks 1-3), with the Institute for Urban Economics (IUE), Moscow, leading the work on task one, and Municipal Development Center (MDC), Kiev, leading on tasks two and three. Sergei Sivaev (IUE) served as project coordinator. The project team included Alexei Rodionov, Marina Shapiro and Ilya Mescheryakov (IUE), Aliona Babak, Tamara Hipp, Oleg Tsarinnik, Michail Sharkov, Olga Romanyuk, Hasmik Ghukasyan and Alexander Kucherenko (MDC). Valuable comments were provided by Brendan Gillespie and Peter Borkey (OECD).

The project has entailed a close cooperation with the State Committee of Water System (SCWS) and the Ministry of Finance and Economy (MoFE) in Armenia. Many officers and experts contributed to the project, and we thank all of them, and specifically Gagik Khachatryan, Mger Mkrtumyan and Liana Karapetyan (SCWS), Ruben Davtyan and Hrayr Yesayan (MoFE), Astghik Minasyan (Ministry of Labour and Social Affairs), Armen Arshakyan and Garegin Baghramyan (Public Services Regulatory Commission), Patrick Lorin and Kamo Aghababyan (SAUR/Armvodocanal), Suren Poghosyan (ATOS Consulting).

The whole project was financially supported by UK DFID. Lessons learnt from this project, on policy and method, are relevant to most EECCA countries and beyond.

The views expressed in this report are those of the authors and do not necessarily reflect those of the OECD, its member states, UK DFID, or the Armenian government.

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## List of abbreviations

AMD	Armenian Dram
ATP	Ability to Pay
CJSC	Closed Joint Stock Company
EBRD	European Bank for Reconstruction and Development
EECCA	Eastern Europe, Caucasus, and Central Asia ( <i>region</i> )
FBP	Family Benefit Programme ( <i>income support of poor households in Armenia</i> )
GPOBA	“Global Partnership for Output Based Aid” World Bank Programme
IBT	Increasing block tariffs
ILCS	Integrated Living Conditions Survey
MFE	Ministry of Finance and Economy
MLSI	Ministry of Labour and Social Issues
NSS	National Statistics Service
OECD	Organisation for Economic Co-operation and Development
PFBP	Poverty Family Benefit Program
PSRC	Public Services Regulatory Commission
PSU	Primary Sample Unit
RA	Republic of Armenia
SAUR S.A.	ArmVodokanal Management contract holder
SCWE	State Committee of Water Economy under the Government of Armenia <sup>1</sup>
USAID	United States Agency for International Development
UfW	Unaccounted-for-Water
WB	World Bank
WSS	Water supply and sanitation
WTP	Willingness to Pay

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<sup>1</sup> In official documents in English the Committee is also called the *State Committee of Water System* (SCWS).

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## **EXECUTIVE SUMMARY**

### **IMPLEMENTING A NATIONAL FINANCE STRATEGY FOR THE WATER SUPPLY AND SANITATION IN ARMENIA**

In 2003-04, the State Committee for Water Economy (SCWE)<sup>2</sup> and the Ministry of Finance and Economy (MoFE), in co-operation with the EAP Task Force, designed a Finance strategy (FS) for urban water supply and sanitation (WSS) in Armenia. The strategy (hereafter FS-2004) has contributed to the establishment of realistic priorities, promoted sound financial planning in WSS, provided an input to the budgetary process and helped reform water tariff policy. Key objectives of the present project were to update the Finance strategy and help SCWE implement it by:

- Linking the strategy to the budgetary decision making process;
- Increasing the reliability of investment needs assessment, using robust methods to assess, manage and forecast demand for water supply and sanitation services;
- Ensuring that tariff policies were sustainable from an economic and social point of view.

#### **Rationale for updating the Finance Strategy**

Several factors called for the revision of the initial strategy: new opportunities generated by the rapid economic growth and the concomitant rise of financial resources in the Republic of Armenia (RA); and developments within the water sector, including higher-than-expected operation and maintenance costs, and tariff collection rates that failed to reach expectations.

The institutional context had also changed. In particular, Armenia has engaged in a revision of its budgetary decision making process, and of the relationship between line ministries and the Ministry of Finance and Economy. The pilot implementation of a Medium-Term Expenditure Framework has provided an incentive to improve medium-term planning in government agencies. Revision of the Finance Strategy was an opportunity to contribute to the new public expenditure planning process by providing the SCWE with reliable information and consistent financial simulations on which it could base its dialogue with the MoFE.

The Finance Strategy has been designed and updated using the FEASIBLE tool initially developed by the OECD/EAP Task Force secretariat in co-operation with Denmark.

#### **Feasibility of Development Scenario**

WSS infrastructure in Armenia is often oversized, deteriorating and inefficient, while most of wastewater treatment plants are not operational. Based on a dialogue with the main stakeholders, a development scenario was defined for water supply and sanitation in Armenia to 2015.

Specific development targets for water supply and sanitation were established, consistent with the internationally-agreed Millennium Development Goals on water supply and sanitation and with the Poverty Reduction Strategy Paper (PRSP) approved by the Armenian government in 2003: rehabilitating

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<sup>2</sup> In various documents in English the committee is also named as State Committee of Water System (SCWS)

the water supply system of Yerevan; avoiding the decay of infrastructure in all other cities; gradually recovering water supply to 15-24 hours per day; extending sewerage services to city dwellers and ensuring effective mechanical treatment of wastewater.

The analysis conducted for the project suggests that this Development Scenario would be feasible only if:

- Over the 2006-2016 period, the public budget allocated a total of 170.8 billion dram (or 15.5 billion dram - 31 million euro - per annum, on average) for WSS infrastructure rehabilitation and development;
- Households allocate 2.5% of their average income to WSS services;
- The collection rate for water bills increases from 60% in 2006 to 95% by 2010; this would require, *inter alia*, a wide public-information campaign to enhance consumers' willingness to pay;
- Water losses per kilometer of network are reduced by 50% (and come close to the Russian benchmark, though still well above West European level);
- Infrastructure is rehabilitated and rationalized by adjusting its capacity to present and future demand, with a view to optimizing capital and operational expenditure.

These assumptions are mutually supportive: e.g. a lower collection rate would require either additional claims on the public budget, or a higher share of household income to be allocated to water.

Under these assumptions, from 2010 onwards, budget subsidies will not be needed to cover operational deficits of water utilities. After 2011, user charges will fully cover operational costs and partially cover capital costs for repairs, re-investment (amortization) and renovation (up-grade). However, until 2015, investments in WSS infrastructure are expected to be financed mostly from the public budget and by debt.

### **Measures to facilitate the implementation of the strategy**

A policy package has been designed to facilitate the implementation of the development scenario and the development of sustainable policies and programmes for WSS in Armenia.

#### ***Adapt the performance of the SCWE***

The successful implementation of the Finance Strategy requires stable support from the central budget. The SCWE would need to secure a sufficient and stable amount of budgetary resources via the Medium Term Expenditure Framework. To do so, the SCWE will have to demonstrate that its proposals meet the criteria defined in the Medium Term Expenditure Framework procedure; in particular that WSS projects contribute to achieving the objectives of the Poverty Reduction Strategy of Armenia.

This requires the SCWE to monitor progress towards water-related MDGs and to demonstrate that projects selected for public funding contribute to closing the gap; it should assess (*ex ante* and *ex post*) the outcomes of investment projects, using the indicators defined in the PRSP to monitor the proportion of the population having access to safe water and basic sanitation. In addition, the SCWE should demonstrate that investment in water supply and sanitation contributes to poverty reduction, by assessing the social and economic benefits from improved public health accrued from safe water and basic sanitation in the Armenian context. Demonstrating that WSS projects contribute to the PRSP would also help to mobilize donor and IFI support.

To ensure effective implementation of the Finance Strategy, the SCWE should:

- Strengthen its capacity to plan, and to implement plans. The SCWE should develop a comprehensive program for WSS in Armenia which would integrate overall sector development targets and the Finance Strategy with all individual investment projects and pipelines, rather than plan piecemeal improvement of individual facilities and WSS networks in selected cities and regions of the country.
- Implementation of the comprehensive program for WSS and the Finance Strategy should be linked to improved administrative procedures. SCWE should coordinate closely the actions of all stakeholders, including utilities and IFIs to make sure they contribute to the priorities set by the Armenian government for the water sector. In addition, procedures to develop and to select priority investment projects should be improved, enhancing the consistency of decisions and the sequencing of project implementation. This would also strengthen the Committee's control over the projects financed by the international community;
- Create incentives, at all levels, for stakeholders to perform and to contribute to the overall objectives. At the central level, performance-based budgeting can contribute to this. At utility level, performance-based contracting can provide such an incentive; current experience of the SCWE in this domain has been reviewed, and recommendations developed;
- Report on achievements and progress against agreed targets and objectives, to secure additional political and financial support. A system is needed to monitor and evaluate the condition of WSS, the outputs of modernization and development projects, and the achievements of WSS enterprises. This would rely on a strengthened information basis for administrative decisions in WSS.

Such an ambitious package can only be implemented if the State Committee for Water Economy, as the single agency working in the sector, is considerably strengthened: responsibilities of the Committee, its departments and staff should be clarified and/or revised, capacity to initiate project proposals, or to monitor project implementation should be strengthened.

### ***Better assess investment needs***

The Finance Strategy suggests that investment needs could be cut, if demand for water was better managed and the share of unaccounted-for-water was under control. In turn, this would save capital costs and optimise the use of financial resources for operation and maintenance.

Appropriate methods and tools for achieving these goals include water mass balances and water audits, the reduction of leakages and uneconomic uses of water, and improving metering and accounting. They have been tailored to the Armenian context and applied in two pilot cities: Echmiadzin and Hrazdan, with the support of the utility servicing these settlements.

Capacities required for wastewater collection and treatment in these two cities were measured, and priority projects for investment were identified and described in the Project concept review memorandum format used by EBRD.

Application of the proposed water demand management tools can reduce the volume of water abstracted from the aquifer. It can also help to cut down the volume of wastewater submitted for treatment to the wastewater treatment plant. With time, improvement of water consumption metering and accounting should ensure availability of reliable data inputs to assess the required capacity of wastewater treatment facilities when planning capital improvements.

These data are also a prerequisite for reliable financial planning (at national and local levels) and for tariff calculations.

### ***Adapt tariff policies and social safety net to ability-to-pay and willingness-to-pay***

The Finance Strategy has indicated that the Development Scenario could be implemented if households allocate no less than 2.5% of their average income to WSS services. This requires a sound tariff policy that generates sufficient and stable revenues, and takes account of the ability-to-pay of user groups.

Analysis based on available statistics and additional data collected in two pilot cities has indicated that:

- If water consumption is metered, then the tariff increases anticipated by utilities are affordable by more than 90% of the population in the pilot cities; this essentially results from the sharp decrease in households' global expenditure for WSS services after installing meters, and rapid growth of household disposable income, fuelled by rapid economic growth and poverty reduction measures;
- The current social safety net which provides income support to most poor households is adequate to mitigate the adverse consequences of tariff increases for the poor. Such households would benefit from installation of water meters in their dwellings, as this would help them to manage their water bills. Therefore, it would be expedient to mobilise additional financial resources from the public budget and donors for installation of water meters in all poor households.

In the medium term, some measures should be taken to adapt the institutional system which implements and monitors the water tariff policy in Armenia. First, tariff revisions should be linked to service improvement; this is a prerequisite to enhance households' willingness-to-pay. Second, the data basis for the calculation of tariffs should be improved; in particular, the quality of water meters and customers data-base should be enhanced, so that they produce reliable information on water consumption. Third, systematic ability-to-pay assessments should be included into the tariff revision procedure; this would allow the social safety net to be adapted to changing circumstances.

### **Further steps**

The project has indicated that a Finance Strategy can support a policy dialogue on urban water supply and sanitation policy among key stakeholders. This approach will be extended to rural areas, which is envisaged in a companion project, implemented in the framework of the EU Water Initiative.

The project has also indicated that the implementation of the Finance strategy heavily relies on planning capacity at local and national levels:

- The project has illustrated how water audits and water mass balances can contribute to producing reliable data on water demand and on capacity of infrastructure required to meet the demand, thus providing a remedy to the chronic oversizing of WSS infrastructure in the country;
- The project has confirmed that reliable data on revenue streams is a prerequisite for a sound and sustainable tariff policy. An additional module of this project, which is reported separately, has contributed to strengthening the financial planning capacity at the utility level, using the Financial Planning Tool for Water Utilities (FPTWU), developed by the EAP Task Force and tailored to the Armenian context;

- Securing sufficient and stable revenue streams from consumers, the central budget and the donor community is a pre-requisite for effective financial planning and implementation. In the medium term, this capacity will be a requisite to attract private investors.

The lessons learnt from this project, on policy and method, are relevant to most EECCA countries which also have oversized and deteriorating infrastructure, unsustainable tariff policies, and poor planning capacity.

**EXECUTIVE SUMMARY**  
**ADVISING THE ARMENIAN WATER AUTHORITIES ON THE DESIGN AND MONITORING**  
**OF A SOUND TARIFF POLICY (TASK 3)**

**Scope of the project**

This Task 3 addresses three intertwined issues which are topical for the implementation of a Finance Strategy for water supply and sanitation in Armenia: i) the affordability of the tariffs envisioned in the scenarios; ii) the reform of the tariff revision procedure, to take account of ability-to-pay and willingness-to-pay assessment, so that revised tariffs will be affordable in the future; iii) the improvement of the existing social safety net to ensure that it will mitigate the consequences of tariff increase for the poor.

A detailed field study was undertaken in two pilot cities, Echmiadzin and Hrazdan, to supplement existing statistics and provide detailed and reliable information on affordability and the needs for social assistance. The results supported a dialogue among key stakeholders in Armenia on affordable tariffs, and on the appropriate modes of social assistance to the poor.

**Affordability of urban water services for households**

Affordability of water supply and sanitation services in the two pilot cities was assessed using two approaches:

1. households were grouped in accordance with the share of water service charges in their consumer expenses; and
2. the water charges were analysed by household quintile income groups. The affordability threshold was set at 4% of the household consumer expenses.

This method was used to assess the affordability of the 2005 tariffs and of new tariffs considered for 2007-08.

In 2005, 12% and 20% of households in Echmiadzin and in Hrazdan, respectively, had difficulties paying for WSS services. Families with the lowest incomes (20% of the total number of surveyed households) allocated 3.5% and 6.7% of their consumer expenses to water in Echmiadzin and in Hrazdan, respectively.

Affordability was higher in Echmiadzin than in Hrazdan, despite lower household income in the former city, partly because 91.8% of households were metered (versus 55.4% in Hrazdan). Metering helps to reduce consumption and control expenses on water. It was also found (see Task 2) that due to their poor quality, meters do not measure the entire volume of water consumed.

The new tariff scenario envisages that tariffs will increase by 30% in 2007 (as proposed by ArmVodokanal in July 2006), and by 15% in 2008, to cover operation and maintenance costs. Calculations were based on the following hypotheses: real incomes of the population will increase by 6% annually; 100% of consumers will be metered; billed water consumption in 2007 and 2008 will increase up to 80-90 litres/person/day in Echmiadzin and 60-80 litres/person/day in Hrazdan, compared to 62 and

34 litres/person/day in 2005, respectively.

Based on these assumptions, 8% of households in Echmiadzin and 14% in Hrazdan will need social support in 2007 to foot the water bill. In 2008, this share will be 14.5% and 5.3% respectively. In Hrazdan, the installation of meters could compensate for the rise in actual consumption; this is not the case in Echmiadzin, hence the expected need for further income support in this city.

This indicates that metering, in conjunction with a robust increase in households' disposable income, contributes to the "user pays" principle, according to which revenues from user charges cover the costs of the service. This also indicates that affordability is an issue in Armenian cities and that the existing social safety net (including the Poverty Family Benefit Program) has to be further improved and better targeted to the right user groups.

In Armenia, the Water Code requires that the consumers' ability-to-pay be monitored. However, no institution carries out such assessments. In particular, the tariff revision procedure does not include affordability assessments. Institutions involved in the policy dialogue facilitated by the project have agreed that affordability assessments were appropriate and have discussed who should undertake them in the future on regular and/or on *ad hoc* basis. Stakeholders have generally agreed that such an *ad hoc* assessment should be undertaken if and when water utilities request for substantial tariff increases, or major investments are envisaged. Rules should be set establishing who is responsible for the ability-to-pay assessment (water utilities and sponsors of investment projects, and/or the State Committee of Water System and National Statistical Agency) and how such studies would be funded.

### **Social Protection of Consumers for WSS Services in Armenia**

The analyses above indicate that the first step to protect poor water users is to install water meters, as this enables consumers to control their expenditures. Now, additional social protection is needed.

In Armenia, three different ways can be considered to channel social support to urban water users: assistance for service payment within the framework of the Poverty Family Benefit Program; social tariffs; or a special program of assistance for service payment.

Analyses suggest that, on the one hand, increasing block tariff for water supply and sanitation is not efficient, as that assistance is not targeted to the poor. On the other hand, a special program for water supply and sanitation would be too costly to run, for a relatively small benefit.

The conclusion was that the existing Family Benefit Program is an adequate mechanism to provide protection for vulnerable social categories in the course of reform implementation. It has a flexible system of family needs' assessment; and it is supported by reliable and comprehensive databases. And there is some room for further improvement of the program towards better targeting to the poor.

However, in the long run, once the immediate goals of poverty reduction in Armenia are achieved, the country will need to develop a comprehensive program for communal services allowance, dealing with all utilities (including electricity, gas, central heating, water supply and sanitation) and housing maintenance.

### **Recommendations on Tariff and Social Protection Policies**

The tariff regulation system in Armenia has a number of strengths:

- Existence of a single, public regulator – the Public Services Regulatory Commission;
- Adoption in 2004-2005 of the legislative framework necessary for the regulation of water tariffs

(in particular, tariff calculation methods and tariff revision procedure);

- Uniform tariffs for all consumer groups served by the same water company (no cross-subsidisation of households by other consumer groups);
- Flexibility of pricing methodology, with a possibility for the utility to propose new pricing methods and new tariff structures;
- Absence of water consumption norms for households. Since July 1, 2005, the volumes of water and sewerage used for tariff calculation are based mainly on actual consumption measured by water meters.

On the other hand analyses have revealed that the uniform tariff effectively results in some “hidden”, non-transparent and not always fair cross-subsidisation between households living in different geographic areas.

The following reforms could further improve the tariff policy, taking account of consumers’ ability and willingness to pay for water services:

1. Reform the procedure to revise tariffs, to include ability and willingness-to-pay assessments;
2. Establish in the tariff calculation methodology that asset depreciation and return on investment will be gradually included in the tariffs;
3. Set tariffs which drive water companies to improve their efficiency; the current “*cost plus*” pricing method fails to do so;
4. Improve mechanisms to ensure fair compensation to water companies of economically justified costs associated with providing water/wastewater services to different consumer groups; the present mechanism of state subsidies to water companies does not meet this requirement, as the subsidies benefit all consumer groups, and are not properly targeted;
5. Equip all low-income consumers with individual water meters - it would be expedient to mobilise additional financial resources from the public budget and donors for installation of water meters in all poor households;
6. Improve water metering and customer data-base to support financial planning by water companies; deficient metering of water consumption hampers the accuracy of water sales forecast and of billing of metered consumers.

## CHAPTER 1: REGULATION OF WATER AND WASTEWATER TARIFFS IN ARMENIA

### 1.1 Regulation of Water & Wastewater Tariffs

#### *Water & Wastewater Tariff Legislation*

The key regulatory requirements to calculation, setting and revision of tariffs for drinking water supply, wastewater collection and wastewater treatment in Armenia, as well as price regulation powers of public regulatory bodies are defined in the following legislative and statutory acts:

- Water Code of Armenia, Articles 14, 38, 79, and 791;
- Procedure for Establishment and Revision of Water & Wastewater Tariffs in Armenia approved by the Public Services Regulatory Commission (Resolution No. 97H of 9.08.04).
- Tariff Setting Methodology for Water Supply, Wastewater Collection, and Wastewater Treatment approved by the Public Services Regulatory Commission (Resolution No. 33-H of 5.04.05).
- Rules for Drinking Water Supply and Sewage, Water Supply and Sewage Model Contracts, Technical Specifications Setting Procedure for Connecting to Water Supply and Sewage Systems approved by the Government of Armenia (Resolution No. 130-N of 22.01.04).
- Annexes to Resolution No. 130-N of 22.01.04 approved by the Government of Armenia (Resolution No. 2250-N of 22.12.05).

An independent regulator – the Public Services Regulatory Commission (herein after the Commission)<sup>3</sup> – sets tariffs for each regulation agent acting in the urban water sector.

On 9 February 2001, the Government of Armenia issued its Resolution No. 92 to form **the State Committee of Water Economy** under the Government of RA. According to its charter, the Committee shall implement the government policies on the use and management of water systems and submit its proposals on the regulated tariffs to the Commission.<sup>4</sup>

Today, the Commission regulates the operations of five water companies:

- *YerVodokanal CJSC* (drinking water supply, water sewage, wastewater treatment);
- *ArmVodokanal CJSC* (drinking water supply, water sewage);
- “*Nor Akunk*” *CJSC* (drinking water supply, water sewage);

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<sup>3</sup> The Commission was set in Armenia in 1997; however, it started regulating tariffs and setting of minimal service quality requirements for water companies only in February 2004. The Commission consists of 5 members appointed by the President for 6 years with annual rotation.

<sup>4</sup> Para 13 of Article 12 of the Water Code of Armenia.

- “Shyrak Vodokanal” CJSC (drinking water supply, water sewage);
- “Lori Vodokanal” CJSC (drinking water supply, water sewage);

Table 1<sup>5</sup> below describes the current water tariffs established by the Commission in 2006:

**Table 1. Water &Wastewater Tariffs in Armenia, on July 2006 (AMD/m3, VAT included)**

Service	YerVodokanal CJSC		ArmVodokanal CJSC	“Nor Akunk” CJSC	Shyrak Vodokanal”	“Lori Vodokanal” CJSC
	before 1.07.06	after 1.07.06				
Water Supply	106.14	146.88	115.65	120.61	76.98	91.74
Sewerage	8.21	12.096	24.35	29.59	43.16	29.42
Wastewater Treatment	10.74	13.824	-	-	-	-

The principles for regulation of water supply and wastewater tariffs are set forth in the Water Code of Armenia.<sup>6</sup> Among other, they envisage that tariff regulation shall be based on the quality of service and consumer ability to pay.<sup>7</sup>

The Commission also establishes the tariff calculation procedure (Procedure No. 33) and the tariff review and approval order (Order No. 97<sup>8</sup>).

Procedure No. 33 defines the following aspects of pricing:

- Approaches to establishing revenue requirements (two approaches are envisaged: the utility costs approach, under which depreciation and a (planned) profit margin are included in the tariff; and the cash-needs approach);
- Revenue forecast formula (allowed costs, depreciation, allowed profits, other incomes from operation leasing and sale of assets less their cost);
- Categories of recovered costs (operating costs, taxes, license fees, payment of the interest on state loans, and other expenses established by the legislation);
- Expected profit assessment procedure;
- Cost calculation principle for determining revenue requirement (based on the analysis of the previous year costs);
- Cost allocation principles among individual consumer groups that exclude cross subsidising of residential consumers at the expense of other consumer groups;
- Fixed and variable costs differentiation criteria;
- Tariff types and structures (unified, two-tier, other); and

<sup>5</sup>Source: Official website of the Public Services Regulatory Commission (<http://www.psrc.am/Tariffs/Potable%20water.html>)

<sup>6</sup> Article 79.

<sup>7</sup> Para 5 of Article 79.

<sup>8</sup> See in detail in section 1.1.4 of this report.

- Two-tier tariff setting formula for small and large consumers.

The volumetric (i.e. uniform) tariff is computed by means of division of the planned costs that are allowed for recovery *plus* the planned return (profit margin) by the planned volume of consumption. Consequently, the definition of both the sums of expenses allowed to be compensated and the planned consumption belong to the key pricing aspects that need to be considered.

The legislative support to the pricing regulation in Armenia is still under development and is being changed with the accumulation of the relevant regulation experience both by the Commission and due to the initiative of the regulated agents (water utilities).

The pricing system in Armenia is positively characterised by the flexibility of Procedure No. 33 as it entitles the regulated agents to submit their proposals to the Commission as concerns the improvement of the pricing procedure and introduction of new tariff types and structures (Procedure No. 33, Paragraph 4.3). The tariff regulation procedures in Ukraine and Russia, for example, lack such flexibility as in Armenia.

The pricing principles that are set in the Procedure allow to make it universal for all natural monopolies. It includes economic principles of cost allocation among individual consumer groups depending on the type of service, technical parameters, and cost accounting possibilities by consumer group. Implementation of such principles results in the establishment of uniform tariffs for all consumer groups served by any specific water company.

Some clauses of the Procedure, however, still need to be developed and clarified, in particular:

- The Procedure lacks requirements to the calculation of individual cost categories for their inclusion in the tariff calculation, which raises discussions between the regulator and the regulated agents at the stage when the tariff review requests are considered;
- The Procedure envisages tariff regulation only on the basis of the *cost plus regulation* method and provides for the application of no other methods, like the ones that are internationally referred to as the *incentive-based regulation* methods. This limitation formally prevents water companies from making profit by improving their efficiency;
- The Procedure is not clear about whether a water company may take account of the doubtful debts reserve when assessing the current assets. The current value assets, at the same time, is estimated as part of the net total assets for the calculation of the expected profit;
- The amount of the water company's working capital that is used for the calculation of the expected income shall be reconciled with the Commission, which can be described as informal regulation by the Commission of the water production programme as concerns the expected volume of the sale of service.

It seems promising for future development of the pricing system in Armenia that, provided full consumption metering is achieved, fixed and variable costs are going to be differentiated and the two-tier tariff structure will be implemented. Introduction of fixed subscriber fees may become the first step to implementing the two-tier tariff system (see further in detail).

It should also be noted, however, that despite of uniform tariffs introduced for all consumer groups, one cannot fully deny the existence of cross-subsidising of certain consumer groups by some other in Armenia (see discussion of this topic in Section 1.1.2 hereof).

### ***Definition of Water Supply and Sewerage Service Volumes for Pricing Purposes***

One of the key pricing aspects is definition of the planned volumes of water supply and sewage service consumption. In Armenia, this is regulated by the Rules for Drinking Water Supply and Sewage, Water Supply and Sewage Model Contracts, Technical Specifications Setting Procedure for Connecting to Water Supply and Sewage Systems, approved by the Government of Armenia (Resolution No. 130-N of 22.01.04) and its Annex (Resolution No. 2250-N of 22.12.05) (Resolutions No. 130 and No. 2250). These Resolutions set forward the following requirements:

#### *Resolution No. 130*

- Block water meters shall be installed at the inlets to the apartment houses' distribution systems before 1 July 2004 in Yerevan and before 1 July 2005 in other Armenian marzes;
- Block water meters shall be installed at the inlets to private houses' distribution systems before 1 July 2004;
- Before water meters are installed prior to the indicated deadlines:
  - Consumers shall pay the bills calculated as per 100 liters/person/day (150 liters/person/day in Yerevan) and 50 liters/person/day provided water-pumps are installed; the bill shall be calculated in accordance with the established consumption norms per the actual number of consumers as informed by the chairmen of house committees or other authorised persons;
  - With water meters installed, the bill for the water supply and sewerage services shall be calculated on the basis of the meter reading and established tariffs;
- After the expiry of the period established for the installation of water meters, the bill for organisations and private consumers residing in private houses shall be based on the volume of water, calculated in accordance with the pipe diameter (though it is not established whether this calculation takes account of the water supply schedule);
- Residents of apartment house without individual water meters shall pay the bill based on the reading of the house water meter reduced by the amount of water consumed by the residents with individual water meters; such fee shall be distributed in proportion to the actual number of consumers without water meters.

#### *Resolution No. 2250*

- Residential consumers who do not have a water meter as of the end of 2005, shall pay in the period between 1 January 2006 and 1 August 2006 upon signing contract with a water supply organisation (valid up to 1 year) and until the water meter is installed, for a normative consumption of 200 liters/person/day (and 250 liters/person/day in Yerevan),
- After the expiry of the period established for water meters installation, the water bill for private consumers shall be calculated as required by Resolution No. 130.

The positive aspect of the above Resolutions is that they require that fees be calculated on the basis of the information on the actual number of consumers residing in apartment houses, and not the registration data about the residents maintained by public authorities which is still used in some other EECCA countries (like Ukraine or Russia).

In addition, on the basis of Resolution No. 130, after 1 July 2005 Armenia practically stopped

applying the concept of water consumption norms adopted in the majority of EECCA countries (except the application of norms established for the homestead land sprinkling and other irrigation purposes). Resolution No. 2250, however, extended the application of the water consumption norms for the period between 1 January 2006 and 1 January 2007 (or till 1 August 2007 at the latest, provided the water meter installation contract does not come into effect over a year upon its conclusion).

Thus, the volumes of water consumption and sewage used for the calculation of tariffs shall be based mainly on the actual water meter readings.

However, Resolutions No. 130 and No. 2250 also have a considerable drawback, as they require that the fees for organisations and private consumers residing in private houses shall be calculated as per water pipe capacity should the consumers fail to install water meters or conclude contracts for their installation. This requirement seems a motivation factor for water meter installation, but only at first sight. From the perspective of water company financial management, however, this fee calculation practice results in an artificial increase of the accounts receivable and the necessity to increase the doubtful debt reserve. The latter is a financial indicator, which signals of negative business operation of water companies.

The targeted survey of ArmVodokanal CJSC (AWSC) consumers, undertaken within the framework of this study in the cities of Echmiadzin and Hrazdan, has proved that those consumers, for whom the fee is calculated on the basis of the water pipe capacity, simply do not pay for the services. This conclusion was made because the consumers did not answer to the question about the volume of their monthly water consumption for which they pay. In particular, in Hrazdan, the proportion of consumers without water meters made up almost 45% of the surveyed households, and in Echmiadzin – 8%. Since the general share of the unmetered residential consumers served by AWSC over the first six months of 2006 made up about 51% (according to the AWSC Commercial Department), it can be assumed that it is this category of consumers who do not pay their bills.

One of the weaknesses of the Resolutions No. 130 is as follows: though it sets mandatory requirements for water meter installation, but for the owners of the meters it has not specified mandatory requirements for metrological testing of individual meters in use after a specified period of time.

Among issues that need to be accounted while planning water and wastewater consumption for tariff setting purposes, in our opinion, currently in Armenia, is the volume of water losses in the internal networks of apartment buildings. In particular, there is a need to decrease the commercial losses of water companies caused by poor and deteriorating metrological features of individual water meters installed by consumers in their apartments.

It is generally assumed that the actual data on the average daily consumption of subscribers with water meters is a reliable planning resource. However, the information received due to the implementation of Tasks 2 and 3 of this Project prejudice this assumption. Thus:

- Results of the technical assessment (See Annex 2-5 to Volume 2 of this report) of the water supply and sewage systems in Echmiadzin and Hrazdan prove that the average water consumption of an apartment building makes up 548 liters/person/day, and losses in the in-house water supply network amount to some 20% of the supplied water. The same conclusions were confirmed on the example of metering and inspection that was done in one of the apartment buildings in Echmiadzin, where daily consumption makes up 62.9 m<sup>3</sup> per house (or 480 liters/person/day as per the actual number of residents – 131 persons), while according to the AWSC commercial department, in April 2006 this house consumed 175 m<sup>3</sup> or 5.8 m<sup>3</sup>/day or 44 liters/person/day, which is much less than the volume of water actually supplied to this apartment building;
- According to the results of the targeted survey of AWSC consumers in Echmiadzin and Hrazdan

(See Table 4), the declared actual average consumption per person made up 62 liters/person/day in Echmiadzin, and 34 liters/person/day in Hrazdan;

- According to the AWSC's data for 2005,<sup>9</sup> water meters show that the average consumption per person makes up 61 liters/person/day (32.61% of the company's water volume was billed on the basis of water meters).

Thus, the metering in the systems, the consumption volumes declared by the consumers during the survey and comparison of the consumption data with the actual billings made by AWSC have revealed considerable commercial losses. The problems that result in the commercial loss of water (i.e. water supplied to the customers but not paid for by them) were summarised in two groups:

- Company management problems (commercial section, technical services management);
- Problems related to the maintenance and use of internal networks of apartment buildings and metrological testing of individual meters.

Part of the problems can be eliminated by the companies themselves. Thus, the sample survey of subscribers done by AWSC<sup>10</sup> in 2005 revealed the following facts:

- Current water meter readings in many apartments and in the apartment block as a whole were lower than those at the end of the previous month;
- Absence of seals on meters;
- Tempered meters;
- Unregistered meters on one of the supply pipes (if there are more than one lifting pipes in the apartment; and
- Unauthorised connections.

Elimination of such problems is just a question of time, as it is proved by the work done by the company in 2005.

At the same time, while implementing this project, there was also conducted a sample study of the status of meters and internal systems in the apartments of one of the houses in Echmiadzin (See Annex 2-5 to Volume 2 of this report), which revealed a number of problems, the resolution of which is beyond the powers of water companies, in particular:

- Water companies have no mechanisms to eliminate leakages in non-metered apartments (apart from their partial decrease by means of adjusting hydraulic regimes). It is important to note that in apartments without water meters leaking taps and toilets can be found 2.5 times more often than in metered apartments;
- There is no nationwide water meter testing system. For the majority of water meters their inspection term has either expired, or is coming to expiry date, which results in further deterioration of metrological characteristics (which are already far from being ideal). Some of the inspected water meters were either not working, or working with considerable negative error

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<sup>9</sup> SAUR Annual report 2005, done by Management Contractor, 19/02/2006, P.Lorin.

<sup>10</sup> SAUR Annual report 2005, done by Management Contractor, 19/02/2006, P.Lorin.

(e.g. they did not register water flow even when the flush tank was filled in!).

The studies show that the amount of loss in the Armenian apartments may make up not less than 230 liters/person/day<sup>11</sup> or 42% of the water supplied to an apartment building.

The above raises questions about the scale of the commercial losses suffered by water companies due to poor metrological characteristics of apartment water meters, manipulations with them and inadequate water consumption metering.

The leakage problem in the residential sector should also be considered from the perspective of fairness of cost recovery by individual customers groups. Definition of tariffs for all consumer groups on the basis of the planned consumption, which takes leakages in the residential sector into account, effectively means a hidden form of subsidies provided to the population. This is because the commercial and other losses that occur in provision of service to the residential customers due to bad metrological characteristics of apartment water meters and other problems related to the bad maintenance of inter-building networks are much higher than those incurred in the service provided to the industry, commercial consumers, and public budget-funded organisations.

Thus, from the perspective of efficient tariff policy formation, for the water companies in Armenia it is more important today to resolve the problems related to the record of actual water consumption and development of optimal financial and economic forecasts on their basis.

### ***Special Aspects of Urban Water Pricing in Armenia***

When making decisions about tariff setting in Armenia, the Commission takes into account the indicators and programs defined in permits issued to water companies for their operation, in particular:

- The share of the payments collected (in relation to billings);
- The share of losses (in relation to the water supplied);
- Minimal requirements to the quality of drinking water supplied to households for everyday needs (e.g. the water supply schedule); and
- The company's investment program aiming to decrease the amount of losses and improve the quality of supply and sales calculations.

To decrease water losses, the Commission<sup>12</sup> has established targets for water loss norms for ArmVodokanal, YerVodokanal, LoriVodokanal, and ShyrakVodokanal for the period until 2008, which they need to account while submitting proposals for tariff review. According to the recommended targets, which ArmVodokanal and YerVodokanal have to consider, the unaccounted-for-water (UfW), that is total physical and commercial water losses, should not exceed 65% of water supplied to the system (instead of 71.86% and 75% respectively in 2005), while for LoriVodokanal and ShyrakVodokanal the indicator was set at 50% (instead of 70 and 84% respectively in 2005).

The actual share of the payments collected by water companies in 2005 made up:<sup>13</sup>

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<sup>11</sup> See Section 2.2 of the Volume 2 of this report.

<sup>12</sup> According to the information presented by Robert Nazaryan, Chairman of the Public Services Regulatory Commission, at the first meeting of the National Water Board of Armenia: [http://www.gov.am/ruversion/information\\_centre\\_8/official\\_news.php?date=1136923200](http://www.gov.am/ruversion/information_centre_8/official_news.php?date=1136923200)

<sup>13</sup> Source: Official website of the Public Services Regulatory Commission (<http://www.psrc.am/Armenian/index.htm>)

**Table 2. Payment Collection by Water Companies in Armenia in 2005 (% of billings)**

<b>Consumer Group</b>	<b>YerVodokanal CJSC</b>	<b>ArmVodokanal CJSC</b>	<b>“Nor Akunk” CJSC</b>	<b>Shyrak Vodokanal CJSC”</b>	<b>Lori Vodokanal CJSC</b>
Residential	74	45	89	40	68
Public Sector	115	91	97	107	106
Other	104	94	88	94	102
Collection Share Across Company	85	53	90	50	72

According to the Procedure for Provision of State Budget Subsidies and Grants to Legal Entities (Governmental Resolution No. 1937-N of 24 December 2003), water companies, like other business operators in Armenia, are entitled to a subsidy should their service production expenses exceed their income on sales at the regulated prices, which take into account the minimum profitability. In compliance with the annual requirements of the budget legislation, the amount of the subsidy required is first calculated by companies, then submitted to the State Committee of Water Economy and further for the discussion and approval by the Government. The Government’s policy is aimed at gradual decreasing and further elimination of budget funding to compensate for the economically justified expenses of water companies with the full transition by 2009 to funding companies’ operations at the expense of consumers.

### ***Tariff Setting and Revision Procedure***

Order No. 97 establishes that, when reviewing their tariffs, the companies shall:

- File a tariff revision request in the established form;
- Publish an announcement in three Armenian newspapers with the biggest circulation on their intention to establish or review tariffs;
- Calculate tariffs for the services provided by the drinking water supply and sewage company;
- Provide information on the water balance in the forecasted year for the company in general and its subsidies; and
- Provide information on pumping stations used by the company.

Order No. 97 requires that the tariffs are established for a period of at least one year. Should the preliminary review of the submitted request for setting new tariff is considered positive, then within 10 days upon its delivery the Commission shall start considering the request. The Commission shall establish, revise (approve or change) and make a relevant decision on the tariff within 90 days after the requester gets a written notification on the results of the preliminary review. The established tariff shall come into effect in 30 days after the decision is taken.

Thus, it takes some four months from the moment when the tariff request is considered and till the date when the new tariff comes into force (should the Commission come up with positive results of the preliminary review of the submitted request).

Regulatory requirements related to the tariff review procedure do not envisage the necessity to take into account the consumer’s ability and willingness to pay for the water supply and sewage services when regulation agents calculate the tariffs. Despite the fact that the Water Code establishes the requirement to use the tariff regulation with due regard of the quality of service and the consumer paying capacity, the Commission does not make such studies in the course of its regulatory efforts, and they are not defined in any regulatory act.

## 1.2 Regulation of ArmVodokanal Water and Wastewater Tariffs

The tariffs for the AWSC's services valid as of July 2006 were set up on the basis of the following decisions of the Commission:

- On Approval of the Minimum Requirements to the Quality of the Drinking Water Supply by ArmVodokanal for Everyday Needs (No. 62 N of 1 June 2004).
- On Approval of Tariffs for the Water Supply and Sewage Services Provided to the Consumers by ArmVodokanal (No. 27 N of 22 March 2005) (the tariffs took effect on 1 May 2005).

In 2004-2006, the following tariffs for the ArmVodokanal services have been valid (See Table 3).

**Table 3. AWSC Water and Wastewater Tariffs (AMD/m<sup>3</sup>, VAT included)**

Service Tariffs	2004	2005	2006 (plan, 07/2006)*
Water Supply	90.36	115.65	152.66
Water Sewage	10.05	24.35	32.15
General Tariff	100.41	140.00	184.81

\*Note: tariff proposals submitted by the State Committee of Water Economy in July 2006.

As it is envisaged by Procedure No. 33, instead of compensating for the depreciation and expected profit in the water supply and sewage tariffs, which were established as of 1 May 2005 for AWSC as a temporary measure, the expected utility revenues are defined without depreciation and return on investment, but account for certain amounts for capital investments aiming to ensure the stability of the water utility operation (i.e. revenue requirements are determined following the cash – needs approach rather than the utility costs approach).

Setting the tariffs that came into effect on 1.05.2006, the Commission also used the following target indicators: the collection rate (collected revenues (cash basis) to what was billed over the year in question (accrual basis) ratio) – 59%; and the UfW – 71.86%<sup>14</sup>.

Consequently, current tariff setting system does not allow customers to participate in investment financing, as such, the government subsidizes all customer groups by funding major capital items from the public budget.

To calculate the tariffs for the AWSC services in 2006, in its Resolution No. 27 the Commission established<sup>15</sup> that the following target indicators shall be used as a basis: the collection rate – 70%; the UfW – 65%. In July 2006, AWSC filed a request with the State Committee of Water Economy to receive a state budget subsidy to cover cash deficit of the company in the amount of about 1.6 billion drams. This deficit appeared due to low collection rate, as well as to losses due to the use of the tariffs that do not fully cover the economically justified costs of the company.

When calculating the new tariffs for 2006 (Table 3) and the subsidy amount that was submitted by the company to the State Committee for Water Economy in July 2006 for mid-term financial planning for consideration of the Government, the utility has taken into account that the expected collection of payments will make up 88% of the bills, while UfW will amount to 82% of the water supplied to the system. This runs counter the target indicators established by the Commission and confirms once again how important it is to resolve the problem related to proper accounting of water use.

<sup>14</sup> According to ArmVodokanal.

<sup>15</sup> Paragraph 2 of Resolution No. 27 issued by the Public Services Regulatory Commission on 22.03.2005.

There is a need to look more closely into the clause of the management contract between AWSC and the managing company SAUR S.A.<sup>16</sup> as concerns the requirement that the managing company shall provide for the consideration and approval of the Managing Company Board<sup>17</sup> (the Board) the following:

- Proposals for the calculation of tariffs for metered and non-metered consumers with special proposals for the poor and vulnerable customers (households) (submitted for the Board's approval on an annual basis);
- Analysis and recommendations related to the structure of tariffs and the plan for their gradual increases in order to increase consumers' ability and willingness to pay for services.

Therefore, the Board established additional requirements for the managing company regarding tariff calculation in order for the aspects of consumers' ability and willingness to pay be taken into account.

Fulfilling the contract requirements, at the end of November 2005 the company prepared its proposals for the revision of the tariff scheme, in particular, by switching from the unified tariffs to the system of the increasing block tariffs (IBT) established as a special offer for the poor and vulnerable consumers. This suggestion was forwarded to the State Committee of Water Economy to be further submitted to the Commission's approval. However, as of July 2006, the proposed tariff scheme was not agreed upon by the Board of the managing company, and consequently not submitted to the Commission.

The document developed by the SAUR S.A. with proposals on improvement of the tariff scheme also contained a number of scenarios to ensure social protection of consumers, including the tariff one. The summary of the proposals of the managing company submitted to the State Committee of Water Systems as an alternative to ensure the social justice and economic stimulation to decrease the prices for the services for all or individual consumer categories is as follows:

- Direct compensation of certain payments included into the cost of services (like debt servicing) or granting certain tax exemptions;
- Provision of state budget subsidy to cover the deficit between the revenues and expenses of the company;
- Provision of subsidies to individual low-income consumer categories. Such categories will have to pay the established share of the cost of service depending on their real situation, and the difference will be compensated to the managing company by the defined public authority. The advantages of this system is that it shows to the consumer the economic cost of the service provided;
- Introduction of a "social tariff" under which big consumers will be paying part of the cost of service for poor consumers. The tariff can consist of three or four blocks. The price for the service will be different depending on the volume of water consumed. The real price for the service will correspond to one of the middle blocks.

In such a way, the managing company suggested to ensure the accessibility of service to the low-income citizens either through establishment of one or more social tariffs, or by exempting them, partially or completely, of certain payments.<sup>18</sup> In the opinion of SAUR S.A., the introduction of the increasing block tariffs is one of the means of ensuring social protection of low-income households.

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<sup>16</sup> Contract of 21 July 2004, Annex No. 2.

<sup>17</sup> The managing company board includes representatives of the Government of Armenia.

<sup>18</sup> Tariff Scheme prepared by SAUR S.A., November 2005.

The authors of this report have no doubts that the application of block tariffs is economically advisable to stimulate thrifty use of resources; however, it does not seem efficient to use them to protect low-income consumers due to the insufficient targeting of assistance. If the IBT are introduced, families with many children, as a rule, will get to the upper block of consumption having no possibility to decrease their use of water.<sup>19</sup>

This argument has also found its confirmation in the course of a special sample survey of water service consumers in Echmiadzin and Hrazdan, conducted within the framework of this study. According to the survey results, 20% of the worst-to-do households are normally the biggest in size (See Annex 2) making up on average 5.1 people in Echmiadzin and 4.9 people in Hrazdan. At the same time, 20% of the affluent households make up 2.7 in Echmiadzin and 2.6 in Hrazdan. As a result, despite of higher average per capita consumption of water by high-income households as compared to those with the lowest income (See Table 5), poor families actually consume more than rich families, by 27% in Echmiadzin and by 12% in Hrazdan.

Consultants of the USAID / PA Consulting Program “Institutional and Legislative Strengthening of the Water Resource Management in Armenia”<sup>20</sup> also do not recommend considering the IBT as a means to protect poor consumers, as it does not ensure targeted provision of social assistance.

Thus, despite of the two opposite positions on the measures to protect low-income strata of population when introducing the economically justified tariffs for water supply and sewage, the authors of this report see the solution of this issue in implementation of a balanced approach to the selection of the social protection measures and implementation of effective tariff policy.

### **1.3 Conceptual Aspects of Urban Water Pricing System Development in Armenia**

Further development of the urban water pricing system in Armenia can be conceptually defined in the following directions:

- improvement of the tariff revision procedure;
- economically justified differentiation of tariffs for services provided to individual consumer groups;
- allowing participation of the customers in financing of capital items, by using depreciations and return on a rate base as the basis for capital requirements; and improving targeting of state financing to the water utilities (meaning that the government will be subsidizing not all customer groups, but only low-income ones);
- introduction of subscriber fees; and introduction of metrological inspection of water meters
- increased role of the State Committee of Water Economy in preparing suggestions on improving tariff policy in the sector.

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<sup>19</sup> See the works by Henry Smets and the analytical paper “Service Affordability, Social Security, and Public Participation in the Urban Water Sector Reform in Eastern Europe, Caucasus, and Central Asia Countries: Key Aspects and Recommendations” //OECD, Paris, 2003

<sup>20</sup> Memo on the PSRC-PA Joint Seminar for Discussion of Tariff Policy Options, July 20-21, 2006 by Hayk Petrosyan and Paul Kuminski.

## ***Tariff Revision***

Despite of the fact that the Armenian legislation allows only one revision of tariffs per year, like in the majority of other EECCA countries, any tariff increase has the negative public perception, and therefore, the regulator needs to come up with weighty reasons for the adoption of an unpopular decision.

To provide for better justification, the tariff review procedure may be improved by conducting independent studies at the request of the Commission to assess the effectiveness of adopted regulatory acts on tariff introduction with the publication of its results; this could be done, for example, by surveying consumers' ability and willingness to pay for water and sewerage services.

Such a study could aim at assessing the parameters of the quality of service at the request of consumers and defining the priorities from the perspective of further improvements proposed by the servicing company. For example, the following parameters could be studied: the quality of customer service, pressure in the systems, the number of interruptions in the water supply for more than 3 hours a day, complaints for water supply schedule, water organoleptic features, content of salts, and the acceptability of using drinking water for food preparation, etc.

Similar targeted studies or public opinion surveys by means of focus groups<sup>21</sup> can be done in the cases when:

- It is proposed to change the tariff structure (e.g. switching from the unified tariffs to the IBT);
- It is expected that up to 10% of the consumption structure will change due to redistribution of consumption demand among different consumer groups (new water consumption or sewerage objects are commissioned, the consumption metering by residential consumers achieves 75%, certain consumers refuse from the service (individual municipal or village systems), the billing mechanism for the consumed water volume in absence of water meter is changed, etc);
- A new service is introduced (e.g. sewerage treatment);
- Fixed monthly subscription fee is introduced;
- It is considered to attract a loan to fund a new construction or reconstruction of systems to improve the quality or ensure the stability of the water supply and sewage infrastructure.

## ***Tariff Differentiation***

Avoiding cross subsidizing of residential consumers at the expense of other consumer groups is one of the progressive principles, which is implemented in Armenia in a more coherent manner than in the majority of other EECCA countries. However, the AWSC example shows that application of the unified average tariff for all consumer groups does not take into account the following features of the company's operation:

- The actual expenses for the production of water and wastewater services per unit in terms of electricity and labour costs expenses differ considerably depending on geographical and topographical features of the systems. For example, if the expected profit from the sale of water/wastewater service in accordance with the average tariffs in the AWSC Southern Division

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<sup>21</sup> Public opinion survey by the method of focus groups – is a well planned and conducted discussion with a relatively small (8-10 people) target group of customers (who are jointly gathered by some definitive characteristics – age, social status, gender, education level etc.) to learn their attitude to certain problem and better understand their behavior.

(Sissyan, Yegenadzor, Goris, Kapan) makes up 53% of expected revenue, the sale of each cubic meter of water in the Northern Division (Sevan, Dilizhan, Idzhevan, Gavar, Alaverdi, Spitak) is loss making where losses amount to 2% of expected revenue.<sup>22</sup> This means that residential and other consumers in other service districts of AWSC subsidise the group of industrial consumers in the North-Eastern area. In addition, the existing pricing system contains a negative incentive to increase the water supply schedule in the North-Eastern unit, thus improving the quality of service.

- The actual costs related to the sale of services to residents are usually higher than as compared to other consumers, since they include expenses for bank services on payment collection from residents, as well as costs related to maintaining divisions of controllers who service residential consumers. For example, in Ukraine, one controller serves on average no less than 1,700-1,800 subscribers. Should this standard be applied to the AWSC data, the company will need more than 150 controllers to serve residential consumers<sup>23</sup> (or 9% of the total number of the company's staff);<sup>24</sup>

The existing tariff policy may be improved through differentiation of tariffs depending on the actual cost of service in different geographical areas:

- By setting different tariffs depending on the service production expenses in individual service areas; and/or
- By introducing block tariffs (for non-residential consumers).

In this case, as demonstrated by the results of the target survey conducted within the framework of this project, introduction of consumption blocks should not affect the group of residential consumers. Estimations show that from the perspective of ensuring the principles of social protection it is advisable to introduce the first consumption block at the level of no less than 19 m<sup>3</sup> per subscriber a month (assuming a family of 5.1 people<sup>25</sup> would consume 120 liters/person/day<sup>26</sup>), since all big households (which are less well-to-do according to the survey) will fall under this category.

Therefore, introduction of a higher than average tariffs in the North-Eastern unit served by AWSC for volumes more than 19 m<sup>3</sup> per subscriber a month will serve as an economic incentive for the water company to set a more regular water supply schedule for the city, as the consumption-intensive consumers will be paying the actual cost of service set for the specific district, rather than the company averaged cost,<sup>27</sup> which is lower than the actual one at this service area.

On the other hand, in the areas where the actual prime cost of services is considerably lower than the average for the company (e.g. in the Southern unit), the following options may be considered:

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<sup>22</sup> Calculated on the basis of "Armenia Water and Sewage Company" Financial Flows for the Period between 1 July 2006 and 30 June 2007. Estimation".

<sup>23</sup> According to the AWSC commercial department, as of 1.07.2006 the company had 257,944 residential subscribers.

<sup>24</sup> Total staff: 1,652 employees, See "Armenia Water and Sewage Company" Financial Flows for the Period between 1 July 2006 and 30 June 2007. Estimation".

<sup>25</sup> Average size of the lowest-income households within the framework of this study.

<sup>26</sup> Average size of the lowest-income households within the framework of this study.

<sup>27</sup> According to the AWSC's forecast data, water consumption by non-residential consumers makes up about 24-25% of the total consumption both in the North-Eastern unit, and also company-wide.

- Decrease of tariffs for consumers with high water consumption to the level of actual cost (as a factor stimulating economic development of the territories through attraction of big commercial water consumers/producers to this area); or
- Decreasing residential consumer tariffs to the level of actual prime cost (as a social security factor), and preservation of the company's average tariff for large customers.

### ***Introduction of Fixed Payments***

As the first stage on the way to develop the market of servicing huge number of individual water meters, there is a need to introduce into legislation (e.g. in the service provision rules) a clause on customer payment for dismantling, transportation, examination, and installation of subscriber-owned water meters should their examination term is over. Concurrently, a regulatory provision should be introduced requiring water companies to maintain the database of water meters kept by the subscribers, monitor their examination terms, and duly notify the consumers about these terms. A fair mechanism to compensate these expenses to the water companies should also be developed.

For the regular update of the subscriber databases and their maintenance by water companies, it is recommended to consider a possibility of introducing a symbolic (e.g. 200 AMD/month) minimal payment for subscriber service.

### ***Increasing the role of the SCWE in preparing recommendations on improving the tariff policy***

The SCWE could play a greater role in studying alternative options and formulating recommendations on improving tariff policy in the WSS sector.

*Inter alia* introduction of the utility costs approach as opposed to the cash-needs approach in determining revenue requirements could be considered for tariff setting. It would entail that the depreciation cost and a profit margin are included in the tariff. Switching to such an approach might be appropriate when the collection efficiency is improved to certain level (say, when the collection rate of the amounts billed the population reaches 70% or more).

## CHAPTER 2. AFFORDABILITY OF WATER SERVICES IN ECHMIADZIN AND HRAZDAN

### 2.1 Concept of Economic Affordability of Services

The economic affordability of water supply and wastewater services shall be defined as the size of the WSS bill at which consumers (households in the first place) are able to use those essential services without cutting down other vital expenses.

When assessing the economic affordability of services, it is important to distinguish two concepts:

1. consumer's *ability to pay* for the services (paying capacity), and
2. consumer's willingness to pay.

The *ability to pay* indicator demonstrates whether any household has sufficient income to pay for the service in question without a serious impact on the consumption of other essential goods and services. It is considered that a household is unable to pay for the services if it entails a considerable reduction of expenditures on other first priority (vital) goods and services. Analysis of the customer's ability to pay is based on statistical data, and its results are considered to be quite objective.

Analysis of the *willingness to pay* seeks to define the maximum amount that a consumer is ready to pay for a certain service of defined quality. In addition, such analysis reveals how much *more* the households would be willing to pay for better quality services (including the chemical composition, taste and colour of water, and the quality of the provided service). This analysis is based on subjective opinions of consumers about their financial capacities, quality and price of service.

The service affordability analysis is primarily focused on the ability to pay indicator, but water and wastewater companies should equally be interested in assessing also the willingness of their customers to pay for the (same or improved) services provided at higher tariffs.

#### ***Assessing Households' Ability to Pay***

The households' ability to pay is a function of both water prices and the customer's financial capacity to pay for the services consumed. This means that the services may become more affordable if 1) their cost is decreased, or if 2) the people's financial possibilities improve, or 3) both factors simultaneously.

The concept of the consumer's ability to pay is mainly related to the definition of the monetary burden (the specific weight) that people will have to bear to pay for water supply and wastewater services on the total expenditures of the family.

Usually, the following methods are used to assess this indicator:

1. Grouping of households by charges for water/wastewater services as a percentage of total household expenditures (*Method 1*); and
2. 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. Such 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 Armenia National Statistical Service (NSS) and from a *special survey* of service customers conducted within the framework of this project in March 2006.

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.

### ***Service Affordability Criterion***

This indicator also may be called the criterion of the paying capacity of service consumers, as it is defined as a maximum share of income/expenses that households are able to spend for water/wastewater services without jeopardizing their consumption of other essential goods and services.

There is no single affordability criterion acceptable for all countries/regions with their varying local conditions. In practice, many different criteria are used.<sup>28</sup>

This study is based on the affordability threshold recommended by international financial institutions, including the World Bank and the EBRD, for the transition period in the EECCA countries: the average water and wastewater charges shall not exceed 4% of the average household income. This criterion was used to assess the ability to pay of water/wastewater customers in Yerevan and Vanadzor in March 2003.<sup>29</sup>

### ***Assessment of the People's Willingness to Pay***

To assess the people's willingness to pay means to define the share of the consumers that are ready to pay more for the higher quality services or to prevent their deterioration in the future.

In Echmiadzin and Hrazdan, the consumers' willingness to pay has been 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 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 discloses 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.

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<sup>28</sup> 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, 2002. – p.46-47.

<sup>29</sup> "Consumer Protection in Urban Water Sector Reforms in Armenia: Ability to Pay and Social Protection of Low Income Households" // Final Report. OECD, Paris, 2004

## 2.2 Methodology of the Survey

### *Household Sample*

A special targeted survey of the water and wastewater service consumers in Echmiadzin and Hrazdan was conducted in March-April 2006 on the basis of a probability sample of households.

In each of the cities the sample of households consisted of four independent subsamples (each of which was a representative sample for the relevant city):

- Households which participated in the Integrated Living Conditions Survey (ILCS) in 2004 regularly conducted by the NSS;
- Households which participated in the 2005 ILCS;
- Households which participated in the 2006 ILCS; and
- An additional sample formed specifically for the survey of the WSS services consumers undertaken in the framework of this project in March 2006.

The households covered by the ILCS were included into the targeted WSS services consumers survey to ensure access to the reliable information on the households' incomes and expenses collected through the ILCS.

All samples were formed independently (and in different times) through a two-stage selection. The first stage selection units were so called "instructor districts" and "calculation districts" formed for the population census in 2001. At the first stage of sample selection, the units (primary sample units (PSUs)) were selected through the mechanism of systemic selection with the probability proportional to their size (number of households). At the second stage, the mechanism of systemic selection was used to pick out households in each of the chosen PSUs. The number of households taken from each PSU was the same.

The first stage sample was based on the population census information about the number, location, and size of the "instructor" and "calculation" districts. The households were selected on the basis of address lists formed for the census and specified based on its results.

Since after the census the household address lists have not been updated, *reserve* lists of households were formed for the cases when it might be impossible to interview the households from the core list.

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.

### *Echmiadzin*

In 2004, 128 households participated in the ILCS, 119 – in 2005, and 18 – in January-February 2006. 142 households were selected for the target survey in 2006. Thus, the total sample size made up 408 households.

The total number of households in Echmiadzin is 13,038. Thus, one selected household represented 32 households of the total population (entire assembly).

### *Hrazdan*

In 2004, 51 households participated in the ILCS, 87 – in 2005, and 16 – in January-February 2006.

241 households were selected for the target survey in 2006. Thus, the total sample size made up 395 households.

The total number of households in Hrazdan is 14,623. Thus, one selected household represented 37 households of the total population.

### ***Questionnaire***

The specially developed questionnaire contained 47 questions related to the various aspects of water supply and sewage service provision, the respondents' satisfaction with the quality of services provided; the consumers' opinion about the levels of tariffs and the necessity to penalise the default and late payers; self-assessment of their well-being; enjoyment of privileges and social assistance under the Family Benefit Programme; service payment arrears and their reasons; customers' attitude to the implemented reforms, and their willingness to pay higher tariffs should the quality of service improves. The questionnaire also included a number of questions related to the composition of the household, characteristics of its members, etc.

### ***Conducting the Survey***

10 regular survey administrators (interviewers) conducted the survey (5 in each of the cities). This work was coordinated by 2 supervisors (1 in each of the cities). The interviewers were trained in using the questionnaire and the instructions on 17 March 2006.

The study was conducted in both cities in the period between 27 March and 15 April 2006.

#### ***Echmiadzin***

408 households were interviewed including 66 households from a reserve list. A so-called "closed door" was the major reason for using substitutes (64 instances), one address was not found, and one household refused to participate in the study.

Each interviewer covered an average of 82 households.

#### ***Hrazdan***

395 households were interviewed -- 124 taken from the reserve list due to the change of address (120 cases), "closed doors" (tenants were out), location of an office at one of the address, and three refusals to participate in the study.

Each interviewer covered on average 79 households.

### ***Data Processing Stages***

Data received from the survey were processed in three stages:

- Entering data: primary data was entered in the main NSS office with the help of specially developed data entrance software. This work was performed by four operators. To improve the quality of the primary data, data were repeatedly entered by different operators;
- 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 the data set an imputation technique was used to fill in missing data.

To properly take into account the complex structure of the household sample in the targeted survey of the WSS services consumers and the implemented mechanisms of sample formation, a special system of statistical weighting was developed to assess the indicators based on survey data.

### 2.3 Results of the Targeted Survey of Service Consumers

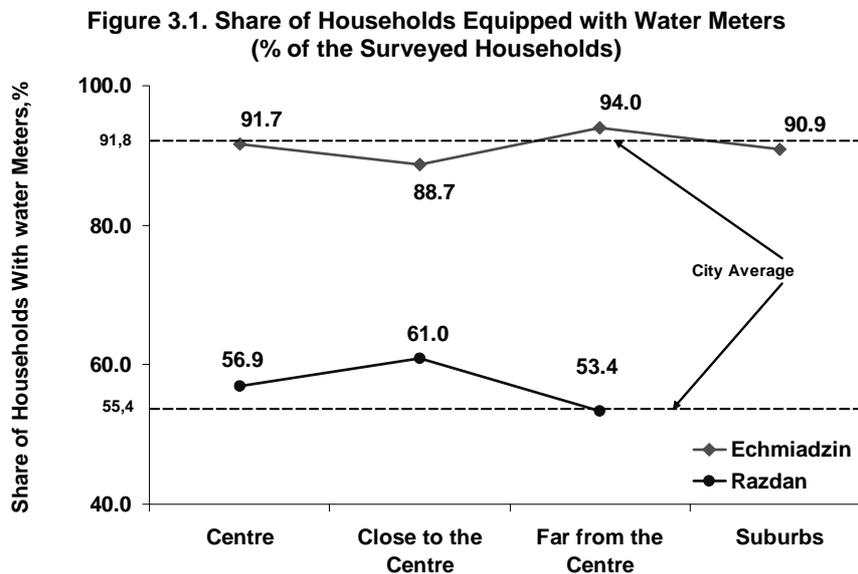
#### *Volume and Specifics of Water Consumption*

Since only the families with access to the centralised *water supply* were included in the survey, the coverage by centralized water supply services in this survey is 100 percent.<sup>30</sup> As concerns the services of centralised wastewater treatment, only 96.3% of the surveyed households have access to these services in Echmiadzin and 95.7% in Hrazdan.

The percentage of metered households is quite high in Echmiadzin (91.8% according to the March 2006 study), and much lower in Hrazdan (55.4%)<sup>31</sup>.

No considerable differentiation due to the location of houses and apartments has been revealed. Thus, there was just insignificant difference between the data related to the equipment of the population with water meters (Figure 3.1):

- in Echmiadzin – from 88.7% in the downtown to 94.0% in the suburbs;
- in Hrazdan – from 53.4% in the downtown to 61.0% in the suburbs.



At the same time, 2.8% respondents in Echmiadzin and 21.3% in Hrazdan said that they were going to install a water meter in the near future. Less than 1% of the surveyed families (3 families in Echmiadzin

<sup>30</sup> Out of 408 households surveyed in Echmiadzin, 8 households said that they were not using the centralised water supply services. Further, these households were excluded from the study.

<sup>31</sup> According to ArmVodokanal, as of 1 July 2006, 49% private consumers installed individual water meters.

and 1 in Hrazdan) expect that they will have a water meter installed under the Family Benefit Program.

Regarding the equipment of buildings with block water meters, the specific share of households that mentioned their existence makes up only 0.3% (1 household) in Echmiadzin and 5.1% (20 households) in Hrazdan.

#### *Echmiadzin*

Analysis of water consumption by Echmiadzin households with water meters have shown that its actual average per capita consumption all over the city is 1.86 m<sup>3</sup>/person/month which corresponds to 62 litre/person/day (see Table 4). The average per capita consumption of water by households residing in private cottages is some 8% higher than the same indicator for households residing in apartment buildings.<sup>32</sup>

#### *Hrazdan*

According to the study results, the actual volumes of water consumed by households with water meters in Hrazdan (on average – 1.02 m<sup>3</sup>/person/month which corresponds approximately to 34 litre/person/day) have appeared to be almost 80% less than in Echmiadzin (see Table 4). At the same time, the volumes of water consumption in private cottages, and in apartment buildings in this city are almost equal.

Such low volumes of water consumption by households (especially in Hrazdan) are primarily explained by the limited possibility for the majority of city residents to receive water on the regular basis. Besides, according to the results of the water meter examination in Echmiadzin (Aragats borough, building 8), water meters installed in the apartments do not provide sufficiently precise record of water consumption. In particular, for the majority (85%) of the installed water meters their examination term has either expired, or is close to expiry, every tenth water meter is either not working, or shows a considerable negative error, not even reacting to the filling of the flush tank, while the current indicators of 16% water meters have appeared to be lower than they were at the end of the previous month which indirectly signals of the potential manipulations by consumers (see Volume 2 of this report, Annex 2-5, Section 4.4).

**Table 4. Actual Water Consumption by Households with Water Meters (March 2006)**

Type of Dwelling	Water Consumption					
	m <sup>3</sup> /month per household		m <sup>3</sup> /person/month		litre/person/day	
	<i>Echmiadzin</i>	<i>Hrazdan</i>	<i>Echmiadzin</i>	<i>Hrazdan</i>	<i>Echmiadzin</i>	<i>Hrazdan</i>
Private Sector	7.76	3.60	1.96	1.04	65	35
Apartments	5.89	3.34	1.80	1.02	60	34
City Total	6.68	3.40	1.86	1.02	62	34

The study has made it possible to establish that there is a quintile differentiation of indicators of the actual water consumption by households both in general, and per person (Table 5).

Thus, if we would consider water consumption by households, then in Echmiadzin the first quintile households (the poorest) consume 27% more as compared to the fifth quintile households (the most well-off), and almost 10% more than the city average indicator. In Hrazdan, water consumption by households with the lowest income (1<sup>st</sup> quintile) is by 12% higher than the volumes of water consumed by those households who belong to the fifth, the richest, quintile.

<sup>32</sup> 41% of respondents in Echmiadzin and 26% in Hrazdan reside in private cottages.

The per capita consumption shows an inverse dependence. Thus, in Echmiadzin, the first quintile households consume on average 1.49 m<sup>3</sup>/person/month, which is 44% less than the households belonging to the fifth, the highest quintile. In Hrazdan, the same ratio makes up 1.6 (0.74 m<sup>3</sup>/person/month in the first quintile against 1.22 m<sup>3</sup>/person/month in the fifth, the most well-off, quintile group. Such a reverse dependence is mainly explained by the quintile differentiation of the size of the households that participated in the study (see Annex 2).

**Table 5. Actual Water Consumption by Quintile Groups of Households with Water Meters (m<sup>3</sup>/month)**

Indicators	Quintile groups					City Average
	First	Second	Third	Fourth	Fifth	
	<b>Per Household</b>					
Echmiadzin	7.30	7.20	6.46	6.68	5.77	6.68
Hrazdan	3.37	3.72	3.40	3.53	3.00	3.40
	<b>Per Household Member</b>					
Echmiadzin	1.49	1.68	1.85	2.14	2.15	1.86
Hrazdan	0.74	0.96	1.10	1.04	1.22	1.02

The above difference in the volumes of actual consumption by quintile groups will be taken into account in the future to accurately forecast the demand of the population in 2007-2008 (see Section 2.6).

#### ***Degree of Satisfaction with Water/Wastewater Services***

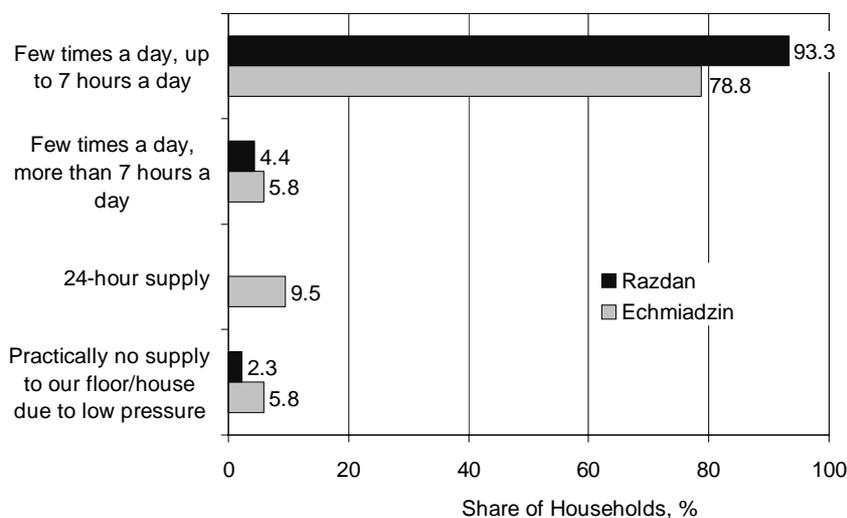
The study results have demonstrated that many respondents are not satisfied with the quality of services they receive. Thus, fully or partially, 21.5% of respondents are not satisfied with the ArmVodokanal services in Echmiadzin, while in Hrazdan the number of such consumers is quite high – 42.7%.

At the same time, each fifth (19.4%) household in Echmiadzin replied that it was “fully satisfied” with the services, and only 1.3% of Hrazdan residents agreed with this.

#### ***Water Supply Schedule***

The possibility of receiving drinking water for 24 hours a day is quite limited in Echmiadzin, and is absent in Hrazdan with a quite rigid schedule of water supply (Figure 3.2).

**Figure 3.2. Potable Water Supply Schedule  
(% of the Surveyed Households)**



Thus, in Echmiadzin, only 9.5% of households have access to the 24-hour water supply, while the overwhelming majority of respondents (78.8%) get water a number of times per day for the total duration of up to 7 hours.

This schedule is even tougher in Hrazdan. No respondents have testified that they can get drinking water 24 hours a day. The predominant majority of households (93.3%) receive water only few times a day with the total duration of up to 7 hours (Figure 3.2).

“Due to low pressure our floor practically gets no water”, – answered about 5.8% of households in Echmiadzin and 2.3% in Hrazdan to the question about the quality of service.

A certain part of respondents is worried about the fact that quite *often* over the recent year they had the following cases:

- violation of the water supply schedule (10.4% of the surveyed in Echmiadzin and 13.4% – in Hrazdan);
- low water pressure (43.0% – in Echmiadzin and 19.8% – in Hrazdan); and
- water cut-offs for a few days (22.6% in Echmiadzin and 12.2% – in Hrazdan).

### *Water Quality*

Survey results disagree somewhat with common statements about the relatively good quality of water in Armenia.

Every fifth family (19.0%) in Echmiadzin and 8.9% of households in Hrazdan said that “practically always” or “often” they received poor quality water over the recent year. At the same time, to the question “How often was the water of poor quality?”, 11.8% of households in Echmiadzin and 6.6% in Hrazdan gave a flatly negative answer – “never”. Both in Echmiadzin and in Hrazdan, every fifth respondent ranked low (“bad” or “very bad”) such qualities of water as its *transparency* and *colour*.

About every fifth household in Echmiadzin said that the water *tasted* and *smelled* “bad” or “very

bad”; in Hrazdan, twice as less respondents thought of these qualities of water as bad (10%).

At the same time, Hrazdan residents have appeared to be more demanding regarding the *mineral content* in the water which results in formation of scale and sediments after boiling: 20.8% of households assessed this quality as “bad” and “very bad”. In Echmiadzin, 15.1% of citizens say that the mineral content in their water is high.

Comparison of this survey results with the data of a similar study conducted in 2003 in Yerevan and Vanadzor<sup>33</sup> suggests that in the recent years the quality of water in Armenia has improved. Thus, consumers in Echmiadzin and Hrazdan characterised individual features of water as “bad” or “very bad” much less frequently than Yerevan and Vanadzor respondents (Table 6).

**Table 6. Share of Respondents that Characterised Water Quality as “Bad” or “Very Bad”**

Water Quality Characteristics	2006 Study		2003 Study	
	Echmiadzin	Hrazdan	Yerevan	Vanadzor
Transparency	10.0	10.1	32.7	34.1
Color	9.8	9.6	25.2	24.3
Smell	18.3	10.1	29.8	18.5
Taste	21.1	10.9	39.7	14.1
Mineral content	15.2	20.8	42.0	15.6

Despite of this, the overwhelming majority of the respondents drink tap water without boiling it, use it for making food, and never use filters or other water-purifying devices (Table 7).

**Table 7. Individual Characteristics of the Use of Potable Water by Residential Customers (% of the Surveyed Households)**

	<i>Echmiadzin</i>	<i>Hrazdan</i>
Drink tap water	84.0	75.2
Drink tap water because they have to do so	12.7	13.9
Use tap water for cooking purposes	97.8	96.2
Never use filter or other water-purifying devices	97.0	94.7
Do not use water from alternative sources	71.0	92.4

One of the reasons why Echmiadzin and Hrazdan consumers give low marks to the quality of water which mainly comes from underground sources is, according to experts, the intermittent water supply schedule and secondary contamination of water in the worn out pipes due to the lengthy period of the sector underfunding in 1990s. Not more than 3% to 5% of the surveyed families use water purification devices, but the share of those who would like to do so is quite higher both in Echmiadzin and Hrazdan (64.5% and 53% of respondents accordingly).

Wishing to consume higher quality water, some respondents (28.5% in Echmiadzin and slightly more than 8% in Hrazdan) take it from other sources. Thus, Echmiadzin residents prefer water from wells (20.0% of all households), use water delivered from other places (4.5%), or buy sterilised water (2.5%). Hrazdan residents who use water from other sources said that they were mainly using fetched water (5.6%), while only about 1% of the surveyed households have a possibility to purchase sterilised water.

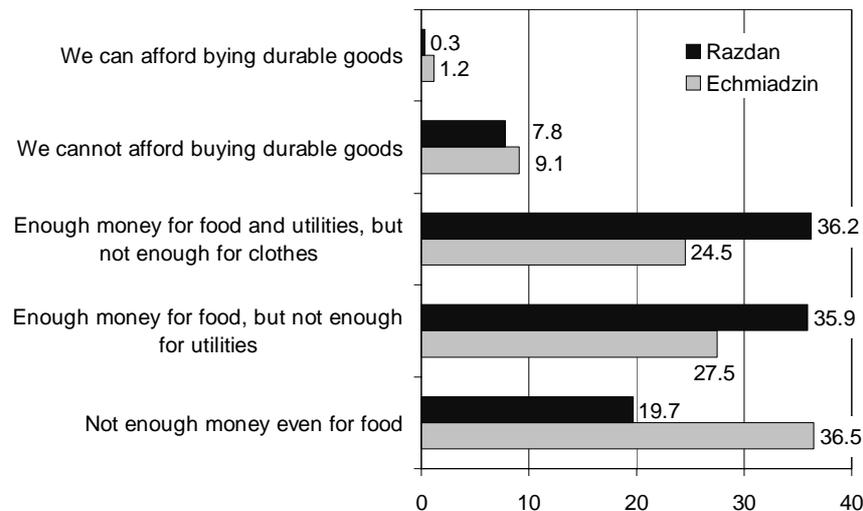
<sup>33</sup> “Consumer Protection in Urban Water Sector Reforms in Armenia: Ability to Pay and Social Protection of Low Income Households” // Final Report. OECD, Paris, 2004 - Section 2.3.2.1.

### *Self-Assessment by Households of Their Economic Situation*

Echmiadzin and Hrazdan households were analyzed according to how they *self-assess* their financial status (Figure 3.3). More than one third of respondents (36.5%) in Echmiadzin and almost twice as less in Hrazdan (19.7%) characterized themselves as “lacking money even for food”. At the same time, 27.5% of those surveyed in Echmiadzin stated that they had sufficient funds for food but found it difficult to pay communal service bills; in Hrazdan the share of such households makes up about 36%.

This suggests a conclusion that the majority of households in both cities (64% in Echmiadzin and 56% in Hrazdan) to some extent “lack money to pay for the utility services (including WSS service)”.

**Figure 3.3. Self-assessment by Households of Their Financial Status  
(% of the Surveyed Households)**



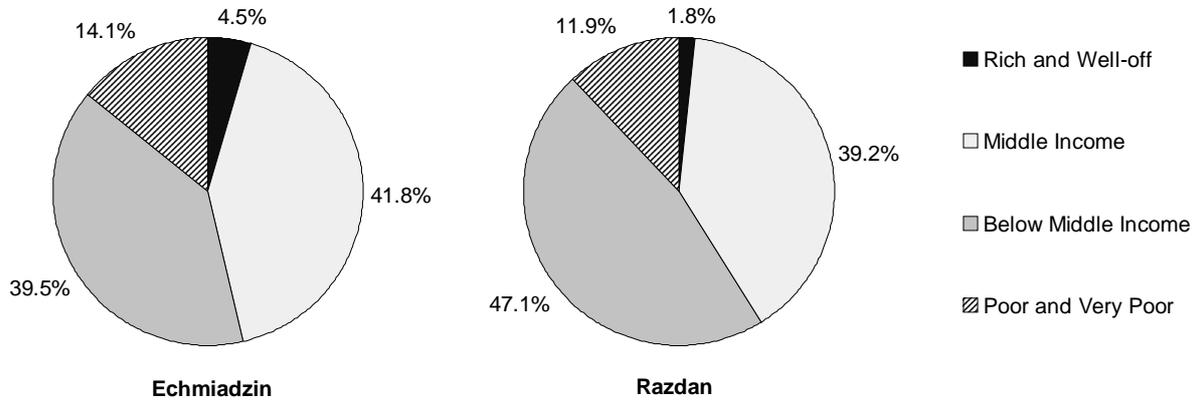
#### *Echmiadzin*

2.5% of the surveyed households consider themselves “very poor”, and 11.6% called themselves “poor”. About 40% of households referred themselves to the “less than middle income families”, and around the same – to the “middle income families”. Only one household described itself as “rich”, and 4.5% (17 households) see themselves “well-off”.

#### *Hrazdan*

Only two of 395 surveyed households consider themselves “very poor”, and almost 11.4% called themselves “poor”. Almost every second household (47.1%) referred itself to the “less than middle income families”, while about 40% – to the “middle income families” (Figure 3.4). None of the surveyed households described itself as “rich”, and only seven families (1.8%) see themselves “well-off” (Figure 3.4).

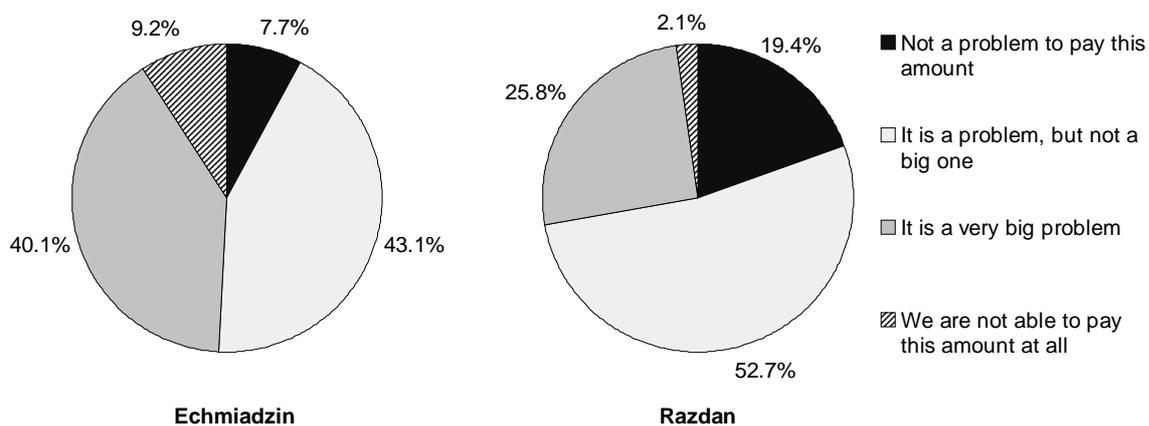
**Figure 3.4. Self-assessment by Households of Their Economic Situation (% of the surveyed)**



Low level of money income and other earnings, and spending of the major part of income for food (65.4% on average in Echmiadzin, and 73.1% – in Hrazdan)<sup>34</sup> result in difficulties with payment for utilities. Only a small number of the surveyed households in Echmiadzin (7.7%) and, at the same time, every fifth household in Hrazdan (19.4%) answered that “it was not a problem for them to pay such charges” (Figure 3.5). Other families in both cities confessed that with their family budget it was to certain degree problematic for them to pay for the water/wastewater service. For 40% of Echmiadzin households and for every fourth household in Hrazdan this is quite a serious problem.

It is also alerting that almost every tenth family in Echmiadzin believes it cannot afford paying the utility bills at all.

**Figure 3.5. How Large Are Charges for Water/Wastewater Services? (Self-Assessment by Households, % of the Surveyed Households)**



The survey results also demonstrate that:

- One of the surveyed households in Echmiadzin and 12 households in Hrazdan enjoy privileges (discounts) when paying for WSS services;

<sup>34</sup> According to the respondents' self-assessment.

- Almost every sixth family (17.5%) in Hrazdan and 6.3% of Echmiadzin households receive social assistance under the Family Benefit Program.

*Hot poor are recipients of social assistance?*

When self-assessing their financial status, more than half (56.0%) of the recipients of social assistance under the Family Benefit Program in Echmiadzin and 46.4% in Hrazdan said that they “lacked money even for food”, while 12% of such respondents in Echmiadzin and each third (33.3%) household in Hrazdan experience financial difficulties with paying utility bills.

The quintile distribution of these households by per capita consumer expenditures (Table 8) indicates that some of them (12% in Echmiadzin and 24.6% in Hrazdan) belong to the 4<sup>th</sup> and 5<sup>th</sup> quintile groups and shall be considered relatively well-off.

**Table 8. Distribution of Family Benefit Recipients by Consumer Expenditure quintiles (according to the survey data, March 2006)**

	Per Capita Consumer Expenditure Quintile					Total
	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	
<b>Echmiadzin</b>						
Share of the recipients which belong to certain quintile	44.0	28.0	16.0	4.0	8.0	100.0
<b>Hrazdan</b>						
Share of the recipients which belong to certain quintile	43.5	20.3	11.6	21.7	2.9	100.0

It should be noted that during 2003-2005 the targeting of the Family Benefit Program has considerably improved. This conclusion is confirmed by a comparative analysis of the quintile distribution of family benefit recipients in Yerevan and Vanadzor shown in the previous demonstration project (OECD, 2003). That year, more than 30% of households that receive social assistance in Yerevan and over 40% in Vanadzor belonged to the most well-off 4<sup>th</sup> and 5<sup>th</sup> quintile groups.<sup>35</sup>

The share of the family benefit recipients with individual water meters is almost the same as the average of the city. In Echmiadzin, for example, only one Family Benefit Program recipient has no meter, while in Hrazdan the share of those who installed them makes up 49.3% (against 55.4% of city average).

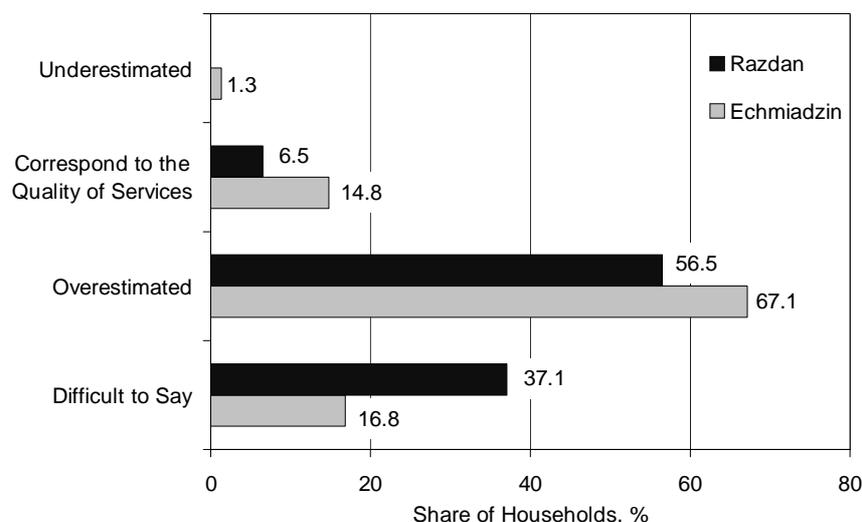
***Public Attitude toward the Level of Tariffs***

Today, Echmiadzin and Hrazdan consumers pay AMD 140 per m<sup>3</sup> (equivalent of 0.34 USD) for the urban water services, including water supply – AMD 115.65 per m<sup>3</sup> (0.28 USD), sewerage and wastewater treatment – AMD 24.35 per m<sup>3</sup> (0.06 USD). Does this tariff accurately reflect the cost and quality of provided services from customers’ perspective?

Answering to the question about the correspondence of the tariff to the *cost* of services provided, the overwhelming part of respondents in both Echmiadzin and Hrazdan (67.1% and 56.5% accordingly) answered that the tariffs were set too high. The number of those who think that the current tariffs are adequate to the service costs is much less (almost 15% of Echmiadzin households and 6.5% families in Hrazdan) - see Figure 3.6.

<sup>35</sup> “Consumer Protection in Urban Water Sector Reforms in Armenia: Ability to Pay and Social Protection of Low Income Households” // Final Report. OECD, Paris, 2004 Section 2.3.2.3.

**Figure 3.6. Public Attitude towards the Level of Tariffs for Water/Wastewater Services (% of the Surveyed Households)**



It should be noted that in the 2003 study, the urban water service consumers in Yerevan and Vanadzor were more confident that the tariffs correspond to the service cost (37.8% and 41.3% accordingly), and there were much less (3-5 times) of those for whom it was difficult to answer this question.<sup>36</sup>

We think that one of the reasons for such attitude is low public awareness of the water companies' economic situation, tariff structure and service costs.

The respondents had practically the same opinion about the correspondence of the tariff to the service quality. Thus, almost two thirds of the surveyed households in both cities stated that the tariffs are much higher than the quality of service provided.

### ***Residential Indebtedness for Water/Wastewater Services***

Each tenth family in Echmiadzin confessed that it had utility payment arrears, while the share of debtors in Hrazdan appeared to be almost 4 times bigger (38.2%).

Echmiadzin consumers (with lower per capita expenses than in Hrazdan (see Annex 1) seem to be more disciplined about paying for services: 75% of respondents in Echmiadzin against 31% of respondents in Hrazdan replied that they were making full payments every month (Figure 3.7)<sup>37</sup>.

Full but irregular payments (only once in a few months) are made by 37% of households in Hrazdan, which is practically twice as higher as in Echmiadzin (18%).

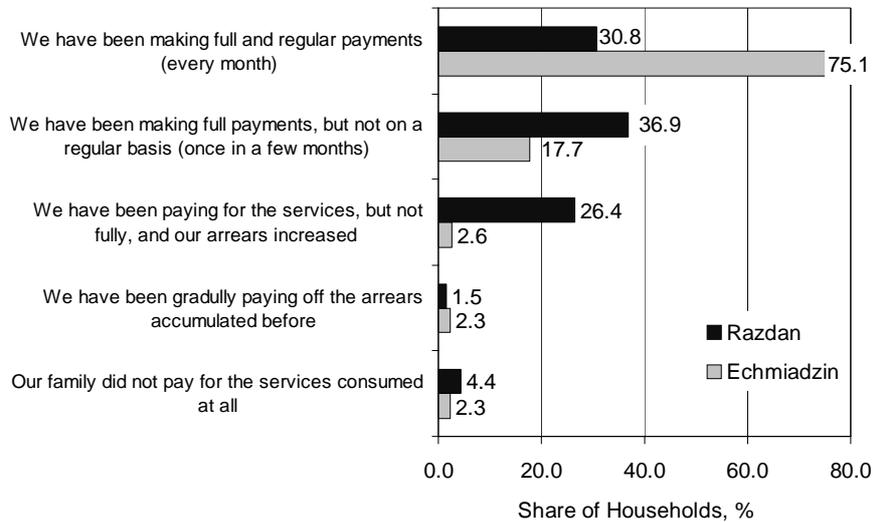
There is a very high number in Hrazdan of those who do not make full payments, thereby increasing the accumulated arrears. The share of such households makes up 26.4%. At the same time, 4.4% of

<sup>36</sup> "Consumer Protection in Urban Water Sector Reforms in Armenia: Ability to Pay and Social Protection of Low Income Households" // Final Report. OECD, Paris, 2004, Section 2.3.2.4.

<sup>37</sup> In 2003 twice less respondents admitted they were making payments regularly and in full: there were only 35.2% of such respondents in Vanadzor, and 13.5% - in Yerevan. This fact is the evidence of improvements in the consumers' payment discipline as a result of reforms conducted in RA recently

services consumers in Echmiadzin and 2.3% in Hrazdan confessed that they were not paying for services provided at all.

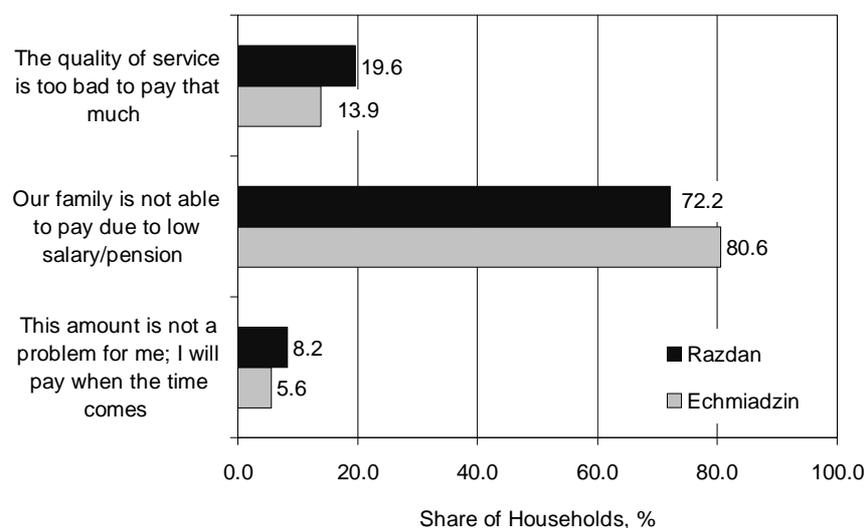
**Figure 3.7. Patterns of Payment for WSS Services by Household (% of Respondents)**



*Reasons for Residential Indebtedness*

The majority of debtors (72.2% in Hrazdan and slightly more than 80% in Echmiadzin) stated that the primary reason behind the accumulation of arrears was their low cash incomes (Figure 3.8). Fourteen to twenty percent of indebted families are not willing to pay “that much” because of the low quality of services.

**Figure 3.8. Reasons of Urban Water Service Payment Arrears (% of the debtors)**



There are also some consumers who state that paying bills is not a problem and that “they will pay when the time comes” (about 6-8% in both cities). This fact demonstrates that there is some potential for further increasing the collection rate regarding residential consumers (households) through a more active public information and awareness campaign.

Answering to the question about the reasons of arrears, every eighth respondent in Hrazdan stressed that their arrears were explained both by low income and low quality of service.

Assessing the real reasons of the debts, it is important to mention that the overwhelming majority of the debtors are the **households without water meters**, therefore they have to pay in accordance with established norms (just as a reminder, the temporary “consumption norm” introduced as of January 1, 2006 is 6 m<sup>3</sup>/person/month, while previously the water charges were calculated based on the pipe diameter). This also explains why Echmiadzin citizens are more disciplined about paying for services: less than 10% of them have no water meters, while in Hrazdan the number of such families makes up about 45%.

### *Sanctions and Penalties*

Surprisingly, respondents turned out to be practically unanimous in regard to sanctions and penalties applied to debtors and late payers. 92.3% and 94% of respondents in Echmiadzin and Hrazdan, respectively, strongly object to *penalizing* households falling behind their payment schedule.

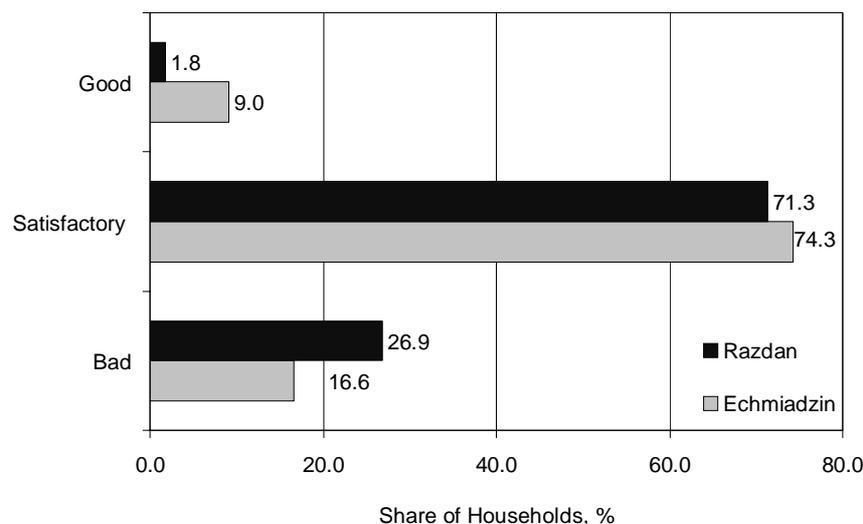
As concerns the application of *penalty sanctions* to non-payers for vodokanal services, households in both cities were also unanimous, though their opinions were somewhat unexpected. Thus, the majority of respondents (83-86%) flatly said that “no sanctions should be applied”. The idea of disconnecting debtors was supported by only 3% of respondents in Hrazdan and about 6% in Echmiadzin.

*None* of the surveyed families in Hrazdan supported such kinds of penalty sanctions as “eviction with further sale of the apartment” or “seizure and sale of debtors’ property”. The share of those who supported such kinds of penalty sanctions in Echmiadzin is paltry (3 and 1 households respectively). Therefore, most residential customers today are not ready to be held liable for failing to pay their water bills.

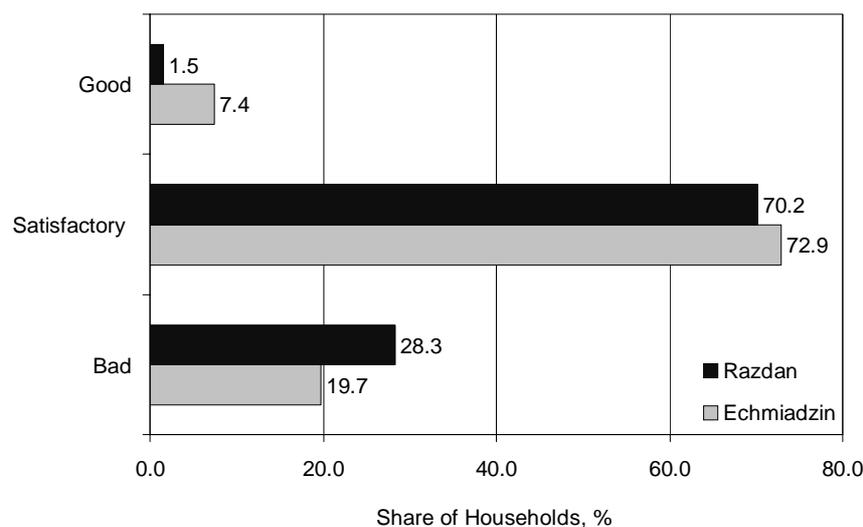
### *Assessment by Consumers of the ArmVodokanal and Local Authorities Operation*

The surveyed households in the both cities were unanimous in their opinions on the efficiency of the water company which service them, and on local authorities as concerns the provision of water/wastewater services (Figure 3.9- 3.10).

**Figure 3.9. Assessment of ArmVodokanal Performance by Respondents**



**Figure 3.10. Assessment of Local Authorities Performance by Respondents**



Both in Echmiadzin and Hrazdan the share of those who estimated the efforts of ArmVodokanal and local authorities to provide water and wastewater services to the population as “satisfactory” is quite high – slightly more than 70%. Residents of both cities were quite unanimous in this assessment.

The opinions differed when “good” or “bad” marks were distributed. There are more people in Echmiadzin than in Hrazdan who assess the operation of both ArmVodokanal and local authorities as “good” (9% respondents against 1.8% and 7.4% against 1.5% accordingly) (see Figures 3.9 – 3.10). Consequently, in Hrazdan there appeared to be more respondents who assess their work as “bad”. About 17% of Echmiadzin respondents think that ArmVodokanal is working bad against 27% families of the same opinion in Hrazdan. As to the local authorities, every fifth family in Echmiadzin and 28% of households in Razadan estimate their operation as “bad”.

Therefore it appears that the Echmiadzin population holds a higher esteem both of ArmVodokanal and local authorities.

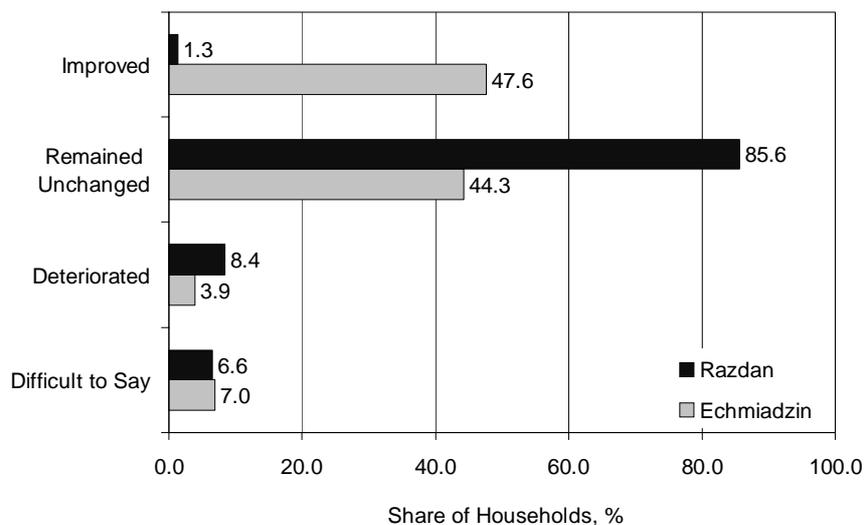
Echmiadzin respondents appeared to be more aware of the fact that currently ArmVodokanal is managed by a French company SAUR: 68% of them positively answered this question. The share of those who know about SAUR in Hrazdan is slightly smaller (62%).

At the same time, Echmiadzin residents were much more positive than Hrazdan citizens about the changes in the quality of service that happened since ArmVodokanal is managed by SAUR. In particular, they gave the following answers:

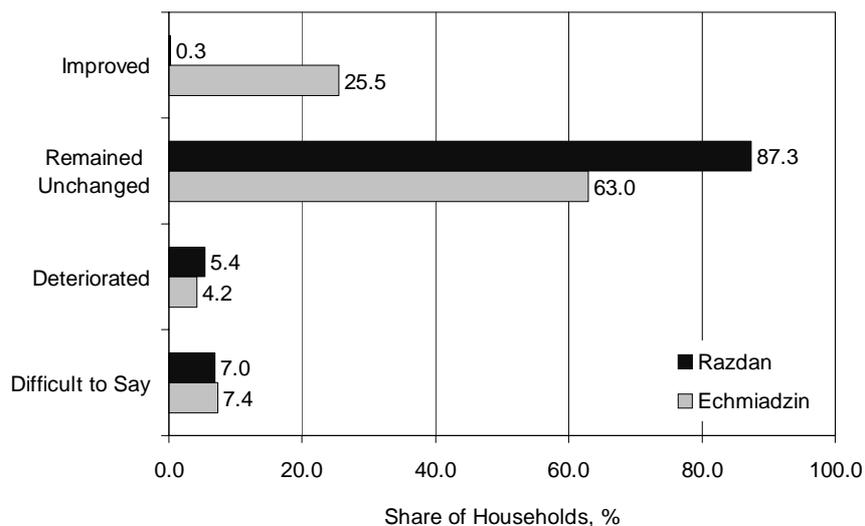
- *water supply* – 48% said that the quality of services improved, and other 44% mentioned that it remained the same;
- *wastewater treatment* – 26% think that the service has improved, while 63% claimed that it remained unchanged (Figures 3.11 – 3.12).

In their turn, Hrazdan citizens practically didn’t notice any improvements in the quality of water and wastewater services (1.3% and 0.3% accordingly). The overwhelming majority (86-87%) mentioned that in their opinion the quality of services remained the same (Figures 3.11 – 3.12).

**Figure 3.11. Assessment by Respondents of the Changes in *Water Supply* Quality under SAUR Company**



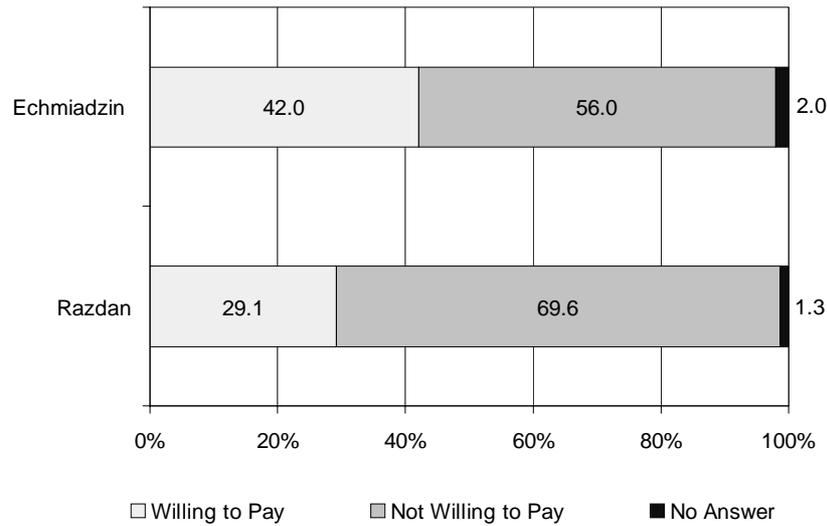
**Figure 3.12. Assessment by Respondents of the Changes in the *Sanitation Service* Quality under SAUR Company**



**2.4 Analysis of the Households’ Willingness to Pay More for Better WSS Services**

Study of the consumers’ willingness to pay is an integral part of the analysis of economic affordability of services (See Section 2.1). The respondents were first asked a *direct* 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 sufficient, the quality of water is improved)?”.

**Figure 3.13. Respondents' Willingness to Pay More for Better WSS Services**

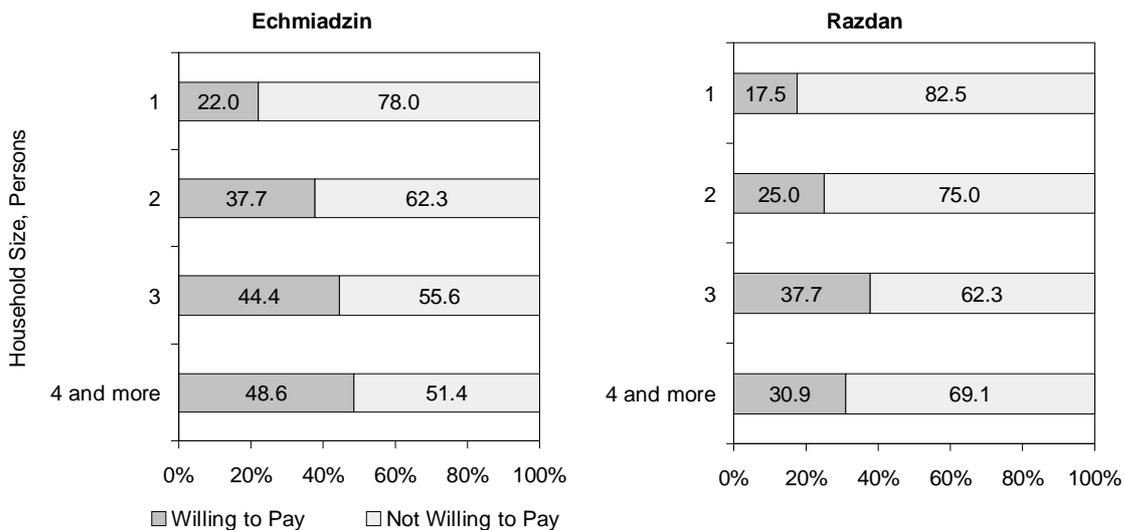


In Hrazdan, 29.1% of households expressed their readiness to the tariff increase (see Figure 3.13). In Echmiadzin, the share of such people has appeared to be one and a half times higher (42.0%).<sup>38</sup>

The following factors influence the households' willingness to pay:

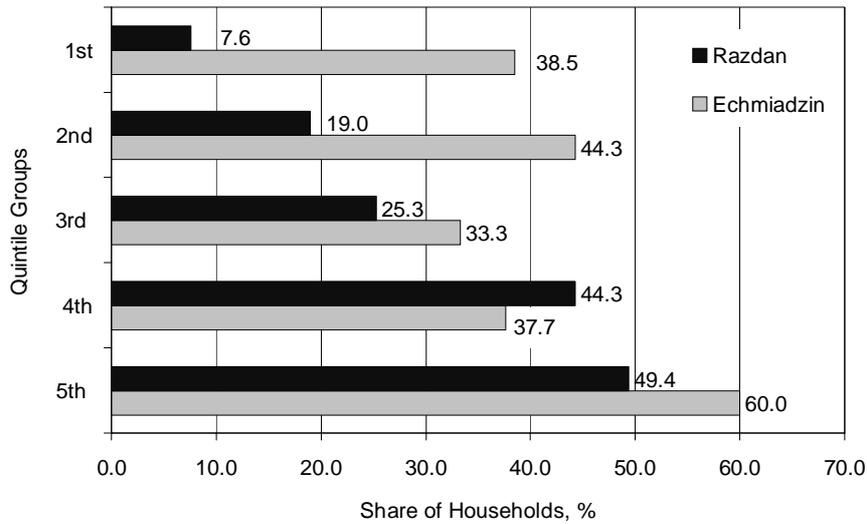
- household size (normally, the willingness to pay more rises with the increase of the number of family members) – Figure 3.14; and
- household income (it is obvious that the better off is the household, the higher is its ability to pay for better quality of services) – Figure 3.15.

**Figure 3.14. Dependence of the Willingness to Pay More on the Size of Household**



<sup>38</sup> It is much higher than expressed three years ago by Yerevan consumers. According to the March 2003 survey, only a minor part of Yerevan households (14.3%) expressed their readiness to the tariff rise. In Vanadzor, the share of such families was almost twice as large and made up 27% (which is almost the same as currently in Hrazdan).

**Figure 3.15. Dependence of the Willingness to Pay More on the Household Income**

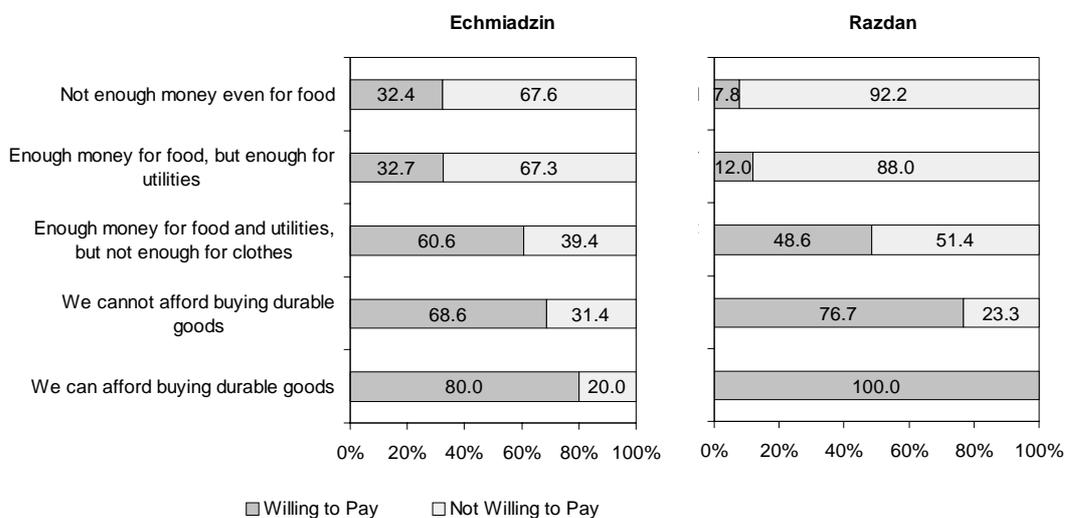


According to the survey results, the specific weight of those willing to pay more in Hrazdan is noticeably rising as moving from the first, the poorest, to the fifth, the richest, quintile group of households. The share of those willing to pay more in the fifth quintile is 6.5 times higher as compared to the first quintile households (see Figure 3.15).

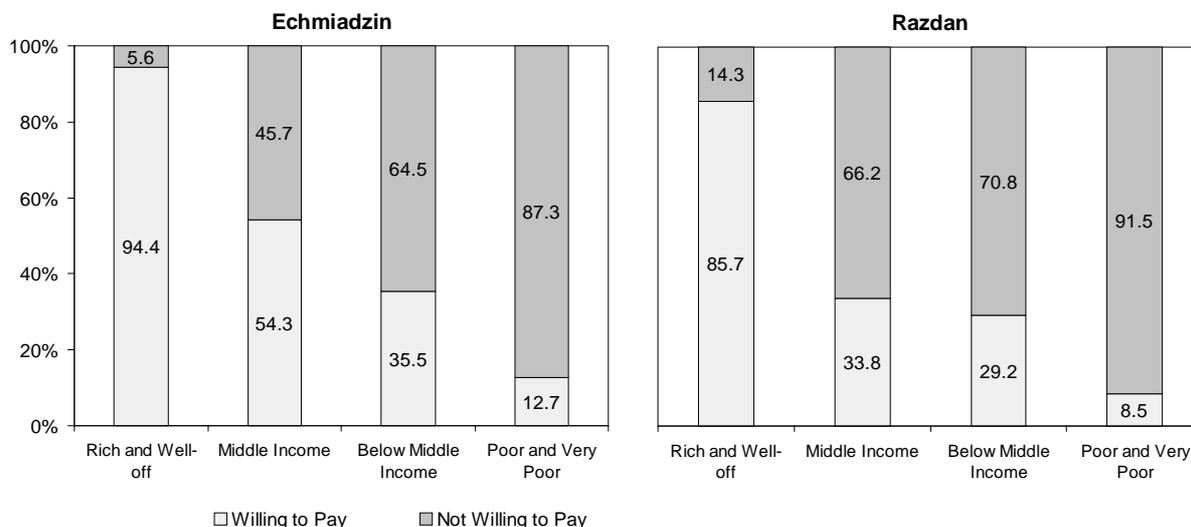
In Echmiadzin, this dependence is traced not so clearly. Even though in general, there are 1.6 times more households in the fifth quintile ready to pay more as compared to those belonging to the first quintile, there is a certain decrease of the share of households ready to pay more in the third and fourth households as compared to the first and second quintiles (see Figure 3.15).

Dependence of the willingness to pay more on the welfare of families is illustrated in Figures 3.16-3.17.

**Figure 3.16. Dependence of the Willingness to Pay More on Households' Self-Assessment of Their Financial Status (% of Surveyed Households)**



**Figure 3.17. Dependence of the Willingness to Pay More on Households' Self-Assessment of Their Economic Situation (% of Surveyed Households)**



These were the answers of the households to the *direct* question on their willingness to pay more.

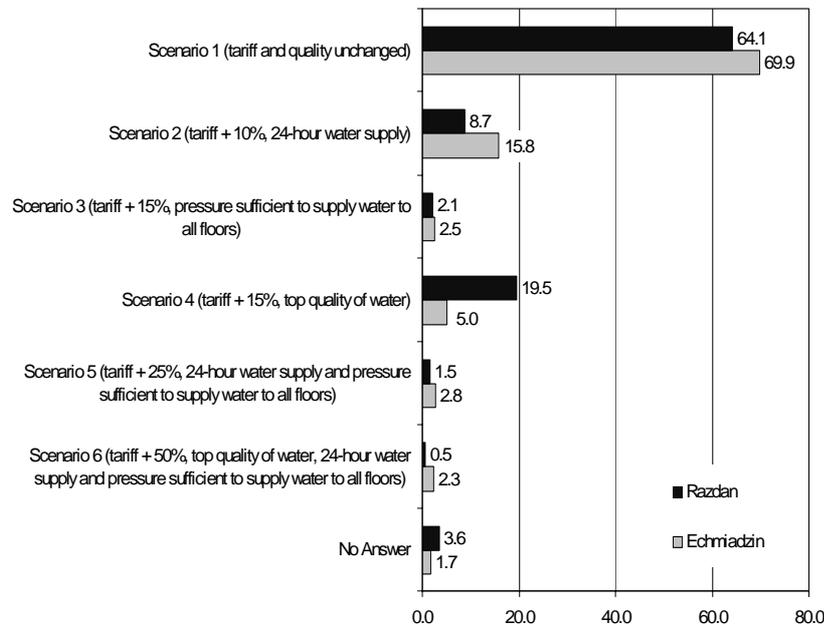
While assessing consumers' willingness to pay more it is important to identify their priorities as concerns improvement of specific quality characteristics. To this end, each respondent was asked to discuss six scenarios of service quality improvement with the relevant level of tariff increase. Thus, Scenario 1 envisaged the unchanged tariff and unchanged quality of services; in Scenario 2, the 24-hour supply of water was offered against a 10% tariff increase; under Scenarios 3 and 4, it is proposed to improve some specific features of the service (e.g. water quality or pressure) against a 15% tariff increase. Scenarios 5 and 6 envisaged 25% and 50% tariff increase for even more essential improvement of the service quality.

According to this analysis (Figure 3.18):

- The predominant number of households in both cities (70% of Echmiadzin households and almost 2/3 of Hrazdan families) have selected Scenario 1 (unchanged tariff) having stressed that they agree to receive the service of existing quality;
- The second biggest group of respondents in Echmiadzin (about 16%) and slightly less than 9% in Hrazdan agree but only to a small (10%) tariff increase if water is supplied 24 hours a day;
- It seems that for Hrazdan households the most important is improving quality of water – in this case they are ready to pay 15% more. This scenario was supported by practically every fifth Hrazdan respondent. In Echmiadzin, only every twentieth households is ready to pay a 15%-higher tariff to get the top quality of water;
- The 15% tariff increase to ensure the pressure sufficient to supply water to all floors was supported by only 2.0-2.5% respondents in both cities;
- Also insignificant (1.5-3.0% of the surveyed families) is the number of those who are ready for the 25% tariff increase in exchange of 24-hour water supply and pressure sufficient to supply water to all floors; and
- The smallest (0.5-2.3%) is the share of those who are ready to the 50% rise if all parameters (quality of water, pressure, and supply schedule) improve considerably.

Consumers unwillingness to accept a higher tariff increase can be explained, in particular, by the fact that water and wastewater services are considered as part of the broader complex of services (including also gas and electricity) and therefore consumers' willingness to pay more should be assessed in the context of other services.

**Figure 3.18. Households' Willingness to Pay More for Better WSS Services Depending on the Degree of Tariff Increase**



Thus, according to the survey results, more than one third of households in both cities are ready to pay more if the quality of services increases. The households are mostly interested in 24-hour water supply and considerable improvement of its quality.

Hrazdan consumers are more coherent in expressing their readiness to the tariff increase: their willingness to pay more defined on the basis of both the response to the direct question and selection of a potential tariff increase scenario practically coincide (the share of households ready to pay more fluctuates between 30% and 33%).

As for Echmiadzin residents, their assessments are to some extent divergent. First, about 42% of them declared that they were ready to pay more, when selecting a possible scenario of tariff increase and quality improvement, it appeared that only 30% would agree to the tariff increase. The remaining 70% preferred to keep the previous quality of service if tariffs remain unchanged.

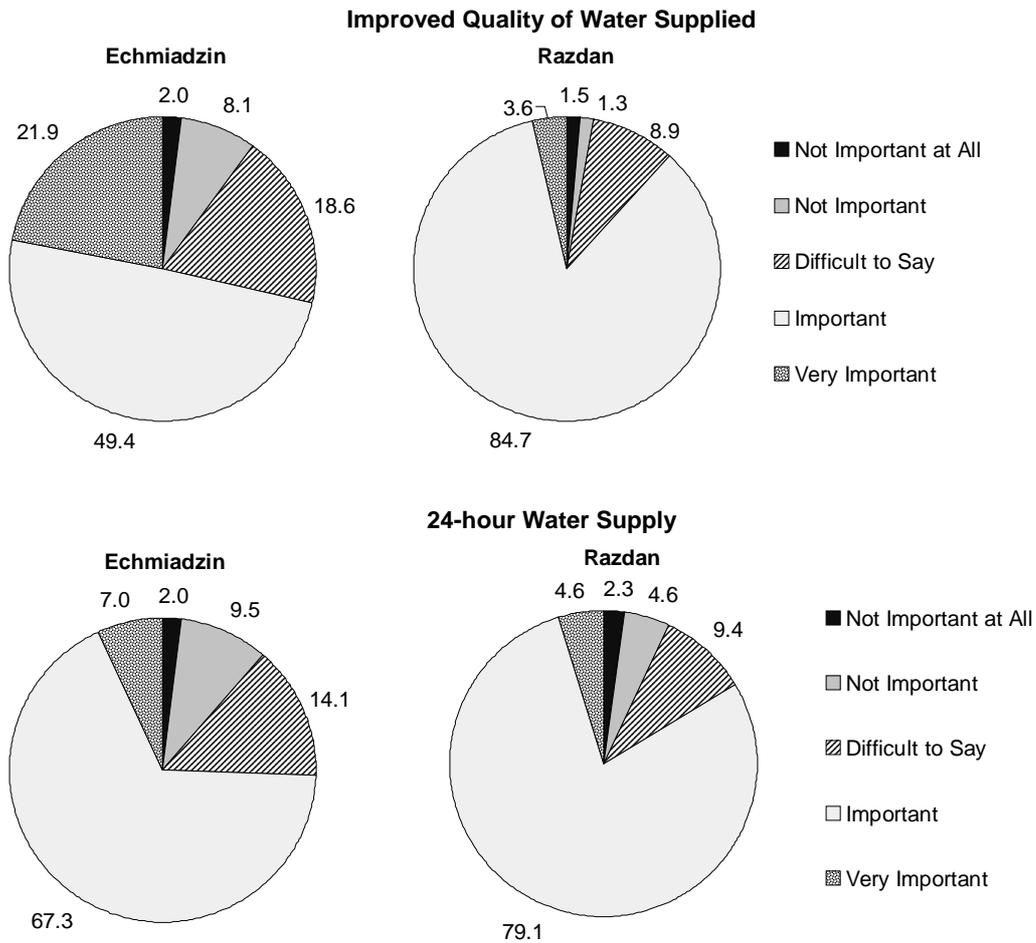
The respondents were asked the question about their willingness to pay more in different contexts, therefore their general willingness may be assessed by uniting positive answers to both questions. As a result, there are 45.8% in Echmiadzin and 32.9% in Hrazdan of respondents who confirmed their willingness to pay more for better services.

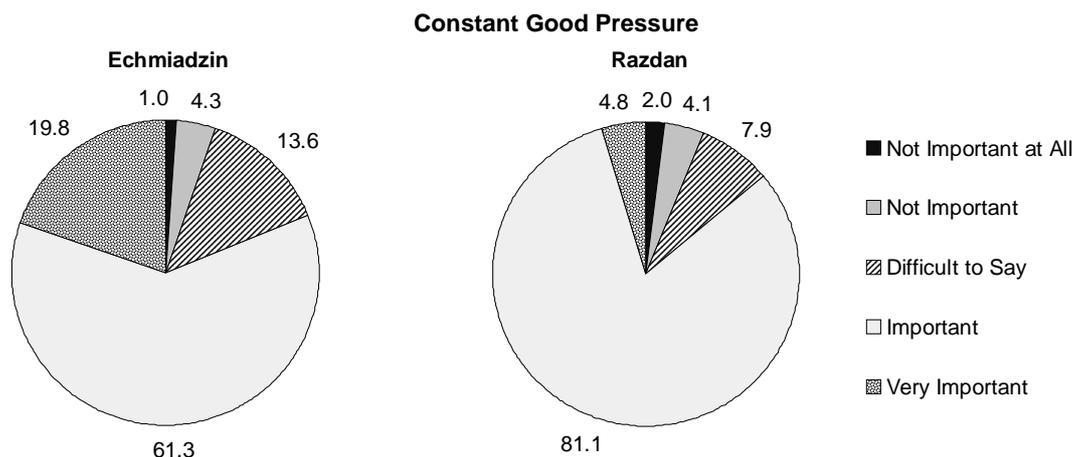
As concerns the most important features of the water and wastewater services, the following priorities were defined (Figure 3.19). The changes below were assessed as “important” and “extremely important” (% of surveyed families).

**Table 9. Priorities in service improvements** Error! Bookmark not defined.

Potential Improvements in the Service Quality	Echmiadzin	Hrazdan
• Improved water quality (including elimination of smell)	71.3%	88.3%
• Ensuring the pressure sufficient to supply water to all floors	81.1%	85.9%
• 24-hour water supply	74.3%	83.7%

**Figure 3.19. Importance of Individual Characteristics of WSS Service Quality (% of the Surveyed Households)**





The survey results show that Hrazdan respondents feel a stronger need to improve certain characteristics of service – their indicator of the “importance” of potential improvements in the quality of water services is higher by all positions as compared to Echmiadzin.

Results of the WTP assessment (with regard to consumers’ priorities in improvement of specific service quality characteristics) serve as an important information basis for selection and development of investment projects.

## 2.5 Consumers’ Ability to Pay the Current Tariffs

The consumers’ ability to pay for urban water services under the current tariffs in Echmiadzin and Hrazdan was analysed separately: i) for households having individual water meters; ii) for households that do not have individual water meters; and iii) city-wide.

For households with water meters the water charges were calculated on the basis of the current tariff (AMD 140 per m<sup>3</sup>) and actual consumption (m<sup>3</sup>/month) as informed by respondents during the survey.

For those households who do not have water meters, due to the absence of data on real billing, their charges were calculated on the basis of the current tariff and the temporary consumption norm (6 m<sup>3</sup>/person/month).

Provided below are the estimates of the current customer ability to pay in Echmiadzin and Hrazdan, calculated by the two methods recommended for EECCA countries.<sup>39</sup> 4% of household expenses was taken as an affordability threshold (i.e. water/wastewater services are considered affordable if the average payment for WSS services does not exceed 4% of the household consumer expenditures).

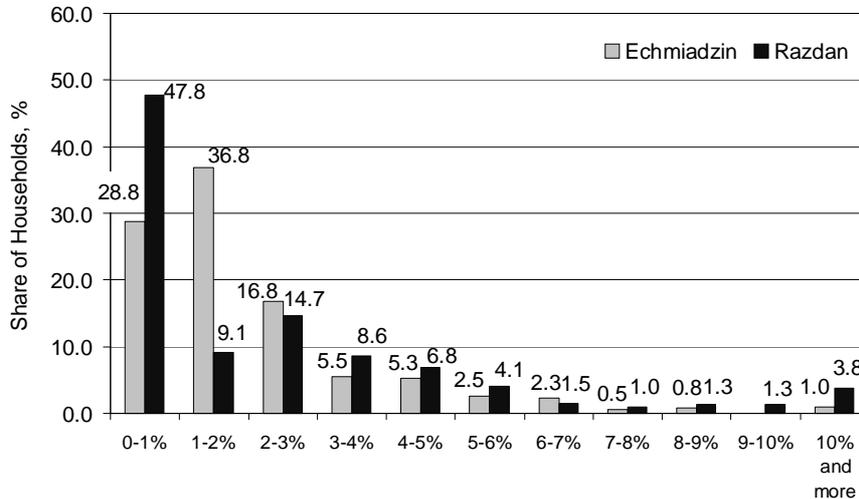
*Method 1. Distribution of households by the level of their charges for water and wastewater services (in per cent of their total consumer expenditures).*

The calculation results prove that about 30% of households in Echmiadzin and 48% in Hrazdan do not pay more than 1% of their consumer expenditures for water company services (Figure 3.20). Generally, 88% of Echmiadzin households meet the affordability criterion, and a bit less in Hrazdan – (80.3%).

<sup>39</sup> 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, 2002.

At the same time, however, 12% of households in Echmiadzin and 20% of households in Hrazdan pay more than the 4% affordability threshold.

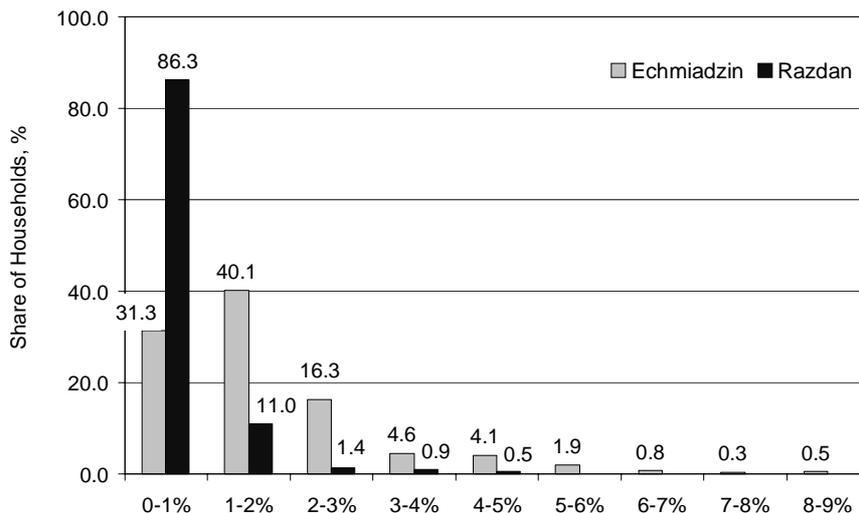
**Figure 3.20. Charges for WSS Services as Per Cent of Household Consumer Expenditures**



Higher service affordability in Echmiadzin as compared to Hrazdan is mainly explained by the fact that Echmiadzin has quite a high share of households with water meters which considerably exceeds the share of metered households in Hrazdan (91.8% vs. 55.4%).

In both cities, rather small share of households with water meters (about 0.5 % in Hrazdan and 7.6% in Echmiadzin) pay more than 4% of the general family budget for water and wastewater services (Figure 3.21). It is easy to see that the predominant part of metered households (about 70% in Echmiadzin and the prevailing 97.3% in Hrazdan) pay not more than 2% of their consumer expenditures for urban water services.

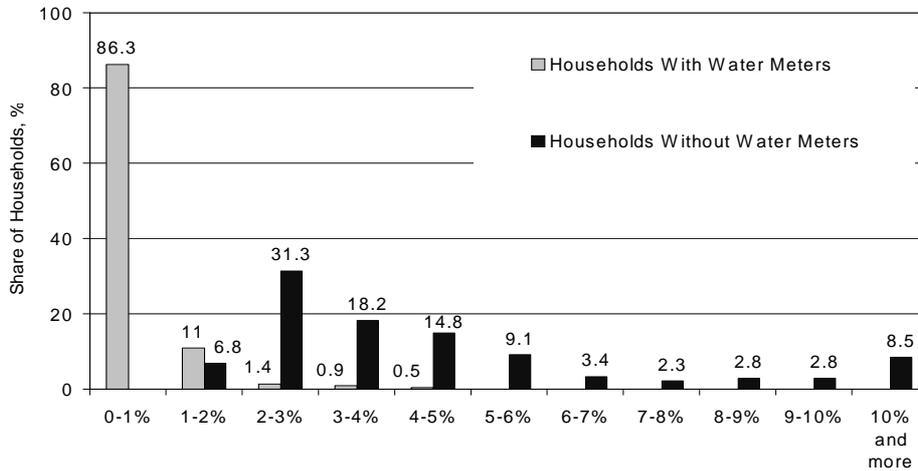
**Figure 3.21. Charges for WSS Services as Per Cent of Household Consumer Expenditures (Only for Metered Households)**



A comparative analysis of Hrazdan household's ability to pay for metered and non-metered households clearly demonstrates that installation of water meters and payment for water *actually consumed* (and not *conventionally estimated based on the "consumption norms"*) noticeably improves

customers' ability to pay. Thus, among the households that installed water meters only 0.5% find themselves behind the "4% affordability threshold" as compared to 44% of families that have no water meters and are forced to allocate more than 4% of their family budget to pay for WSS services (Figure 3.22).

**Figure 3.22. Hrazdan: Comparative Analysis of Charges for WSS Services by Metered and Non-Metered Households (in Per Cent of Household Consumer Expenditures )**



Therefore, taking the "4% threshold" as an affordability criterion, we may conclude that:

- about 12% of consumers in Echmiadzin and around 20% in Hrazdan experience problems with payment for services;
- Installation of water meters considerably improves service affordability by consumers (service charges for metered households' in most cases do not exceed 1-2%).

*Method 2. Analysis of the burden of water charges by household consumer expenditure quintiles*

For the purpose of this method households were grouped in quintiles by per capita consumer expenditures. The results of the analysis are presented in Table 9.

**Table 10. Household Expenses for WSS Services as Per Cent of Household Consumer Expenditures (by Per Capita Expenditure Quintiles)**

	Per Capita Expenditure Quintiles					City as a Whole
	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	
<b>Echmiadzin</b>						
Households With Water Meters	2.90	1.82	1.51	1.30	0.68	1.65
Households Without Water Meters	11.79	6.46	5.15	3.67	2.33	5.43
City Average	3.45	2.23	1.74	1.56	0.82	1.96
<b>Hrazdan</b>						
Households With Water Meters	1.11	0.74	0.61	0.46	0.33	0.63
Households Without Water Meters	11.88	4.68	3.4	2.69	1.89	5.19
City Average	6.69	2.28	1.88	1.59	0.88	2.66
<b>For Information: Share of Households With Water Meters</b> (% of households in the relevant group)						
Echmiadzin	93.8	91.3	93.8	88.8	91.3	91.8
Hrazdan	48.1	60.8	54.4	64.6	23.3	55.4

It is evident that a relative burden of water charges differs by quintile groups and essentially weakens moving from the groups with the lowest incomes to the more well-off households. In other words, families with the lower incomes pay bigger part of their incomes for water services, than the households with higher income levels.

The results of the study show that:

- With 1.96% as an average burden of water expenses in *Echmiadzin*, the share of water charges in the budget of the poorest families (3.45%) is 4.2 times higher than in the fifth, the best-off, group (0.82%). The ratio of water/wastewater charges in consumer expenditures of the first quintile households (3.45%) to the average burden for all city households (1.96%) makes up 1.8;
- For a statistically average *Hrazdan* household, the burden of water expenses is somewhat higher than in *Echmiadzin* and makes up 2.66%. The share of water charges in the budget of the poorest families (6.69%) is 7.6 times higher than in the fifth, the best-off, quintile group (0.88%). The ratio of water/wastewater charges in consumer expenditures of the first quintile households (6.69%) to the average burden for all city households (2.66%) makes up 2.5.

The city-wide customer affordability of services in *Echmiadzin* (as well as their affordability by quintiles) can be generally considered as acceptable from the point of view of their financial ability to pay for the services. At the same time, majority of consumers *without* water meters experience essential difficulties with payment for services since their water charges exceed the “4% affordability threshold” (there are 60% of such households– Table 9). However, since the absolute number of such families is small (more than 90% of respondents are equipped with water meters), this is not a serious problem for the city.

*Hrazdan* finds itself in a more complicated situation: results of the ability to pay analysis prove that the problem exists both for households *without water meters* and city-wide. The reason lies in the big number of households without water meters. For such families belonging to the first and second quintile groups, the water expense burden significantly exceeds the 4% affordability threshold (11.88% and 4.68% accordingly) (Table 9). On the other hand, for households equipped with water meters, such burden mainly does not exceed 1%.

#### *Factors Defining the Urban Water Customers' Ability to Pay*

The following factors are critical for the *Echmiadzin* and *Hrazdan* households' ability to pay:

1. household incomes (the higher they are, the higher is the economic affordability of services);
2. installation of water meters (the higher is the share of households with water meters, the more affordable are services);
3. water consumption by those who have installed water meters (the higher is the consumption, the lower is service affordability).

At first sight it looks like the consumer income is the most important factor to influence the economic affordability of services. However, analyzing the average consumer expenditures for *Echmiadzin* and *Hrazdan* households received as a result of this study (see Annex 1), it is evident that *Hrazdan* service consumers are more well-to-do in general: their incomes are higher than in *Echmiadzin* both on average (by 30%), and by each quintile group (by 10-50%). On the other hand (Table 4), the water consumption by metered households in *Hrazdan* is almost twice as low as in *Echmiadzin* (34 against 62 litre/person/day), which should promote higher capacity of people in *Hrazdan* to pay for the consumed water services. Why are the ability to pay indicators in *Hrazdan* noticeably lower than?

The answer is obvious – the lower share of households with water meters. As it has already been mentioned, this share makes up 91.8% in Echmiadzin against 55.4% in Hrazdan. This is why almost half of Hrazdan households have to pay not for the actually consumed, but rather for the conventionally calculated volumes of service (based on the consumption norm of 6 m<sup>3</sup>/person/month). It makes their water expenses much higher, and consequently decreases their ability to pay (despite of higher incomes).

Therefore, it can be concluded that:

- with the same coverage of households in both cities by water meters and with other equal conditions, the current ability to pay of consumers in Hrazdan could be noticeably higher than in Echmiadzin;
- water meters considerably improve the affordability of services.

The calculations in the subsequent section assess the effect of projected tariff increases on customers' ability to pay.

## 2.6 Ability-to-pay in 2007-2008

Under this project the customers' financial capacity to pay for water/wastewater services has been assessed for the period of 2007-2008.

### *Assumptions*

Projections have been done on the basis of the following *assumptions*:

1. *Tariffs* for water and wastewater services will increase:
  - in 2007 – by 30% as compared to the basic year of 2005;
  - in 2008 – by 50% as compared to 2005 (or by 15% as compared to the previous year);
2. People's *real incomes* in 2006-2008 will grow by 6% annually as compared to the previous year. This means that population's real incomes will have grown by 12.36% in 2007 and by 19.1% in 2008 as compared to 2005.
3. The share of households with water meters will make up:

City	2007	2008
Echmiadzin	100%	100%
Hrazdan	76.7% (Scenario 1) <sup>40</sup> 100% (Scenario 2)	100%

4. Actual consumption volumes charged to households with water meters on average will make up the following (litre/person/day).

City	2007	2008
Echmiadzin	80	90
Hrazdan	60	80

<sup>40</sup> The share of Hrazdan households with water meters in 2007 (Scenario 1) was defined on the basis of a sample survey and an assumption that by 2007 water meters will be installed by all households that have answered that "they do not have a water meter, but are going to install one soon" (21.3% respondents)

Projections were made based on the assumption that water consumption by households with water meters both in Echmiadzin and in Hrazdan will increase as compared to 2005 due to the improved water supply schedule,<sup>41</sup> better control of water meter check-ups, elimination of abuses, improved management, improved collection of payments, and other factors.

5. For Hrazdan households who do not have water meters the normative consumption is established at 6 m<sup>3</sup>/person/month.

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 2006 survey rather than based on city average indicators (see Annexes 3 and 4). The ability to pay estimates were developed with the same two methods which were used in the preceding section.

Projections for Echmiadzin and Hrazdan are presented *separately*.

### **Projection Results: Echmiadzin**

Table 11 below shows indicators assumed when projecting the ability to pay of Echmiadzin households.

**Table 11. Indicators Used to Project the Echmiadzin Households’ Ability to Pay**

Projection Period	Tariff, AMD/m <sup>3</sup>	Average Metered Consumption		Charges, AMD/person/month
		litre/person/day	m <sup>3</sup> /person/month	
2005	140	62	1.86	260.4
2007	182	80	2.40	436.8
2008	210	90	2.70	567.0

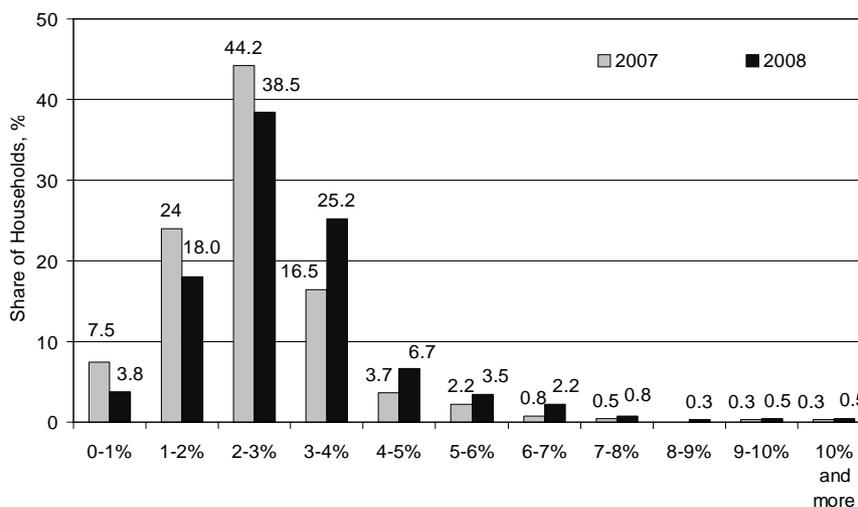
In view of projected tariff increases and changes in per capita water consumption, charges for water services for Echmiadzin consumers will make up on average AMD 436.8 person/month in 2007 and AMD 567.0 person/month in 2008. In 2007 the water charges for households (per person per month) will rise by the factor of 1.7 (on average) as compared to 2005, and in 2008 – by 30% as compared to the previous year. How burdensome will these charges be to households?

*Method 1. Projected distribution of households by charges for water and wastewater services measured in per cent of household consumer expenditures.*

In Echmiadzin only 8% of households will find themselves behind the “4% affordability threshold” after the 30% tariff increase in 2007 (Figure 3.23). A relatively small share (7.5%) of households will be spending up to 1% of their family budget to pay for the services, and every fourth household – between 1 and 2%.

<sup>41</sup> According to the study done in Echmiadzin, the households that have a 24-hour water supply (the sample includes 38 such households which is 9.5% of the total number of respondents) consume on average 77 liter/person/day which is by 24% more than the city average.

**Figure 3.23. Echmiadzin: Distribution of Households by Expenses for WSS Services Measured as Per Cent of Household Consumer Expenditures, Projections for 2007 and 2008**



As regards the 2008 projection, the situation becomes a bit more complicated: 14.5% of Echmiadzin families consuming water company services will find themselves behind the “4% affordability threshold” (Figure 3.23).

*Method 2. Analysis of the water charges burden by household income quintile*

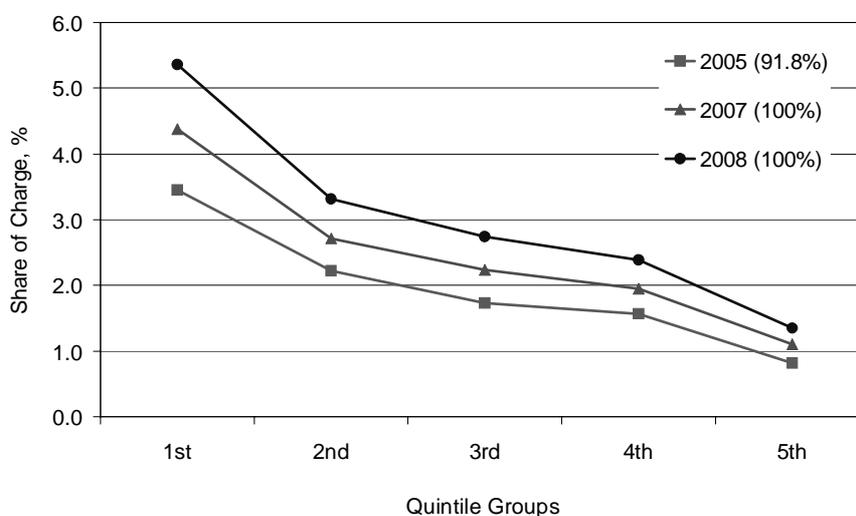
According to projections for the years 2007-2008, in 2007 the relative burden of water charges in Echmiadzin will be 2.48% on average, which is slightly higher than the same indicator in the basic year of 2005 (1.96%). The 1<sup>st</sup> quintile households, which will have to allocate on average 4.38% of their family budget to pay for services, will have certain affordability problems. In 2008 the situation will become more complicated, though the water charge burden in the city will not exceed the threshold value of 4%. Like in 2007, only the first quintile households will have to pay more than 4% of their family budget for water services (see Table 12).

**Table 12. Household Expenditures for Water as Per Cent of Consumer Expenditures in Echmiadzin**

	Per capita expenditure quintiles					City as a Whole
	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	
2005	3.45	2.23	1.74	1.56	0.82	1.96
2007	4.38	2.71	2.24	1.95	1.11	2.48
2008	5.37	3.32	2.74	2.39	1.36	3.03

Figure 3.24 shows the results of comparing the burden of water charges on Echmiadzin households across quintiles in the base year 2005 with the projected burdens for years 2007 and 2008.

**Figure 3.24. Echmiadzin: Burden of Water Charges on Households by Quintiles (Percentage of Household Consumer Expenditures)**



How will situation in Echmiadzin change as compared to 2005?

In 2007 due to the expected considerable increase of population's incomes (by 12.36% as compared to 2005) and 100% coverage of consumers by water meters, only the poorest quintile households will exceed the 4% affordability threshold. Therefore, the 30% tariff increase in 2007 will have no negative effect on the Echmiadzin citizens' ability to pay.

In 2008 projection year, there may be an insignificant deterioration of the situation, since the burden of water charges will rise on average to 3.03%. However, only the first quintile households will find themselves behind the 4% affordability threshold.

Therefore, as a result of the expected tariff increase in 2007-2008 and increased water consumption by the households with water meters:

- water charges burden will increase (as compared to the basic year) for all households;
- only households in the first quintile will have to allocate more than 4% of their budget for water services (in 2007 and 2008 they will have to spend for water 4.38% and 5.37% of their budget, respectively). These are the households that will need support from the government;
- projected percentage of households who may need government support in the total number of residential consumers is 8% in 2007, and 14.5% in 2008.

***Projection Results: Hrazdan***

Table 13 below shows patterns of indicators which were taken into regard when projecting the ability to pay of Hrazdan households.

**Table 13. Household Water Consumption and Expenditures for Water as a Percentage of Consumer Expenditures in Hrazdan**

Projection Period	Tariff, AMD/m <sup>3</sup>	Average Metered Consumption		Charges, AMD/person/month
		litre/person/day	m <sup>3</sup> /person/month	
2005	140	34	1.02	142.8
2007	182	60	1.80	327.6
2008	210	80	2.40	504.0

Taking into account the projected increase of tariffs and changes in the average per capita water consumption, the average cost of water services for households in Hrazdan will make up AMD 327.6 per person per month in 2007 and AMD 504.0 per person per month in 2008. Water charges (per person per month) for households with water meters will increase by the factor of 2.3 in 2007 (on average) as compared to 2005, and by 50% more in 2008 –as compared to the previous year.

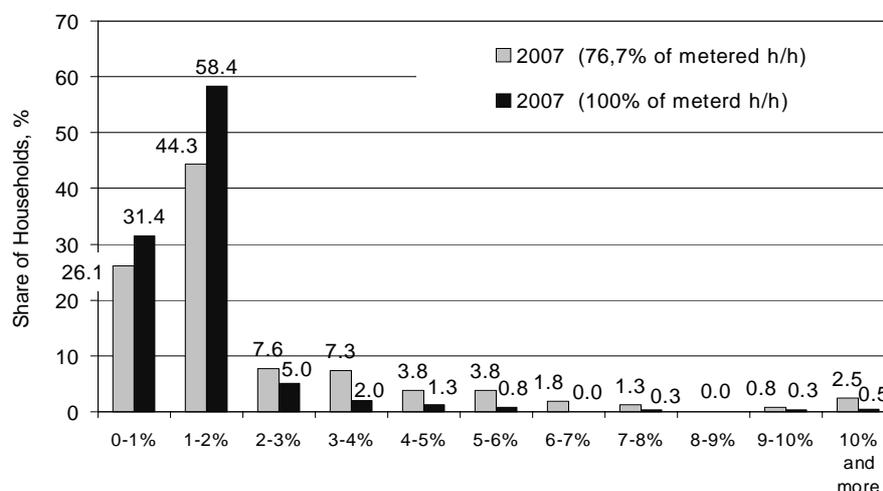
At the same time, in 2007 the households without water meters will have to spend AMD 1,092 per person per month for WSS services, which is 3.3 times more as compared to those who have water meters and are paying only for actually consumed volumes of water. How burdensome will these charges be to households?

*Method 1. Projected distribution of household by the charges for WSS services measured as per cent of household consumer expenditures, projections for 2007-2008*

According to the projection for 2007, 13.7% of Hrazdan households may find themselves behind the “4% affordability threshold” as a result of the 30% tariff increase and provided that 76.7% of households will have water meters (Scenario 1) (Figure 3.25). Each fourth household will spend less than 1% of its family budget for water, and almost every second household – between 1 and 3% of total consumer expenditures.

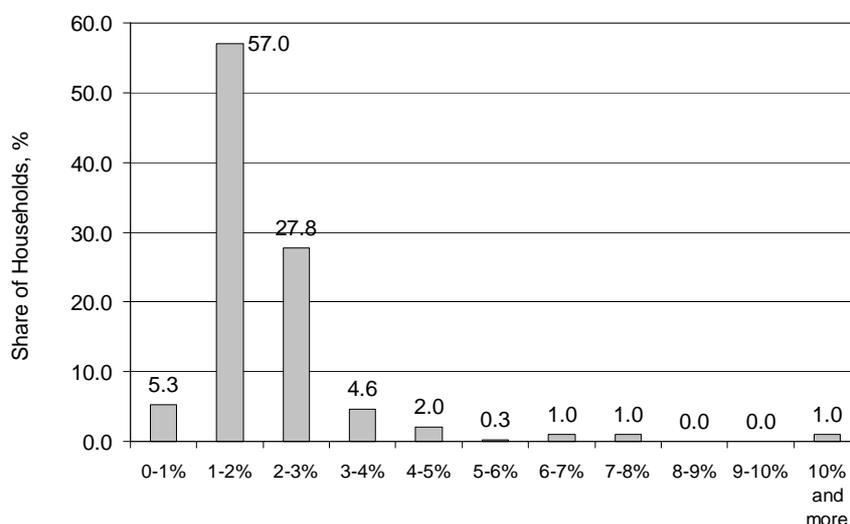
But if all households install water meters (Scenario 2), the projected indicators in 2007 will considerably improve – only 3.2% of Hrazdan households will fail to meet the 4% threshold, while 90% of households will spend on WSS not more than 2% of their budget (Figure 3.25).

**Figure 3.25. Hrazdan: Distribution of Households by Expenses for WSS Services Measured as Per Cent of Household Consumer Expenditures, Projection for 2007 (Scenarios 1 and 2)**



The projection for 2008 shows that practically the situation will remain unchanged: after the next tariff increase only 5.3% of Hrazdan households will find themselves behind the 4% threshold (Figure 3.26). This is much less compared to Echmiadzin (14.5%) – this difference is primarily explained by the lower forecasted volumes of water consumption and higher incomes in Hrazdan.

**Figure 3.26. Hrazdan: Distribution of Households by Expenses for WSS Services Measured as Per Cent of Household Consumer Expenditures, Projection for 2008**



*Method 2. Analysis of the burden of water charges, by household income quintile, projections for 2007 and 2008*

In 2007 the relative burden of water charges in Hrazdan will be 2.54% on average (provided that 76.7% of households will have water meters installed) or 1.43% (in case of 100% coverage) which is much less than the same indicator in the base year 2005 (2.66%) and can be considered as quite an acceptable service affordability indicator for the city.

The households belonging to the first quintile groups will experience certain difficulties (with 76.7% water meter coverage) as they will have to allocate 6.08% of their family budget to pay for water services (Table 13). However, with 100% coverage, households in all quintile generally will have no problems with paying for the WSS services consumed.

According to the projection for 2008, all customers will have enough financial resources to pay for WSS services. The water charge burden will not exceed the 4% threshold neither on average for the city (2.07%), nor in any of the quintile groups.

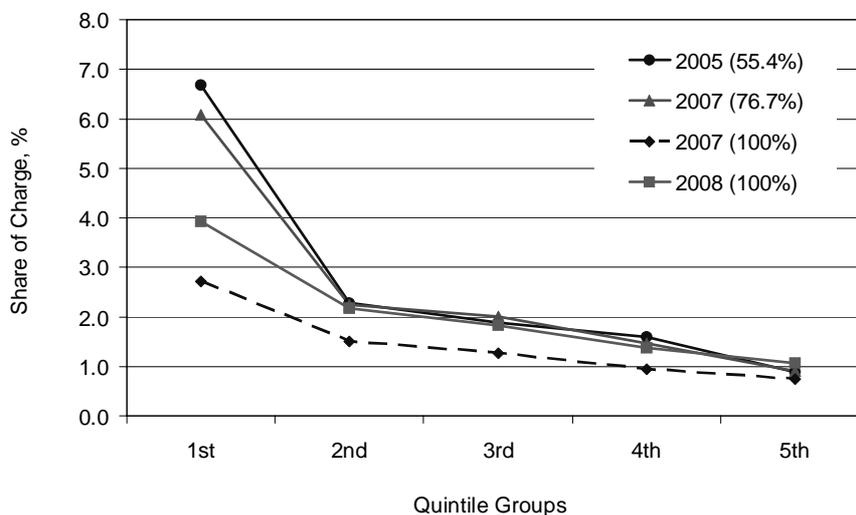
There is a certain fear, however, that many households in the first quintile (most poor) might be “balancing” very close to the “affordability threshold”, which means that some of them may need assistance from the state.

**Table 14. Household Expenditures for Water as Per Cent of Consumer Expenditures in Hrazdan**

	Per capita expenditure quintiles					City as a Whole
	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	
2005	6.69	2.28	1.88	1.59	0.88	2.66
2007 (76.7%)	6.08	2.24	2.01	1.46	0.90	2.54
2007 (100%)	2.71	1.50	1.26	0.94	0.73	1.43
2008	3.93	2.17	1.83	1.37	1.07	2.07

Figure 3.27 shows the results of comparing the burden of water charges across quintiles in the basic year of 2005 (basic year) with projected burdens for the years 2007 and 2008.

**Figure 3.27. Hrazdan: Burden of Water Charges on Households by Quintiles (Percentage of Household Consumer Expenditures)**



How will the situation in Hrazdan change as compared to 2005?

The trend observed in this city is somewhat different from that of Echmiadzin.

**In 2007:**

- provided that 76.7% of households will have water meters, then only households in the poorest quintile might exceed of the 4% affordability threshold (though the burden of WSS charges will

go down as compared to 2005). For the predominant majority of consumers (for at least 80% of them) the burden will actually remain at the base year level;

- in case if all households have their water meters installed, the situation would considerably improve for all consumers (Figure 3.27)

Thus, due to the expected rise of people's incomes and 100% coverage by water meters, the 30% increase of tariffs in 2007 will not impact the affordability of services for Hrazdan citizens. Households in all quintiles will have no problems with paying for WSS services consumed.

The situation may somewhat change in 2008, when the projected 15% increase of tariffs and a slight increase of consumption may occur as compared to the previous year. However, none of the quintile groups will come close to the 4% affordability threshold. In comparison to the base year (2005), a certain increase of the water charge burden will only be experienced by the households in the fifth, well-to-do, quintile group – though overall the burden will be quite light for them.

Therefore, in Hrazdan, despite of the envisaged tariff increases and the growth of metered consumption in 2007-2008, it is expected that:

- the affordability of WSS services for the low-income consumers belonging to the 1<sup>st</sup> quintile group will be considerably improved. It is expected that the share of the household budget to be allocated for WSS services will go down from 6.69% in 2005 to 3.93% in 2008;
- expenses by the well-off families (in the 5<sup>th</sup> quintile group) will slightly increase; and
- projected share of households who may need social support will make up: in 2007 – 13.7% (in case of 76.7% metered consumers) and 3.2% (for 100% coverage by water- meters), and 5.3% in 2008.

It may be concluded that, both in Echmiadzin and Hrazdan, a small share of households may be considered eligible for state social protection as a result of water tariff increase, while the service affordability problem seems quite manageable.

## **CHAPTER 3. SOCIAL PROTECTION OF CONSUMERS OF WSS SERVICE IN ARMENIA**

### **3.1 Existing System of Social Protection in Armenia**

Currently, there is a number of social protection programs for low-income citizens in Armenia, including the Family Benefit Program for poor families, allowances for families with children, and unemployment allowances. The most significant is the Family Benefit Program based on a special means-testing system, or the PAROS system.

The Program criteria and mechanisms were described in detail in the final paper prepared under the OECD Demonstration Project “Consumer Protection in Urban Water Sector Reforms in Armenia: Ability to Pay and Social Protection of Low Income Households” in 2003 which contains a detailed analysis of the aid provision conditions and statistics about the allowance beneficiaries as of 2003. This document also includes recommendations for improvement of the program targeting mechanisms, which, as proved by the results of this study, have been duly taken into account by the Ministry of Labour and Social Issues of Armenia. Further we will dwell more on the recent changes in the program and analyse the efficiency of poverty alleviation mechanisms used in Armenia, as well as the need in providing additional assistance to the low-income consumers of water services.

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, etc.). The score for a family is calculated based on these documents. To become eligible, the family must score at least 33.01 points. Family allowances are provided by the local offices of the social security service.

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:

- Members of a household belong to any vulnerable/socially unprotected category (e. g., an orphan, physically disabled individual, pensioner, unemployed, student, etc.)
- Averaged need category of the household in general
- Number of children and disabled persons 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 any vulnerable/socially unprotected group is the decisive factor, while the other factors are used for specification or adjustment purposes. Additional filtering or screening systems are used to check whether a family (household) is eligible. Based on these factors, the score is calculated to determine eligibility for assistance.

If before 2003 the benefit size (conditional to eligibility to such assistance) did not depend on the score, starting with 2004 the benefit size is differentiated depending on the needs of a household. Thus, in 2006, 3 main levels were introduced with sublevels for families with many children and families residing in border and mountain vicinities.

The basic part of the benefit is 7,000 drams, while an additional sum is calculated depending on the number of children and household living conditions. If the indigence degree is defined within the limits of 33.01-37.00 scores, the following formula is used to calculate the amount of benefit:

$$P = 7000 + 4000 \cdot N \text{ (dram)},$$

where

$P$  – benefit size,

$N$  – number of family members under 18 years old;

$M=4000$  AMD – additional benefit per child.

The additional benefit per child is equal to 5,000 drams for families with 4 and more children and amounts to 5,500 drams for families residing in border and mountain (high land) vicinities.

When the total score is within the limits of 37.01-40.00, the amount of the benefit is calculated in the following way:

$$P = 7000 + 4500 \cdot N \text{ (dram)}$$

Additional benefit per child makes up: 5,500 drams for families with many children, 5,000 drams - for families residing in border and mountain vicinities, and 6,000 drams if such a family has many children.

Finally, if any family gets 40.01 and more scores, their benefit will amount to:

$$P = 7000 + 5000 \cdot N \text{ (dram)},$$

Additional benefit per child makes up: 6,000 dram for families with many children, 5,500 dram for families residing in border and mountain areas and 6,500 dram for if such a family has many children.

One-time assistance makes up 35,000 drams in case of birth of a child, and 20,000 drams when a child starts going to school.

Establishing such dependence of the allowances on the number of scores allows to:

- Decrease the gap between those who received the allowance and those who did not get sufficient number of scores;

- Increase the allowance to the most needy; and
- Decrease the number of relatively well-off families applying for allowance.

This had a positive impact on the targeting of assistance, which will be further proved by the recent statistics.

Table 15 presents the data on the allowance beneficiaries over the recent 4 years. As of July 2006, 194,899 households applied for allowances. Out of them, allowances were granted to 129,698 families (households) which make up 66.6% of the applicants.

**Table 15. Household Enrolment in Family Benefit Program (2003-2006)**

	2003		2004		2005		2006 (on 1.07.06)	
	HH	Citizens	HH	Citizens	HH	Citizens	HH	Citizens
Benefit Applicants Registered in the FBP								
Armenia	219,190		210,093		208,910	670,566	194,899	621,939
Echmiadzin	3,914		3,638		3,597	12,567	3,295	12,325
Hrazdan	4,312		4,242		4,186	14,600	4,188	13,427
Number of Beneficiaries								
Armenia	139,706	505,560	134,224	476,495	127,167	467,534	129,698	487,049
Echmiadzin	2,355		2,419		2,308	9,556	2,421	10,289
Hrazdan	3,017		2,696		2,571	10,177	2,802	11,089

Source: Ministry of Labour and Social Issues of Armenia

The data in the table do not include the families that did not get the sufficient number of scores and that were allocated temporary (monthly or quarterly) allowances with further revision of their case. In 2004, there were 7,782 such families or 5.8% of the permanent beneficiaries.

Table 16 shows the ratio between the number of households applying for assistance and receiving benefits in the total number of households in Armenia in 2003-2006.

**Table 16. Share of Households in Armenia that Participated in the Family Benefit Program in 2003-2006 (%)**

	01.01.2003	01.01.2004	01.01.2005	01.01.2006
Share of Households Registered in the Program, % of the Total Number of Households in Armenia	38.6	27.00	26.8	25.0
Share of Beneficiary Households in the Total Number of Households in Armenia	19.3	17.2	16.3	16.6
Share of Beneficiary Households in the Total Number of Households that Requested the FBP Allowance	67.8	63.9	60.9	66.6

Source: Ministry of Labour and Social Issues of Armenia

According to the Ministry of Labour and Social Issues of Armenia, in the recent four years:

- the share of households that applied for poverty benefits has decreased from 38.6% as of 01.01.2003 to 25.0% as of 01.01.2006;

- the share of households receiving family benefits has noticeably decreased (from 19.3% in early 2003 to 16.6% in early 2006);
- the share of households that were refused an allowance has stabilised in the recent four years at the level of 32-39%, which is much lower than in 2000-2002 (45-50%).

Table 17 shows the ratio of households that have filed allowance request and received aid to the total population of Echmiadzin and Hrazdan, as well as Armenia in general as of 1.01.2006.

**Table 17. Share of Households That Participated in the Family Benefit Program in Echmiadzin and Hrazdan, as of 01.01.2006 (%)**

	Share of Households Registered in the Program	Share of Beneficiary Households
Armenia	25.0	16.6
Echmiadzin	25.3	18.6
Hrazdan	28.6	19.2

Source: Ministry of Labour and Social Issues of Armenia; calculations by the authors

Statistics prove that the degree of coverage of households in Echmiadzin and Hrazdan by family benefits (some 18-19%) is slightly more than the average country level (16.64%).

In 2003-2006 the funding of the Program has been steadily rising (on average by 20-25% a year) (Table 18), which means that the size of the benefit (per recipient) has been also increasing.

**Table 18. Funding of the Family Benefit Program from the Public Budget (AMD million)**

	2003	2004	2005	2006 (plan)
Armenia	12,745.2	16,093.0	20,236.9	24,337.8
Echmiadzin	234.1	308.3	397.1	475.2
Hrazdan	299.3	360.9	401.3	502.6

Source: Ministry of Labour and Social Issues of Armenia

Table 19 shows that the average size of the allowance per household in 2003-2006 has more than doubled in Armenia and will make up more than AMD 15,200 household/month in 2006.

**Table 19. Average Size of Benefits (AMD per Month per Family)**

	2003	2004	2005	2006 (plan)
Armenia	6,700	8,950	12,300	15,200
Echmiadzin	7,208	9,500	12,199	15,915
Hrazdan	6,916	9,050	11,732	14,778

Source: Ministry of Labour and Social Issues of Armenia

The efficiency of measures taken by the Government to improve the targeting of the Family Benefit Program is supported by the data received in the course of integrated living conditions survey in Armenia in 2005, presented in Table 20. It shows that almost 63% of allowance beneficiaries belong to the two lowest quintile groups as concerns the income level and get 67% of the budget funds allocated for the allowances. This picture is positively different from what was observed three years ago when the number of allowance beneficiary in the two lowest quintiles made up 50%, and the amount of funds that they received was not more than 54%<sup>42</sup>.

<sup>42</sup> "Consumer Protection in Urban Water Sector Reforms in Armenia: Ability to Pay and Social Protection of Low

**Table 20. Distribution of Family Allowance Beneficiaries, by Quintile**

	Quintile Groups by Average Per Capita Consumer Expenditures					Total
	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	
Share of FBP Beneficiaries which belongs to certain quintile, % of total beneficiaries , in %% of total	40.0	22.6	18.0	11.2	8.2	100.0
Benefits received by the recipients in certain quintile as the share of total, benefits provided, in % of total	44.8	21.9	16.5	9.6	7.2	100.0

Sources: Social Snapshot and Poverty of the Republic of Armenia. Statistical Analytical Report. Yerevan 2004, p.136

### 3.2 Social safety nets for Low-Income Service Consumers

#### *Potential Forms to Implement Social Protection Measures*

In 2003, OECD experts<sup>43</sup> analysed the applicability of alternative measures to protect the low-income water consumers in Armenia on the verge of doubling the water tariff. In particular, the following forms of implementation of social security measures were considered:

- provision of assistance for service payment within the framework of the existing Family Benefit Program;
- Development and implementation of tariff methods of social protection (social tariff, block tariffs);
- Implementation of a special program of assistance for service payment.

Regarding the development of a special assistance program, it was concluded that given the relatively small water benefits, administration, organizational and technical costs of the program may well exceed the value of benefits themselves. Consequently, 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 the whole set of communal services including natural gas, district heating, electricity, and housing maintenance services (just like the housing subsidy programs implemented in a number of EECCA countries).

Concerning the tariff methods of protection, it was acknowledged that application of increasing block tariffs has economic expediency to stimulate thrifty resources consumption, but its use to protect low-income consumers would be ineffective due to low targeting that this mechanism involves (for more details please see Section 1.2). As a result, the experts developed recommendations to provide additional assistance to water services consumers within the framework of the existing social security system, in particular the Family Benefit Program.

Over the recent three years the Family Benefit Program has been considerably transformed: its targeting has been improved, and its budget funding has considerably increased which essentially strengthened the efficiency of the provided aid. According to the World Bank international consultants,

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Income Households” // Final Report. OECD, Paris, 2004

<sup>43</sup> “Consumer Protection in Urban Water Sector Reforms in Armenia: Ability to Pay and Social Protection of Low Income Households” // Final Report. OECD, Paris, 2004

the social security system in Armenia ranks among the best in the post-Soviet countries as concerns its targeting and the update of the beneficiary lists. It is not surprising that the Government of Armenia continues seeing it as the main mechanism used to mitigate the negative consequences of urban water tariffs increase in relation to low-income citizens.

Further we will consider the negative outcomes of the potential increase of water prices to the low-income consumers and the possible ways of their mitigation.

### ***Assessment of the Need in Additional Assistance for Low Income Service Consumers -Family Benefit Recipients***

Assessment of the consumers' ability to pay in Echmiadzin and Hrazdan in 2005 (see Section 2.5) shows that the share of water expenses in consumer expenditures is on average 1.96% in Echmiadzin and 2.66% – in Hrazdan (see Table 9) while the percentage of households who had to pay more than 4% of their consumer expenditures makes up 12% in Echmiadzin and 20% in Hrazdan (see Figure 3.20).

This information relates to all consumers – those who have water meters, and those for whom water charges are calculated on the basis of a normative of 6 m<sup>3</sup>/person/month. Just as a reminder, the study has revealed that 91.8% of respondents used water meters in Echmiadzin and only 55.4% – in Hrazdan. Analysis of water expenses of those who paid for water in accordance with meter readings shows that (on average) water charges make up 1.65% of consumer expenditures of such households in Echmiadzin and 0.63% – in Hrazdan, while only 7.6% of those households in Echmiadzin and just 0.5% in Hrazdan had to spent for WSS services more than 4% of their total consumer expenses (see Figure 3.21).

The figures above prove that metering water consumption has significant impact on the cost of services for consumers and ultimately affordability of services for low income consumers. We see that availability of a water meter is the most reliable means to protect poor consumers under the conditions of changing tariff policy, since thereby consumers may control their expenses for WSS services themselves.

In the recent years, the Government of Armenia has been pursuing a coherent policy for ubiquitous introduction of water metering. Thus, the share of residential consumers using water meters in such cities as Yerevan, Echmiadzin and a number of other has exceeded 90%. Currently, the State Committee of Water Economy and ArmVodokanal with support from the World Bank and other donors are implementing the program for installation of water meters for all company's consumers. According to the governmental resolution #2250-H of 22 December 2005 (see Section 1.1.2), in the period between 1 January and 1 August 2006, all subscribers without water meters has been granted an opportunity to conclude agreements with water supply companies for installation of water meters with a possibility to pay for them in the course of six months. For the period until the water meter is installed a normative consumption of water is established at 200 litre/person/day (and 250 litre/person/day for Yerevan).

Therefore, assuming the completion of water meters installation for all water consumers, we will be basing our assessments of the need of social protection measures under the assumption that all low-income families are charged in accordance with their meter readings.

According to the projection for 2007 (see Section 2.6), with due consideration of a 30% water tariff rise and established consumption at the level of 80 litre/person/day in Echmiadzin and 60 litre/person/day in Hrazdan, the share of households that will have to pay more than 4% of their aggregate income will make up 7.8% in Echmiadzin and 3.2% in Hrazdan. Water expenses of the first quintile group in Echmiadzin will be 4.38% of the total household expenses with the average city indicator of 2.48%. In Hrazdan, due to higher incomes, these figures will make up 2.71% and 1.43% accordingly. This suggests that, after the water tariff rise, the water services will be quite affordable for most consumers in Echmiadzin and fully affordable for consumers in Hrazdan.

As to the most vulnerable social groups, which, in accordance with general assessments, include family benefit recipients, even though their consumer expenditures for WSS services in both cities are by one third lower than the average expenses of all households in the city, the share of water expenses in their budget is only 20% higher than the average city indicator. This is due to the lesser water consumption registered by water meters – the family allowance beneficiaries generally consume 10-15% less water than households in the city on average.

The most critical aspect influencing the benefit recipients' ability to pay is the availability of water meters. Practically all benefit recipients with water meters in Hrazdan and Echmiadzin pay less than 4% of their aggregate income while the volumes of water consumed are not less than the social consumption norm, which is usually established at the level of 50 litre/person/day. This means that if low-income consumers use water meters, there is no need to develop and implement additional measures for social protection of water consumers.

With an average monthly water bill for a household enrolled in the Family Benefit Program of 823 drams in Echmiadzin and 420 drams in Hrazdan (at current tariffs) and average consumer expenditures of households in the amount of 46,000 drams in Echmiadzin and 62,000 drams in Hrazdan, the average family benefit in the amount of AMD 15,200 is quite sufficient to cover the necessary water expenses of low-income households.

This conclusion is confirmed by the results of the affordability study of low-income water consumers in Yerevan which, on the Government's order, was conducted by the Castalia Consulting Company in 2005 in view of the envisaged rise of tariffs in Yerevan. According to the lease agreement between the Government of Armenia and *Generales des Eaux*, water tariffs in Yerevan were to increase in July 2006 from AMD 150 per m<sup>3</sup> to AMD 172.8 per m<sup>3</sup>. Having considered the possibility of providing additional assistance to family allowance beneficiaries, the consultant has found it inadvisable, as the expenses of these families for water services made up on average only 1.9% of the aggregate household expenses.

### ***Alternative Mechanisms to Support Low-Income Service Consumers***

It has been planned previously that additional aid for water service charges to the family benefit recipients in Yerevan would be covered by the grant provided by the Global Partnership for Output Based Aid Programme (GPOBA). This Programme is funded by the UK DFID and administered by the World Bank. Initially, it was planned that within the next seven years up to USD 4 million will be spent to provide social assistance to the water/wastewater service consumers that receive family allowances in Yerevan. However, upon the study of the situation, this idea was rejected to consider alternative ways of social support to the reforms in the water sector. In particular, the following two possibilities to use the funds were analysed:

- purchase and free installation of water meters for the benefit recipients who receive services from YerVodokanal, ArmVodokanal, ShyrakVodokanal, and LoryVodokanal and still do not have meters, and coverage of debts for the installation of water meters for the subscribers/benefit recipients to whom they were supplied before; and
- recovery of the most damaged and emergency-state water supply systems in the villages which are not served by water companies (about 565 villages).

According to State Committee of Water Economy, as of 1 July 2006 there were 29,289 subscribers that were receiving family allowances and did not have water meters. The amount of funds necessary to purchase water meters, complete installation works, and pay off the arrears makes up AMD 526.5 mln or USD 1.26 mln.

Consultants of this OECD project consider that it would be advisable to use the GPOBA grants for

this purpose, or, should this be impossible, provide all family benefit recipients without water meters with a lax credit that can be paid off by instalments in the period of five years. It is worth noting here that the coverage of debts for the consumers that have signed a payment deferral agreement is unfair in relation to the consumers who have paid their part of cost in time.

## CHAPTER 4. RECOMMENDATIONS ON TARIFF POLICIES AND SOCIAL PROTECTION MEASURES

As described above, currently the decisions of the Public Services Regulatory Commission in Armenia have no individual clauses related to the issues of social security or tariff methods to ensure protection of the low-income consumers of water supply and wastewater treatment services. In the Consultant's opinion, to ensure the consumers' financial ability to pay for urban water services in accordance with both the current and forecast tariffs, as well as to increase their willingness to pay, there is a need to implement a balanced approach to the selection of non-tariff measures to ensure social protection of the low-income consumers and mechanisms to improve the tariff policy.

### 4.1 Reform of Tariff Policy and Tariff Regulation Procedures

The following ways to improve the tariff policy in Armenia can be proposed to ensure better service affordability and higher consumers' willingness to pay for water/wastewater services:

1. The regulatory procedure should be improved in order to provide more solid grounds for the tariff revision taking into account customers' ability and willingness to pay
  - Prior any considerable tariff increase or realization of a large investment project it is recommended to conduct special (targeted) surveys of water/wastewater service affordability and publicize their results. Such surveys will provide government with information on the actual consumers' ability and willingness to pay to be further used as an argument to support the tariff increase and to ensure transparency of the decision making process. At the same time, the affordability analysis results will serve as an invaluable source of information to develop social protection measures for the low income consumers of WSS services. Public presentation of results would contribute to better public education and increasing consumers' awareness.

Such a survey may be *ordered* by the State Committee for Water Economy (or by the Commission) at the stage of the review of an application submitted by a water company and to be conducted by consulting firms, scientific research or academic institutions with the methodological and organizational support of the NSS. It may be financed from the state budget funds allocated for research work or activities of the central executive bodies.

- It is recommended to introduce the practice of conducting sample surveys of the quality of customer services by applying the method of *focus groups*, i.e. identification of target groups of consumers (workers, pensioners, housewives, etc) and generalisation of their results. Survey results will make it possible to identify the priorities of consumers in the area of service provision in order to be further taken into account for the purpose of developing investment programmes and selection of operational technical solutions.
- It is advisable to introduce a requirement for the initiators of the investment programs and individual capital investment projects in water and wastewater sectors to submit tariff calculations for tariffs that will result from implementation of such programs. These proposals should provide justification of economic affordability of services for the majority of residential customers. Such requirement might be established as a temporary one for the

period when large capital projects need to be carried out in water supply and wastewater treatment sector in the RA. Such estimates are to be submitted to the Government of Armenia via the State Committee of Water Economy and will serve as the basis for decision making regarding project implementation feasibility.

- It is not recommended to formalise the process of accounting for the customers’ ability to pay in the course of regular tariff revision, since methodologically it is not possible to take into account the survey results when defining the tariff.
  - At the same time, since currently the public in Armenia is extremely negative about introducing sanctions against non-payers and practically does not support none of the proposed measures (like fines levied on late payments or seizure and sale of debtors’ property through the court procedures – see section 2.3.5), it has been recommended that the servicing companies should strengthen their efforts on educating public and increasing public awareness (through mass media campaigns, meetings with customers, and public discussions on the issues of debts or cost and quality of services for which they are willing to pay).
2. Improvement of mechanisms to ensure fair compensation by each consumer group of expenses for provision of WSS services to this group - to decrease the state dependence on international borrowings for the purpose of investments in WSS, in particular:
- Introduction of the utility costs approach as opposed to cash-needs approach in determining revenue requirements for tariff setting (by including depreciation while calculating tariff and rate of return on a defined base) as soon as a water company achieves the 70% collection rate from the population;
  - Introduction of tariff differentiation depending on the actual cost of services in different geographic areas: either through establishment of different tariffs depending on the service production cost in individual service areas, or through introduction of block tariffs (for non-residential consumers);
  - Introduce a fixed “subscriber fee” levied on all customers to finance maintaining of the customer data-base and regular inspections of water meters (whether they are installed correctly and work properly, etc.).
3. Significant improvement of metering to improve financial planning in water companies by:
- Requiring water companies to maintain a database on individual water meters that are installed at subscribers’ places, monitor their inspection/testing terms, and notify consumers on the due inspection terms (concurrently with the introduction of the fixed fee for subscriber service to establish a fair mechanism for compensation of these expenses);
  - Introducing a fee to be paid by the customers for dismantling, transportation, examination/testing, and installation of subscriber-owned water-meters with the expired term of metrological examination, or expired life-time;
  - Development of a comprehensive program for installation of block-meters to measure water consumption by each apartment building.

The role of the State Committee for Water Economy in improving the system of water metering and providing recommendations on improving tariff policy in the sector might be significantly increased.

## 4.2 Mitigation of the Consequences of Tariff Increase for Low-Income Consumers

The following recommendations derive from the analysis of the categories and characteristics of consumers who may need protection in view of the proposed tariff increase:

- The Poverty Family Benefit Program for low-income households is the basis of the social security system in Armenia which covers the majority of low-income and vulnerable families. The program has a flexible system of means testing, precise and comprehensive database of candidates for the allowance and is able to rapidly respond to any social changes in the society. Therefore, it is the best mechanism that can be used today to develop additional measures to protect the vulnerable categories of citizens in the course of reforms. Nevertheless, the work on further improvement of the program targeting should be continued.
- The number of consumers that may need protection in the future is manageable in both cities and does not justify introduction of additional social security measures.
- Once the immediate goals of poverty reduction in Armenia are achieved, the country will need to develop a comprehensive communal services allowance program to cover electricity, gas, central heating, water supply and wastewater treatment, removal of municipal waste, and housing maintenance.
- The most reasonable way to use the state and donor funding to protect the poor consumers is the provision of water meters to all poor households for free, in particular to those registered under the family benefit program. For this purpose, there is a need to unite the efforts of the donors (in particular the World Bank GPOBA Program) and budget funds allocated for state subsidising of water companies.

## ANNEXES

### *Annex 1*

**Table 21. Assessment of Household Consumer Expenditures by Quintile Group (thousands of drams per month, 2005)**

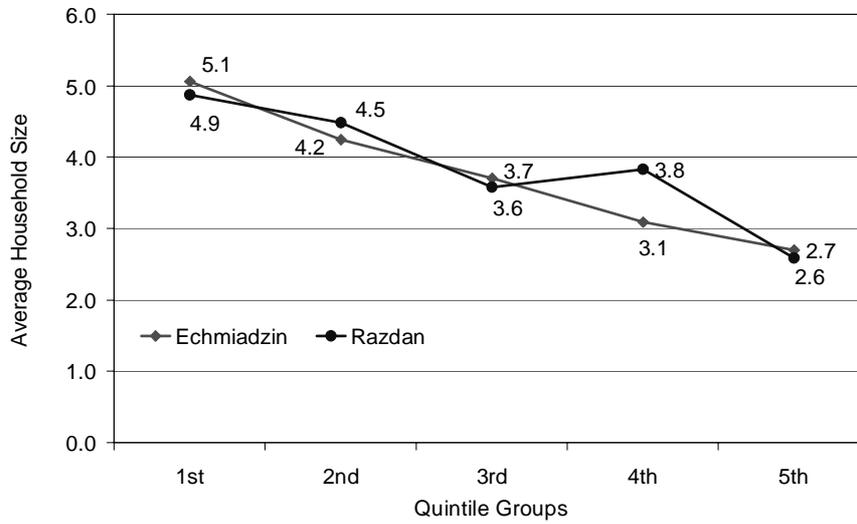
Quintile Groups by Average Per Capita Consumer Expenses	By Household		By Household Member	
	Echmiadzin	Hrazdan	Echmiadzin	Hrazdan
First	39.2	47.3	8.0	10.0
Second	55.4	82.7	13.1	18.4
Third	64.7	90.3	17.4	25.1
Fourth	71.5	119.2	23.2	31.7
Fifth	118.4	122.5	46.4	51.6
Total	69.9	92.4	21.6	27.4

**Table 22. Water Supply and Sewage Expenses by Quintile Group of Households with Water Meters (drams per month, 2005)**

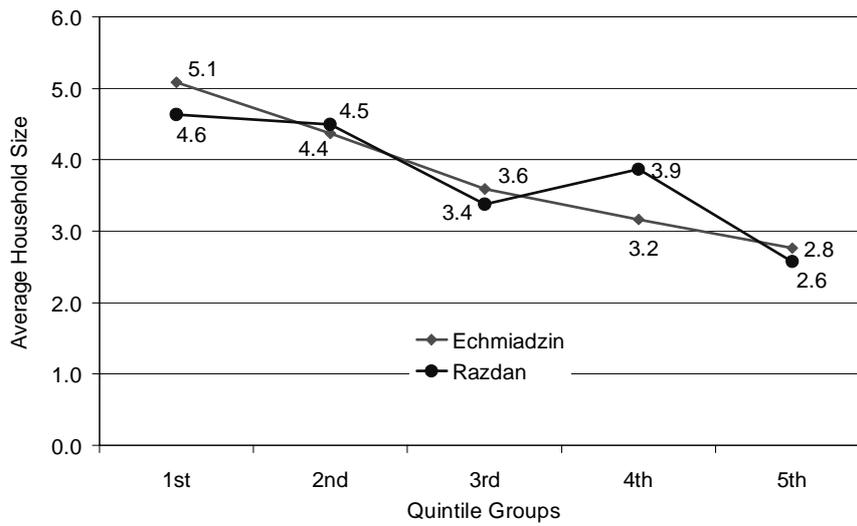
Indicators	Quintile Groups					City Average
	First	Second	Third	Forth	Fifth	
Echmiadzin	1,022.19	1,008.38	904.32	935.89	807.40	935.75
Hrazdan	471.58	520.43	475.35	494.88	420.00	475.62

Annex 2

Average Size of Households by Quintile Group



Average Size of Households with Water Meters by Quintile Group



Annex 3

Table 22. Echmiadzin: Dynamics of Indicators Taken into Account to Forecast the ability-to-pay of Households with Water Meters (by Quintile Group)

Period	Quintile Groups	Tariff, Dram/m <sup>3</sup>	Consumption		Cost of Service, Dram/person/month
			l/person/day	m <sup>3</sup> /person/month	
2005	<b>Average</b>	<b>140</b>	<b>62</b>	<b>1.86</b>	<b>260.4</b>
	First		50	1.49	208.6
	Second		56	1.68	235.2
	Third		62	1.85	259.0
	Fourth		71	2.14	299.6
	Fifth		72	2.15	301.0
2007	<b>Average</b>	<b>182</b>	<b>80</b>	<b>2.40</b>	<b>436.8</b>
	First		64	1.92	349.4
	Second		72	2.17	394.9
	Third		80	2.39	435.0
	Fourth		92	2.76	502.3
	Fifth		92	2.77	504.1
2008	<b>Average</b>	<b>210</b>	<b>90</b>	<b>2.70</b>	<b>567.0</b>
	First		72	2.16	455.7
	Second		81	2.44	512.4
	Third		90	2.69	564.9
	Fourth		104	3.11	653.1
	Fifth		104	3.12	655.2

*Annex 4*

**Table 23. Hrazdan: Dynamics of Indicators Taken into Account to Forecast the Paying Capacity of Households with Water Meters (by Quintile Group)**

Period	Quintile Groups	Tariff, Dram/m <sup>3</sup>	Consumption		Cost of Service, Dram/person/month
			l/person/day	m <sup>3</sup> /person/month	
2005	<b>Average</b>	<b>140</b>	<b>34</b>	<b>1.02</b>	<b>142.8</b>
	First		25	0.74	103.6
	Second		32	0.96	134.4
	Third		37	1.10	154.0
	Fourth		35	1.04	145.6
	Fifth		41	1.22	170.8
2007	<b>Average</b>	<b>182</b>	<b>60</b>	<b>1.80</b>	<b>327.6</b>
	First		44	1.31	238.4
	Second		56	1.69	307.6
	Third		65	1.94	353.1
	Fourth		61	1.84	334.9
	Fifth		72	2.15	391.3
2008	<b>Average</b>	<b>210</b>	<b>80</b>	<b>2.40</b>	<b>504.0</b>
	First		58	1.74	365.4
	Second		75	2.26	474.6
	Third		86	2.59	543.9
	Fourth		82	2.45	514.5
	Fifth		96	2.87	602.7