

EAP Task Force



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

INTEGRATING THE FINANCE STRATEGY INTO THE BUDGETARY PROCESS (TASK 1)



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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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Table 1. Abbreviations and acronyms

AMD	Armenian dram (national currency)
BOD	Biochemical oxygen demand
CEE	Central and Eastern Europe
CJSC	Closed joint-stock company
DANCEE	Danish Cooperation for Environment in Eastern Europe
DD	Design Documentation
DFID	Department for International Development (United Kingdom)
EAP TF	Environmental Action Programme Task Force
EBRD	European Bank for Reconstruction and Development
EECCA	Eastern Europe, Caucasus and Central Asia (region)
EUR	Euro
FEASIBLE	Financing for Environmental, Affordable and Strategic Investments that Bring on Large-Scale Expenditure (computerised tool)
FS	Finance Strategy
GDP	Gross Domestic Product
GoA	The Government of Armenia
HCS	Housing and Communal Services (<i>sector of the economy</i>)
IFIs	International Financial Institutions
KfW	Kreditanstalt für Wiederaufbau
lcd	litres/capita/day
LWWTF	Local Wastewater Treatment Facilities
MAC	Maximum Allowable Concentration (of pollutants)
MTEF	Medium-term expenditure framework
OECD	Organization of Economic Cooperation and Development
O&M	Operating and maintenance
PBB	Performance-based budgeting
PBC	Performance-based
PI	Performance indicator
PRSP	Poverty Reduction Strategy Paper
RA	Republic of Armenia
ROB	Result-oriented budgeting
SCWE	The State Committee for Water Economy ¹
CIS	Commonwealth of Independent States
UfW	unaccounted-for-water
USD	US dollar
VAT	Value-added Tax
WB	The World Bank
WHO	World Health Organization
WSS	Water supply and sanitation
WWPS	Wastewater pumping station
WWTP	Wastewater Treatment Plant

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

EXECUTIVE SUMMARY

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

In 2003-04, the State Committee for Water Economy (SCWE)² 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.

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

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 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 (TASK 1) INTEGRATING THE FINANCE STRATEGY INTO THE BUDGETARY PROCESS

Background: water supply and sanitation in Armenia

In the first ten years following Armenia's independence, the quality of water supply and sewerage (WSS) services declined sharply. This was caused by massive cuts in financing for WSS which resulted from the general economic decline and the reduction of real household income and public revenues. As a result, by 2004:

- 50% of water supply networks and 45% of sewerage networks needed immediate replacement (in Yerevan, 87% and 46% needed replacement, respectively);
- The share of leaks and unaccounted-for water exceeded 75% of the total volume of water pumped into the networks. For each 1 kilometer of network, 91 cubic meters of water leaked per day (in Russia, that figure is 48 cubic meters/day; in the United States, it is less than 13);
- In 5 of Armenia's 11 regions, wastewater was discharged directly into the environment without any treatment whatsoever. In 3 other regions, less than half of wastewater received treatment; wastewater treatment plants in Armenia did not ensure effective treatment and purification of wastewater, if any.

The low ability-to-pay of consumers combined with the low quality of services had resulted in a low collection rate of payments.

The Government of Armenia is committed to reverse this cycle and the Poverty Reduction Strategy Paper, developed and approved in 2003, sets as a priority the rehabilitation of water supply systems and gradual restoration of round-the-clock residential water supply. However, the PRSP does not specify sources of finance for such improvements. Regarding sanitation the PRSP does not set any specific tasks and targets.

An important opportunity to address these problems was created by a significant increase of finance for water supply and sanitation, fueled by the rapid economic growth and the active policy to attract international loans, including loans directed at rehabilitation and modernization of WSS systems.

A Finance Strategy was developed to substantiate a national policy dialogue on water supply and sanitation in Armenia, and to support the establishment of realistic objectives for the development of the sector, and the design of a coherent policy package to support their attainment.

Key outcomes of the Finance Strategy for WSS in Armenia

Following the methodology for Finance strategies, two scenarios were prepared for water supply and sanitation in Armenia to 2015. The scenarios were based on a dialogue with the main stakeholders. They set targets which contribute to the Millennium Development Goals on water supply and sanitation, and they were consistent with the 2003 Poverty Reduction Strategy Paper (although the PRSP sets no particular target on sanitation).

The baseline scenario

The Baseline Scenario aims at rehabilitating water supply in Yerevan and maintaining the infrastructure condition and service volume and quality of the base year in all other cities (stopping deterioration).

The costs associated with this scenario are 30.3 billion dram (€60.6 million) per year, or 423.8 billion dram (€847.6 million) for the period 2002-2015. The available finance resources (revenues from user charges, loans and public spending) amount to 278.1 billion dram (€538.2 million) over the period 2002-15. The cumulative financing gap by 2015 exceeds 154.7 billion dram (€309.4 million). The figures cover 19 cities under review, representing 53% of total population in Armenia.

According to calculations, the annual financing gap can be closed by 2009 and the cumulative gap by 2016, if a package of policy measures for optimizing WSS revenues and expenditures is implemented:

- Over 2004-2007 gradually increase payments for WSS services (tariffs and collection rates) by residential consumers, so that their expenses for WSS services reach 2.0% of average per capita income, and stabilizes at that level in 2007-2015;
- Increase the collection rate for water bills from 60% in 2006 to 90% by 2008³;
- Allocate 1.5% of total budgetary resources to water supply and sanitation, for the period 2002-15;
- Save 32.7 billion dram (68 million euro) on electricity over the period by reducing specific power consumption per m³ of water sold. This can be achieved by cutting leakages and optimizing pressures in the systems. For instance, if the water naturally pouring from the mountains to Yerevan was properly channeled, there would be no need to abstract and pump water from Ararat valley.

These conditions 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.

The development scenario

The Development Scenario is the baseline *plus* coverage of city dwellers by sewerage service and effective mechanical wastewater treatment of wastewater in all cities and towns included in the Finance Strategy.

³ Nor Akunk water company operating in Armavir marz (region) has already achieved 86% collection rate.

The costs associated with this scenario are 38.76 billion dram (€77.5 million) per year, or 542.7 billion dram (€1085.4 million) for the period 2002-15; 70% of that amount is for sanitation; investments for construction and rehabilitation of WSS facilities represent more than 20% of the total. The cumulative financing gap by 2015 will exceed 273 billion dram (€546 million).

According to simulations, an additional policy package could close the annual financing gap by 2010 and the cumulative gap by 2016:

- Households allocate 2.5% of their average income to WSS services; thus tariffs will remain affordable for most households, while the collection rate for water bills reaches 95% by 2010; this probably requires, *inter alia*, a public-information campaign to enhance consumers' willingness to pay;
- The public budget allocates to WSS infrastructure rehabilitation and development 1.5-2% of total resources over the 2006-2008 period, and 1% of total resources over 2009-2015;
- Energy consumption of WSS utilities is cut by 40%; leaks and unaccounted-for water are drastically cut down (by 50-60%);
- Infrastructure is rehabilitated and rationalized by adjusting its capacity to present and future demand, with a view to optimizing capital and operational expenditure.

As for the Baseline scenario, these assumptions are mutually supportive: for instance, if the collection rate stabilises at the current level (60% in 2006), then households who pay for water would have to allocate 4.4% of their income to foot water bills, or a higher share of the public budget should be allocated for water.

Under these assumptions, from 2010 on, operation and maintenance of water utilities will not need to be subsidized anymore. However, WSS infrastructure renovation and development works will have to be financed from the public budget and debt.

Key recommendations for implementation of the Finance Strategy

The SCWE would need to secure a sufficient and stable amount of budgetary resources via the Medium Term Expenditure Framework.

To do so, it has to improve its capacity to meet the criteria defined in this procedure. In particular, it has to demonstrate that public resources invested in water supply and sanitation will contribute to the Poverty Reduction Strategy of Armenia. Similarly, SCWE's submissions to IFIs should convincingly demonstrate the contribution of particular projects to the PRSP.

Now, in Armenia, the PRSP does not identify target indicators for wastewater collection and treatment. So, the SCWE would benefit from reference to the Millennium Declaration signed by Armenia in 2000 and the international obligations taken by Armenia regarding sanitation. It is expected that revised PRSP would establish that sanitation contributes to poverty reduction, by improving public health and creating favourable conditions for developing small businesses, including farming, tourism and recreation business, in particular in rural and/or recreational areas.

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 related 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;
- Improve 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 should be clarified and/or revised, capacity to initiate project proposals, or to monitor project implementation should be strengthened. This may require additional staff. SCWE staff would benefit from the transfer of additional know-how and expertise, typically in project management and monitoring.

The report provides recommendations to move further on these issues.

SECTION 1. BRIEF DESCRIPTION OF THE EXISTING CONDITION OF WSS SECTOR IN ARMENIA

1.1. Regulation of WSS operations

1.1.1. Key trends in government policy in the water sector

In the goals of reforming the water supply and sanitation (WSS) sector in Armenia, government resolution № 92, passed 09.02.2001, titled “On management reform of the water sector,” provides for legislative, structural, organizational reforms, as well as a phased program of financial recovery for the sector, which will be carried out through 2009.

The key trends envisioned in the program include:

- Improved quality of WSS services;
- Uninterrupted, high-quality water supply based on zoning and sectorization of the water supply networks;
- Reform of the WSS management structure;
- Introduce a system of metering of water consumption and reduce water loss;
- Effective use and preservation of water resources and WSS capital assets;
- Transition of vodokanals’ operations to commercial principles, including 100% payment for electricity and energy and timely payment of salaries, taxes, and customs;
- Introduce measures to contribute to the creation of condominiums in order to increase collection rates for utility services;
- Attract investment to the WSS sector;
- Introduce ecological practices.

1.1.2. Obligations of key entities and legal acts that define their interrelations

Armenian government Resolution № 130-r passed 22 January 2004 adopted new rules for use of WSS infrastructure (the previous rules had been adopted in 1999) as well as the types of contracts to be concluded between various groups of consumers. These contracts create the basis of the legal relationship between key entities in WSS and establish their respective rights and responsibilities.

Vodokanals may operate WSS infrastructure on the basis of contractual obligations with communities and work directly with end users of WSS services.

The rules for using WSS infrastructure regulate:

- Legal relations that arise between operators of WSS systems and their customers,
- The line of responsibility for the network and facilities,
- Conditions for installation and operation of metering equipment for use of drinking water and disposal of wastewater,
- Conditions for evaluating the quality of WSS services provided,
- Rights, obligations, and responsibilities of all parties.

1.1.3. Legal basis of ownership of facilities of engineering WSS infrastructure

Rules for water use were adopted in accordance with government resolution № 130-n on 22.01.2004. In the established procedure, water supply enterprises bring into use networks that are in the community ownership, on a contract basis in the form of uncompensated use. Recently, in accordance with communities' proposals, distribution networks have been transferred to the ownership of water supply enterprises.

By law, community leaders are directly responsible for water supply and sewerage, but in practice, this function is not carried out, despite the fact that communities cooperate with WSS organizations on their territory.

1.2. Management of WSS in Armenia

Until the beginning of this decade, there was no unified body for managing WSS in Armenia; as a result, several state institutions, as well as local governmental bodies, carried out regulation of WSS.

The State Committee for Water Economy (SCWE) was created by the Armenian governmental resolution № 92 of 09.02.2001 to optimize management of water resources and increase effectiveness of reforms in the WSS sector, as well as to improve tariff policy. By statute, the SCWE is responsible for carrying out the Armenian government's policies on use and management of WSS systems.

SCWE is responsible for making the most important decisions about WSS. In particular, the committee:

- Participates in the development of a national water program and in analysis of demand for water resources;
- Has authority for government management in investment programs in the water sector;
- Manages equity stake of WSS sector enterprises constituting state-owned property, specifically:
 - 100% stock of CJSC Yerevan Water Supply and Sewerage Enterprise (YerVodokanal), and CJSC Armenian Water Supply and Sewerage Enterprise (ArmVodokanal);
 - 51% stock of CJSC Lori Water Supply Enterprise, CJSC Shirak Water Supply Enterprise and CJSC Nor Akunk.

- Ensures preliminary examination of project documents for facilities that influence the water systems;
- Oversees the organization of work on uncompetitive water systems; presents proposals for authorization of use of water systems, prepares proposals for tariff regulation, etc.

When making important decisions (establishing development goals, appointing enterprise executives, developing and approving targeted programs, planning capital investment, etc.), the SCWE may, depending on the complexity of the issue, turn to the government, which makes the decision following established procedure.

Throughout existence of the SCWE, an array of legal acts have been adopted, aimed towards fundamental improvements in the operations of WSS enterprises. These acts include:

- Water Code of the Republic of Armenia
- Law of the Republic of Armenia “On the establishment of benefits for payment of arrears for water supply, sewerage, wastewater treatment, and irrigation services”
- Resolution № 440 of the government of the Republic of Armenia, passed 17.05.2001 “On measures for carrying out the program for improving operations and financial streams of WSS enterprises of the Republic of Armenia in 2001-2005”
- Resolution № 690-A of the government of the Republic of Armenia, passed 23.05.2002 “On financial streams and measures to improve the operations of AOZT Yervodokanal in 2002-2005”

SCWE was previously an independent administrative entity, but since recently, by decree of the president, it has become part of the Ministry for Territorial Development. This decree created the concept of “state body within a ministry.”

The following Administrations are currently part of the SCWE:

- Administration for operations of WSS infrastructure—10 people,
- Administration for coordination of financial-economic, accounting, and sales operations (hereafter Financial Administration)—13 people, spread over three departments
- Economic department,
- Financial department (including accounting),
- Department for sales of drinking and irrigation water, coordination of subscriber accounts, and accounts for electric energy.
- Judicial administration – 5 people,
- Administration for inspection – 9 people (operates on the basis of the code on administrative offenses, a supplement to governmental resolution № 1278-H of 17 September 2003).

SCWE had 52 employees at its founding; by mid-2006, that figure had grown to 64 employees.

In accordance with the Statute on Administration № 159A, affirmed by Order of the Chair of the State Committee for Water Economy on 02.08.2004, the SCWE Financial Department has 32 objectives, of which it is important to highlight the following:

- Organization of processes of financing capital investments and current expenditures in accordance with the requirements of the law “On Procurement,” and of financing subsidies for state institutions and allocations from the state budget;
- Comprehensive analysis of the financial operations of WSS organizations;
- Organization of processes of financing implementation of WSS programs using state budget funds or funds from IFIs;
- Preparation of a package of measures aimed at improving the financial health of WSS enterprises;
- Presentation of proposals for the efficient use of government property in WSS organizations;
- Formation of a unified methodological policy for WSS organizations;
- Evaluation of the financial condition of the WSS sector;
- Examination, analysis, and forecast of indicators describing the volume of WSS and irrigation services provided;
- Comprehensive analysis and forecast of the financial-economic operations of WSS organizations and presentation of proposals for minimizing expenses, increasing profits, and reducing arrears of WSS organizations;
- Coordination of the provision of water supply services and sewerage services, as well as agricultural irrigation;
- Participation in the development of contracting mechanisms for trust management, leasing, and concessions in WSS;
- Collecting and analysis of accounting of outcomes of WSS enterprises’ operations.

SCWE Department for Inspection oversees:

- Organizing the work of uncompetitive water supply systems in accordance with conditions for authorization of use of water systems;
- Meeting requirements established by authorization of use of publicly-owned water systems by commercial organizations;
- Compliance with public health requirements for water systems and water bodies and violation of the (sanitary-)protection zones thereof;

- Plumbing systems and devices (preventing from the use of damaged meters, and meters without a seal, unauthorized replacement (forgery) or intentional breaking of seals put on the devices) in water supply systems of multifamily buildings, apartments, and single-family homes.

The Inspection also tries to prevent the cases of:

- Violation of property rights (illegal appropriation) of water systems in whole or in part (including water supply and sewerage systems), violation of their appropriate usage, and the acquisition and (or) transfer of rights of use in violation of the law;
- Use of water in violation of the rules of water supply and sewerage (including unauthorized use), wasteful use, unauthorized hydrotechnological construction work;
- Use of water systems without authorization, use of water systems in violation of the conditions of authorization;
- Violation of safety standards in using water reservoirs, channels, pipelines and other infrastructure that may cause emergencies or disrupt work;
- Unauthorized work that affects the condition of the water system;
- Violation of rules (conditions) of use of water resources for recreation and sport;
- Violation of rules for the safety and integrity of the main trunk lines;
- Compliance with public health standards and compliance with rules for operation of the WSS system, including pumps in multifamily dwellings (apartment blocks).

We note that the set of functions entrusted to the Department for Inspection looks overloaded and unrealistic, especially considering that many of these can only be done at the local level, while the Department does not have the capability to do that.

1.3. Key entities in water supply and sanitation in Armenia

Five specialized enterprises supply the bulk of water supply and sanitation services in Armenia; their service territories cover approximately 80% of the population:

- CJSC Yervodokanal
- CJSC Armvodokanal
- CJSC Nor Akunk
- CJSC Lori-Vodokanal
- CJSC Shirak-Vodokanal

In about 600 villages, the provision of centralized WSS services is the responsibility of local government and is supplied with the help of local WSS infrastructure.

CJSC Armvodokanal (further ArmVK) is responsible for operation and maintenance of WSS systems in 47 cities and 250 villages. In the majority of these settlements, ArmVK has contracts with local governments to operate the distribution network. In 2004, the French company SAUR undertook management of the enterprise.

CJSC Yervodokanal (further YerVK) is responsible for WSS operations in the capital, as well as operation and maintenance of WSS systems in 33 villages located near Yerevan. In 1999, the enterprise was transferred via trust management to the Italian company Acer & Company Armenian Utility S.C.A.R.L. As a result of a tender in 2005, the enterprise was transferred via lease to the French company Veolia/Generale des Eaux. According to the contract signed between the Government of Armenia and Generale des Eaux, from 1 May 2006, the newly created company Yerevan Dzhur (Yerevan Water) will provide water supply and wastewater treatment services in Yerevan.

CJSC Nor Akunk was established in 1999 as a joint-stock company for water supply and sanitation in the cities of Armavir and Metsamor, as well as neighboring villages (51% of shares belong to the State, while 49% belongs to local communities of Armavir marz).

CJSC Lori-Vodokanal and CJSC Shirak-Vodokanal were created in 2004 with the goal of successfully implementing the program for rehabilitation of utilities infrastructure of the Shirak and Lori regions of Armenia, financed by loans from Germany's KfW Bank.

SECTION 2. STRATEGIC PLANNING AND BUDGETARY FINANCING OF WSS IN ARMENIA

2.1. Targeted benchmarks for WSS development in Armenia

In September 2000, Armenia, along with other United Nations member states, signed the Millennium Declaration and accepted obligations for achieving the Millennium Development Goals⁴ (MDG) by way of integrating the goals with a national development strategy.

The MDG, among other things, envision a reduction by half of the share of the population without access to safe drinking water by 2015, and a cessation of environmentally unsustainable use of water resources. At the World Summit on Sustainable Development held in Johannesburg in 2002, the following two goals were adopted:

1. Develop an integrated water resource management systems and develop a plan for effective water use by 2005; and
2. Reduce by half the share of the population without access to basic sanitation by 2015.

Sustainable access to safe water in terms of the MDG means the following:

- Fair access to an adequate quantity of safe water (including treated surface water, as well as untreated but uncontaminated water, for example, from natural springs or boreholes);
- In urban communities a water source could be a pump or a stand-post located not more than 200 meters from a dwelling;
- In rural communities it is assumed that household members should not spend a disproportionate amount of the day carrying water;
- An adequate quantity of water necessary to satisfy physiological, hygienic, and household needs.

Access to basic sanitation in terms of the MDG means the presence of facilities (simple but clean private pit latrines, or flush toilets with piped sewerage) for defecation that prevent people, animals, and insects, from coming into contact with excrement.

The Millennium Development Goals were integrated with the national development strategy of Armenia in 2003, when the Poverty Reduction Strategy Paper was approved by government decree № 994-H dated 08.08.2003.

⁴ Millennium Development Goals, 2000

The Poverty Reduction Strategy Paper (PRSP) includes both: the target indicators used for defining the MDG, as well as an array of additional indicators that make it possible to more accurately determine the existing level of access to WSS services and the quality of service provision, as well as to formulate targeted benchmarks, taking into account the specifics of WSS in Armenia.

Indicators describing the level of access and quality of water supply services are directly included in the group of indicators called “Basic social services” and included in the group of targeted indicators and the group of component indicators. The **target indicators** are:⁵

- D1(i) = Share of the population with stable access to safe drinking water (%)
- D1(ii) = Average daily continuity of water supply services provided (hours per day/24, in %)
- D1(iii) = Share of households using drinking water from natural water sources (%)
- D1(iv) = Share of households using non-piped, bulk water (delivered by water tankers) (%)

Component indicators include:

- d1.1 = Length of new sections of water supply networks (km)
- d1.2 = Length of repaired and replaced section of water supply networks (km)
- d1.3 = Collections efficiency of user charges for water supply services (collected/billed, in %)
- d1.4 = Share of water volume supplied to customers that is billed according to meter readings (water meters)
- d1.5 = Water losses in the water networks (%)

Indicators of accessibility of basic sanitation services and quality of wastewater treatment are combined in a group of so called component indicators describing the condition of the environment and are presented as the following indicators:

- f2.3 = Share of the population with access to a system of improved sanitation (%)
- f2.4 = Share of wastewater disposed of without treatment (%)

The interim results of implementation of the Poverty Reduction Strategy are published in annual reports. The table below shows the baseline level and growth rate in 2002-2004 of the values of indicators describing access to drinking water.

⁵ Hereafter, the names and descriptions of indicators are taken from “PRSP Monitoring Indicators System. Conceptual framework”

Table 2. Accessibility of drinking water

	2001	2002	2003	2004
Access to centralized/piped water supply systems	85,0%	89,1%	91,0%	91,5%
- urban communities	94,2%	97,0%	97,8%	96,7%
- rural communities	64,7%	77,0%	80,6%	81,3%
Share of households using water from uncontrolled sources	6,1%	5,2%	5,9%	4,5%

Source: Poverty Reduction Strategy Paper Progress Report (August 2003 – December 2004). Yerevan 2005; Poverty Reduction Strategy Paper Progress Report (2004 – 2005 First Term). Yerevan 2005

We note that the objectives defined in the Poverty Reduction Strategy are first and foremost related to residential water supply, whilst objectives on water sewerage services have not been determined, and the water sewerage issue is mentioned only in the section on environment.

2.2. Strategic and middle term planning tools

At the present time, Armenia only uses middle term planning tools, which include:

- Investment programs for rehabilitation and development of WSS in individual communities and regions of the country, financed by loans from international financial organizations;
- Medium-term expenditure framework (MTEF), which is a combination of middle term financial planning techniques and result-oriented budgeting (ROB).

Medium-term investment programs have been successfully implemented in Armenia over the past decade. However, alongside their clear achievements, they have some inherent shortcomings related to the absence of a comprehensive approach to the WSS sector insofar as the programs have as their goal an overwhelmingly *piecemeal* improvement of *individual* facilities and WSS networks in *some* regions of the country, first and foremost in Yerevan. This does not diminish their significance and importance, but the implementation of the current set of investment programs (quite significant in terms of financing) would benefit from a comprehensive picture, to establish priorities and to facilitate sequencing.

The development and implementation of a medium-term expenditure framework assumes an assessment of the requirements of the entire WSS sector. However, in light of the limitations of the consolidated state budget, the medium-term expenditure frameworks developed so far consider as priority only the following measures:

- Co-financing of programs implemented by using IFIs' attracted loans – in amounts envisioned in the loan agreements;
- Ensure budget subsidies to cover the gap in financial streams of WSS enterprises,
- Financing of maintenance work for strategically important infrastructure,
- Implementation of low-budget projects for modernization of WSS facilities and networks.

Strategic planning tools are not used at the present time. Armenia has not developed and approved a comprehensive Targeted Program for the WSS sector development that would make it possible to integrate all various individual investment programs financed by IFI loans. The Financial Strategy for WSS developed in 2004 could be essentially the financial section of the Targeted Program mentioned above, but unfortunately that time it had little influence on government financial policy.

Incidentally, it must be noted that in 2006 some very positive changes took place in this area. In particular, there is presently active preparation of a program for implementation of an array of sewerage projects, cited as priority projects in the Financial Strategy. It is assumed that they will be financed by a loan from the European Bank for Reconstruction and Development.

2.3. Principles of budget financing of WSS in Armenia

2.3.1. History of the introduction and procedures of formation of MTEF and budget project

Three years ago the Armenian Ministry of Finance and Economy and the World Bank concluded an agreement on the introduction of elements of a program of result-oriented budgeting (ROB).

The introduction of MTEF (medium-term expenditure framework), a combination of the techniques of medium-term financial planning and performance-based budgeting, was divided into three phases.

The first phase began two and a half years ago, when MTEF was introduced in the Ministry of Labor and Social Issues.

The second phase provided that MTEF would be introduced in the Ministry of Education and Ministry of Health. This phase has also been implemented. The third phase supposed that all ministries and agencies would move to programmatic-targeted budgeting, which turned out to be unrealistic, in that there are over 80 government bodies in Armenia and the simultaneous transition of that many entities to MTEF would be an organizational mess. Therefore in September 2005, the World Bank and Ministry of Finance and Economy agreed to postpone the implementation of the third phase.

The introduction of the MTEF program is being carried out by ATOS-Consulting and financed by DFID. The leadership team for preparing MTEF developed an active training program for ministry employees, as well as a timetable for MTEF for the next three years and a budget for the coming year.

The MTEF timetable and the budget are divided into two parts (phases), each of which is annually approved by a separate resolution of the prime minister. The first part of the timetable regards preparation of MTEF and the second part regards preparation of the annual budget.

For example, the first part of the timetable, which regards preparation of MTEF for 2006-2008, was approved on 2 December 2004 by a resolution № 790-H of the prime minister of Armenia. This timetable covers the period from 1 December 2004 to 1 July 2005.

The second part of the timetable, which regards preparation of the budget for 2006, was approved on 4 June 2005 by resolution of the prime minister of Armenia №394-A, "On the approval of the timetable for implementation of work relating to the second step of the process of preparing the state budget for 2006 for the Republic of Armenia." This timetable covers the period from 4 June 2005 to 5 October 2006.

The obligation of three-year planning of state budget expenditures is fixed by the Law № AL-137 “On the Budgetary System of the Republic of Armenia,” passed 21 June 1997 (with subsequent changes)⁶. In accordance with the Part 4, “The State Budget of the Republic of Armenia,” article 16, “The Structure and Contents of the State Budget Bill,” the proposed state budget should be composed of:

1. The draft law on the state budget.
2. The budget message of the cabinet, which includes:
 - The statement of the Cabinet on the main directions of socio-economic development and fiscal policies in the coming year,
 - Three-year forecast of the main indices of socio-economic conditions in the republic
 - Explanatory note on the draft of the state budget law.

We note that the proposals for the MTEF from the profiled ministries are considerably more detailed. In particular, a table that detailed the goals, tasks, and financial and non-financial indicators of the Ministry of Labor and Social Issues was approved as an appendix to the 2006 budget.

2.3.2. *The role of SCWE in the formation of MTEF*

We examine the role of the SCWE in the formation of MTEF and discussion of the annual state budget in 2006.

The Ministry of Finance and Economy, as the body responsible for the process of middle term financial planning, prepared the key principles of financial policy and strategic priorities of MTEF under the leadership of the MTEF Coordination Group and MTEF Steering Committee by mid-December 2005. The MoFE then sent the document to the budgetary agencies.

By 15 February 2006, the budgetary agencies sent the elaborated MTEF for branch sectors to the MoFE.

Then the MTEF Coordination Group, MTEF Steering Committee, and budgetary agencies discussed the preliminary version of the MTEF, which was to be presented to the National Assembly (Parliament) by July 1.

In this way, over the course of almost three months SCWE developed the amended version of the MTEF for the subsequent three years.

The MTEF for 2007-2009 is currently being prepared. The timetable for preparing the MTEF and the budget is approved annually and can change from year to year. Some dates from this year’s timetable have been changed, in comparison with the timetable for the preparation of the MTEF for 2006-2008.

⁶ Citations of the law’s text can be found on the website of the National Assembly of the Republic of Armenia, <http://www.parliament.am/legislation.php?sel=alpha&lang=eng>

In accordance with the resolution of the prime minister, the SCWE should gather preliminary applications for projects for modernizing WSS facilities. In 2006, the SCWE timetable established that preliminary applications for projects are sent to SCWE in the period until January 24. SCWE then sends them to the MoFE by January 28.

In accordance with SCWE's statutes approved by the governmental resolution №1400-P dated 5 September 2002, the SCWE is responsible for the following functions directly related to the problem in question:

- Ensure preliminary examination of project documents for construction and rehabilitation work on facilities that impact the water systems, and make proposals;
- Establish management authority over state institutions that are carrying out investment programs in the regulatory sphere;
- Participate in the work of developing a national water provision program;
- Participate in annual and long-range evaluations of demand for water resources.

2.3.3. Selection process adopted by MoFE for financing WSS projects

The Armenian Ministry of Finance and Economy (MoFE) consists of two blocks, budget and economy. The budgetary block is divided into departments, subsections related to the budget process, and the administration of programmatic budgetary expenditures.

After applications from SCWE arrive they are simultaneously reviewed by the Department for Branch Programs and the Budgetary Department of the MoFE. If the structural subsections of the MoFE disagree, then the first deputy minister of finance and economy makes the decision about including the project (facility) in the budget.

Financing of those projects for which there is agreement with the World Bank, i.e. projects for which there are specified sources of financing (usually external loans and moderate co-financing from the budget of Armenia), is accepted automatically.

The selection of all other projects, both in SCWE and MoFE (in the event that the number of projects submitted to MoFE by SCWE is reduced by MoFE) takes place on the basis of priorities set by the Supreme Council, headed by the prime minister. These priorities are as follows:

- Compliance with the Poverty Reduction Strategy of Armenia,
- Extent of completion of projects already begun (preference is given to the projects of high degree of completion),
- Project expenditures (preference is given to low - cost projects)
- Environmental impact of the project,
- And finally, least priority is assigned to new projects, providing the availability of design documentation (DD).

These priorities reflect current practice and have not been formalized.

It is important to note that targeted programs for development of WSS enterprises are adopted within the framework of the budget. Essentially, they are business plans for the vodokanals. The overall value of the targeted programs is included in the state capital investment program, which is developed a year in advance and is an appendix to the budget.

2.4. Existing principles and methods of selecting WSS modernization and development projects for budget financing

Proposals (applications) for MTEF that are submitted to SCWE are prepared by WSS enterprises on the basis of the Non-leading (system) 2007-2009 MTEF Policy Paper. ATOS-Consulting developed this document.

This document is also a model of a summary report, which SCWE presents to MoFE. It is composed of six points:

1. Short overview and problems of the sector.
2. Goals and priorities for expenditures, including goals that can/cannot be influenced by changes in the volume of budgetary expenditures.
3. Presumed programmatic expenditures, including existing expenditures and those connected with new initiatives. It is recommended to indicate alternative sources of financing for new programs, like non-budgetary sources or the economy of resources expected as a result of implementing said program.
4. Sources of revenues in the sector, including donations from the Armenian diaspora and revenues from service charges.
5. Programs that will be financed from non-budgetary sources, but whose financing will be accounted for in the state budget.
6. Overall financial requirements.

To a significant extent, this document meets requirements for evaluating the development of the sector, but it is unlikely that it can be used effectively to choose concrete projects.

All WSS enterprises-providers submit proposals to SCWE regarding drinking water projects. The Department for WSS Infrastructure Operations organizes the collection of applications. Then applications are given to the finance section of the Finance Department, which reviews them, checks to see that they follow the methodological instructions prepared by MoFE, and summarizes them. Then the applications are sent to the deputy chair of SCWE for approval. After this, the SCWE chair signs the summarized application and the approved application is sent to the MoFE.

The summarized application that SCWE presented to the MoFE in 2006 regarding capital investments, not counting facilities financed within the framework of international projects, was equal to 22 billion dram, split into three years. It is proposed to request financing in the amount of 6 billion dram for 2007. However, SCWE employees calculate that real financing of facilities will be at the level of 200-250 million dram, which is still higher than the amount of financing in previous years.

Preparation and evaluation of applications for financing facilities that already have sources of financing (for example, international loans) has been to some degree a formality, insofar as such projects do not participate in the selection on the same level as the rest. The PIU⁷ deals with the preparation of applications from Armvodokanal and Yerevandzhur.

Insofar as Yerevandzhur has been managed by a private operator for more than five years (a consortium of three Italian firms under the leadership of ACEA until December 2005, and from 2006 following a tender it was transferred by lease contract to the French company Veolia/Générale des Eaux), it does not submit any facilities for financing from the state budget. All expenditures for Yerevandzhur's development are covered by its own funds and targeted loans provided by international financial organizations. The state is responsible only for guarantees and co-financing on these projects (see *Table 5*), it also performs regulatory functions.

At the present time, the overwhelming majority of projects in the summary application were proposed by Armvodokanal (48 facilities). Taking into account the fact that Armvodokanal is now run by the private operator Saur S.A. under a management contract, one can assume that the quantity of suggested projects from Armvodokanal and their total cost will decrease since the private operator is more likely to better prioritise the projects and therefore present a more concise list of projects.

In the course of consultation with specialists from SCWE, and particularly from the Financial Department of SCWE, it was determined that project cost is the key criterion for evaluating project feasibility, which determines whether the project is included in the summary application. Despite the fact that the real amount of budget financing is much smaller than the number of applications for capital investments, submitted to the SCWE by localities: municipalities and water supply enterprises, the projects presented to the Ministry of Finance and Economy will be those that the SCWE chooses on the basis of established priorities, particularly projects for which local decisions have already been made and projects that were included in the list compiled following the President's travels in the Armenian provinces.

Among the applications that SCWE sends to MoFE there are both applications for continuation of construction of facilities and proposals for construction, repair, and rehabilitation of new facilities for which there is not yet design documentation. In connection with this, MoFE refuses to include in the MTEF any proposals for budget financing for facilities for which design and estimate documentation is not yet ready. On the other hand, MoFE is not always ready to include expenses for preparation of design and estimate documentation in the draft budget.

In this respect we note that applications for capital investment prepared by municipalities and WSS sector enterprises should not be submitted on "*the more the better*" principle; and, to avoid extra work, it seems necessary and expedient to send target figures of possible amount of financing of new projects to the SCWE and WSS enterprises at the initial stage of planning.

At present, Saur S.A. calculates and evaluates its projects itself. In this way, SCWE trusts the rationale prepared by Saur S.A. (for example, "improvement of round-the-clock service provision and the sanitary conditions of communities"). The technical side of project implementation, profitability, and feasibility is predominantly done by applicants (WSS enterprises) with participation of SCWE.

The economic department of the Financial Department and/or the operations department of the SCWE Coordination Department conduct this work using the corresponding methodology.

⁷ It is a positive point that the Project Implementation Unit (PIU) of the World Bank serves as client for all procurement for all investment projects in the WSS sector, and not only those financed with World Bank funds.

Among the management tasks enumerated in the Statutes, one can highlight part 2.2 “Organization of the process of financing capital investments.” Therefore, from our point of view, it seems expedient to implement an improved application selection process (see [Section 4.3.](#)) proposed in the present report.

2.5. Amount of budget financing in the WSS sector in Armenia

Attraction of IFIs’ loans and rapid economic growth ([Table 3](#)) helped the Republic of Armenia significantly increase budget financing in the WSS sector in 2000-2006 ([Figure 1](#) and [Table 4](#)).

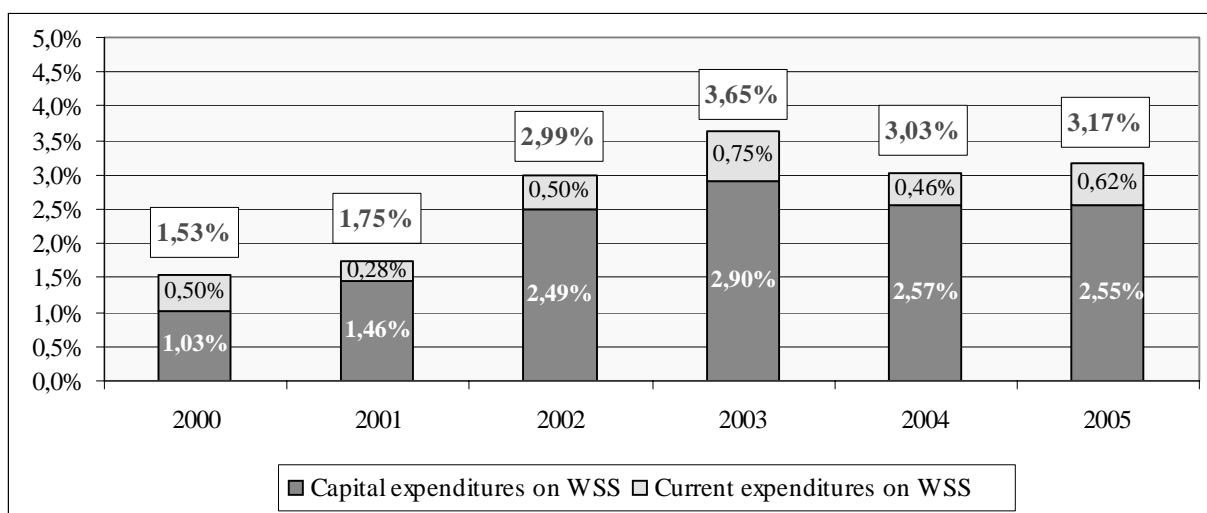
Table 3. GDP dynamic in Armenia

	1995	2000	2005
GDP (in real terms)			
Billions dram	522,3	1031,3	2228,0
Millions U.S. dollars	1286,5	1860,2	4868,0
GDP growth rate			
In U.S. dollars	106,9%	105,9%	113,9%
GDP per capita			
Thousands dram	138,9	271,2	692,5
U.S. dollars	342,2	489,1	1513

Source: Ministry of Finance and Economics, Annual Statistical Report, Armenia, 2005

Over the last 4 years, the share of WSS expenditures in the consolidated budget steadily met or surpassed 3% (see [Fig.1](#)), which is a very positive outcome attesting to the fact that rehabilitation and development of the WSS sector has become a priority for the government of Armenia.

Figure 1. Expenditures on WSS as a share of the consolidated budget of Armenia



Source: own calculations on the basis of Table 4.

Table 4. Budget support to housing and utilities expenditure (including subsidies), 2000-06, million drams

Indicators	Accounting period						
	2000	2001	2002	2003	2004	2005	2006
GDP, billions of dram	1,031	1,175	1,362	1,624	1,896	2,228	n.a.
<i>Growth index (year-on-year), %</i>	---	114	116	119	117	117	na
Expenditures of the consolidated budget	254,425	278,067	299,801	364,617	393,452	417,200	n.a.
<i>Ratio of consolidated budget expenditures to GDP</i>	24.7	23.6	22.0	22.4	20.7	18.7	
<i>Growth index (year-on-year), %</i>	---	109	108	122	108	106	n.a.
State budget expenditures	222,886	244,381	263,912	312,697	333,969	n.a.	n.a.
<i>Growth index (year-on-year), %</i>	---	110	108	118	107	n.a.	n.a.
- current state budget expenditures	162,084	180,167	207,718	215,871	252,882	n.a.	n.a.
- capital state budget expenditures	39,283	40,525	35,801	86,392	65,193	n.a.	n.a.
Municipal budget expenditures	12,714	14,940	18,220	21,415	26,037	n.a.	n.a.
<i>Growth index (year-on-year), %</i>	---	118	122	118	122	n.a.	n.a.
- current municipal budget expenditures	12,114	14,187	16,612	18,794	21,462	n.a.	n.a.
- capital municipal budget expenditures	593	752	1,608	2,589	4,575	n.a.	n.a.
Financing of housing and utilities from the consolidated budget	15,500	9,654	11,018	41,202	17,465	n.a.	n.a.
<i>Growth index (year-on-year), %</i>	---	62	114	374	42	n.a.	n.a.
- financing of housing and utilities from the state budget	12,764	7,054	8,364	37,844	11,967	23,062	24,561
<i>Growth index (year-on-year), %</i>	---	55	119	452	32	193	106
- financing of housing and utilities from municipal budgets	2,736	2,600	2,654	3,358	5,498	n.a.	n.a.
<i>Growth index (year-on-year), %</i>	---	95	102	127	164	n.a.	n.a.
Share of consolidated budget expenditures	6.09	3.47	3.68	11.30	4.44	n.a.	n.a.
Financing of WSS (current and capital expenditures) overall, millions of dram	3,889	4,860	8,956	13,301	11,924	13,223	n.a.
<i>Share of consolidated budget expenditures</i>	1.5	1.7	3.0	3.6	3.0	3.2	n.a.
Grants and subsidies to cover losses from current operations and financing of current expenses of WSS	1,277	787	1,499	2,745	1,820	2,568	1,633
- Armvodokanal	721	560	1,229	810	1,064	1,366	1,381
- Yervodokanal	556	227	270	1,935	756	1,202	252
<i>Rate of growth compared to the previous year, %</i>	---	62	190	183	66	141	64
Share of consolidated budget expenditures	0.5	0.3	0.5	0.8	0.5	0.6	n.a.
Financing of capital expenses for WSS, including targeted programs	2,612	4,073	7,457	10,556	10,103	10,654	n.a.
<i>Rate of growth compared to the previous year, %</i>	---	156	183	142	96	105	n.a.
Share of consolidated budget expenditures	1.03	1.46	2.49	2.90	2.57	2.55	n.a.

Source: Annual Statistical Booklet "Finance Statistics of Armenia", 2005, MoFE, SCWE

As the table 4 shows, state budget financing of housing and utilities for the period 2000-2006 nearly doubled, from 12.8 billion dram to 24.6 billion dram. Even more significant is the growth in expenditures for financing WSS, which more than tripled from 3.9 to 13.2 billion dram over the period 2000-2005. As a result, the share of WSS expenditures in the consolidated budget grew from 1.53% to 3.17%; the main growth took place because of the sharp increase in financing capital expenses, which in absolute terms quadrupled, from 2.6 do 10.7 billion dram.

Table 5 below presents data on the costs of investment programmes supported by IFIs and co-financed by the GoA.

Table 5. Investment programs in WSS in Armenia

Name of the program	Start and end dates	Overall cost	Financing parties	Executor
Program for municipal development	19.06.1998 – 30.06.2004	\$35.5 million	International Development Association –85% Contribution from Armenia – 15%	Bureau for program implementation
Program for development of municipal water supply and sewerage	11.11.2004 – 28.02.2009	\$1.32 million	World Bank – 88%, Contribution from Armenia – 12%	CJSC Armvodokanal, Bureau for program implementation
Program for WSS development in towns in the Lori region	01.11.2005 – 01.04.2008	11.41 million euros	Loan from Germany (bank KfW) – 90% Contribution from Armenia- 10%	CJSC Lori-Vodokanal, consulting consortium GITEC
Program for WSS development in towns in the Shirak region	01.11.2005 – 01.04.2008	14.58 million euros	Loan from Germany (bank KfW) – 90% Contribution from Armenia- 10%	CJSC Shirak-Vodokanal, consulting consortium GITEC
Program for WSS development in the Armavir region	Expected to end in mid-2006	14.10 million euros	Loan from Germany (bank KfW) – 90% Contribution from Armenia- 10%	CJSC Nor Akunk, technical consultant Fitchner
Program for water supply and sewerage in Yerevan	01.05.2006 – 11.02.2011	\$22 million	World Bank – 91% Contribution from Armenia - 9%	Operator CJSC Yerevandzhur, Bureau for program administration ⁸
Program for urban water management, grant program for improvement of water networks in multifamily buildings in Yerevan	27.03.2003 – 30.08.2006	\$2.022 million	Japanese foundation for social development– 95% Contribution from Armenia– 5%	Bureau for program administration

Source: Ministry of Finance and Economy of Armenia

2.6. Informational background for management decisions

2.6.1. Statistical reporting

Currently, information about the condition of WSS enterprises and the outcomes of their operations is presented in two forms of statistical reporting (1-water supply and 1-sanitation), that have characteristics of water supply and sewerage facilities and networks, as well as outcomes of water supply and sewerage service provision.

These forms are practically identical to the statistical reporting forms that were developed and used in Soviet times and do not contain extremely important information necessary for a thorough understanding of the condition of the WSS sector, the quality of WSS services, and whether the volume, quality, and charges for WSS services are reasonable.

In accordance with a procedure adopted in 2005, WSS service providers (water utilities) present the completed statistical reporting forms directly to the State Statistics Council. Up until 2004, the SCWE received the forms as well.

⁸ State institution, “Bureau for administration of municipal development programs”

2.6.2. WSS enterprises' reports

Beside statistic and financial reporting, WSS enterprises may also report on indicators envisioned in the contract with the owner of property managed (or rented) by enterprises. In accordance with Article 2 "Objectives and Responsibilities," of Appendix 2 "Description of the Services" to the Contract between CJSC Armvodokanal and SAUR S.A. (further Operator), the operator concluding this Contract accepts the following responsibilities, among others:

1. Increase the efficiency of WSS service provision, paying special attention to increasing the duration, reliability, and safety of water supply services'
2. Increase the population's willingness to pay for WSS services by increasing the quality of services and making sure services correspond with consumer demands;
3. Improve the financial condition of CJSC Armvodokanal and achieve a high level of financial stability in its operations;
4. Train personnel of CJSC Armvodokanal in order to achieve high quality management;
5. Ensure the maintenance, repair, and modernization of equipment used by JSC Armvodokanal;
6. Develop and implement investment programs with the use of available capital funds over the duration of the contract.

To ensure that the Management Council and the Contract Management Unit (CMU) receive credible information about the outcomes of the Operator's activities and the Operator's fulfillment of the obligations it has assumed, a minimal set of indicators is defined in Appendix 1 of Appendix 6 "Performance and Deliverables" to the Contract. These indicators are used for monitoring the Operator's activities and the Operator presents them in periodic reports. The indicators are presented in the table below.

Table 6. List of indicators used in the contract with SAUR S.A.

No	Name of indicator	Unit of measurement
1	Weighted average continuity of water service provision	Hours/day
2	Share of individual consumers billed on the basis of meter readings (water meters)	%
3	Share of water quality tests that meet bacteriological safety standards	%
4	Working capital utilization ratio	%
5	Share of cities with minimal continuity of water service provision	%
6	Share of multifamily buildings with individual or collective water meters	%
7	Share of multifamily buildings served on a contractual basis	%
8	Residential collections per registered resident	Dram/month
9	Collections level (excluding state-funded organizations)	%
10	Share of consumers with arrears of more than 4 months	%
11	Average volume of water consumption determined by meter readings per registered resident	Liters/day
12	Average amount consumers are charged per cubic meter of water	Dram/cubic meter
13	Rate of growth of overall volume of revenues (excluding revenues from state-funded organizations)	%
14	Share of general volume of water provided to consumers that is billed according to meter readings	%
15	Average daily volume of water produced per registered resident	Liters/day
16	Average daily volume of water sent through the networks per registered resident	Liters/day
17	Share of general volume of water produced that is delivered to consumers	%
18	Working capital utilization ratio in branches with gravity pipes	%
19	Working capital utilization ratio in branches with pumping and treatment stations	%
20	Expenditures for electric energy relative to the general volume of revenues gathered by systems with pumping and treatment stations	%
21	Expenditures for chlorination per resident per year	Dram/year
22	Number of personnel per 1000 individual customers	People
23	Expenditures on personnel relative to the general volume of revenues	%

Source: SAUR

Comparison of the Operator's obligations with the list of indicators used to analyze outcomes of the Operator's activities allows us to draw the following conclusions:

1. The set of indicators as a whole makes it possible to get a general impression of the outcomes of the Operator's activities
2. When formulating the list of indicators, emphasis was placed on indicators describing the financial outcomes of the Operator's activities and the efficiency of its work (47.8% of the list, including indicators 4, 8, 9, 12, 13, 15-24 describing financial outcomes) as well as the outcomes of implementing the water meter installation program (13% of the list, including indicators 2, 6, 14 describing water meters installation).
3. At the same time, the indicators describing water supply service quality are inadequate (only 13% of the list)—two indicators describe the duration of water supply services (indicators 1 and 5) and one indicator describes the extent of water treatment with regard to meeting bacteriological safety standards. The following indicators are absent in the Contract but are necessary for evaluating changes in service quality:
 - Share of consumers receiving water with standard pressure;
 - Share of water collected at treatment facilities that is treated and disinfected.
4. The set does not contain any indicator describing sewerage service quality. It would be wise, at minimum, to have information describing the share of wastewater that is treated at wastewater treatment facilities.
5. The set presented in the contract does not contain any indicator describing residential WSS service coverage. The report presents the minimal set of indicators describing residential WSS service coverage deemed necessary from the Consultant's point of view:
 - "Residential water supply coverage"—the number of residents of a given region that have uninterrupted access to water supply systems (centralized and decentralized) relative to the overall number of residents of that region;
 - "Centralized water supply coverage (internal access)"—the number of residents of a given region connected to a centralized (piped) water supply system relative to the overall number of residents of that region;
 - "Sewerage coverage"—the share of the population whose dwellings have sewerage systems, septic tanks, or other sanitary-hygienic means for disposing of wastewater;
 - "Centralized sewerage coverage"—the share of the population whose dwellings have uninterrupted access to a centralized (piped) sewerage system;
6. The set does not have any indicator describing the condition of WSS facilities and networks. As a result, this set cannot be used to evaluate the effect of repairing and modernizing the fixed assets. Indicators that could be used in this capacity include indicators describing the accident rate on WSS networks, as well as the level of deterioration of WSS facilities and networks.

The set of indicators suggested in the contract between JSC Armvodokanal and SAUR S.A. gives a general representation of the key outcomes of the enterprise's operations. Nevertheless, the lack of indicators describing the influence of SAUR S.A.'s operations on WSS service quality, the condition of WSS facilities and networks, and the population's WSS service coverage makes it difficult to call the set of indicators presented in Appendix 6 to the Contract optimal.

(For more detailed analysis see *Annex 4* of the Report)

SECTION 3. FINANCE STRATEGY FOR THE WSS SECTOR IN ARMENIA, 2002-2015

3.1. A note on method

To ensure consistency of the results of the updated Financial Strategy with results obtained in the 2004 Financial Strategy, preparation of the updated version was carried out with these conditions in mind:

- All calculations were done in constant 2002 prices;
- 2002 was set as the baseline year of the Financial Strategy;
- The set of WSS development projects, and the project content, were maintained without changes;
- For the period from 2002-2005, accounting information about real outcomes of WSS operations was used. The information was provided by SCWE.

3.2. Rationale for updating the Financial Strategy

The Finance Strategy presented in this report is an updated version of the “Financing strategy for the wastewater collection and treatment sector in large and medium-sized cities in Armenia,” developed in 2004 by the State Committee for Water Economy and the Ministry of Finance and Economy of Armenia in collaboration with Environmental Action Program Task Force (EAP TF) whose Secretariat is located in the Organization for Economic Cooperation and Development (OECD).

Necessity of updating the 2004 Financial Strategy took place due to the following reasons:

- The actual economic growth in the country from 2003-2006, including rate of growth of GDP, budget revenues and expenditures, income of the population, was much more substantive in comparison with the fairly conservative scenario proposed in the 2004 Financial Strategy, namely possibilities of financing the WSS sector have enlarged.
- The strengthening of Armenia’s currency (in the 2004 Financial Strategy the dram-euro exchange rate was estimated at 650 dram/euro, the updated version of the FS took into consideration an exchange rate of 528 dram/euro) resulted in a nearly 20% reduction in the cost of implementation (all other conditions being equal).
- Given the strong economic growth and improving macroeconomic indicators Armenia managed to attract more loans than expected to meet the needs of WSS sector development. Meanwhile the cost of projects implemented through loans has been refined.
- That is why information about the volume of external borrowing was subject to significant modification⁹:
 - The updated version of the Financial Strategy includes a loan from the EBRD in the sum of 23.2 million euros,

⁹ Source: Department for water sector programs, Ministry of Finance and Economy of Armenia.

- The increased cost of implementation of the first Program for Municipal Development, financed by the International Development Association (IDA) —in the 2004 FS, the cost of the program was calculated to be \$35.5, but then the actual expenses were \$37.5 (a \$31 million loan from the IDA and a \$6.5 million contribution from the Armenian government).
- On the other hand, there was a significant downward adjustment of the cost of programs for rehabilitation of the WSS systems in the Armavir, Shirak, and Lori regions—in the 2004 FS, the cost was estimated to be 40 million euros, but in the updated version the cost is calculated at 25 million euros (a 15.5 million euro loan from KfW bank and two grant programs in the summer of 7.8 million and 1.7 million euros).
- At the same time rate of charges collection for WSS services turned out to be much lower than expected rate (under Development scenario), which necessitated continuation of budget subsidy delivery to WSS enterprises in amounts that are considerably larger than those envisioned within the FS-2004 and for a longer period;
- Resource prices (energy costs, pipes, salary) appeared to be much higher than expected (for instance, the salary in WSS sector has increased on average by 38 percent, instead of expected 12 percent, energy tariff has grown by 37 percent etc.), which has influenced the growth of costs in dram that has attained higher levels than expected;
- The implementation start of the investment projects envisioned within the Development Scenario has been delayed. Consequently the projects' implementation terms set in the Financial Strategy have been adjusted as well – almost all projects of the updated strategy are planned to be implemented two – three years later than it was considered in the Financial Strategy 2004.

The results of a comparison of initial data and the forecast results of the 2004 Financial Strategy with the updated version of the strategy are presented in *Table 7* of this report.

Table 7. Comparison of initial data and macroeconomic forecasts used in preparation of the 2004 Financial Strategy with the updated version of the strategy

Indicator	Source	Accounting period														Sum	Average
		2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015		
Gross domestic product, billion dram	FS-2004	1 357,0	1 586,3	1 745,0	1 884,6	1 997,6	2 117,5	2 244,5	2 379,2	2 522,0	2 673,3	2 833,7	3 003,7	3 183,9	3 375,0	32 903,3	2 350
	FS-2006	1 362,5	1 624,6	1 896,4	2 228,0	2 562,2	2 922,4	3 273,1	3 633,1	3 996,4	4 356,1	4 704,6	5 081,0	5 487,5	5 926,5	49 054,4	3 504
	%	100%	102%	109%	118%	128%	138%	146%	153%	158%	163%	166%	169%	172%	176%	149%	149%
Budget expenditures, billion dram	FS-2004	263,9	333,1	331,5	361,8	379,6	402,3	426,5	452,1	479,2	507,9	538,4	570,7	604,9	641,2	6 293,2	450
	FS-2006	299,8	364,6	393,5	417,2	486,8	557,6	621,9	690,3	759,3	827,7	893,9	965,4	1042,6	1126,0	9 446,6	675
	%	114%	109%	119%	115%	128%	139%	146%	153%	158%	163%	166%	169%	172%	176%	150%	150%
Expenditures for WSS, billion dram	FS-2004	1,8	4,0	6,6	8,0	8,4	8,9	9,4	9,9	10,5	10,2	9,7	9,1	8,8	7,7	113,0	8,1
	FS-2006	1,8	4,0	9,1	11,0	7,5	9,9	8,6	6,1	4,5	3,5	7,9	8,3	8,8	9,4	100,4	7,2
	%	100%	100%	137%	138%	90%	112%	92%	61%	43%	34%	81%	91%	101%	122%	89%	89%
Expenditures for WSS, % of budget expenditures	FS-2004	0,7%	1,2%	2,0%	2,2%	2,2%	2,2%	2,2%	2,2%	2,2%	2,0%	1,8%	1,6%	1,5%	1,2%		1,8%
	FS-2006	0,6%	1,1%	2,3%	2,6%	1,5%	1,8%	1,4%	0,9%	0,6%	0,4%	0,9%	0,9%	0,8%	0,8%		1,2%
Cumulative volume of IFI loans, billion dram	FS-2004	3,8	6,1	3,8	16,9	16,6	8,9	8,9	8,9							73,8	9,2
	FS-2006	2,3	2,5	4,7	4,8	8,0	8,7	9,4	6,0	6,0	1,2					53,7	5,4
	%	62%	42%	122%	28%	48%	98%	106%	68%							73%	58%
Cumulative volume of WSS expenditures (budget and loans), billion dram	FS-2004	5,6	10,1	10,5	24,8	24,9	17,7	18,3	18,8	10,5	10,2	9,7	9,1	8,8	7,7	187	13,3
	FS-2006	4,2	6,5	13,7	15,8	15,4	18,7	18,1	12,1	10,5	4,7	7,9	8,3	8,8	9,4	154	11,0
	%	75%	65%	131%	64%	62%	105%	99%	64%	99%	46%	81%	91%	101%	122%	83%	83%
Real per capita income, thousand dram per year	FS-2004	254	279	302	320	339	359	381	404	428	454	481	510	540	573		402
	FS-2006	316	363	418	452	543	624	693	762	831	897	969	1 047	1 130	1 221		733
	%	124%	130%	139%	141%	160%	174%	182%	189%	194%	198%	202%	205%	209%	213%		183%
Charges billed to consumers for WSS services, billion dram	FS-2004	6,1	6,5	6,9	7,3	7,7	8,2	8,7	9,2	9,7	10,3	10,9	11,6	12,3	13,0	128,5	9,2
	FS-2006	6,1	6,5	5,0	5,9	7,6	11,4	12,1	12,8	13,6	14,4	15,3	16,2	17,2	18,2	162,3	11,6
	%	100%	100%	73%	80%	99%	140%	140%	140%	140%	140%	140%	140%	140%	140%	126%	126%
Collection level for payments for WSS services	FS-2004	31,4%	65,0%	85,0%	90,0%	90,0%	90,0%	90,0%	90,0%	90,0%	90,0%	90,0%	90,0%	90,0%	90,0%		83,7%
	FS-2006	31,4%	40,0%	47,4%	48,0%	55,0%	60,0%	65,0%	70,0%	80,0%	90,0%	90,0%	90,0%	90,0%	90,0%		67,6%
Average salary in WSS sector, thousand dram per month	FS-2004	41,5	48,5	53,4	57,6	61,1	64,8	68,6	72,8	77,1	81,8	86,7	91,9	97,4	103,2		71,9
	FS-2006	41,5	51,0	59,1	69,5	79,9	87,9	96,7	104,4	112,7	121,8	129,1	136,8	145,0	153,7		99,2
	%	100%	105%	111%	121%	131%	136%	141%	143%	146%	149%	149%	149%	149%	149%		138%

Table 8. Comparison of implementation periods of projects included in the 2004 Financial Strategy and those in the updated version

The name of the city, town	Water supply				Wastewater collection and treatment			
	FS-2004		FS-2006		FS-2004		FS-2006	
	Start year	End year	Start year	End year	Start year	End year	Start year	End year
Yerevan	2002	2005	2002	2013	2005	2009	2005	2011
Alaverdi	2005	2009	2007	2011	2009	2015	2009	2015
Aparan	2005	2009	2007	2011	2009	2015	2009	2015
Ararat	2005	2009	2007	2011	2009	2015	2009	2015
Martuni	2005	2009	2007	2011	2006	2009	2009	2015
Artashat	2005	2009	2007	2011	2009	2015	2009	2015
Ashtarak	2005	2009	2007	2011	2007	2010	2009	2015
Berd	2005	2009	2007	2011	2009	2015	2009	2015
Dilizhan	2005	2009	2007	2011	2009	2015	2009	2015
Echmiadzin	2005	2009	2007	2011	2007	2010	2009	2015
Gavar	2005	2009	2007	2011	2006	2009	2007	2011
Gyumri	2005	2009	2008	2010	2009	2015	2009	2015
Masis	2005	2009	2007	2011	2009	2015	2009	2015
Razdan	2005	2009	2007	2011	2006	2009	2007	2011
Sevan	2005	2009	2007	2011	2006	2009	2007	2011
Sisian	2005	2009	2007	2011	2009	2015	2009	2015
Tsakhkadzor	2005	2009	2007	2011	2006	2009	2007	2011
Vanadzor	2005	2009	2008	2010	2009	2015	2009	2015
Vardenis	2005	2009	2007	2011	2006	2009	2007	2011

The changes listed above and included in the updated version of the Financial Strategy were taken into consideration during the development of both scenarios for financing WSS in Armenia. A description of those scenarios and key outcomes of calculations are presented in the following sections.

In summarizing the key changes considered in preparation of the updated version of the Financial Strategy, we note the following:

- Strong growth of real household income helps partially shift the burden of financing the WSS sector development from the budget to customers, among other ways increase in the amortization element of the tariff for WSS services can be considered;
- Strengthening of Armenian currency has reduced the expenditure (in euro terms) envisaged by the FS (along with other equal assertions) nearly by 20 percent;
- Simultaneously the rise in resource prices in the WSS sector (salary, pipe and electricity) has affected the growth in the FS implementation cost in dram.

3.3. Methodology for developing the Financial Strategy

The Financial Strategy is a set of strategic development goals and several scenarios by which they can be achieved. The strategy is marked by the absence of a financing gap, i.e. an approximate balance between required expenses and available financing has been reached.

The Financial Strategy was developed using the FEASIBLE computer model based on a methodology developed by the OECD/EAP Task Force in cooperation with the Danish government with consulting company COWI A/S as contractor and financial support from the Danish government. A short description of the methodology is given in *Appendix 1*.

The Financial Strategy for the WSS sector was developed for 19 large and medium-sized cities in Armenia, including communities in the Lake Sevan region, for the period from 2002 to 2015. Agriculture water provision and irrigation were not examined in the strategy. The Financial Strategy was developed in order to determine a consensual, realistic, desirable and affordable level of service provision and demonstrate how the necessary expenditures can be financed within the planned time frame.

The communities included in the strategy and their population size are presented in the table below. Overall, approximately 1.7 million people live in them, i.e. around 60% of Armenia's total population.

Table 9. List of the communities included in the strategy

City, town	Population	City, town	Population
Yerevan	1102,9		
Alaverdi	17,0	Gyumri	148,9
Aparan	6,6	Dilizhan	16,0
Ararat	20,6	Martuni	11,9
Artashat	25,2	Masis	21,6
Ashtarak	21,5	Razdan	52,9
Berd	8,7	Sevan	23,0
Vanadzor	105,7	Sisian	16,7
Vardenis	12,7	Tsakhkadzor	1,6
Gavar	26,3	Echmiadzin	56,5

Source: Armenian Statistical Agency

The year 2002 was taken as a base year, and analysis was conducted using 2002 prices. The calculations span 14 years, from 2002 to 2015. For the period from 2002-2005, accounting information about outcomes of WSS operations in Armenia provided by the State Committee for Water Economy was used, and direct planning of expenditures for implementing the Financial Strategy was carried out for the interval from 2006-2015. This helped preserve continuity between the updated Financial Strategy proposed in this report and the baseline version of the Strategy, presented in the Final Report in 2004.¹⁰

Though sanitation was in the focus of the analysis, model simulations were made for WSS as a whole, for the following reasons:

- water utilities in Armenia provide both water supply and sanitation services, which are financed from and compete for the same funds (user charges, public funds and loans);
- demand for capacity and expenditure needs in sanitation very much depends on water demand and coverage by water supply;
- and last but not least, FEASIBLE model does not allow to simulate sanitation separate from water supply.

¹⁰ “Financial strategy for the sewerage and wastewater treatment sector in large and medium cities in Armenia. Final report.” State Committee for Water Economy and Ministry of Finance and Economy of Armenia in collaboration with the EAP Task Force Secretariat, 2004.

3.4 Basic assumptions of the baseline scenario

The main target of the baseline scenario for the entire planning period (2002-2015) is maintaining water supply and wastewater collection systems as well as the service level at the level of the base year 2002, with a gradual restoration of continuous water supply according to a tentative schedule. In terms of development and upgrade of the water supply infrastructure, it includes only rehabilitation of the water supply system in the city of Yerevan.

In the FEASIBLE computer model, financing needs are calculated assuming proper operation, maintenance, capital repair and timely replacement of deteriorated fixed assets. However, this does not mean that depreciation in its full amount must be included into the tariff – the state budget is an alternative source for funding of capital costs, as are loans from international financial institutions.

International practice demonstrates the following alternative approaches to the funding of communal services provided to the population—full funding by users; full funding by the budget (from general tax revenues or ear-marked taxes); or a combination of both approaches, when services are paid in part by the user and in part from the public budget. In the combination approach, operational costs, maintenance costs, and repair of capital assets are fully covered by user payments, and capital expenses are funded from the budget.

Even in EU countries, the government initially pays some communal services from the public budget (for example, services for removal of municipal solid waste in some communes in Denmark and in the Netherlands), which is then compensated at the expense of taxpayers, though not necessarily by targeted taxes.

In Armenia, the WSS sector infrastructure is public property. The owner of the water supply and sanitation infrastructure is ultimately responsible for capital repair, rehabilitation and modernization of fixed assets and new construction. Consumers ultimately pay for these expenses through inclusion of depreciation (amortization) into the tariff (it is important to ensure that the tariff is affordable for the bulk of the population and include social welfare measures for the poor). However, given limitations with regards to the affordability of tariffs (and even in the absence of such limitations) the state may assume the burden of funding capital expenses until household income reaches a level at which a tariff ensuring full financial autonomy of the vodokanals becomes affordable for the majority of population. This is the approach that has been chosen in Armenia. The only issue is when the conditions for full financial autonomy of the vodokanals will develop. The answer to this question is given below, in the analysis of financial indicators for different scenarios.

When the Baseline scenario assumptions were modeled, the financing needs and the available funds were calculated only for WSS in the 19 urban areas specified above. Calculations of the available funds were based on macroeconomic forecasts (GDP growth rates, growth rates of the population's incomes, revenues and expenditures of the state budget as % of GDP, expenditures on WSS as % of the expenditure portion of the budget) as well as a forecast of vodokanals' revenues.

Of all loans, only the first World Bank loan for the Municipal Development Program was included into the Baseline scenario.

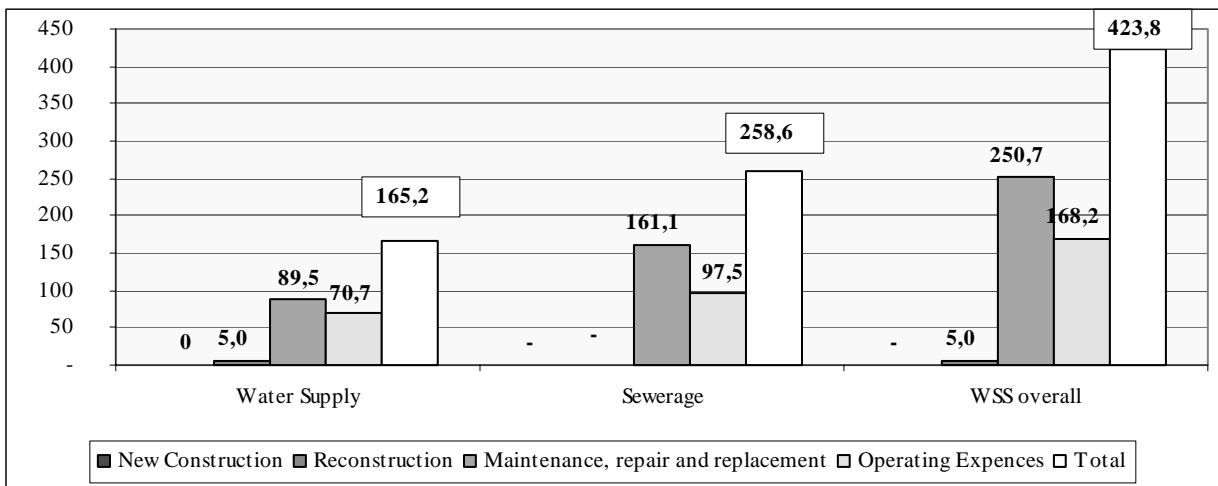
As regards the tariff policy and WSS enterprises' revenues, the Baseline Scenario assumes that the user fee rates for the WSS services paid by residential consumers will increase in real terms at the same rate as the real household incomes, while for the rest of consumers, the tariff will remain stable.

Given the significant progress achieved in recent years with regards to improving collection of user charges from the population, the model calculations were made assuming the collection rate would grow to 85% of the total billed charges (average rate for Armenia) and then stabilize at this level.

3.5 Results of calculations for the Baseline Scenario

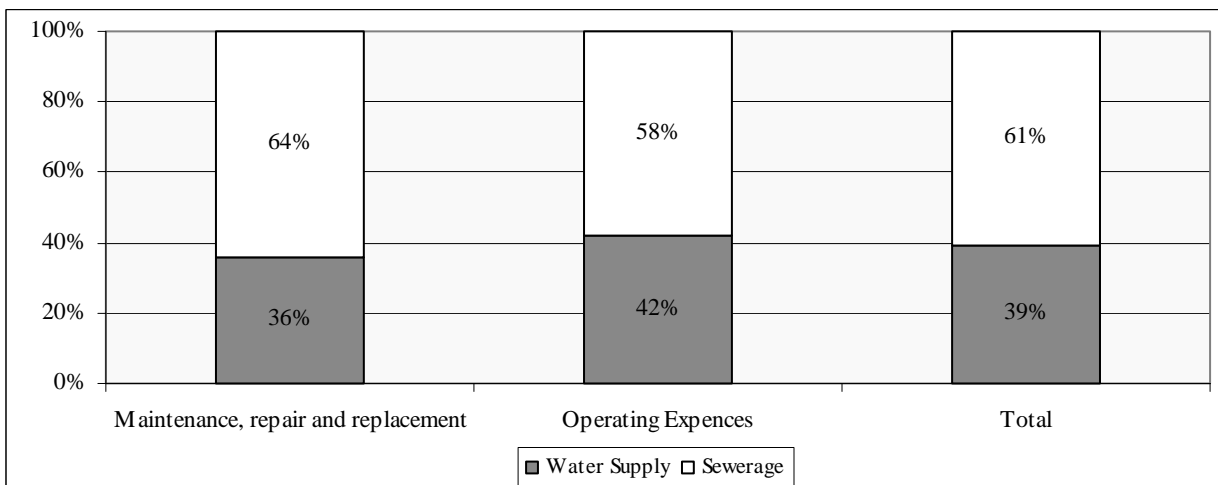
Fig.2 shows the results of calculations of the financial needs and available financing for WSS in the cities under review for the period 2002-2015 in the Baseline Scenario.

Figure 2. Overall financial needs for WSS for the period 2002-2015 in the Baseline Scenario (billion dram at 2002 prices)



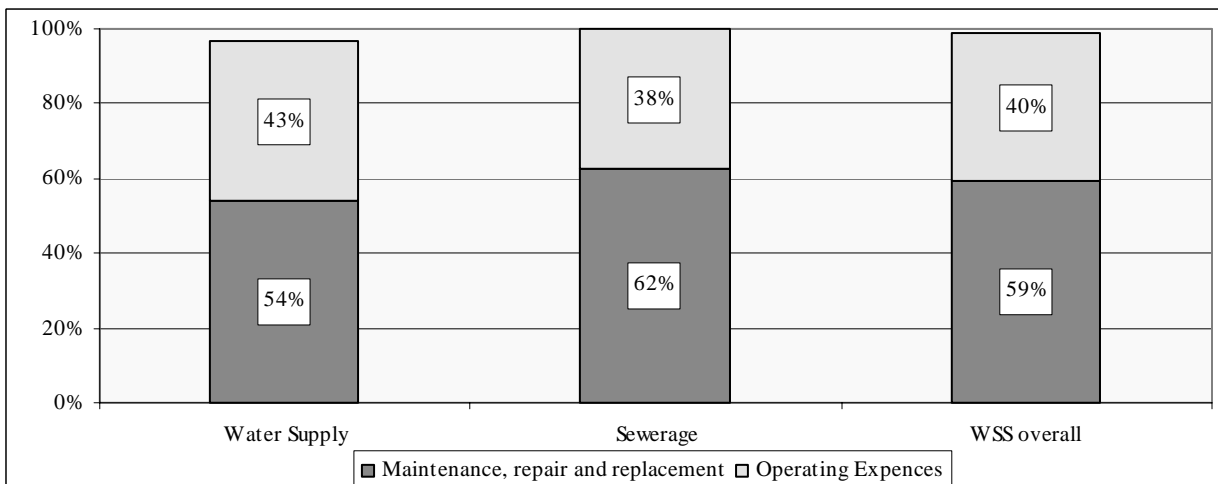
Source: calculations based on the FEASIBLE model

Figure 3. Structure of financial needs for WSS for the period 2002-2015 (by type of expenditure)



Source: calculations based on the FEASIBLE model

Figure 4. Structure of financial needs for WSS for 2002-2015 (by subsector)

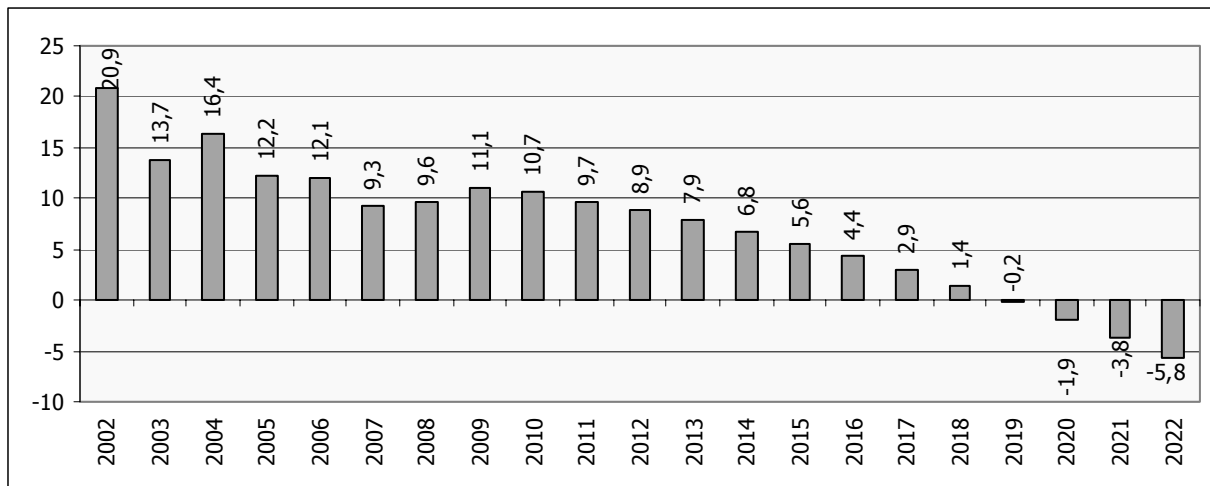


Source: calculations based on the FEASIBLE model

According to statistical reporting data, in 2004, the actual overall expenditure for sewerage and wastewater treatment (including pollution fees for wastewater discharges) in all towns and cities of Armenia was 1.7 billion dram. In comparison, the FEASIBLE model predicted average annual financial needs of 19.4 billion dram. That is, the actual financing of necessary general expenditures for sewerage was not more than 8.5% of the financial needs calculated by the model, including needs for capital repairs, rehabilitation, and replacement of deteriorated fixed assets (provided proper operation and maintenance of fixed assets).

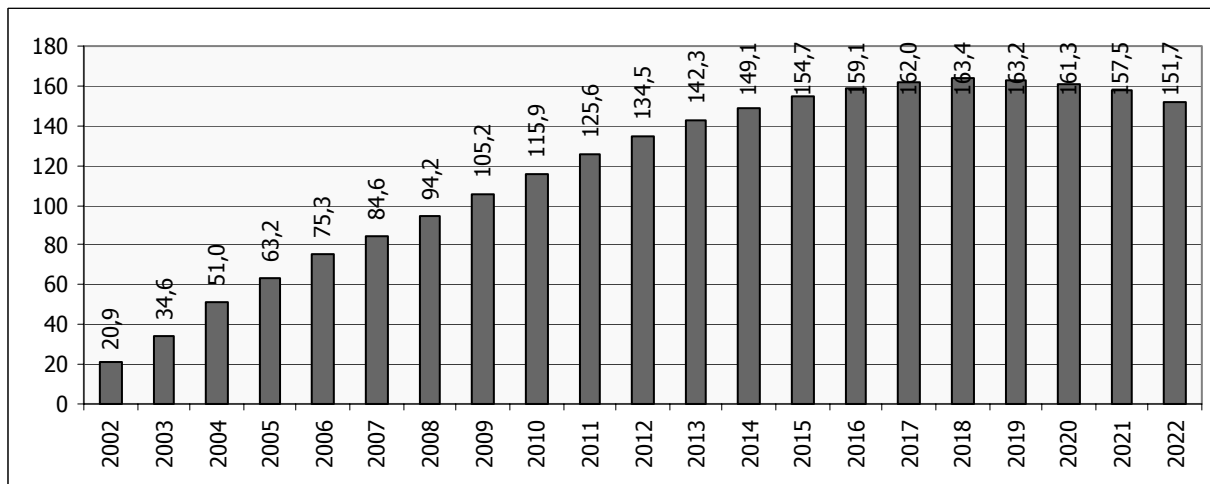
The results of calculations of available financing and evaluation of the financing gap for the Baseline Scenario are shown in the figures below.

Figure 5. Annual financing gap for implementation of the Baseline Scenario for WSS development in Armenia (billion dram at 2002 prices)



Source: calculations based on the FEASIBLE model

Figure 6. Cumulative financing gap for implementation of the Baseline Scenario for WSS development in Armenia (billion dram at 2002 prices)



Source: calculations based on the FEASIBLE model

As is clear from these figures, under the “no new policy” scenario, the annual financing gap for implementation of the Baseline Scenario for WSS development in Armenia will not be eliminated until 2020. As a result, the accumulated financing gap will be 154.7 billion dram in 2015, and the gap will exceed 161 billion dram by 2020.

3.5. Opportunity for gradual elimination of the financial gap for the Baseline Scenario

Despite its magnitude, the financial gap could be gradually eliminated if the package of policy measures presented below (or a similar package) is implemented.

A sample package aimed at increasing financing and economizing expenditures:

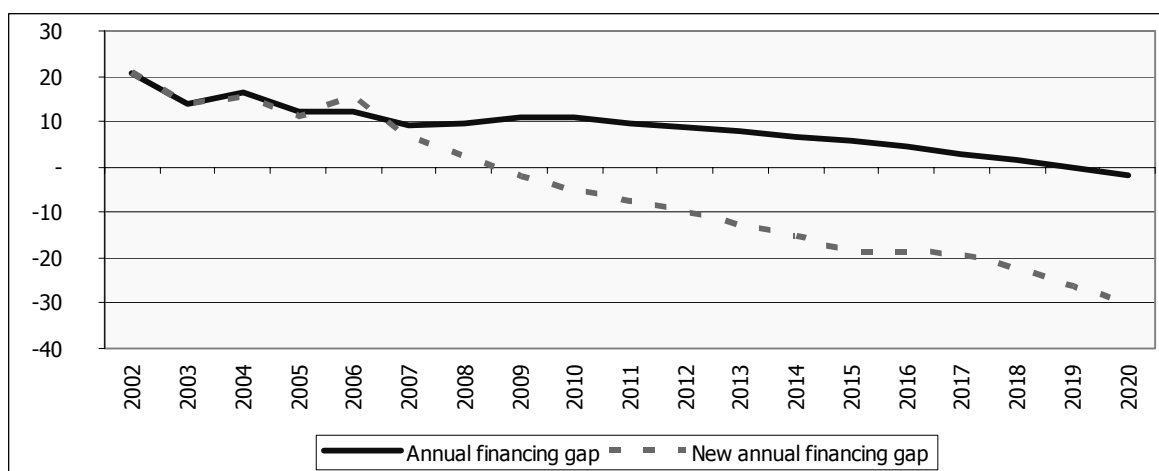
1. Increasing tariff rates for WSS services (in the base year prices) for residential consumers such that residential expenses for WSS services (as a % of average household income) would grow to **2.0%** by 2007 and is maintained at that level from 2007-2015.
2. Increasing the collection rate for charges billed to residential consumers for WSS services to **90%** and maintaining that level in the long term.
3. Maintaining WSS financing from the public budget and from international loans and grants at the level of **1.5%** of state budget expenditures for the whole implementation period of the scenario (this figure only concerns WSS expenditures for the 19 cities under review; the overall figure for the WSS sector in Armenia will be higher).
4. Energy conservation—since water that naturally flows to Yerevan from the mountains is nearly enough to satisfy the city’s demand, ending the practice of piping water from the Ararat valley could result in conserving a large amount of the electric energy currently consumed by the Yerevan vodokanal.

We note that first three measures are interchangeable. For example, if actual rate of charges collection is lower than expected, then it can be either compensated by increase in budget subsidies to cover the deficit of WSS enterprises’ cash flow (in other words to levy the burden of the under-collection on the public budget) or by raising tariffs for WSS services up to over 2.5 percent of the average household income (in other words to levy the burden of the under-collection on those consumers who regularly pay for WSS services, though such measure does not seem to be fair).

3.5.1. Modeling results

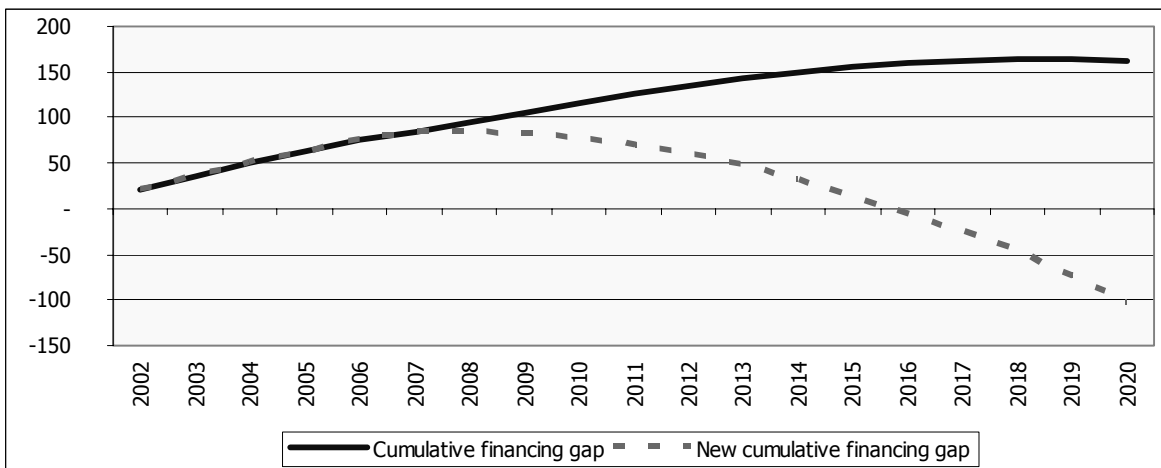
The modeling results are presented in the figures below, where a solid line shows the initial annual financing gap, and the dotted line shows the new, reduced gap.

Figure 7. Effect of implementing the package of policies on the magnitude of the annual financing gap (billion dram at 2002 prices)



Source: calculations based on the FEASIBLE model

Figure 8. Effect of implementing the package of policies on the magnitude of the cumulative financing gap (billion dram at 2002 prices)



Source: calculations based on the FEASIBLE model

As shown in *Fig.8*, the annual general financing gap will be eliminated by 2009, and the cumulative gap may be eliminated by 2016.

Considering that rehabilitation of the water supply system and introduction of measures to conserve energy, reduce leaks, and encourage more rational use of water may also considerably economize operating expenses, as well as reduce the need for maintenance expenditures on fixed assets, the Armenian government's decision to implement such measures in the rest of the cities of Armenia is justified and timely.

Only after the implementation of measures to reduce leaks and unaccounted-for water, the determination of the actual volume of water consumption (according to meter readings), and undertaking water demand management measures, including tariff policy measures, will it be possible to precisely determine the needs of the sewerage and wastewater treatment systems. This will facilitate the optimization of infrastructure and consequently reduce capital expenses on a rehabilitation and development program for sewerage and wastewater treatment systems.

It is further assumed that the program for rehabilitation of water supply systems in Armenia will be largely implemented by 2011. The options for WSS sector development, the costs associated with achieving the targets, and the possible sources and amounts of financing are presented in the Development Scenario.

3.6. Assumptions for the Development Scenario

This scenario assumes achievement of rather ambitious targets for WSS infrastructure development in the 19 cities and towns of Armenia under review. In addition to ongoing rehabilitation of water supply infrastructure in Yerevan provided for in the Baseline Scenario, these targets also include:

- Rehabilitation of water supply systems in Yerevan by 2009, and in the rest of Armenia in 2007-2011;
- In Yerevan: the reconstruction of the aeration station (with adjustment of its capacity in accordance with changes in the actual volume of water consumption and water discharged into the sewer system); construction of new sewer mains and pumping stations; and replacement of deteriorated sewerage networks in 2007-2011;
- Priority construction of new wastewater treatment plants in Vardenis, Gavar, and Martuni and rehabilitation of existing wastewater treatment plants in other towns located near Lake Sevan in 2007-2011
- Rehabilitation of wastewater treatment plants in the rest of the towns and cities under review in 2009-2015;

- Simultaneous rehabilitation (replacement of the most deteriorated parts of the network) of an average of 10% of the total length of existing sewerage networks and significant increase in residential sewerage service coverage in the other cities of Armenia, which means an expansion of existing sewerage networks or construction of new networks at the same time that work on wastewater treatment plants is conducted in the corresponding cities.

The last point in particular assumes priority construction of sewerage systems in settlements located near and above the water supply sources for the city of Yerevan (the settlements of Garni, Gokht, Karnis and Arzin in Kotaik region), because lack of sewerage in the settlements results in contamination of the groundwater and the drinking water sources.

As a result of implementing these measures, effective mechanical treatment of wastewater will be achieved in the cities and towns under review.

When modeling the Development Scenario, financing needs and available financing were calculated only for WSS in the 19 cities that were included in the Baseline Scenario (i.e. excluding Armavir and Metsamor).

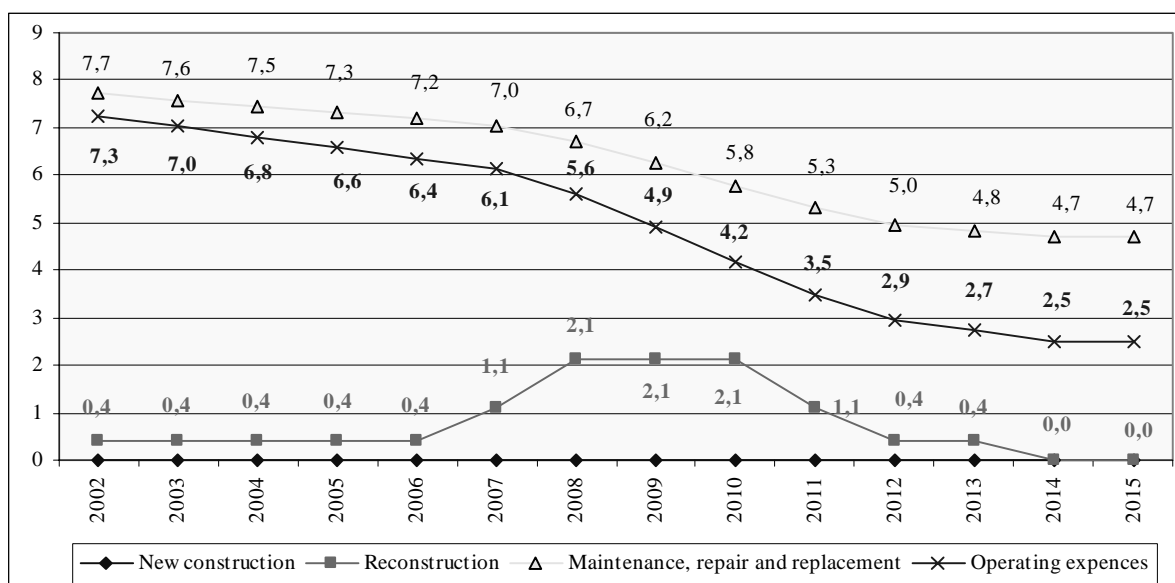
We note that although our attention is focused on the sewerage and wastewater treatment sectors, it is impossible to not consider expenses for rehabilitation of water supply infrastructure. This is because the water supply component of the program competes for limited available financial resources allocated for WSS, and its implementation substantially influences both the choice of optimal capacity of sewerage and wastewater treatment facilities, and the financial condition of WSS enterprises. Therefore, expenditures for water supply were also included when modeling the Development Scenario.

When calculating the amount of available financing it was assumed that the financing gap in the Baseline Scenario would be gradually eliminated through implementation of a package of policy measures for increasing financing suggested in the Baseline Scenario (or a similar package). Regarding committed loans, in those cases where the loan disbursement schedule was not yet determined, it was assumed that a nearly equal share of funds would be disbursed in each year, with slightly smaller shares in the first and last years of program implementation.

3.7. Results of calculations for the Development Scenario

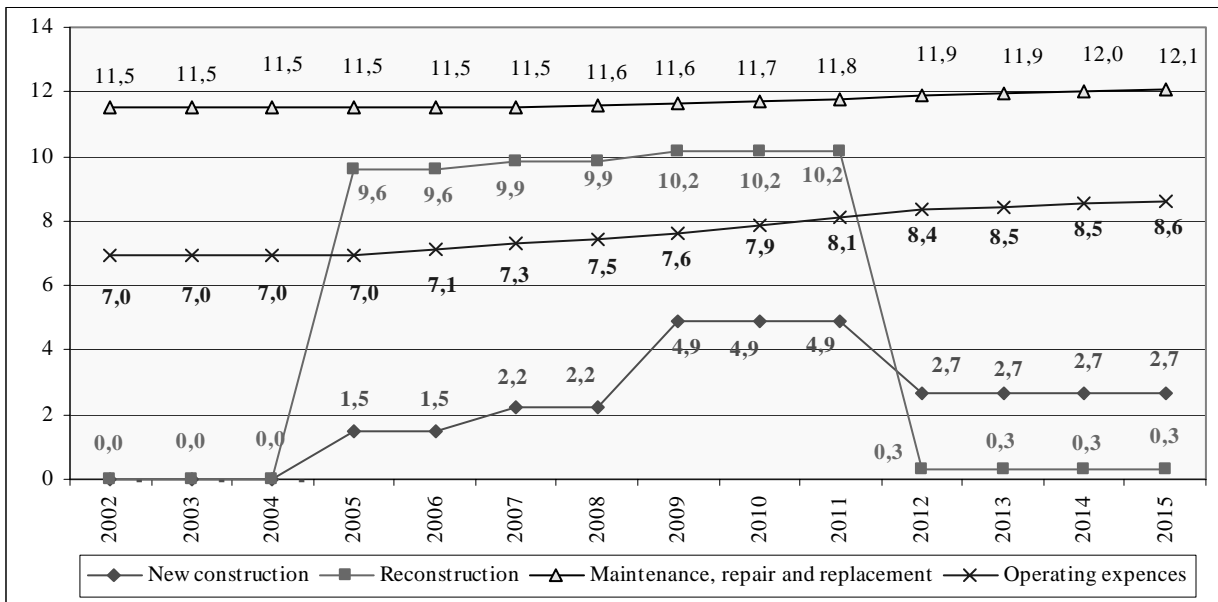
The results of calculations of total financial needs in the cities under review for 2002-2015 to achieve the WSS Development Scenario are shown in *Figures 9-14*.

Figure 9. Annual financial needs in the water supply sector for 2002-2015 for the Development Scenario (billion dram at 2002 prices)



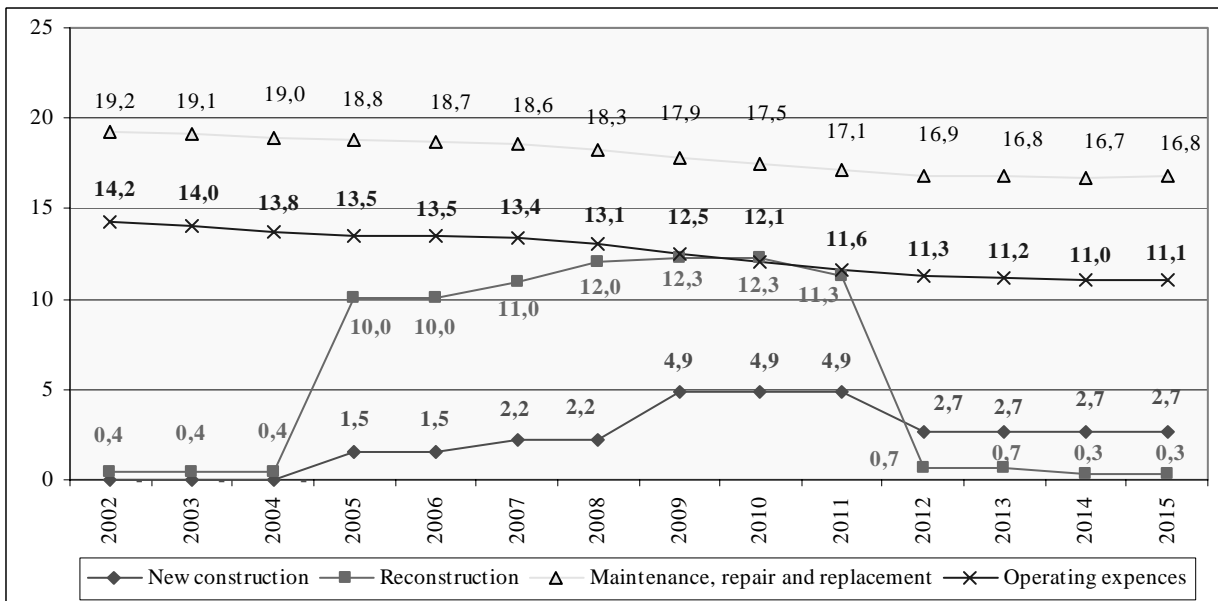
Source: calculations based on the FEASIBLE model

Figure 10. Annual financial needs in the sewerage sector for 2002-2015 for the Development Scenario (billion dram at 2002 prices)



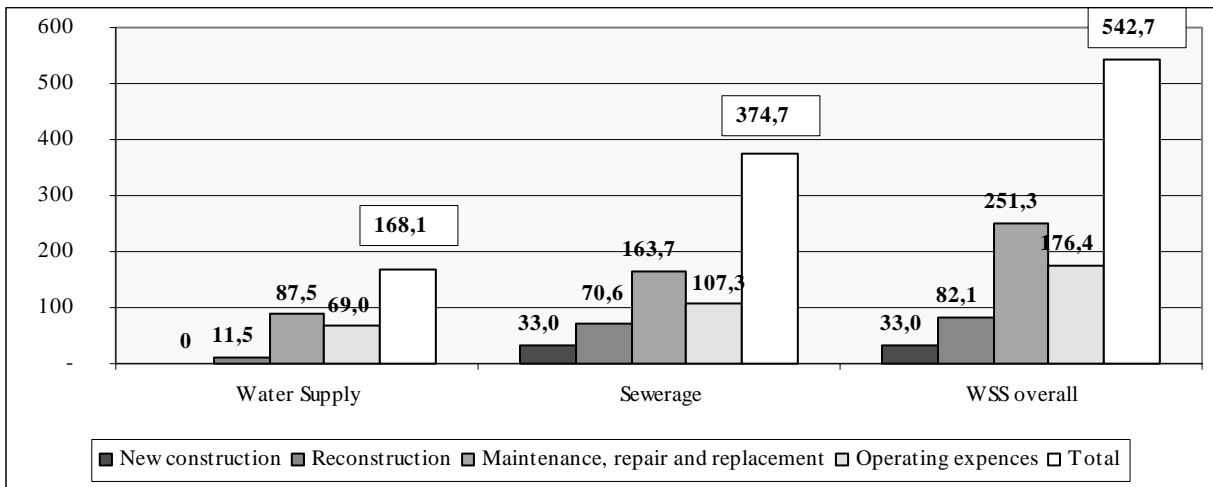
Source: calculations based on the FEASIBLE model

Figure 11. Annual financial needs for WSS for 2002-2015 for the Development Scenario (billion dram at 2002 prices)



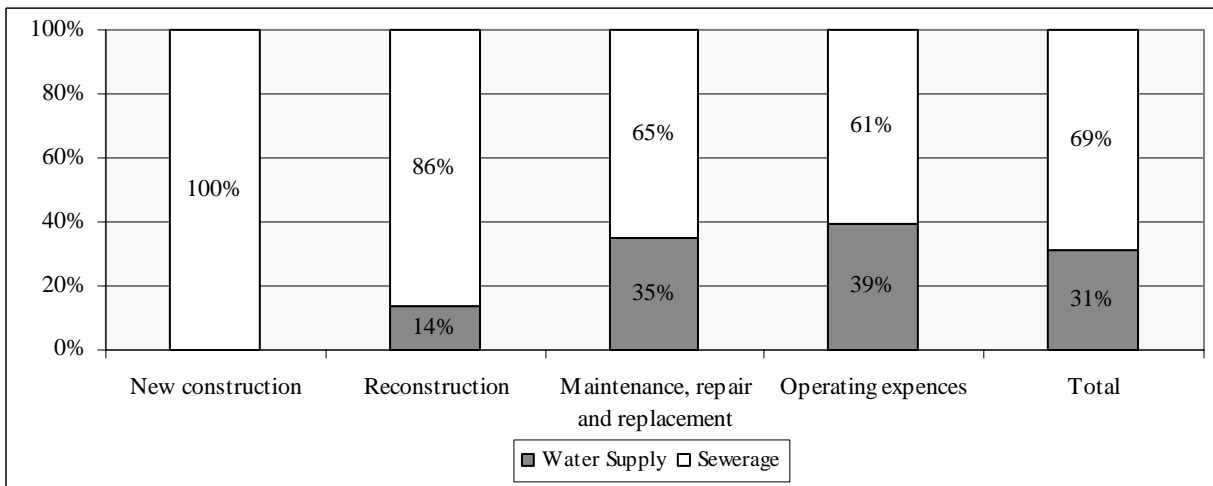
Source: calculations based on the FEASIBLE model

Figure 12. Cumulative financing needs for WSS for 2002-2015 for the Development Scenario – by type of expenditure (billion dram at 2002 prices)



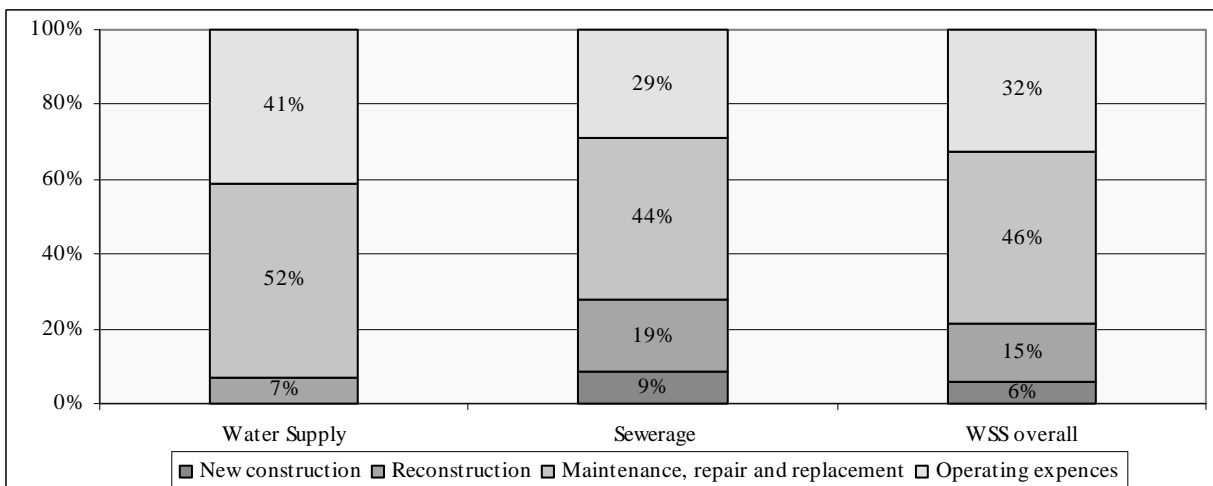
Source: calculations based on the FEASIBLE model

Figure 13. Structure of financial needs for WSS for 2002-2015 (by type of expenditure)



Source: calculations based on the FEASIBLE model

Figure 14. Structure of financial needs in WSS for 2002-2015 (by WSS sector)



We note that, based on the results of the FEASIBLE model, the estimated funds needed for rehabilitation and new construction of WSS in the 19 cities under review amount to 115.1 billion dram for 2002-2015 (or 8.2 billion dram per year). These estimates generally concord with the amount of capital investment in WSS anticipated by the Poverty Reduction Strategy Paper for 2004-2015, which is 217.5 billion dram, i.e. 18.1 billion dram per year, with a focus on the water supply sector.

Unfortunately, the Poverty Reduction Strategy Paper does not mention rehabilitation of the sewerage and wastewater treatment sector as a priority, and hence, the financing needs in this sector were not estimated. However, the FEASIBLE model estimates show that rehabilitation of the sewerage and wastewater treatment sector, and the subsequent proper operation and maintenance of fixed assets would require far more financing, including capital investment, than the water supply sector. In particular, according to the FEASIBLE model calculations, the sewerage sector would need 86% of expenditures for rehabilitation, 65% of maintenance expenditures for maintenance, repair, and replacement of deteriorated fixed assets, 61% of operational expenditures, and 100% of expenditures for new construction (see *Fig.13*).

3.8. Opportunity for closing the financial gap for the Development Scenario

Unsurprisingly, the result of implementing the Development Scenario instead of the Baseline Scenario is the emergence of an increase in the financing gap of the Development Scenario for WSS in Armenia.

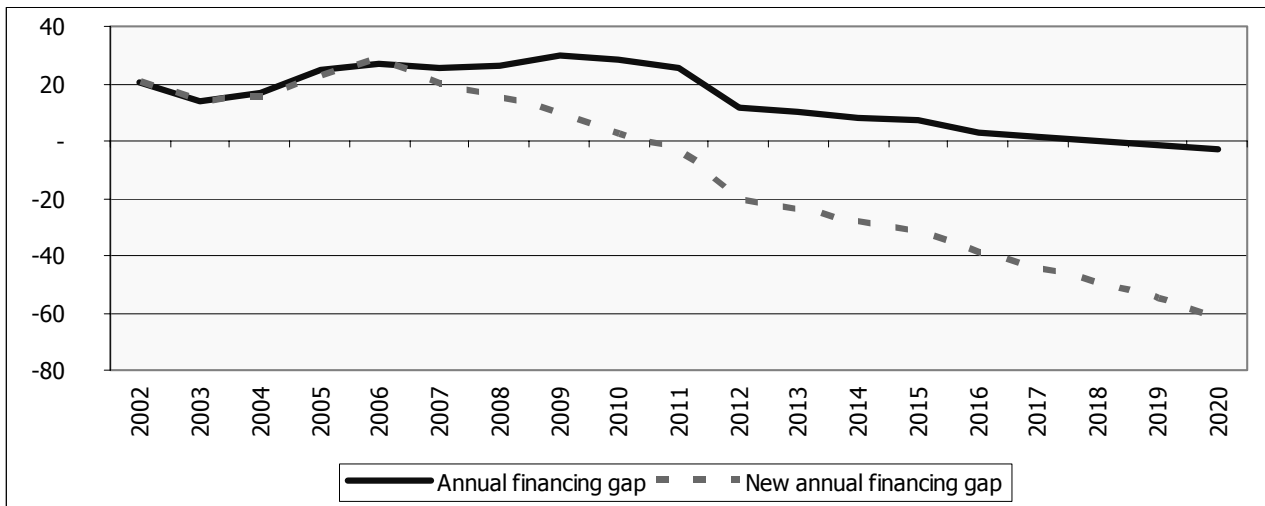
Calculations show that to close the financing gap in the Development Scenario is it not enough to implement the package of policies that facilitated closing the financing gap in the Baseline Scenario. In particular, the annual financing gap in the Development Scenario would not be eliminated until 2018, and the cumulative financing gap would only be eliminated around 2025.

As a result, an additional package of policy measures for increasing financing of the sector and economizing expenses is necessary, including:

1. Increasing the collection rate for billed charges for residential WSS services to 95% (from 2010 on);
2. Economizing expenses—along with conserving energy at Yervodokanal, it is assumed that other WSS service providers must economize approximately 40% of current energy consumption;
3. From 2007, a growth in sewerage tariffs such that the combined tariff for WSS services grows to 150% of its 2002 level (at constant 2002 prices).

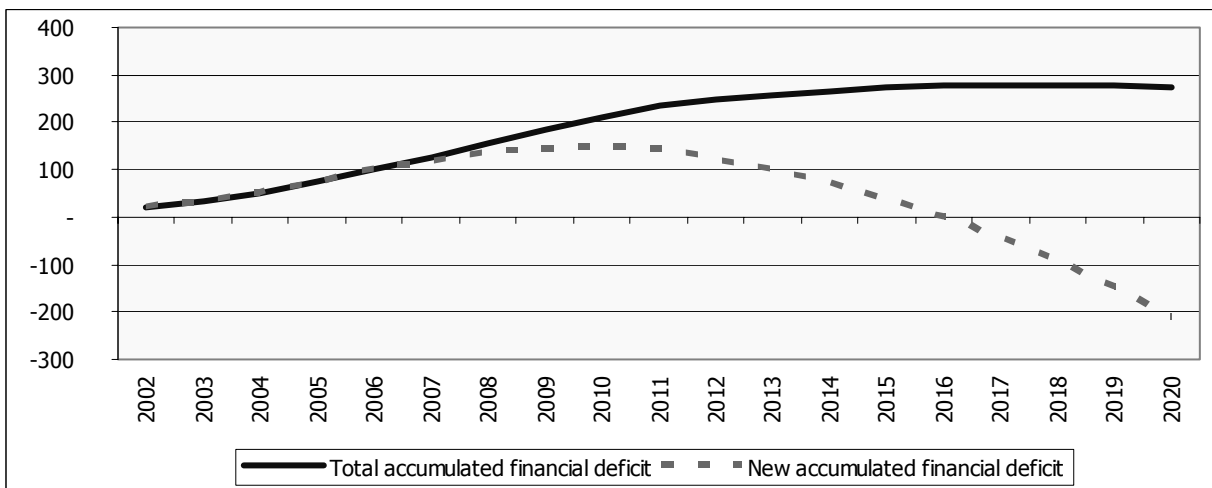
The results of calculations of the annual and cumulative financing gap if the Development Strategy is implemented are shown in *Fig.15* and *Fig.16*, as well as the new gap that would result if the additional package of policy measures outlined above is introduced. The solid line shows the initial financing gap and the dotted line shows the new, reduced gap.

Figure 15. Annual financing gap if WSS Development Scenario for Armenia is implemented (billion dram at 2002 prices)



Source: calculations based on the FEASIBLE model

Figure 16. Cumulative financing gap if WSS Development Scenario for Armenia is implemented (billion dram at 2002 prices)



Source: calculations based on the FEASIBLE model

As illustrated above, implementation of the additional package of policy measures has resulted in the elimination of the annual financing gap by 2011, and the cumulative financing gap will be eliminated by the end of the implementation period of the Development Scenario, i.e. by 2016.

We note that if the goal of raising the collection rate to 95% is not met, the cumulative financing gap by 2015 (given other assumptions of the Development Scenario) will amount to 118 billion dram if collections remain at present level of 60% throughout the country. As a result, to ensure sufficient financing for implementing the Development Scenario at lower levels of collections, the size of residential payments for WSS services must be raised. In particular, if only 60% collection rate is achieved then full implementation of the Development Scenario by the end of 2015 will be possible only if households would spent **4.4%** of their average income for WSS services, that is well above the affordability threshold.

The balance between the (collected) revenues from user charges and the O&M expenses represents the volume of WSS enterprises' own resources, which can be spent on capital repairs, rehabilitation, replacement of fixed assets, and new construction. As seen in *Fig.17*, consumer payments for WSS services (i.e. the enterprises' own resources) will be enough to fully cover O&M costs for the period from 2010 onward, though they will not be enough to fund implementation of the capital repair and investment programs, which are necessary to achieve the targets of the Development Scenario.

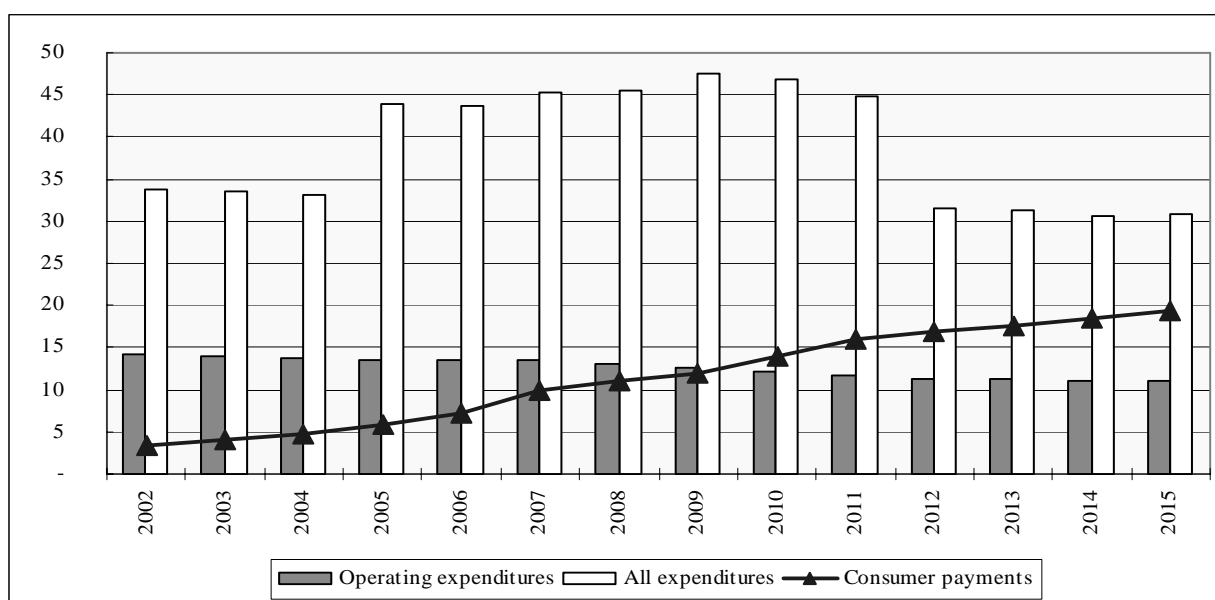
If we set a target of fully covering O&M costs, repair costs, and the costs associated with replacement of deteriorated fixed assets (i.e. all expenses except those for rehabilitation and new construction) using consumer payments, then it would be necessary to nearly quintuple the revenues from user charges in 2006. Clearly, this would be far beyond the limit of affordability both for residential consumers, as well as for commercial consumers. As a result, we conclude that under given assumptions financing all expenditures on maintenance, capital repair, and replacement of deteriorated assets from collected user charges will not be possible during the time period under consideration.

Consequently, during the period of implementation of the Development Scenario, it will be necessary to secure significant budgetary and/or credit financing of WSS in Armenia.

To figure out the amount of time it might take for vodokanals to achieve full financial autonomy, a special calculation was done of the minimum per capita income necessary to fully cover all WSS operating and capital expenses using consumer payments, under the condition that the payment rate for WSS services was the maximum affordable for the population.

The calculation showed that the average monthly consumer payment for WSS services should exceed 1900 dram by 2010. Consequently, to ensure affordability of WSS services for the population with the affordability threshold set at 3% of household income, the average per capita income in 2006 should exceed 64,000 dram (162 U.S. dollars) per month against about 30 thousand dram in 2005.

Figure 17. Coverage of expenditures for implementation of the Development Scenario by consumers' payments (billion dram at 2002 prices)



Source: calculations based on the FEASIBLE model

To create the conditions for full financial autonomy for the vodokanals, it is particularly necessary to increase the real household income at least by the factor of 2. Clearly, it will take time to implement this task. Therefore, capital expenditures in the WSS sector in Armenia will continue to be financed mainly from the state budget and IFI loans for many more years to come.

Table 10. Required WSS financing, billion dram

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Financial Needs											
Total expenditure	43,73	45,22	45,60	47,61	46,78	44,91	31,59	31,35	30,71	30,83	27,98
- New construction	1,50	2,23	2,23	4,92	4,92	4,92	2,69	2,69	2,69	2,69	0,00
- Rehabilitation	10,04	10,97	12,01	12,30	12,30	11,26	0,70	0,70	0,29	0,29	0,00
- Maintenance, repair and re-investments (replacement of fully deteriorated capital assets)	18,71	18,60	18,28	17,86	17,49	17,12	16,86	16,78	16,71	16,77	16,82
- Operating expences	13,48	13,42	13,07	12,54	12,08	11,62	11,34	11,18	11,02	11,09	11,16
Finance available											
Total	15,6	24,9	29,6	35,4	41,4	44,6	48,2	51,9	55,8	60,0	64,5
Revenues form user charges	11,3	16,5	20,3	23,3	26,2	28,1	30,4	32,6	34,9	37,5	40,2
Allocation from the public budget (incl. loans)	4,3	8,4	9,3	12,1	15,2	16,6	17,9	19,3	20,9	22,5	24,3
Financing gap											
Annual financing gap	-28,2	-20,4	-16,0	-12,3	-5,4	-0,3	16,6	20,3	24,8	28,8	36,1
Total accumulated financial gap	-28,2	-48,5	-64,5	-76,8	-82,2	-82,4	-65,9	-45,6	-20,8	7,9	44,0

Source: calculations based on the FEASIBLE model

3.9. Comparison of the 2004 and 2006 Financial Strategies

The results of a comparison of the financial needs specified above with similar assessments made in the 2004 Financial Strategy is shown in *Table 11*. As can be seen in the table, the cost of policy measures planned within the implementation framework of the Financial Strategy was clarified, and the updated cost is 543 billion dram in 2002 prices. The cost of implementing the strategy has fallen by nearly 21% compared to the forecast completed in 2004.

Table 11. Required WSS financing for the cities under review, 2002-2015

estimated by FEASIBLE model for the WSS Development Scenario

Billion dram (at 2002 prices)	Calculation Option		Comparison	
	2004 Strategy	2006 Strategy	Increase	Growth index
WSS overall	686.87	542.75	-144.13	79%
Operational expenses	203.08	176.38	-26.70	87%
New construction	41.80	32.98	-8.82	79%
Rehabilitation	133.40	82.12	-51.28	62%
Expenses for maintenance, capital repairs, and replacement of fully deteriorated capital assets	308.60	251.27	-57.33	81%
Water supply overall	193.64	168.06	-25.58	87%
Operational expenses	64.54	69.03	4.49	107%
Rehabilitation	28.96	11.49	-17.47	40%
Expenses for maintenance, capital repairs, and replacement of fully deteriorated capital assets	100.09	87.54	-12.55	87%
Sewerage and wastewater treatment overall	493.29	374.69	-118.60	76%
Operational expenses	138.54	107.35	-31.19	77%
New construction	41.80	32.98	-8.82	79%
Rehabilitation	104.44	70.63	-33.80	68%
Expenses for maintenance, capital repairs, and replacement of fully deteriorated capital assets	208.52	163.73	-44.78	79%

Source: calculations based on the FEASIBLE model

SECTION 4. CONCLUSIONS AND RECOMMENDATIONS

The total amount of financing needed to implement the Development Scenario for water and sewerage in Armenia is estimated at 542.7 billion dram (€1085.4 mln.) for the period from 2002-2015, in 2002 prices. Of that total sum, 183.9 billion dram (€367.8 mln.) will be used to fund operational costs for WSS enterprises. The optimization of consumer payments for WSS services (by raising the size of residential payments to the level of 2.5% of the average household income, as well as raising the collection rate to 95% of all bills) will result in eliminating utilities' need for budget subsidies to cover operating costs by 2011. Nevertheless, budget subsidization of expenditures for modernization and renovation of basic equipment, as well as expenditures for maintenance, capital repairs, and replacement of worn-out fixed assets will be needed until 2015 (overall expenditures for these two aims will be 115.1 billion and 251.3 billion dram (€230.2 mln. and €502.6 mln.), respectively).

Implementation of a Development Strategy for WSS in Armenia within any sort of acceptable time frame will be possible only if an array of policy measures are introduced, including:

- Implementing measures to improve the efficiency of WSS enterprises, including energy conservation and minimizing the unaccounted-for-water (UfW) (leakage and commercial water losses);
- Implementing measures to raise revenues of WSS enterprises, including increasing consumer payments for WSS services and raising collections to the level envisioned in the Development Scenario.

However, full implementation of the Development Scenario by 2015 will be possible only with additional financing for capital repairs, whether by increasing the amount of budget financing in the WSS sector, or by taking on additional loans from international financial organizations.

To meet the challenge of ensuring sufficient financing for implementation of the Financial Strategy from the public, it is necessary to integrate the Financial Strategy into MTEF and the budget process. As part of this, projects proposed for implementation within the framework of the Financial Strategy should meet established criteria for project selection for budget financing. The main criterion is the achievement (or facilitation of achievement) of the goals established in the Poverty Reduction Strategy adopted in 2003. Incidentally, it is important to remember that the Ministry of Finance and Economy currently employs additional criteria for priority ranking of investment projects for budget financing, including:

- Inclusion of the project in programs financed by international financial organizations;
- The minimum time frame and resources needed for implementation/completion of the project;
- The social efficiency of implementing the project, that is, the extent to which projects contribute to achieving the key criteria of the Poverty Reduction Strategy.

Essentially, these criteria specify the target criteria of the Poverty Reduction Strategy.

Therefore, it is worth emphasizing that the Poverty Reduction Strategy does not include explicit target indicators on sewerage services, which is not justified economically and socially. The economic rationale relies on the fact that it is much more effective to rehabilitate water provision infrastructure and sewerage infrastructure simultaneously. This reduces the cost of the work and requires less time. The social rationale is based on the fact that ensuring removal of wastewater and an appropriate level of wastewater treatment is an important factor in public health.

The lack of targeted indicators for sewerage services is a key shortcoming of the Poverty Reduction Strategy for a variety of reasons, the main one of which is the fact that that section of the Strategy does not meet Armenia's international obligations. As was mentioned in *Section 2.1* of this report, Armenia signed the Millennium Declaration in September 2000 and accepted obligations to achieve the Millennium Development Goals by way of integrating the given targets into a national development strategy. Among many other things, the Millennium Development Goals envision cutting in half by 2015:

- the share of the population without sustainable access to safe drinking water;
- the share of the population without access to basic sanitation (proper sanitation conditions)⁹.

At present, the Millennium Development Goals are only partially integrated into Armenia's national development strategy.

According to Article 6 of the Constitution of the Republic of Armenia, "International treaties that have been ratified are a constituent part of the legal system of the Republic. If norms are provided in these treaties other than those provided by laws of the Republic, then the norms provided in the treaty shall prevail." Therefore, bringing the Poverty Reduction Strategy into accord with Armenia's international obligations is a priority task. To achieve this, changes should be made to the Poverty Reduction Strategy, including indicators characterizing residential coverage of water sewerage networks, the most important of which (namely a target indicator according to the definition of the Poverty reduction Strategy) will be an indicator for residential water sewerage service coverage.

Amending the Poverty Reduction Strategy will make it possible to properly establish targets for WSS development in Armenia. As a result, the next step should be the development and introduction of a methodology for selecting investment projects that will make it possible to meet the established targets. Recommendations for optimizing existing procedures for selecting investment projects for budget financing are presented in *Section 4.3* of this report.

Properly conducted selection of investment projects should facilitate the achievement of targets of the updated Poverty Reduction Strategy, but that still does not guarantee concrete effects. The necessary next step on the route to successful implementation of the Financial Strategy is the development of a methodology for monitoring investment projects, as well as a methodology for evaluating the outcomes of their implementation. Recommendations for introducing monitoring procedures and project evaluation are presented in *Section 4.4* of this report.

It is clear that a significant volume of financing for modernization and development of WSS in Armenia in the coming years will be provided from the public budget. However, it is also well understood that implementing the proposed Development Scenario exclusively from current budget revenues without support from a sound policy of external borrowings is impossible. As a result, some WSS projects will be funded by international financial organizations. In accordance with current practice, projects that the Armenian government co-finances with international financial organizations are automatically included in mandatory budget expenditures.

Retaining this practice may result in the necessity of budget financing of projects that fully meet the criteria of international financial organizations, but do not fully meet the targets established in the Poverty Reduction Strategy. In order to avoid the likelihood of such a situation arising, it is important to solve the problem of the intertwining of all investment programs implemented in the WSS sector. It would be expedient to create a comprehensive Development Program for WSS in Armenia, which would include all projects currently being implemented, as well as determine a list of projects whose implementation is necessary in the middle term and long-term. Recommendations for developing a Strategy and a Targeted Development Program are presented in *Sections 4.1* and *4.2* of this report.

⁹ access to basic sanitation (proper sanitation conditions) imply household facility for defecation and de-urination meeting minimum sanitation requirements (or improved one) – lavatory, toilet, sanitation cabin (toilet and a washstand), connected to the water sanitation system or septic tanks, as well as facilities unconnected (for example, pit latrine with covered ditch).

In order to execute all the measures listed above, it will be necessary to create a single decision-making center with regard to functioning and development of WSS. In order to do that, it will be necessary to significantly strengthen the State Committee for Water Economy, the existing body with authority over WSS in Armenia. Recommendations for clarifying the existing functions of the SCWE and improving its effectiveness are presented in *Section 4.6* of this report.

4.1. Forming the strategy and Targeted Program for the WSS sector development in Armenia

The financial requirements of the WSS sector in the cities and towns in question in Armenia have been estimated to amount to **542.7 billion dram** up to 2015.

It is quite clear that Armenia needs to carry out renovation and development of the WSS sector using other investment resources, still not abandoning budget financing of the WSS sector as one of essential (not the main and sole) sources of financing.

What are these possible sources of financing for repairing and developing the country's WSS sector?

1. First we must point out that in recent years the positive dynamic of budget revenues has become obvious, which makes it possible to examine the question of increasing the volume of budget funds that are directed toward financing WSS projects;
2. The significant growth in real income of the population/households allows the examination of the possibility to introduce an investment component in the domestic consumer tariff for WSS services, which can finance projects for the development of WSS sector;
3. Armenia has a reputation of a reliable partner among IFIs, it is described as a country with a stable political situation and consistency of economic reforms which enables receiving of new external loans and donors' grants.

We suggest that building and reconstruction of WSS facilities should happen predominantly using borrowed funds. At the same time, the problem of financing the repair and overhaul of the main assets can be solved independently. There are two possibilities for this, which need to be used flexibly: budget resources and tariff policy.

The practice of implementing numerous investment projects shows that selection and preparation of projects is coordinated, as a rule, at the level of the investor and PIU. There are hardly any unified policies for preparing information about investment requirements and the preparation of standardized forms of pre-project documentation and the like is rarely carried out. There is no streamlined system of pre-project preparation, no integral opinion about the priorities of the projects and of the prioritized resources that it is necessary to allocate to the projects

SCWE should coordinate activity for the formation of integral governmental policy regarding rehabilitation and modernization of WSS.

The SCWE's functions might be the following:

- First, coordination of WSS projects. The fact is that in 90% of cases, these projects need to be implemented in parallel. Phased implementation of these projects makes the construction process more expensive.
- Second, organization of the implementation of projects coupled with the repair and overhaul of the main WSS assets, which should be financed predominantly from the budget.
- Third, general coordination of the implementation of projects of repair and new construction.

Planning and implementation of a targeted program of development of the WSS sector could become a significant step in strengthening SCWE's coordinating role.

At the stage of planning and implementing the targeted program it is necessary to find a balance between various types of investment resources and a compromise between necessary expenses and the general volume of resources.

In addition, the relation between work on planning and implementing the WSS strategy and the MTEF becomes obvious.

The Financial Strategy and the suggested Targeted Program of the WSS sector development

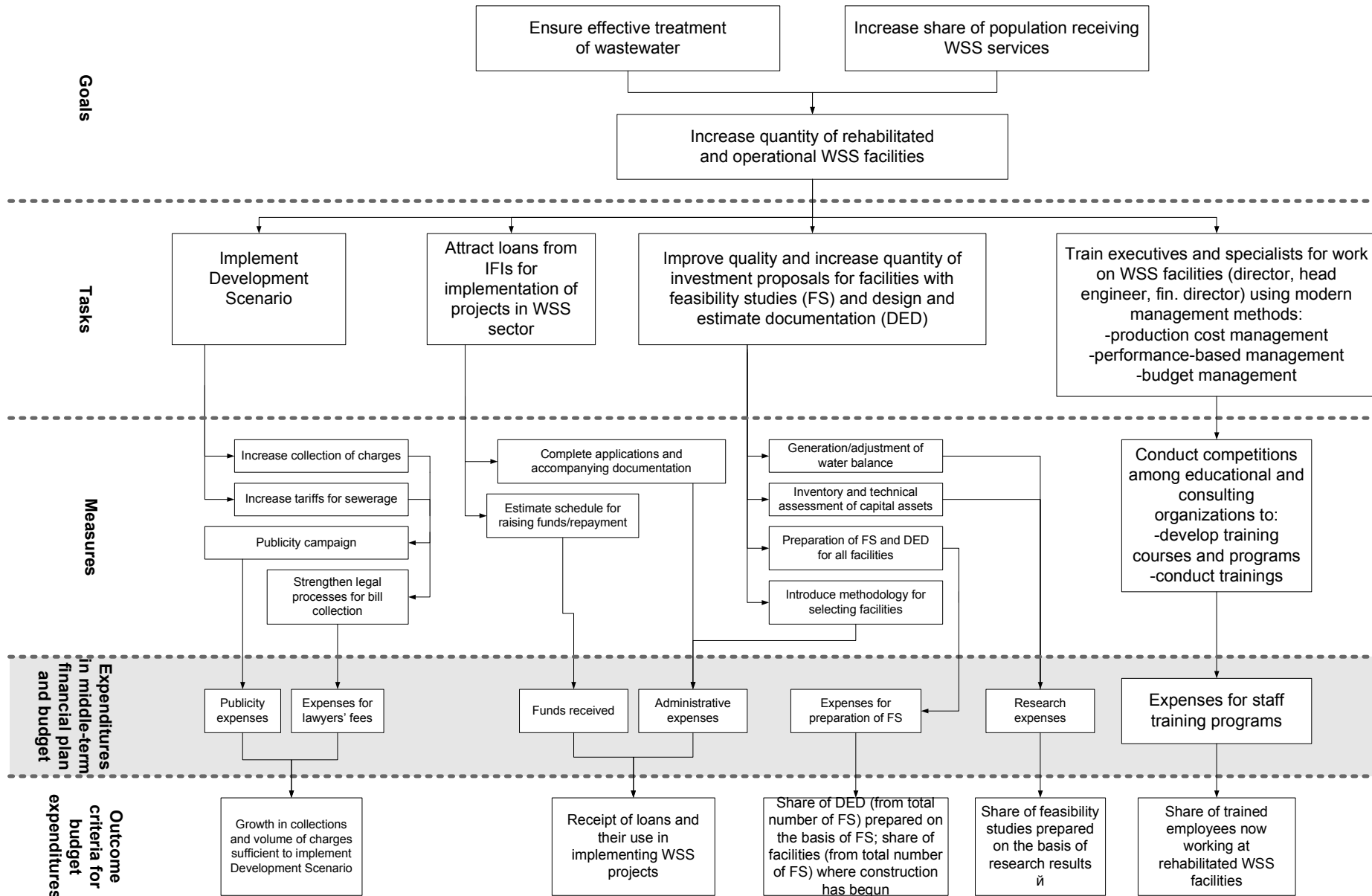
The Financial Strategy developed in the framework of the OECD/EAP Task Force project represents, above all, several variations of a middle term plan for financial expenditures related to:

- Construction work on rehabilitating wastewater treatment plants,
- Procurement of needed equipment,
- Ensuring sufficient current assets for vodokanals by expanding financial turnovers after putting new wastewater treatment plants into operation.

The Financial Strategy discusses the necessity of developing a Targeted Program on rehabilitation of currently existing WWTPs and construction of new sewerage and wastewater treatment systems (further—Targeted Program). It follows that the Financial Strategy should become a key element, the financial section, of the Targeted Program.

We assume that the Targeted Program should define the particular development goals and objectives of both the water supply sector and the sanitation sector, priority investment projects, and supporting measures and propose performance indicators for the sector and several WSS enterprises, as well as indicators of budget expenditure efficiency within the sector. *Fig.18* demonstrates an example of the hierarchy of goals and objectives of the water sewerage sector with supporting measures and performance indicators. An explanation of the figure is given below.

Figure 18. Hierarchy of sanitation section of Targeted Program



Targeted programs are a description of all the measures necessary to achieve stated goals and tasks. The introduction of MTEF does not contradict the existence of separate targeted programs¹¹ for individual administrative entities.

A targeted program should include a description of:

- Services provided within the framework of the program, as well as the groups of consumers who receive these services;
- Goals and tasks of the program;
- Necessary measures for achieving the stated goals and tasks;
- Indicators of program performance (quantifiable outputs and socially significant measurable results):
 - Values of the performance indicators (PIs) for the previous years, target values of the PIs for the current year;
 - Target values of the PIs for year 2, year 3, etc. of program implementation (for long-term programs);
- Necessary resources for executing the program:
 - Expenditures in the previous year;
 - Expenditures planned for the current year;
 - Expenditures for year 2, year 3, etc. of program implementation (for long-term programs);
- Risks associated with the program execution.

While developing the targeted program, it is worth taking into account the experience of other countries in EECCA (Eastern Europe, Caucasus and Central Asia), as well as the typical mistakes encountered in the development of such programs. For example, the targeted programs that exist today in Russia are characterized by an array of shortcomings that Armenia's Targeted Program for WSS development should seek to avoid.

1. Targeted programs in Russian practice, as a rule, are inter-agency. They are developed in situations where the achievement of stated goals requires the coordinated strengths of several administrative entities. As a result, the responsibility for implementation of this or that measure is dispersed between several entities participating in the program, which can lead to "dilution" of responsibility for the implementation of program measures, which hinders coordination between expenditures and performance. Considering that experience, it would be expedient for SCWE to be the sole responsible entity for Armenia's Targeted Program for WSS development.

¹¹ At the present time, the budget includes targeted programs for the development of Yervodokanal and Armvodokanal. Essentially, they are the vodokanal's business plans and do not fully correspond to the concept of a targeted program presented here.

2. Targeted programs often do not contain concrete quantifiable indicators describing the expected final results of the program, which makes it difficult to evaluate the extent to which the program as a whole has been achieved. Instead, they list non-quantifiable descriptions of general trends and general measures, which make an actual assessment of achievements nearly impossible. Therefore, this document suggests concrete criteria for evaluating the effectiveness and efficiency of the targeted program.
3. Measures in targeted programs are often vaguely formulated: there is not a clear connection between the measures to be taken and the goals of the program (the measures are often grouped according to the type of activity rather than by the program goals). Instead of a description of concrete actions, overly vague formulations are listed that do not allow an unambiguous assessment of the extent to which this or that measure has been implemented. Therefore, this document suggests a hierarchy of goals for the targeted program (with regard to wastewater services).
4. Information about program expenses does not usually allow coordination between program outcomes and those expenses that should be made in order to achieve the outcomes, which contradicts one of the key principles of ROB—the ability to identify the cost of each unit of outcome. The basic shortcomings of targeted programs, which complicate the assessment of the full cost of each outcome, are as follows:
 - The absence of a direct connection between program measures (and, consequently, their cost) and the goals and tasks of the program. This problem is particularly acute when calculating capital expenditures, which occupy the greatest share of the programs. Targeted programs are structured so that capital expenses are usually presented as a separate block, such that there does not appear to be a direct connection between these measures and the goals and tasks of the program itself. Sometimes this creates the impression that capital expenditures are the program’s end in itself;
 - Financing is not indicated for the implementation of some measures (so-called measures to be implemented “in the framework of operating costs”). Inclusion of such measures in the program complicates the procedure of comparing expenditures and outcomes. As a result, outcomes of these programs end up being controlled and evaluated in the framework of the targeted programs financed from a separate budget line, while financing, which one way or another is involved in implementation of such measures, is calculated from the current/operational budgets of respective agencies. Therefore complementary measures are also included in the hierarchy of goals of the Targeted Program for WSS development in Armenia.

4.2. Planning and implementing the Targeted Program

Planning budget expenditures according to the goals and tasks requires a change in the principles of budget planning. Planning budget allocation requirements should be based upon policy priorities and expected outcomes.

Accordingly, SCWE, on the basis of priorities for WSS development, identifies goals and tasks for its work in the planning period, formulates programs directed toward achieving the stated goals, and also evaluates the financial requirements of the programs. In this way, the financial requirements of the program, in concurrence with indicators of activity (amount of the population receiving WSS services and the quality of services) can be evaluated by SCWE with the help of FEASIBLE models.

Applications for budget financing should identify the corresponding indicators by which implementation outcomes will be judged, which will facilitate the transition to performance-based budgeting. This can be achieved by specifying the content and format requirements for municipalities' and WSS enterprises' applications for state budget financing.

The application should present information in such a way that clearly illustrates the connection between budget expenditures and achieved outcomes.

This format was developed by specialists from ATOS Consulting in the framework of introducing MTEF (see *Table 12*) and is not yet used by SCWE.

Table 12. Application form for budget financing

Prospective result (goals)	Tasks and measures	Non-financial program indicators					Financial program indicators				
		2005 (actual)	2006 budget	2007	2008	2009	2005 (actual)	2006 budget	2007	2008	2009
Overall program cost											

It is easy to evaluate program effectiveness using this form.

However, it may be most informative to evaluate program results and effectiveness on the basis of non-financial indicators, which must be chosen very carefully.

The following criteria should be met during the final selection of indicators:

- The relevance of the indicator to the goals and tasks at hand;
- A clear, statistically correct formula and its measurability—it should be based on accounting and/or statistical data;
- The efficiency of expenditures for gathering indicators: accounting data should be gathered with as little expense as possible and the indicators used should be based on existing systems of information collection to the greatest possible extent;

- Timeliness and regularity: accounting data should be gathered according to a set cycle, with only a short time period between the time the information is collected and the date of its use (when using data for monitoring, the data should be collected at least once per year, and not more than 2-3 months after the accounting period has ended).
- Consistency: the choice of indicators should be based on the necessity of uninterrupted gathering of data and on ensuring the indicators' consistency across time periods, and their consistency with other indicators used to evaluate progress in similar tasks, as well as with indicators used in international practice.
- Feasibility of verifying indicators;
- Ease of understanding and use of indicators for both internal and external users. The interpretation of a given indicator should be unambiguous both for specialists and for end users of services, including individual consumers.

The following non-financial indicators are presented for evaluating the effectiveness of investment projects:

- Change in the number of hours per day that water is provided.
- Change in the share of the population receiving water supply services (including cold and hot water).
- Change in the share of the population receiving sewerage services.
- Change in water quality with regard to most important quality indicators.
- Change in the number of accidents in the water networks (including hot and cold water supply as well as sewerage networks).
- Change in the number of complaints from customers.
- Change in the number of public warnings from public health officials.

4.3. Selecting projects for budget financing

4.3.1. The necessity of applying formalized procedures when selecting projects for financing

Analysis has shown that very often the decisions made by government bodies when selecting investment projects for budget financing are not conducted on the basis of formalized procedures but rather are based on the personal experience of the official making the decision. These may be decisions about the relationship between expenses for financing different aspects of the water sector (for example, the relationship between expenses for irrigation and other expenses), decisions about allocating additional budget revenues, or decisions on auditing the results of past projects in order to more effectively select similar projects in the future.

If formalized procedures are not used in the decision-making process and only a few decision-makers are involved, then some risks may be overlooked, for example, those related to the financial condition of budget-funded WSS enterprises. The formalization of procedures is required for the following reasons:

1. in order to reduce risks that can, among other things, damage the decision-maker's career.

2. in order to consider the interests of all stakeholders in the process, which makes it easier to implement decisions.

From our point of view, projects in the sanitation sector can be no less significant than other projects. However, when formalized procedures of project selection are absent, governmental bodies are often inclined to spend funds on existing successful projects, rather than begin new ones. This can distort the socio-economic development of the country.

4.3.2. Target process for project selection

The project selection procedure may consist of stages listed in the table below.

Table 13. Procedural stages of selecting projects for budget financing

No	Action	Executor
1.	Identification of projects that should be implemented in the middle term.	Vodokanals and municipalities jointly with SCWE
1.1.	Technical expertise.	SCWE (Department for coordinating activities of WSS infrastructure)
1.2.	Economic and financial expertise.	SCWE (Finance Department)
2.	Preparation of preliminary feasibility studies of projects.	Water supply and sanitation enterprises
3.	Ranking of preliminary feasibility studies of projects based on the project selection methodology for budget financing.	SCWE (Finance Department, Department for coordinating activities of WSS infrastructure)
4.	Exclusion from the ranked list of projects for the following reasons: - inadequate selection of engineering solution, - inadequate cost of engineering solution, - management's qualifications do not correspond to the project tasks and it is not possible to recruit a qualified outside manager (consultant).	SCWE
5.	Submission to MoFE of proposals for inclusion of funds for financing implementation of projects in the expenditure portion of the annual budget, specifically submission of a ranked list of projects to MoFE.	SCWE (Finance Department)
6.	Determination, depending on available amount of funds, of the "funding ceiling," inclusion of projects in the budget and implementation of funding.	MoFE

It should be noted that, according to international best practices, the very criteria for sound decision making in this area is public debate. Accountability is the best stimulus for an official to make decisions which s/he can explain and justify. So, the target procedure which is proposed above can only be efficient if there is an opportunity to publicly present and discuss the outcome of this ranking exercise.

4.4. Monitoring and evaluating

4.4.1. Recommendations for monitoring operations of WSS enterprises

Principles, goals, and tasks of monitoring

Monitoring Armenia's WSS enterprises should be a system of periodic collection, analysis, and dissemination of information about the results of the activities of WSS enterprises in offering WSS services. This information will help in good administrative decision-making.

The use of monitoring procedures can help answer the following questions:

- WHAT is happening in the WSS sector in Armenia?

- WHERE (in which enterprises, in which municipal structures) have positive/negative changes occurred in the volume, cost, and quality of WSS services?
- WHEN did these positive/negative changes happen?
- WHAT ROLE did the following actors play in the changes
 - State Committee for Water Economy as the administrative body for WSS in Armenia
 - Water utilities / providers of WSS services
 - Public Services Regulatory Commission as the body responsible for tariff regulation for WSS enterprises
 - Targeted programs implemented in WSS
- Did the cost for producing and delivering WSS services change in the period of analysis?
- What are the reasons for changes in the cost of producing and delivering WSS services?
- How well do changes in the cost of WSS services correspond to changes in service volume and quality?
- To what extent is budget financing of WSS projects reflected in the volume and quantity of WSS services?
- How did the population react to changes in the cost and quality of WSS services?
- Does the change in the cost of WSS services correspond to the population's ability to pay?

The monitoring procedure has several basic requirements:

- The indicators used in the monitoring process should be consistent and should be identified from the start. In other words, conducting monitoring on the basis of 5 constant indicators is much more useful than conducting monitoring on the basis of 20 indicators that change each time, or are only used occasionally.
- Monitoring should be a regular activity, i.e. it is useful only when measurements are taken regularly and frequently enough, at equal time intervals. Monitoring that is only done occasionally has little value.
- Monitoring is not simply enumeration of data. If the result of monitoring is tables with indicators that do not carry any weight, then monitoring has not achieved its stated goals.
- Monitoring should provide the opportunity to identify existing or potential negative changes in WSS before they become a serious problem that could obstruct the successful implementation of the strategy for improving the functioning of the WSS sector.

The principle condition for productive monitoring is conducting it according to a unified system of indicators on the basis of a unified procedure for data collection and analysis, and a unified procedure for the subsequent identification of the magnitude of the indicators.

The indicators recommended for use in monitoring Armenia's WSS enterprises, as well as the basis for the necessity of their use, is presented in [Section 4.5](#) of this report.

4.4.2. Recommendations for evaluating the implementation of WSS programs

Evaluation of program implementation is another important administrative instrument for achieving set goals.

The differences between evaluation and monitoring are presented in *Table 14*.

Table 14. Features of the monitoring and evaluation processes

Key elements	Monitoring	Evaluation
Mission	Is the project/program properly implemented	Is the project properly implemented?
Process	Carried out continuously	Carried out only at key steps of program implementation
Program ideology (model)	Taken as it is	Subject to analysis
Analysis	Actual data are compared to planned data	The reasons for achievement/failure to achieve planned outcomes are analyzed
Received information	Used to make operative decisions about the project/program	Used to make strategic decisions
Authorized organizations	Operate continuously	Ad hoc action. Contract with independent experts or a company specializing in conducting evaluations
Object of study	Monitoring of external conditions Monitoring of project/program implementation Calendar plan for project/program implementation Financial indicators Extent of achievement of outcomes	Quality of project/program management Extent of achievement of project/program goals Effectiveness of project/program Reasons for failures and possible ways to overcome them

The algorithm below presents practical activities that specialists should complete in the given sequence when conducting evaluations of targeted sectoral programs.

Step 1. The reason for carrying out evaluations

The results of monitoring project/program implementation are often the reason that conducting an evaluation becomes necessary. If the monitoring procedure is running smoothly, then evaluation may be necessary only if monitoring results show that there are problems or difficulties arising during program execution.

Step 2. Determining the goals and tasks of the evaluation

Step 3. Planning the evaluation and developing its structure

Step 4. Data collection

Step 5. Data analysis

Data analysis is the most important step in conducting program analysis. The ultimate goal of data analysis is a qualitative evaluation of what happened (is happening) during the process of program implementation, why it happened, the positive and negative aspects of what happened, and the necessary steps to correct the situation.

Step 6. Preparation of the evaluation report

The content and format of the report are determined in accordance with the evaluation structure and with the client's evaluation questions. The basis of the written report is answers to the evaluation questions.

In the case of evaluation of programs that affect the interests of the whole community, it is expedient to conduct a public presentation of the results after discussing them with the client.

Step 7. Using the evaluation results

An evaluation of the development program is not just scientific research, but above all is a management instrument designed to help in making timely, justified management decisions. Consequently, if there is no demand for evaluation results, then there is no point in conducting the evaluation.

Who should conduct an evaluation? We suggest that a relatively small group of specialists should be formed within SCWE. The group will determine what kind of evaluation should be done and then draw up a contract for its implementation.

4.4.3. *Introducing a system of annual evaluation reports on the outcomes and key trends of SCWE's activities*

The use of *evaluation reports on the outcomes and key trends* of SCWE's activities as an instrument to improve management efficiency merits attention.

The preparation of reports is done to ensure the application in the budget process of middle term, performance-based budgeting methods on the basis of implementation of principles of efficient use of budget funds. The use of reports can become a key area of focus in the application of purpose-oriented methods of budget planning for the justification of budget expenditures in order to ensure a direct correlation between allocation of budget resources and the actual or planned outcomes of resource expenditures.

Accordingly, the introduction of evaluation reports is a necessary element of the introduction of ROB. This would help SCWE to demonstrate measurable, concrete outcomes and better justify applications for increased financing.

In line with the accumulation of considerable experience in introducing ROB, evaluation reports can be not only an instrument to evaluate the effectiveness of SCWE's activities, but also an instrument for allocating budget resources at the stage of budget planning.

On the basis of data on the outcomes of SCWE's work for the preceding periods, presented in evaluation reports, it will be expedient in the future to make decisions about the progress in, and extent of implementation of the Poverty Reduction Strategy (with regards to WSS) and allocation of budget resources. The following sections should be in the evaluation report on the outcomes and general trends of SCWE's activities:

1. Goals and tasks of activities
2. Expenditure obligations and shaping revenues
3. Allocating expenditures according to goals, tasks, and programs
4. Evaluation of outcomes of activities

5. Analysis of the possibilities for improving outcomes of activities

The key goals of SCWE's activities must be formulated in the first section, "Goals and tasks of activities." For each goal there should be a formula and short description of the corresponding strategic tasks (the main areas of focus). The goals should correspond with the priorities of Armenian government policy, including the Poverty Reduction Strategy.

The individual areas of focus for achieving goals should be specified during the formulation of strategic tasks. These goals are envisioned to be the achievement of quantitatively measurable, socially significant results, such as increasing water provision, improving the quality of WSS services, and increasing the effectiveness of budget expenditures on WSS services in Armenia. For each goal it is recommended to formulate 3-7 strategic tasks encompassing all areas of SCWE's activities in achieving the corresponding goals. For each strategic task it would be expedient to outline the way it corresponds to a given goal and to SCWE's functions and spheres of activity.

An evaluation of the volume and structure of SCWE's expenditure obligations should be given in the second section of the report, "Expenditure obligations and shaping revenues". This will allow a more effective allocation of expenditures for service delivery and the carrying out of program functions. This is one of the fundamental outcomes of the transition to performance-based budgeting—the ability to create connections between targeted budgeting and financial planning of resources.

Expenditures for the current year and last two years, as well as for the three coming years, should be itemized according to goals, tasks, and targeted programs and should be presented in the third section, "Allocation of expenses according to goals, tasks, and programs."

In addition, it is necessary to present the justification for the existing and planned structure of expenses and describe changes to the structure in the period under review and planned period while taking into account existing factors and trends. For the analytical allocation of program expenditures, we propose formulating a list of the measures necessary to complete every strategic task, and then group the measures according to targeted programs.

The significance of the indicators describing the outcomes of SCWE's activities should be presented in the fourth section, "Evaluation of outcomes of activities." Indicators should be grouped according to strategic goals, strategic tasks, and targeted programs. Descriptions of existing and/or planned targeted programs should also be presented in the fourth section. The status, duration, goals, a list of indicators of outcomes, and the budget in the period under review and the planned period for each program should be included. Every goal, strategic task or budget program should be described by more than one but no more than 3-5 indicators.

The fifth section, "Analysis of possibilities for improving outcomes" has a special place in the report. If the goal of the first four sections is to present and quantitatively evaluate outcomes with the help of the previously stated criteria, then the goal of the fifth section is the evaluation of outcomes on a qualitative level, including:

- Analysis of reasons that allow the achievement of the given outcomes (for example, improvement of the regulatory framework, regularity of financing, measures to improve the organizational structure, etc.),
- Analysis of factors that prevent improvement in outcomes (for example, low salary scales that prevent recruitment of good specialists, inadequate financing compared to the financing envisioned in the budget, etc.)

4.5. Strengthening the information base for making management decisions

The analysis of the existing system of data support for decision-making about development of WSS in Armenia presented in *Section 1* highlighted the system's obvious shortcomings:

- Information gathered through the existing system of data support is inadequate to making basic managerial decisions about the condition and development of WSS in Armenia;
- The gathered information does not have a clear target audience;
- Information gathered in the framework of formalized procedures for data collection and analysis is used only partially (for example, the statistical accounting for Armenian WSS enterprises for 2005 was not received by SCWE until the middle of May 2006, several months after the formation of consolidated applications by SCWE for budget financing for WSS projects for 2007-2009)

Fundamentally, the procedure for gathering and analyzing information about the condition and outcomes of activities of WSS enterprises and the procedure for making decisions about the goals and tasks of the WSS sector in the upcoming period have very few points of intersection, and there is no unified system of sound and useful accounting on the condition of WSS in Armenia.

At the same time, it would not be accurate to say that there is no demand for a unified management accounting system. The following targeted groups all need information about the condition of the WSS sector and about the prospects for its development:

- Citizens, who are the basic consumers of WSS services;
- The regulatory agency for WSS in Armenia, as well as government agencies whose responsibilities include various aspects of WSS service provision (tariff regulatory agency, public health and environmental protection agencies, etc.);
- Executives of enterprises-contractors for WSS services

For understandable reasons, the representatives of each of the listed targeted groups is concerned about very concrete aspects of WSS activities in Armenia:

- The population and consumers of WSS services are concerned about receiving information about the justification for tariffs for WSS services, the prospects for future changes, and the extent to which service quality correlates to established requirements;
- The owners of property used by enterprises to produce and provide WSS services are concerned about knowing what changes in the condition of the property occurred during the period under review and what changes can be expected in the near future;
- The tariff regulatory agency is concerned about receiving information about the correlation of WSS enterprises' actual expenditures to their planned expenditures, as well as about the enterprises' observation of established norms of service quality;
- The public health /sanitary-epidemiological supervision agency is concerned about receiving information about the compliance of actual water quality with sanitary and epidemiological requirements;
- The environmental protection agency is concerned with receiving information about the influence of WSS enterprises' activities on the condition of the environment;

- The National Assembly of Armenia and other bodies for public representation are concerned about receiving information about how the governmental Development Strategy is being implemented in the WSS sector, for example, the Poverty Reduction Strategy;
- Executives of enterprises-contractors for WSS services are concerned about receiving information about the activities of other water utilities with similar characteristics in terms of production volume and types of services, and working conditions (for benchmarking);
- The SCWE as the administrative body for the WSS sector is concerned about receiving all the information listed above, which is essential for making sound decisions about short-term, middle-term and long-term goals and tasks for the WSS sector in Armenia, as well as decisions about priority WSS projects for budget financing.

The given list may be lengthened and specified, but the conclusion is already clear: there is a clear demand for accurate, valuable information about the condition and outcomes of activities in the WSS sector. As a result, the task of forming a unified system of reporting for WSS enterprises should be a priority task to be implemented as soon as possible.

The optimal format and amount of information in the unified system of reporting for the WSS sector in Armenia must be determined.

For consumers it is most important that the information is presented in a format that does not require additional computations, therefore the report materials should be of a reasonable size and written in simple, understandable language (incidentally, simplicity and understandability of presentation will be useful to all of the targeted groups who will use the unified reporting system). At the same time, for the tariff regulatory agency and the WSS administrative agency will need the benchmark data upon which the indicators are based in addition to the outcomes.

Bearing in mind the recommendations for forming a system for monitoring activities of enterprises and the implementation of projects/programs, developing departmental targeted programs, and preparing reports on outcomes and general areas of focus, the following basic formats for presenting information about the WSS sector can be identified:

- Report on monitoring the activities of WSS enterprises in a particular municipality (target audience—population and administration of the municipality);
- Report on monitoring the activities of WSS enterprises throughout an entire service area (target audience—the executive branch of public authorities);
- Annual report by SCWE on outcomes of WSS enterprises (target audience—population);
- Report on outcomes and basic focus areas of SCWE activities (target audience—Government of Armenia, National Assembly of Armenia);
- Report on results of benchmarking (comparison monitoring of WSS enterprises) (target audience—SCWE and water utilities' executives).

In this case we will refer to the particular format of presenting information on WSS enterprise activities used in an application for budget financing of a project/program for modernization and development of the WSS sector in Armenia.

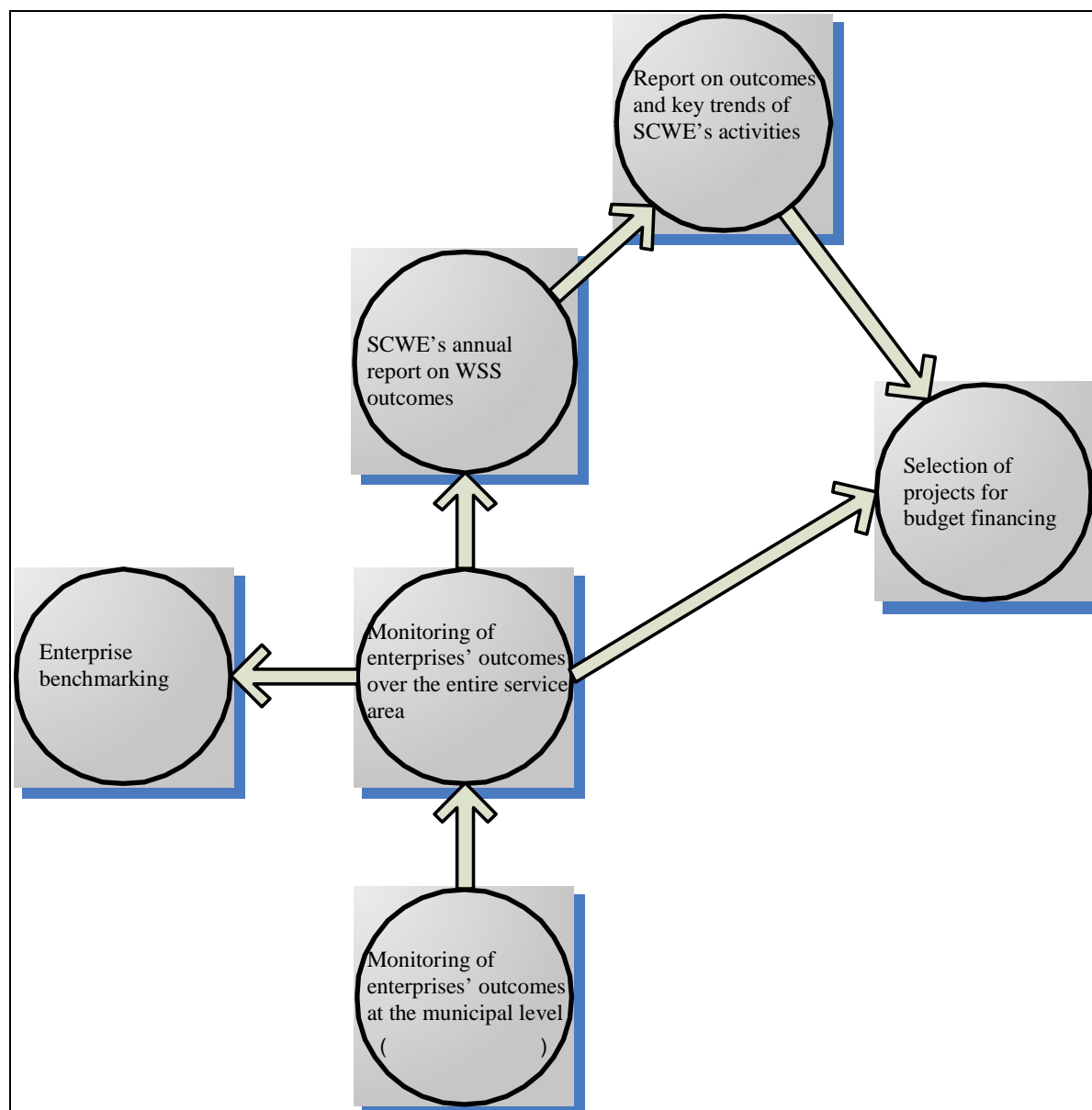
The links between aforementioned reporting formats for presenting accounting information on the outcomes of WSS development are presented in the figure 19 below.

A set of indicators that are recommended for use in forming a unified management accounting system for WSS in Armenia is presented in Appendix 3 of this report.

The selection of indicators should be based on the following criteria:

- The indicator should lend itself to quantitative measurement at any point in time;
- The indicator should describe an outcome and not the process by which the outcome was reached;
- The indicator should yield the same outcome during a repeated measurement (for the same time period), independent of who is conducting the measurement;
- The indicator should have a clear definition that is understandable to anyone;
- The procedure for determining the value of any indicator should not require resources or time that are incommensurate with that spent on other indicators.

Figure 19. Interrelation of component parts of the unified accounting system for WSS in Armenia



4.6. Clarifying SCWE's responsibilities

In *Section 1* it was mentioned that SCWE currently performs several tasks which do not pertain to its main missions; at the same time, there are several other important tasks that are not completed at all, or are carried out deficiently or ineffectively.

A comprehensive evaluation and development of integrated proposals for reexamining/clarifying SCWE's responsibilities with the corresponding changes in resource allocation is far outside the bounds of this project. However, it is advisable to undertake such work in the near future, possibly with the assistance of interested donors.

To assist with such work (such a project), a possible approach to building capacity with regard to tasks which are not properly implemented and strengthening the management potential of SCWE is the creation of an "Implementation Group." The approach is outlined in the section below.

4.6.1. Importance of creating an implementation group and its potential role

Certain techniques (for example, seeking out and initiating project proposals, or real-time monitoring of project implementation) are not yet used in SCWE's work, and the knowledge and skills of key employees may be insufficient.

There are various ways to solve this problem:

1. Training SCWE employees while simultaneously increasing staff at SCWE (using internal resources for capacity building with regard to implementation of new tasks).
2. Hiring a consulting firm to assist SCWE employees in developing and performing new tasks while simultaneously increasing staff at SCWE (outsourcing of the capacity building with regard to implementation of new tasks).
3. Hiring a consulting firm and commissioning it to perform new tasks (outsourcing implementation of new tasks).
4. In cooperation with an outside consultant, creating an implementation group to develop new tasks and train SCWE employees in the skills and knowledge needed to perform new tasks, while slightly increasing staff at the SCWE (creating a re-engineering unit within the organization, but with support from the external consultant).

We suggest that the fourth option is the most preferable, insofar as it presumes the development and refinement of "work techniques and procedures" that the SCWE will, in the long term, use to independently perform new tasks and responsibilities.

The following subsequent activities may be the most effective, in the opinion of the Consultant:

1. Hiring an external consultant to assist in improving deficient procedures and then subsequently communicating improvements to the Committee.
2. Studying international experience, which will require organizing 3-4 study tours for key SCWE employees with the goal of learning from WSS organizations abroad. The most effective source of valuable ideas and knowledge is conversations with colleagues and becoming familiar with the experience of other enterprises. Therefore the study of best practices and benchmarking are becoming more and more popular.
3. Comparing other enterprises' experience with the on-the-ground situation at SCWE. Analyzing what experience may be useful at the SCWE. Creating a list of specific measures for reforming SCWE.
4. Forming a project team for implementing planned measures, i.e. changing the processes and procedures of SCWE in accordance with best practices. In essence, this step involves re-engineering business processes in the SCWE.

Implementing the planned changes should take place on the basis of the following principles:

- Creation of a project team (implementation group) which will exist in the medium term;
- Involvement of the highest leadership (top executives) of SCWE in the process;
- Insofar as it is possible, using not only the best international experience, but also recruiting the best international specialists;

- Gradual, planned changes that are carried out according to plan. The group does not strive to implement all improvements at once;
- Skilful use of techniques for conducting meetings, collective decision-making, functional analysis, and special software programs.

4.6.2. *Formation of the implementation group*

Re-engineering projects, which include the given project, are more effective when conducted by specially selected teams. Team members receive support and methodological assistance from the consultant. Their responsibility is to work with the leader to use the methodology presented to them for re-engineering this or that business process.

It is important to consider the following factors in the process of selecting team members:

- In the event that SCWE employees are selected for the team, it is necessary that they only team work part-time. If they work a full day, there will arise a suspicion that mediocre employees are assigned to the team. In addition, employees on the team should not be separated from the rest of the organization.
- The team should be composed of people from different levels of the work hierarchy,
- Team members should not be directly subordinate to each other,
- It is preferable that not all members be connected with business process changes,
- The team should be composed of 5-7 people, ideally 7, including the leader and not counting his or her assistant,
- The team should be well balanced (in terms of expertise and roles).

We present key factors that need to be considered when forming the project team (implementation group)¹²:

The *team leader* should be responsible for organization and outcomes of the team's work. The leader should conduct meeting and make final decisions.

Requirements of the team leader:

- Know the current practices well,
- Show active interest and enthusiasm, have a good imagination, and be able to rise above stereotypes.

The role of *leader's assistant* is not connected with the working tasks of the group, but rather with the techniques used. The leader's assistant (communicator) should:

- Observe the group's working process and do everything possible during meetings to ensure that nothing interferes with the quality or quantity of the outcome,

¹² This subject is addressed in greater detail in Mike Robson and Philip Ullah's book "A Practical Guide to Business Process Re-engineering."

- Introduce the best techniques and methods and teach other group members new methods, for example, methods of collective decision-making,
- Analyze the results of team meetings along with the leader.

Requirements of the leader's assistant:

- Be communicative, enjoy working with other people,
- So that the assistant can remain objective, it is necessary that he or she does not exhaustively know the old and the new business processes.

Sometimes the responsibilities of the leader's assistant are split between two people: a professional psychologist and an aide.

An *external consultant* (consulting firm) should:

- Thoroughly understand business process re-engineering and its role in the transformation and development of an organization,
- Have a clear, accurate methodology that is openly formulated and available for discussion,
- Be able to train employees with a general approach, but also with specific methods necessary for sound, effective business process re-engineering,
- Ensure communication and exchange of information between all participants.

When choosing a consultant, it is necessary to:

- Make certain that he or she fits the above-mentioned description,
- Check the psychological compatibility between the consultant and the employees who are going to participate in the project.

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APPENDIX 1. FINANCING STRATEGY – CONCEPT AND METHODOLOGY

The Financing strategy (FS) methodology

Key features of the tool and the FS methodology are presented in the box below:

Key features of the FS methodology

Main objectives:

- Set SMART targets for WSS infrastructure rehabilitation and/or development, and design realistic (feasible) scenario(s) to achieve the targets;
- Structure sectoral policy dialogue on priorities, targets, development scenarios and Action plans at national and/or regional and local level.

FS Methodology – general characteristics:

- Use of the FEASIBLE computer tool (based on Generic cost functions) to cost the targets and make projections for the expenditure needs and for the supply of finance.
- Concept of three gaps and constraints:
 - Cash flow gap
 - Affordability for households
 - Affordability for the economy and public budget
- An iterative process of adjusting targets and terms and/or the finance available with an output - a package of policy measures which would allow to bridge the gaps
- Importance of complementary policies and measures

The implementation of the FS methodology in WSS sector follows the following steps:

- collect data and assess the present situation in the WSS sector and status of the WSS infrastructure, identify key problems and challenges;

- assess the so called Baseline (business as usual, or no new policy) scenario which typically anticipates just maintaining the present status of the infrastructure and present level of services and continuation of the present trend with the supply of finance;
- in coordination with local stakeholders, identify priorities and long-term objectives and development targets;
- define a Development scenario, i.e. a set of different measures (technical, institutional, economic and financial) required to reach these objectives/targets; the set of measures should be feasible from all points of view (political, institutional, operational sustainability, etc.);
- calculate the expenditures needed to implement the scenario;
- make projections for volume/structure of finance available from all sources;
- assess affordability of the scenario for households (tariffs and user fees) and for the public budget (capital expenditure programme, operating subsidies and social support measures);
- calculate the difference between the expenditure needs and the supply of finance (defined as the cash flow gap);
- design a package of policy measures that would help to bridge the financing gap; assess the feasibility of the package, in a dialogue with local stakeholders;
- if such a feasible package does not exist, in coordination with local stakeholders, revise objectives/targets and/or financing to adjust the expenditure needs to the finance available.

One outcome of this iterative process is a set (or several sets) of SMART targets and a realistic, feasible and affordable scenario (or several scenarios) to achieve them, including a policy package.

The natural starting point in developing a financial strategy for the WSS sector are international agreements signed/ratified by the government, the goals and tasks establish in government's strategies and sectoral programs, investment plans, and similar documents.

Overall, developing the FS is more a policy dialogue involving key local stakeholders and their international partners than a technical exercise. Social assessment and the institutional component are very important parts of the FS for urban WSS, while complementary policies and measures have always been part of the policy package suggested in the strategy. This is even more so for rural WSS, where institutions are weaker, and household incomes are lower than in urban areas.

The elements listed above are explained in greater detail below:

Study the current situation in the WSS sector

Specialized questionnaires are used for data collection. Data are gathered separately in all major and medium-sized cities. Other settlements might be delineated in groups according to various criteria (population size, extent of development of WSS infrastructure, use of the same technology, similar problems, etc.) for collection of aggregated data or data for selected representative settlements which is then extrapolated to the rest of the group.

For instance, for the wastewater collection and treatment sector, the following issues are particularly important:

- Coverage of residential consumers by WSS service;
- Volume of waste water collected, treated (by type of treatment) and discharged;
- Capacity and status of the fixed assets;
- Environmental and public health indicators of the WSS sector performance, and problems;
- Evaluation of actual financing of current and capital expenditures from different sources and through different mechanisms (user charges, loans, grants etc.).

Use the FEASIBLE computer model

The FEASIBLE computer model is one of the tools used in developing a financial strategy. The model helps evaluate the financial consequences of implementing this or that development scenario. Supply of, and demand for financing is projected in cash-flow terms, i.e. amortization is not taken into consideration, as soon as it is not an outflow of funds (although it is a cost item from an economic point of view).

The data input for assessing expenditure needs are many indicators that describe the technical condition of WSS infrastructure, the actual and predicted demand for WSS services, the dynamic and structure of expenditures for production of services, and other data.

The financial strategy is developed by through a number of iterative use of the FEASIBLE model, which uses various assumptions about the relative acceptability of methods for allocating funds from existing sources and mobilizing additional funds.

Establish targets and estimate expenditure needs associated with achieving them

SMART targets for the established planning time frame should be the outcome of an intensive dialogue and discussions with key stakeholders and experts, including representatives of concerned ministries/agencies, vodokanals, donors and IFIs, etc.

In the FEASIBLE model, targets are defined in terms of:

- Coverage of residential consumers by WSS service
- Water supply sources and water consumption volume in a given community (in liters per capita per day, lcd)
- Volume of wastewater discharged into the sewer systems, by type of the system
- The type, capacity, load, and quality of treatment at existing wastewater treatment plants

The goal may be simply maintaining the current level of service and condition of infrastructure, preventing any further deterioration. The achievement of this prosaic goal is usually the gist of the so-called “Base Scenario,” which is the starting point for evaluating whether achieving more ambitious WSS development goals is realistic.

Then, an evaluation of the financial requirements for achieving the established goals (e.g. MDGs on WSS) is conducted with the help of the FEASIBLE model.

Use of generic cost functions

The FEASIBLE model uses so called “generic cost functions” which were derived using methods of the regression analysis on the basis of empirical data about actual expenses for achieving concrete, quantitatively measurable goals in separate communities, for example

- Development of sewerage networks and increasing residential service coverage to a certain levels
- Construction of wastewater treatment plants of specific capacities;
- Rehabilitation of existing plants of specific types and capacities to ensure wastewater treatment at the design level, etc.

Separate empirical cost functions for current and capital expenditures were constructed for all key elements of WSS infrastructure:

- Surface and underground water intake facilities (including water intakes and boreholes, treatment plants, iron removal stations, pumping stations, etc.);
- Second-lift water pumping stations, water mains and clean water reservoirs, water distribution networks, and pumps;
- Street-level sewerage pipes, sewerage mains, and sewerage pumping stations;
- Wastewater treatment plants.

The variables of the cost functions are:

- Current and forecast population;
- Service coverage;
- Parameters of existing facilities;
- Infrastructure development goals in specific settlement (or a group of settlements).

The analytical type and variables for all cost functions used in the FEASIBLE model are presented in “FEASIBLE Model, Technical Manual, Beta Version-1,” by the Danish Ministry for Energy and Environmental Protection/DANCEE and the OECD EAP Task Force Secretariat.

Although the cost functions produce an estimate of expenditures in Western European countries’ prices, a method for adjusting them to local prices has been developed. It allows the estimation of expenses in local prices for any country and any region. With the help of the so-called “price correction factors”, the generic cost functions are calibrated to local prices. The expense structure characteristic for EU countries is thus changed in accordance with local prices for various inputs including:

- Electricity,
- Chemicals,
- Pipes,
- Salaries in the WSS sector,

- Construction materials,
- Engineering work and
- Civil construction work.

The calculation of expenses with the help of generic cost functions is conducted using given parameters for an individual settlement under consideration, or by using data aggregated for a group of settlements/communities, with the number of group members and the aggregate parameters for each group indicated. In that way, the estimates for a representative settlement from the group can be multiplied by the number of group members.

For each community (or group of communities) expenses are calculated separately for each element of the “production chain” (intake and treatment of water, transport of water, collection and transport of wastewater, treatment of wastewater) and type of expense, which are then summarized for all cities (or groups of cities). The results of the calculations are given for the WSS sector as a whole and are also broken down by water supply and sewerage and by separate types of expenses (operation and maintenance of capital assets; capital repairs and rehabilitation of deteriorated capital assets; rehabilitation of existing facilities; re-investment (replacement of worn-out assets by new assets of the same type and capacity to maintain the economic value of the assets), construction of new facilities).

We note that the calculation of financial requirements in the FEASIBLE model is based on the assumption of appropriate operation, maintenance, and capital repair of existing and newly added capital assets, as well as the timely rehabilitation of deteriorated assets. Therefore expenses for capital repairs and rehabilitation of deteriorated assets are included in the sum, equal to multiplying the cost of rehabilitation of capital assets by the rate of annual amortization.

Assess and project available financing

This part presents an analysis of the trends and a forecast for an array of indicators, including macroeconomic indicators, population, household incomes and consumer expenses, demand for WSS services in the given sector, consolidated public budget revenues, debt financing, etc. A forecast of available financing for current and capital expenses from all sources is based upon this analysis.

Assess eventual financing gap and analyze possibilities for closing the gap

By comparing the financing requirements for current and capital expenditures and the trends of actual volumes of financing, it is possible to estimate the gap in financing measures necessary to ensure the operational safety and reliable functioning of existing WSS infrastructure, as well as the gap in financing measures necessary to achieve the established development goals.

In so doing, the overall cash-flow deficit is examined, and an analysis of possibilities for covering various types of expenses, including capital expenses (new construction, rehabilitation of deteriorated capital assets and expansion of the system) and current expenses for operation, maintenance, and repair of capital assets is conducted. It is important to understand the structure of the financial gap in order to identify the top priority measures to take to bridge the gap.

Then, an assessment of affordability of the suggested measures —both for the population, the public budget and for the national or regional economy as a whole—of expenditures for the baseline scenario and for achieving the established development goals is presented. By affordability, we mean that the share of consolidated budget expenses spent on a given sector, and the share of a household’s budget spent for WSS services, should not exceed an established threshold. The decision as to what share (%) is considered affordable is a political choice and depends upon individual preferences of the population, as well as upon concrete conditions and policy priorities of a given country.

Closing the financing gap

An analysis of possibilities for closing or reducing the financing gap for various development goals and of a package of socio-economic, budget, tariff, and environmental protection policies should be carried out. In particular, in accordance with the FS methodology, we examine the following key ways of solving financial problems in the WSS sector:

- Ensure a more rational use of existing resources;
- Mobilize additional resources from all sources;
- Establish realistic goals relative to the volume and quality of services provided by the WSS sector, and develop a feasible financial strategy.

Combined packages of measures (increase in financing and/or adjustment of goals) are also under review. The ultimate goal of the analysis is to check the feasibility of this or that set of development goals and then identify a set (or sets) of goals and scenarios to meet them where expenses coincide with real possibilities for funding.

An evaluation of expenditures for achieving established goals and a demonstration of how those expenditures may be financed constitute the financial strategy *stricto sensu*.

The FEASIBLE computer tool

Advantages of using the FEASIBLE model

The tool was initially developed for urban WSS. The first version of the tool (EXEL-based) was developed by COWI AS with methodological support from the OECD/EAP Task Force Secretariat and financial support from the Danish government. It was pilot tested in 4 case-studies in EECCA. Several more technologies applicable in urban WSS as well as few more functionalities were added in the second version of the tool (FEASIBLE - Version 2, DELPHI-based), while its structure, including data entry, has been substantially revised.

The FEASIBLE model permits a quick evaluation of the financial consequences of choosing particular WSS development goals and a specific scenario to meet them, as well as the consequences of the use of various sources and instruments for financing and different options to attract additional funds. It does not require expensive technical-economic underpinning, feasibility studies or development of design and estimate documentation.

In addition, the FEASIBLE model allows for the quick conducting of “what-if” simulation and so-called “sensitivity analysis”— to assess the extent to which the outcome (financing requirements or the volume of expected financing) varies depending on changes in the various parameters.

In particular, the model helps assess how much more funding is needed if the rehabilitation program stipulates re-laying 15% of the overall length of worn-out water supply networks as opposed to re-laying 10% of the networks. Or, for example, how much the available financing is reduced if water bill paid by households is set at 3% of average household income as opposed to the situation where the bill is set at 4% of average income, etc.

According to experience in developing strategies in EECCA countries, the preparation of a financial strategy is able to help decision-makers to solve the following tasks:

- A well-documented calculation can lend weight to requests for financing from the state budget and from other sources (for example, from IFIs and donors);
- The outcomes of analysis can demonstrate the necessity of increasing vodokanals' revenues in order to finance O&M, or necessary capital investments, keeping tariffs within the bounds of affordability for the population and taking into consideration the current level and distribution of household income;
- Definition of the realistic level of service that the WSS sector can secure will facilitate the attraction of limited investment resources to the most prior and efficient investment projects;
- Analysis of various measures to optimize the WSS system and increase the efficiency and cost-effectiveness of the sector help focus on the most promising avenues, for example, measures to reduce water losses and other measures to manage water demand, which help reduce need for capital investments in the sector in the long run.

A new module on rural WSS was recently added to the model. The module is now being pilot tested and yet may contain errors overlooked in the trial runs. Moreover, entry data requirements for the new module were developed based on the simulation of an "ideal" situation anticipating that all needed data is available or might be collected, or substituted by experts' judgments at reasonable cost.

Limitations of the methodology and the FEASIBLE model

In addition to its merits, this approach also has certain limitations:

- A financial strategy cannot substitute for a Master plan and comprehensive WSS sector development program. However, it can prove that goals established in a plan (or a programme) are achievable, or are overstated or understated, and it can draw attention to the financial situation, i.e. it can influence the process of establishing goals. Correspondingly, the financial strategy can be considered a helpful element when developing Master plans and programmes for the WSS sector.
- The FEASIBLE model is not intended to optimize the choice of technical measures in terms of most efficient spending or requirements for environmental preservation. It only allows the evaluation of financial applications of choosing this or that technology.
- When making decisions within the framework of this methodology and on the basis of the Financial Strategy, it is important to bear in mind first, that all calculations made according to the model have a margin of error; second, that they are made on the basis of an array of assumptions that may not fully correspond to the reality; and third, that they suppose appropriate operation, maintenance, repair, and timely replacement of deteriorated capital assets. In the event that these assumptions do not hold true, actual expenditures may significantly deviate from those estimated by the model.

- Insofar as the model presents an aggregate outcome for the settlement (urban and rural) under consideration in a country (region) as a whole, the absence of a financing gap overall for a particular period does not mean that in every city/settlement in every year the available financing will correspond to or will exceed financial needs.
- Because the model calculations are conducted with the use of generic cost function, the calculations are sufficiently precise only at the aggregated level (state or regional). To get a more detailed picture at the level of an individual water utility or a city, or to identify the exact expenditures in connection with implementing a particular investment project, it is necessary to carry out an additional detailed technical-economic analysis (calculation) or a feasibility study .

How to get the FEASIBLE model and related documentation

The latest version of the FEASIBLE model, version 2.1 with the new Module on Rural WSS is available for download from COWI AS server at the following link:

<http://www.cowi.com/cowi/en/menu/projects/nature/environmentalpolicyandregulation/feasiblemodel.htm>

User manual with technical Annexes can be downloaded at the following link:

http://www.oecd.org/document/8/0,2340,en_2649_34335_34073160_1_1_1_1,00.html

It has a separate User manual for the new module on Rural WSS attached, which could be downloaded at:

http://www.oecd.org/document/56/0,2340,en_2649_34335_33719928_1_1_1_1,00.html

Finally, documentation on Rural WSS technologies integrated into FEASIBLE tool with relevant generic cost functions, as well as reports on the previous FS case-studies could be downloaded using the following link:

http://www.oecd.org/document/56/0,2340,en_2649_34335_33719928_1_1_1_1,00.html

**APPENDIX 2. TECHNICAL INDICATORS OF WSS INFRASTRUCTURE IN THE
FINANCIAL STRATEGY¹³**

BASELINE SCENARIO - WATER SUPPLY

Table 15. Population covered by centralized water supply services, and the volume of water provided in urban water supply

City name	Number of people covered by centralized water supply services, persons		Share of the population covered by centralized water supply (including stand-posts), %		Specific water consumption (water supplied into the network), liters/capita/day		Quantity of water collected from groundwater sources, %	
	Base 2002	Target 2015	Base year	Target year	Base year	Target year	Base year	Target year
Yerevan*	986,000	1,000,000	100%	100%	954	265	100%	100%
Alaverdi	13,400	13,400	100%	100%	576	576	100%	100%
Aparan	6,600	6,600	100%	100%	328	328	100%	100%
Ararat	11,900	11,900	100%	100%	290	290	100%	100%
Martuni	9,000	9,000	100%	100%	356	356	100%	100%
Artashat	18,400	18,400	100%	100%	2,032	2,032	100%	100%
Ashtarak	20,700	20,700	100%	100%	527	527	100%	100%
Berd	6,900	6,900	100%	100%	318	318	0%	0%
Dilizhan	9,000	9,000	99%	99%	360	360	13%	13%
Echmiadzin	35,100	35,100	100%	100%	1,119	1,119	100%	100%
Gavar	20,000	20,000	100%	100%	799	799	100%	100%
Gyumri	135,500	135,500	100%	100%	529	529	100%	100%
Masis	15,800	15,800	100%	100%	1,672	1,672	100%	100%
Razdan	51,800	51,800	100%	100%	543	543	100%	100%
Sevan	17,900	17,900	100%	100%	1,159	1,159	100%	100%
Tsakhkadzor	2,600	2,600	98%	98%	882	882	80%	80%
Sisian	11,500	11,500	100%	100%	546	546	100%	100%
Vanadzor	84,200	84,200	100%	100%	395	395	72%	72%
Vardenis	8,700	8,700	100%	100%	293	293	100%	100%

* Here and subsequently the number of people in the population is taken from the number of people served by Yervodokanal and Armvodokanal, respectively (calculated on the basis of contracts signed between the water utilities and households).

In the Baseline Scenario, the rehabilitation of water supply systems is limited to a program implemented in Yerevan financed by the first World Bank loan for the Program for Municipal Development.

¹³ Source: "Financial strategy for the sewerage and wastewater treatment sector in large and medium-sized cities in Armenia. Final report." 2004.

BASELINE SCENARIO - SEWERAGE

Table 16. Population covered by sewerage services, volume of wastewater collected into the sewerage system, type of treatment, and capacity of wastewater treatment plants in the 2002 base year

City name	Share of the population covered by sewerage services	Wastewater collected into the sewerage system, m ³ /year	Type of treatment	Wastewater treatment plant capacity, m ³ /day
Yerevan	96%	85,200,000	M (partial)	600,000
Alaverdi	57%	839,500	untreated	0
Aparan	60%	240,000	untreated	0
Ararat	38%	430,000	untreated	0
Martuni	50%	300,000	untreated	0
Artashat	55%	2,550,000	untreated	0
Ashtarak	53%	800,000	M (partial)	10,000
Berd	47%	220,000	untreated	0
Dilizhan	53%	380,000	untreated	0
Echmiadzin	62%	3,100,000	M (partial)	35,200
Gavar	49%	1,250,000	untreated	0
Gyumri	56%	5,820,000	untreated	0
Masis	52%	800,000	M (partial)	53,000
Razdan *	69%	2,800,000	M (partial)	64,000*
Sevan *	58%	1,400,000	M (partial)	
Tsakhkadzor *	60%	210,000	M (partial)	
Sisian	41%	210,000	untreated	0
Vanadzor	70%	2,660,000	M (partial)	28,200
Vardenis	48%	320,000	untreated	0

* Sent for treatment to the wastewater treatment plant near the village of Kakhsi, capacity 64000 m³ per day.

M – mechanical treatment

DEVELOPMENT SCENARIO - WATER SUPPLY

Table 17. Population covered by centralized water supply services, and the volume of water provided in urban water supply

City name	Number of people covered by centralized water supply services, persons		Share of the population covered by centralized water supply (including stand-posts), %		Specific water consumption (water supplied into the network), liters/capita/day		Quantity of water collected from groundwater sources, %	
	Base 2002	Target 2015	Base year	Target year	Base year	Target year	Base year	Target year
Yerevan*	986 000	986 000	100%	100%	954	265	100%	100%
Alaverdi	13 400	13 400	100%	100%	576	160	100%	100%
Aparan	6 600	6 600	100%	100%	328	160	100%	100%
Ararat	11 900	11 900	100%	100%	290	160	100%	100%
Martuni	9 000	9 000	100%	100%	356	160	100%	100%
Artashat	18 400	18 400	100%	100%	2 032	160	100%	100%
Ashtarak	20 700	20 700	100%	100%	527	160	100%	100%
Berd	6 900	6 900	100%	100%	318	160	0%	0%
Dilizhan	9 000	9 000	99%	99%	360	160	13%	13%
Echmiadzin	35 100	35 100	100%	100%	1 119	160	100%	100%
Gavar	20 000	20 000	100%	100%	799	160	100%	100%
Gyumri	135 500	135 500	100%	100%	529	160	100%	100%
Masis	15 800	15 800	100%	100%	1 672	160	100%	100%
Razdan	51 800	51 800	100%	100%	543	160	100%	100%
Sevan	17 900	17 900	100%	100%	1 159	160	100%	100%
Tsakhkadzor	2 600	2 600	98%	98%	882	160	80%	80%
Sisian	11 500	11 500	100%	100%	546	160	100%	100%
Vanadzor	84 200	84 200	100%	100%	395	160	72%	72%
Vardenis	8 700	8 700	100%	100%	293	160	100%	100%

* Hereafter the number of people in the population is taken from the number of people served by Yervodokanal and Armvodokanal, respectively (calculated on the basis of contracts signed between the water utilities and households).

Table 18. Expenditures for rehabilitation of WSS engineering infrastructure

as % of the cost of construction of a new facilities of similar type and capacity

City name	Water intake facilities and water treatment plants, %		Water supply distribution networks, %
	Underground	Surface	
Yerevan	20%	0%	10%
Alaverdi	50%	0%	10%
Aparan	30%	0%	10%
Ararat	20%	0%	10%
Martuni	20%	0%	10%
Artashat	60%	0%	10%
Ashtarak	20%	0%	10%
Berd	0%	50%	10%
Dilizhan	0%	50%	10%
Echmiadzin	30%	0%	10%
Gavar	20%	0%	10%
Gyumri	40%	0%	10%
Masis	20%	0%	10%
Razdan	20%	0%	10%
Sevan	30%	0%	10%
Tsakhkadzor	10%	20%	10%
Sisian	20%	0%	10%
Vanadzor	50%	50%	10%
Vardenis	20%	0%	10%

DEVELOPMENT SCENARIO - SEWERAGE

Table 19. Population covered by sewerage and volume of wastewater collected, 2002

City name	Wastewater collected into the sewerage system, m ³ /year	Share of the population covered by sewerage services	
	Base year 2002	Base Year	Target year 2015
Yerevan	85,200,000	96%	98%
Alaverdi	839,500	57%	65%
Aparan	240,000	60%	70%
Ararat	430,000	58%	65%
Martuni	300,000	50%	60%
Artashat	2,550,000	55%	65%
Ashtarak	800,000	53%	70%
Berd	220,000	47%	60%
Dilizhan	380,000	53%	60%
Echmiadzin	3,100,000	62%	70%
Gavar	1,250,000	49%	60%
Gyumri	5,820,000	56%	65%
Masis	800,000	52%	60%
Razdan	2,800,000	69%	75%
Sevan	1,400,000	58%	65%
Tsakhkadzor	210,000	60%	70%
Sisian	210,000	41%	55%
Vanadzor	2,660,000	70%	80%
Vardenis	320,000	48%	55%

Table 20. Type of treatment and capacity of wastewater treatment plants

City name	Type of treatment		Wastewater treatment plant capacity, m ³ /day	
	Base year	Target year	Base year	Target year
Yerevan*	M (partial)	M	600,000	400,000
Alaverdi	untreated	M	0	4,000
Aparan	untreated	M	0	2,000
Ararat	untreated	M	0	4,000
Martuni	untreated	M	0	2,000
Artashat	untreated	M	0	8,000
Ashtarak	M (partial)	M	10,000	4,000
Berd	untreated	M	0	2,000
Dilizhan	untreated	M	0	2,000
Echmiadzin	M (partial)	M	35,200	10,000
Gavar	untreated	M	0	5,000
Gyumri	untreated	M	0	20,000
Masis	M (partial)	M	53,000	4,000
Razdan *	M (partial)	M	64,000*	16,000*
Sevan *	M (partial))	M		
Tsakhkadzor *	M (partial)	M		
Sisian	untreated	M	0	1,000
Vanadzor	M (partial))	M	28,000	10,000
Vardenis	untreated	M	0	1,500

* Sent for treatment to the wastewater treatment plant near the village of Kakhsi, capacity 64000 m³ per day;
M – mechanical treatment

Table 21. Planned rehabilitation of WSS engineering infrastructure

as % of the cost of construction of a new facilities of similar type and capacity

City name	External sewerage networks %	Wastewater treatment plants %
Yerevan	10%	30%
Alaverdi	10%	20%
Aparan	10%	20%
Ararat	10%	20%
Martuni	10%	100%
Artashat	10%	20%
Ashtarak	10%	20%
Berd	10%	20%
Dilizhan	10%	20%
Echmiadzin	10%	20%
Gavar	10%	100%
Gyumri	10%	20%
Masis	10%	20%
Razdan *	10%	20% *
Sevan *	10%	
Tsakhkadzor *	10%	
Sisian	10%	20%
Vanadzor	10%	20%
Vardenis	10%	100%

* Assumes rehabilitation of the wastewater treatment plant near the village of Kakhsi at reduced capacity of 16000 m³ per day.

APPENDIX 3. SUGGESTED SET OF INDICATORS FOR WSS SECTOR IN REPUBLIC OF ARMENIA

1. Service coverage

1.1. Water supply coverage

Indicator 1.1.1. Water supply coverage

<i>Indicator Definition</i>	<p>The ratio between the number of residents with sustainable access to safe drinking water and the total number of residents living in municipality</p> <p>The indicator is used within the System of indicative monitoring of the Poverty Reduction Strategy [indicator D1 (i)]</p>		
<i>Label</i>	C _w	<i>Calculation formula</i>	P _w
<i>Unit of measurement</i>	%		P
<i>Data requirements</i>	<p>P_w - number of residents with sustainable access to safe drinking water, persons. P - total population in the given area, persons.</p>		

Indicator 1.1.2. Coverage by centralized (pipel) water supply (1000 m)

<i>Indicator Definition</i>	<p>The ratio between the number of persons that has access to centralized water supply (both internal and external access) and total population in the given area</p> <p>The Indicator was recommended by WHO in its Comprehensive Evaluation of WSS in 2000</p>		
<i>Label</i>	C _{wc}	<i>Calculation formula</i>	P _{wc}
<i>Unit of measurement</i>	%		P
<i>Data requirements</i>	<p>P_{wc} – the number of persons that has access to water supply either through direct connection to network or population living at 1000 m from water source. P - total population in the given area, persons</p> <p><u>Note:</u> similar indicator can be defined for the distance of 100 or 200 meters.</p>		

Indicator 1.1.3. Share of households using natural water sources

<i>Indicator Definition</i>	<p>The ratio between the number of households using natural water sources and total of households in the given area.</p> <p>The indicator is used within the System of indicative monitoring of the Poverty Reduction Strategy [indicator D1 (iii)]</p>		
<i>Label</i>	Cwnh	<i>Calculation formula</i>	$\frac{H_{wn}}{H} * 100\%$
<i>Unit of measurement</i>	%		
<i>Data requirements</i>	<p>H_{wn} - the number of households using natural water resources, households</p> <p>H – total number of households in the given area, households</p>		

Indicator 1.1.4. Share of households consuming nonpipied, bulk water

<i>Indicator Definition</i>	<p>The ratio between the number of households consuming water delivered by tanker trucks and the total number of households in the given area.</p> <p>The indicator is used within the System of indicative monitoring of the Poverty Reduction Strategy [indicator D1 (iv)]</p>		
<i>Label</i>	Cwth	<i>Calculation formula</i>	$\frac{H_{wt}}{H} * 100\%$
<i>Unit of measurement</i>	%		
<i>Data requirements</i>	<p>H_{wt} – the number of households consuming water delivered by tanker truck, households</p> <p>H - total number of households in the given area, households</p>		

1.2. Sewerage services coverage

Indicator 1.2.1. Sewerage services coverage

<i>Indicator Definition</i>	The proportion of population with access to sewer systems, pit latrines and other sanitation facilities The indicator is used within the System of indicative monitoring of the Poverty Reduction Strategy [indicator f2.3]		
<i>Label</i>	Cs	<i>Calculation formula</i>	Ps
<i>Unit of measurement</i>	%		$Cs = \frac{Ps}{P} * 100\%$
<i>Data requirements</i>	Ps - population living in buildings equipped with WSS systems (centralized or decentralized), persons P - total population in the given area, persons		

2. Quality of Services

2.1 Quality of water supply services

Indicator 2.1.1. Weighted average continuity of centralized water supply services to households

<i>Indicator Definition</i>	The indicator is calculated as the weighted average number of hours (per day) of water supply. The indicator is used within the System of indicative monitoring of the Poverty Reduction Strategy [indicator D1 (ii)]		
<i>Label</i>	Twh	<i>Calculation formula</i>	$\Sigma (Hwc_i * T_i)$
<i>Unit of measurement</i>	Hours per day		$Tw = \frac{\Sigma (Hwc_i * T_i)}{Hwc}$
<i>Data requirements</i>	Hwc _i – the number of households with sustainable access to centralized water supply systems for T _i hours per day T _i – period of water supply, hours per day Hwc – total number of households with sustainable access to the centralized water supply system		

Indicator 2.1.2. Conformity of water quality to set quality criteria

<i>Indicator Definition</i>	The indicator is the ratio between the number of water samples meeting set criteria and the total number of tested water samples		
<i>Label</i>	Y _w	<i>Calculation formula</i>	$Y_w = \frac{Z_{wq}}{Z_w} * 100\%$
<i>Unit of measurement</i>	%		
<i>Data requirements</i>	<p>Z_{wq} – the number of samples meeting set criteria, (samples)</p> <p>Z_w – total number of tested samples, (samples)</p>		

Indicator 2.1.3 Share of population with uninterrupted connection to centralized water supply with standard pressure

<i>Indicator Definition</i>	The indicator is the ratio of the number of residents living in buildings connected to the centralized water supply system with standard pressure and the total number of residents living in buildings connected to the centralized water supply system.		
<i>Label</i>	P _{wa}	<i>Calculation formula</i>	$P_{wa} = \frac{P_{wcha}}{P_{wch}} * 100\%$
<i>Unit of measurement</i>	%		
<i>Data requirements</i>	<p>P_{wcha} – the number of residents living in buildings connected to the centralized water supply system with standard pressure</p> <p>P_{wch} – total number of residents living in buildings connected to the centralized water supply system</p>		

Indicator 2.1.4 Share of population with discontinuous water supply

<i>Indicator Definition</i>	The indicator represents the ratio between the number of residents living in buildings connected to centralized water supply system, which receive water discontinuously during hours of regular system operation, and the total number of residents living in housings connected to centralized water supply system.		
<i>Label</i>	Pwcb	<i>Calculation formula</i>	$Pwcb = \frac{Pwchb}{Pwch} * 100\%$
<i>Unit of measurement</i>	%		
<i>Data requirements</i>	<p>Pwchb – the number of residents living in buildings connected to centralized water supply system, which receive water discontinuously during hours of regular system operation, (persons)</p> <p>Pwch – total number of residents living in housings connected to centralized water supply system, (persons)</p>		

2.2. Quality of sewerage services

Indicator 2.2.1. Share of untreated wastewater

<i>Indicator Definition</i>	<p>The indicator represents the ratio between the amount of wastewater that was not treated to standard at water treatment facilities and the total amount of wastewater</p> <p>The indicator is used within the System of indicative monitoring of the Poverty Reduction Strategy [indicator f2.4]</p>		
<i>Label</i>	Fm	<i>Calculation formula</i>	$Fne = \frac{Sn - Se}{Sn} * 100\% = 100\% - Fe$
<i>Unit of measurement</i>	%		
<i>Data requirements</i>	<p>Se – volume of wastewater that was not treated to standard at water treatment facilities, 1,000 cu.m</p> <p>Sn – total volume of wastewater, 1,000 cu.m</p>		

3. Volume and consumption of services

3.1. Volume of water supply services

Indicator 3.1.1. Water supply

<i>Indicator Definition</i>	Average annual volume of water supplied (including purchased water in case there was such) as expressed per capita per day		
<i>Label</i>	Qwup	<i>Calculation formula</i>	Wu
<i>Unit of measurement</i>	Cu.m./person		Qwup = ----- / 365
<i>Data requirements</i>	<p>Wu – the volume of water supplied (including purchased water in case there was such), 1,000 cu.m.</p> <p>Pw – total population consuming water supply services (thousand persons)</p>		

Indicator 3.1.2. Residential water consumption

<i>Indicator Definition</i>	Annual volume of water consumed by population and subject to billing		
<i>Label</i>	QSwp	<i>Calculation formula</i>	Wap
<i>Unit of measurement</i>	%		QSwp = ----- * 100%
<i>Data requirements</i>	<p>Wap – the volume of water consumed by population and billed (1000 cu.m.)</p> <p>Wa – total volume of water billed (1000 cu.m.)</p>		

3.2. Volume of sewerage services

Indicator 3.2.1. Sewerage

<i>Indicator Definition</i>	Annual volume of wastewater passed as expressed per capita per day		
<i>Label</i>	Qsp	<i>Calculation formula</i>	$Qsp = \frac{Ws * 1000}{Ps} / 365$
<i>Unit of measurement</i>	Cu.m./person		
<i>Data requirements</i>	<p>Ws – volume of wastewater passed, (1,000 cu.m.)</p> <p>Ps – total population living in housings with access to sewer and other systems (centralized or decentralized), (persons)</p>		

4. Performance efficiency of WSS provider

Indicator 4.1.1. Unpaid water consumption

<i>Indicator Definition</i>	The indicator characterizes the portion of water volume delivered to consumers but not paid (e.g. due to billings based on consumption norms or poor water meters).		
<i>Label</i>	EMn	<i>Calculation formula</i>	$EMn = \frac{Ws - Wa}{Ws} * 100\%$
<i>Unit of measurement</i>	%		
<i>Data requirements</i>	<p>Ws –the volume of water delivered to consumers, (1,000 cu.m.)</p> <p>Wa – the volume of water billed, (1,000 cu.m.)</p>		

Indicator 4.1.2. Collections level

<i>Indicator Definition</i>	The indicator characterizes the ratio between the amount of paid bills for water supply and sewerage services (collected user charges) and the total amount of bills for water supply and sewerage services		
<i>Label</i>	EI	<i>Calculation formula</i>	$EI_{ws} = \frac{IR_w + IR_s}{I_w + I_s} * 100\%$
<i>Unit of measurement</i>	%		
<i>Data requirements</i>	<p>IR_w – amount of paid bills for water supply, (thousand drams)</p> <p>IR_s – amount of paid bills for sewerage, (thousand drams)</p> <p>I_w – total amount of bills for water supply, (thousand drams)</p> <p>I_s – total amount of bills for sewerage, (thousand drams)</p>		

Indicator 4.1.3. Collection rate for residential consumers

<i>Indicator Definition</i>	The indicator characterizes the ratio between the amount of paid bills for water supply and sewerage services and the total amount of bills for water supply and sewerage services		
<i>Label</i>	EIp	<i>Calculation formula</i>	$EIp = \frac{IR_p}{Ip} * 100\%$
<i>Unit of measurement</i>	%		
<i>Data requirements</i>	<p>IR_p – the amount of paid bills for water supply and sewerage, (thousand drams)</p> <p>I_p – total amount of bills for water supply and sewerage, (thousand drams)</p>		

Indicator 4.1.4. Water losses

<i>Indicator Definition</i>	The indicator characterizes the portion of water supplied into the distribution system (elevated or passed// received from outside) but not delivered to consumers.		
<i>Label</i>	NRw	<i>Calculation formula</i>	$NRw = \frac{(Wu - Wn)}{Wu} * 100\%$
<i>Unit of measurement</i>	%		
<i>Data requirements</i>	<p>Wu – volume of water supply, 1,000 cu.m.</p> <p>Wn – volume of water passed into water supply network, 1,000 cu.m.</p>		

5. Characteristics of expenditures for service provision

Indicator 5.1.1. Operating costs for water supply

<i>Indicator Definition</i>	The indicator characterizes the value of water supply operating costs as expressed per unit of service billed		
<i>Label</i>	RUw	<i>Calculation formula</i>	$RUw = \frac{RW}{Waw}$
<i>Unit of measurement</i>	Dram/cu.m		
<i>Data requirements</i>	<p>RW – water supply operating costs, thousand drams</p> <p>Waw – volume of water billed (1,000 cu.m.)</p>		

Indicator 5.1.2. Operating costs of sewerage

<i>Indicator Definition</i>	The indicator characterizes the value of sewerage operating costs as expressed per unit of service billed		
<i>Label</i>	RUs	<i>Calculation formula</i>	RS
<i>Unit of measurement</i>	Dram/cu.m.		RU _s = $\frac{\text{-----}}{\text{Was}}$
<i>Data requirements</i>	RS – sewerage operating costs Was – volume of wastewater billed (1,000 cu.m.)		

6. Characteristics of enterprise revenues

Indicator 6.1.1. Coverage of water supply operating costs by collected user charges

<i>Indicator Definition</i>	The indicator characterizes the ratio between the volume of water supply bills paid by users and the total water supply operating costs		
<i>Label</i>	U _w	<i>Calculation formula</i>	IR _w
<i>Unit of measurement</i>	%		U _w = $\frac{\text{-----}}{\text{RW}} * 100\%$
<i>Data requirements</i>	IR _w – the volume of water supply bills paid, thousand drams RW – total water supply operating costs, thousand drams		

Indicator 6.1.2. Coverage of sewerage operating costs by collected user charges

<i>Indicator Definition</i>	The indicator characterizes the ratio between the amount of sewerage bills paid by users and the total sewerage operating costs		
<i>Label</i>	Us	<i>Calculation formula</i>	IRs
<i>Unit of measurement</i>	%		RS
<i>Data requirements</i>	<p>IRs – the amount of sewerage bills paid, thousand drams</p> <p>RS – total sewerage operating costs, thousand drams</p>		

Indicator 6.1.3. Billing for water supply, per capita

<i>Indicator Definition</i>	<p>The indicator is defined as the ratio between the average volume of water supply revenues (per month) and the total number of persons using water supply services.</p> <p>The indicator is used for monitoring performance of Saur S.A. (indicator 8)</p>		
<i>Label</i>	UUp	<i>Calculation formula</i>	IRwp
<i>Unit of measurement</i>	Dram/person		Pwc
<i>Data requirements</i>	<p>IRwp – total annual volume of water supply revenues, thousand drams</p> <p>Pwc - total population in the given area that has access to water supply through direct connection to the network or lives no farther than 1000 meters from water source, (persons).</p>		

APPENDIX 4. RECOMMENDATIONS FOR PERFORMANCE-BASED CONTRACTS

Performance-based contracts are used in international practice in a wide spectrum¹⁴, ranging from internal agreements on providing management services to signing state contracts with the private sector.

Overall, performance-based contracts are an instrument intended to clearly determine the development goals of the WSS sector and the necessary resources to achieve those goals, as well as the tasks that the public body must fulfill in order to achieve the stated goals.

The goal of performance-based contracts often is to reduce costs and increase productivity and ability to react to changing conditions, while ensuring performance according to set standards. To do that, a certain level of efficiency must be achieved, which is linked to financial planning and management and quality of services. These contracts clearly describe the targets that the contractor must meet, but the methods by which the desired outcomes will be achieved are left to the contractor's discretion.

Thus, performance-based contracts differ from mundane contracts that focus primarily on inputs and procedures. These contracts also contain a mutually agreed-upon set of performance targets to be monitored, and also establish financial incentives and penalties. Insofar as contractors' compensation is tied to their ability to meet the targets, such agreements provide an incentive to improve productivity and efficiency.

In particular, these contracts should established strict planned targets and a framework to meet them, and in exchange, the WSS operators should use their discretion in making concrete production, financial, and management decisions. These decision relate to the quality of service, management and operational efficiency, financial and investment requirements, as well as institutional development. The basis of these contracts should be mutual understanding between the state organization and the WSS enterprise regarding the standards for consumer water provision. That, in turn, makes it possible to determine the corresponding resources and financing necessary to meet the established targets.

Performance-based contracts should include at least the following elements:

- Institutional: the parties to the contract and a clear formulation of their roles and obligations;
- Scope of the contract: indication of the scope of the contract, realistic targets and resources needed to meet them;
- Operations: selection and formulation of indicators for monitoring work, as well as requirements for the size and frequency of reports;
- Financial: mechanism for setting tariff and financial obligations of the public sector.

¹⁴ For more details, see *Guidelines for Performance-based Contracts Between Municipalities and Water Utilities in EECCA*, OECD, Paris, 2006

Risk evaluation of the Contract signed between OJSC Armvodokanal and SAUR S.A on water supply and sewage private management

In 2000, an Italian company, A-Utility, gained control over the Yerevan Water Supply and Sewage system under a 4-year contract that it had won through international competition without a right to ownership of the operated WSS infrastructure and tariff policy making.

A similar contract (hereafter Contract) was signed by and between Armvodokanal and SAUR S.A. company on August 19, 2004. The Contract represents a management contract. According to the international practice, under a management contract, the authorities transfer to a private partner responsibility for managing one or another system and, consequently, risks related to maintenance of the system's performance. Responsibility and risks related to collecting charges for provided services and investment returns remain with the authorities.

This being the case, the private partner is either rewarded on a fixed basis or basis of set goals and performance indicators (PIs) achieved (or level of their achievement) as stipulated by the Contract. In practice, most frequently, a mixed form of performance pay is applied involving both fixed and variable (depending on performance results) components.

The Management Contract obliges the operator to optimize investments, improve operating activities, encourage financing from local and foreign sources.

A positive aspect of the Management Contract is that it enables the operator to participate in management process with making no investments on its part and provides an approach oriented to final deliverables.

At the same time, unlike a standard management contract, the Contract in question provides that the private operator is responsible for calculating and collecting charges. Though, under the given Contract, SAUR S.A. does not have investment liabilities, it manages the enterprise's investment activity.

The Contract signed by and between Armvodokanal and SAUR S.A. company stipulates terms of 4-year's management of Armenia's water supply and sewage system by SAUR S.A. company (hereafter Operator) with possible prolongation of the Contract for two years as agreed by the parties and IDA (International Development Association, World Bank group). Under the Contract, a number of measures are provided to implement the Municipal Water Supply and Water Disposal Project (MWWP) funded from IDA's resources and Armenia's government budget. An expected volume of investments to be made in rehabilitation of water supply system outside Yerevan city by CJSC Armvodokanal is worth US\$ 15,7 million to be matched by US\$ 23 million from the World Bank.

The Contract consists of the main contract and fifteen supplements (annexes) which are integral parts of the Contract.

The texts of the Contract and supplements pose risks to the Operator that are related to tariff regulation and lack of guarantees from budget finance. At the same time, the Contract specifies most other risks to both parties clearly defining areas of responsibilities. However, risks that are not stipulated are likely to limit Operator's abilities to fulfill contract obligations and may lead to violation of the Contract by the Operator.

Major risks not stipulated by the Contract

The most significant risk, against which no protection measures are provided in the Contract, is that of tariff regulation. The tariff regulation risk lies in:

- failure to account all tariff components (for example loan interests);

- unreasonable tariff rate reduction;
- vague tariff validity period;
- refusal to increase the tariff or adjust it according to price index;
- withdrawal of economic effect produced by an investment project through tariff reduction to benefit customers; (for example, due to decrease in specific costs)
- alteration of tariff formation procedure.

The contract provides that the Operator is responsible for calculating and collecting charges, making tariff request and using received funds to run operating and investment activities (except financing measures under MWWP). Thus, Operator's ability to attain set objectives is also related to accounting approved tariff's overall expenditures necessary to be able to finance Operator's operating and investment activities, with due account for customers' paying capacity and rate of charge collection.

There are also possibilities for reducing tariffs for political reasons, for example, at a pre-election time, as well as for tariffs reduced through incompetence of a regulatory body. The amount and steadiness of Operator's revenues are largely affected by the tariff approval process. Non-transparent and unregulated procedures may lead to failure to account Operator's specific expenditures in tariff. Also a risk is posed due to regulatory body's ability to withdraw an economic effect produced by investment and administrative activities through reducing tariff rates to benefit customers. This is a highly important point with contracts based on performance indicators. Performance improvement should be encouraged through an adequate tariff policy that enables enterprises to reap the benefits of performance improvement. Similar interests are also pursued by the Financing Strategy for Development of Armeina's Water Supply and Sanitation Sector.

The clause 5.5.(2) of the main contract and clause 3.1 (6) of Supplement 2 read that the Company Management Board holds responsibility for approval of tariffs put forward by the Operator, however, the Contract has no word as to what this responsibility includes.

The clause 2.6.1 (4) provides that lacks of resources or payments (which may arise from inadequate tariff policy) are not considered as force-majeure and not subject to force-majeure liquidation in compliance with the clause 2.6 of the main contract.

At the same time, the clause 3.2.1 of the main contract specifies that in case of changes made to regulations (and other regulatory and legal acts and laws directly affecting Operator's activity) the clause 6.6(2) of the main contract may come into effect that reads that in case of a change made to the legislation of the Republic of Armenia entailing a rise or fall of total costs of services for more than five percent or impeding service delivery or attainment of set performance indicators Operator's compensation may be appropriately adjusted.

Such protection mechanism enabling the Operator to divert adverse implications directly from itself however fails to address adverse regulation effects made on the whole enterprise because the Operator's compensation includes the cost of management and annual performance bonus. Thus, this mechanism cannot be recognized as a protection measure from the tariff regulation risk.

Thus, the contract provides that the Armenian water supply and sewage enterprise is in charge of setting goals and objectives, the Operator pursues these goals and objectives while the regulatory body, which is neither liable to the Customer nor Operator, is to determine an amount of resources necessary to pursue these goals and objectives.

At the same time, the fact that there are no measures provided by the contract to reduce the tariff regulation risk is due to **regulation process being a matter of administration rather than agreement**. However, even here the Contract should stipulate measures that would make it possible for both parties to minimize losses that may arise from an inadequate tariff regulation. Thus, for example, the mechanism for minimizing tariff regulation risks which can be provided by the Contract goes as follows: the Operator shall draw up a tariff request including all expenditures necessary to achieve goals set; this request shall be agreed with the Company Management Board and thereafter submitted to the regulation body for approval. If the approved tariff opposes the tariff agreed by the Operator and the Company Management Board then the Company Management Board shall be obliged to revise goals and objectives set for the Operator for the respective regulation period. This will minimize the risks to the Operator as the amount of financing shall match the objectives set. Risks to the customer (Armvodokanal) shall also be reduced as the goals that concord the affordable financing shall be much more feasible to achieve.

As provided by this contract, a lack of measures for reducing regulation risks are aggravated by no responsibility that the customer (put forward by the Company Management Board) shall hold towards the Operator in case of inadequate tariff regulation, and by no enabling measures for the Operator to ensure the goals and objectives set are pursued within an approved tariff framework.

As such measures are not available, there is a high risk of the inadequate tariff policy leading to the Operator's violation of the Contract followed by sanctions and dissolution of the Contract. For example, this may occur with the implementation of the task to install water-meters as anticipated by the contract. If the implementation of this task by the Operator is not supported by an inadequate tariff rate set (by the Regulator) for consumers who are billed on the basis of water-meter readings this would sharply deteriorate Operator's financial performance.

Thus, for the purpose of successful implementation of the Financing Strategy, it is necessary to strengthen links between contractual relations and tariff regulation in Armeina's water supply and water disposal sector.

Another risk, omitted in the Contract, is that of failure to receive funds from the government budget of Republic of Armenia or from the IDA. The contract provides financing measures taken under MWWP from the government budget of Republic of Armenia or from the IDA. At the same time, the Contract does not specify cases of government budget or IDA's financing delays for reasons beyond the Operator's control. If this is the case, the current Contract stipulates that the Operator is still liable to achieve the goals set.

Risks stipulated by the Contract

Other risks facing both parties are comprehensively enough specified by the Contract. Thus, Force Majeure risks are set out in the clause 2.6 of the main contract. Mechanisms for minimizing these risks enable the Operator to continue being rewarded as well as grant the Operator delay to eliminate ramifications of the Force Majeure. Other Operator's risks such as the volume and timeliness of management service payment have been reduced through the clauses 2.8.4 and 6.

The majority of Armenia's water supply and sewage system's risks has also been minimized by the Contract. The clause 3.7 of the main contract specifies Operator's necessary insurance for a variety of activities that makes it possible to significantly reduce risks of losses, damages inflicted to enterprise's assets, accident risks etc. The clause 3.8 highlights standards for Operator's accounting to the Company Management Board and CMU making it feasible to conduct continuing monitoring of Operator's performance. Quarterly meetings between the Operator and Company Management Board make it possible to promptly influence Operator's performance.

Risks of assets losses (including financial assets) have been minimized through the clauses 3.12 and 3.14. All of the assets – both existing and newly accumulated over the course of the Contract implementation – remain Armvodokanal’s property. The Contract also obliges the Operator to take all necessary measures to ensure assets’ safety (including financial assets).

Incentives, such as a bonus awarded as part of performance pay, provided for the Operator and operating and investment budgets for upcoming years and long-term investment plans presented by the Operator ensure these goals are achieved.

CMU and the Company Management Board also have ability to control buying process and attract contractors. On the one hand, this makes it feasible to avoid overrating the cost of performance and ensures the most efficient use of resources available. On the other hand, it may impede the Operator to perform in a most efficient way because the Contract’s appropriate provisions allow CMU and the Company Management Board to actually intervene in Operator’s day-to-day activity by imposing buying conditions and choosing contractors for the Operator.

Summary and recommendations for long-term development of contracts

An analysis of the contract signed between Armvodokanal and the SAUR S.A. Company on August 19, 2004 attests that the given agreement is close to the international practice. The Contract specifies the majority of risks arising from transferring management of water supply and sewage systems to private operators.

At the same time, the Contract omits risks related to tariff regulation. Though tariff regulation is administered rather than agreed, the Contract should identify actions that would protect the Operator in case of inadequate regulation. The Contract also omits risk of failure to ensure promised funding from the government budget or IFI.

Analogous agreements in the future should carefully allocate the risks related to contract implementation. The contractual conditions should relate to the assets in operation and to the work to provide WSS services. The questions “Who is responsible for what?” “How will the carrying out of those obligations be financed?” “How will the contract be ended upon its expiration or in the event that one party breaks it?” should all be answered in the contract.

In particular, it is important to give a clear estimation or determination of the operational outcomes that each party should achieve, and the corresponding obligations for management of assets, expenditures, revenues, financial streams, and planned changes in the future, as well as provisions for dissolution or cessation of the contract.

In the event that the parties agree on investment, it should be defined from a technical point of view and estimated and planned in terms of time, as a part of planned expenditures.

The process of working out and signing contracts should go through defined stages:

- Step 1: Strategic planning, keeping in mind the opportunity for performance-based contracting;
- Step 2: Careful preliminary analysis of the legal and regulatory basis;
- Step 3: Careful preliminary analysis of the condition of the WSS assets (technical, legal, and financial aspects);
- Step 4: Determination of the scope (goals and framework) of the contract;

- Step 5: Development of a comprehensive performance-based agreement which considers, at a minimum, the requirements set out here and in the OECD guidelines.

The goal of performance-based contracts is to determine a course for effective cooperation between the public and private sectors in the utilities sector of Armenia. Both parties to such collaboration should receive clear guarantees from their partner. The private operator should receive a guarantee of adequate revenues, and the public agency should receive a guarantee of an established level of service and of maintaining or increasing the value of the assets. The implementation of such contracts should contribute to improving the situation in water and sewerage provision in Armenia.