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PROJECT PERFORMANCE ASSESSMENT REPORT



ARMENIA

Municipal Water Project

Report No. 127226

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Report No.: 127226

PROJECT PERFORMANCE ASSESSMENT REPORT

ARMENIA

MUNICIPAL WATER PROJECT

(IBRD-81290)

June 29, 2018

Currency Equivalent (Exchange rate effective June 30, 2015)

Currency Unit = Armenian Dram

Dram 1 = US\$0.002111

Dram 482.82 = US\$1.00

Abbreviations and Acronyms

ADB	Asian Development Bank
AWSC	Armenia Water and Sanitation Company
CAS	Country Assistance Strategy
CMU	Contract Monitoring Unit
CPS	Country Partnership Strategy
EBRD	European Bank for Reconstruction and Development
EMC	enhanced management contract
IDA	International Development Association
ISR	Implementation Supervision and Results Report
KfW	Kreditanstalt für Wiederaufbau
MDP	Municipal Development Project
MWP	Municipal Water Project
MWWP	Municipal Water and Wastewater Project
NRW	non-revenue water
PAD	Project Appraisal Document
PDO	project development objective
PIE	project implementing entity
PIU	Project Implementation Unit
PPP	public-private partnership
PPIAF	Public-Private Infrastructure Advisory Facility
PSRC	Public Services Regulatory Committee
SCWE	State Committee for Water Economy
WSS	water supply and sanitation
YWSC	Yerevan Water and Sanitation Company
YWWP	Yerevan Water and Wastewater Project

Fiscal Year

January 1 – December 31

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<p>This report was prepared by Joseph W.B. Bredie (Consultant), who assessed the project in March 2018. The Consultant was supervised by Maria Elena Pinglo (TTL). The report was peer reviewed by Carlos Velez and panel reviewed by Fernando Manibog. Romayne D. Pereira provided administrative support.</p>

Box

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Principal Ratings

	ICR*	ICR Review*	PPAR
Outcome	Moderately Satisfactory	Moderately Satisfactory	Moderately Satisfactory
Risk to Development Outcome	High	High	High
World Bank Performance	Moderately Satisfactory	Moderately Satisfactory	Moderately Satisfactory
Borrower Performance	Moderately Satisfactory	Moderately Satisfactory	Moderately Satisfactory

* The Implementation Completion and Results (ICR) report is a self-evaluation by the responsible World Bank department. The ICR Review is an intermediate Independent Evaluation Group product that seeks to independently verify the findings of the ICR.

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About this Report

The Independent Evaluation Group (IEG) assesses the programs and activities of the World Bank for two purposes: first, to ensure the integrity of the World Bank's self-evaluation process and to verify that the World Bank's work is producing the expected results, and second, to help develop improved directions, policies, and procedures through the dissemination of lessons drawn from experience. As part of this work, IEG annually assesses 20-25 percent of the World Bank's lending operations through field work. In selecting operations for assessment, preference is given to those that are innovative, large, or complex; those that are relevant to upcoming studies or country evaluations; those for which Executive Directors or World Bank management have requested assessments; and those that are likely to generate important lessons.

To prepare a Project Performance Assessment Report (PPAR), IEG staff examine project files and other documents, visit the borrowing country to discuss the operation with the government, and other in-country stakeholders, and interview World Bank staff and other donor agency staff both at headquarters and in local offices as appropriate.

Each PPAR is subject to internal IEG peer review, panel review, and management approval. Once cleared internally, the PPAR is commented on by the responsible World Bank department. The PPAR is also sent to the borrower for review. IEG incorporates both World Bank and borrower comments as appropriate, and the borrowers' comments are attached to the document that is sent to the World Bank's Board of Executive Directors. After an assessment report has been sent to the Board, it is disclosed to the public.

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IEG's use of multiple evaluation methods offers both rigor and a necessary level of flexibility to adapt to lending instrument, project design, or sectoral approach. IEG evaluators all apply the same basic method to arrive at their project ratings. Following is the definition and rating scale used for each evaluation criterion (additional information is available on the IEG website: <http://ieg.worldbankgroup.org>).

Outcome: The extent to which the operation's major relevant objectives were achieved, or are expected to be achieved, efficiently. The rating has three dimensions: relevance, efficacy, and efficiency. *Relevance* includes relevance of objectives and relevance of design. Relevance of objectives is the extent to which the project's objectives are consistent with the country's current development priorities and with current World Bank country and sectoral assistance strategies and corporate goals (expressed in Poverty Reduction Strategy Papers, Country Assistance Strategies, Sector Strategy Papers, Operational Policies). Relevance of design is the extent to which the project's design is consistent with the stated objectives. *Efficacy* is the extent to which the project's objectives were achieved, or are expected to be achieved, taking into account their relative importance. *Efficiency* is the extent to which the project achieved, or is expected to achieve, a return higher than the opportunity cost of capital and benefits at least cost compared to alternatives. The efficiency dimension generally is not applied to adjustment operations. *Possible ratings for Outcome:* Highly Satisfactory, Satisfactory, Moderately Satisfactory, Moderately Unsatisfactory, Unsatisfactory, Highly Unsatisfactory.

Risk to Development Outcome: The risk, at the time of evaluation, that development outcomes (or expected outcomes) will not be maintained (or realized). *Possible ratings for Risk to Development Outcome:* High, Significant, Moderate, Negligible to Low, Not Evaluable.

World Bank Performance: The extent to which services provided by the World Bank ensured quality at entry of the operation and supported effective implementation through appropriate supervision (including ensuring adequate transition arrangements for regular operation of supported activities after loan/credit closing, toward the achievement of development outcomes). The rating has two dimensions: quality at entry and quality of supervision. *Possible ratings for World Bank Performance:* Highly Satisfactory, Satisfactory, Moderately Satisfactory, Moderately Unsatisfactory, Unsatisfactory, Highly Unsatisfactory.

Borrower Performance: The extent to which the borrower (including the government and implementing agency or agencies) ensured quality of preparation and implementation, and complied with covenants and agreements, toward the achievement of development outcomes. The rating has two dimensions: government performance and implementing agency(ies) performance. *Possible ratings for Borrower Performance:* Highly Satisfactory, Satisfactory, Moderately Satisfactory, Moderately Unsatisfactory, Unsatisfactory, Highly Unsatisfactory.

Preface

This Project Performance Assessment Report (PPAR), prepared by the Independent Evaluation Group (IEG) of the World Bank Group, evaluates the Armenia Municipal Water Project (MWP, Loan No. IBRD-81290). The project is the last of four water and wastewater projects financed by the World Bank in Armenia since 1998.

The project's objective was to improve the quality and availability of the water supply in selected areas of the Armenia Water and Sewerage Company (AWSC) Service Area. The selected service areas included the towns of Masis, Ashtarak, and Echmiatsin and their surroundings.

The project was approved on February 21, 2012 with an International Bank for Reconstruction and Development (IBRD) loan of US\$15 million. The project cost at appraisal was estimated at US\$18.0 million (including baseline costs and front-end fee). Actual costs at closing was US\$17.96 million due to exchange rate fluctuations. At completion, US\$14.93 million of the IBRD loan had been disbursed. The IBRD loan was planned to be implemented over a three-year period and the project closed as scheduled on June 30, 2015.

This report presents evaluation findings based on a review of the project's Implementation Completion and Results (ICR) report dated December 15, 2015; project and legal documents; prior World Bank sector studies and reviews; records on file; and other relevant materials. An IEG mission visited Armenia in March 2018 to conduct field visits and hold discussions with World Bank country office management and staff; government officials; project staff; public and private companies engaged in Armenia's water and wastewater sector; and other development agencies.

This project was selected for an in-depth PPAR to verify the development outcomes and their sustainability; assess the reasons for, and consequences of, the government's transitioning to an Enhanced Management Contract; and derive lessons to inform public-private partnerships in the water sector.

The contributions of all project stakeholders and World Bank staff are gratefully acknowledged.

Following standard IEG procedures, the draft PPAR was sent to the relevant government officials and agencies for their review and feedback. Comments received from the borrower have been included in Appendix E of this report.

Summary

Armenia's Water Resources and Water Supply Sector. Armenia enjoys abundant water resources averaging 10.2 billion m³ per year, of which 2.4 billion are used for drinking water. Drinking water is provided by five state water companies (The Yerevan Water and Sewerage Company; The Armenian Water and Sewerage Company and three small regional utilities in the cities of Lori, Shirak, and Nor Akunq). Demands on water production are high because of excessive levels of non-revenue water (NRW) of up to 85 percent. In 2012, at the time of the appraisal of the Municipal Water Project (MWP), Armenia had recorded significant legislative and institutional achievements in terms of water resources management in cooperation with international institutions, including the World Bank. The water sector reforms were aimed at decentralizing the water resources management function for the benefit of water users and best use of water resources. However, water tariffs have been low since 2009 (the average water and waste water tariff has been kept at Dram 180/m³ (US\$0.38/m³) and revenues insufficient for asset rehabilitation to reduce NRW.

In 2000, the Government of Armenia introduced private partners to manage the utilities as part of a public-private partnership (PPP) program. The PPP program and investment in networks and systems have been financed by donors. Short- to medium-term investment requirements (2012-2016) were US\$100 million, of which US\$85 million was financed by three international financial institutions— the European Bank for Reconstruction and Development; Kreditanstalt für Wiederaufbau (KfW); and the Asian Development Bank— and US\$15 by the International Bank for Reconstruction and Development (IBRD) for this project under review.

The Municipal Water Project. The MWP's project development objective (PDO) was to support improvement of the quality and availability of the water supply in selected areas of the Armenia Water and Sewerage Company (AWSC)—a state water company owned by the State Committee of Water Economy (SCWE). AWSC provided water supply and wastewater services outside the capital of Yerevan, to 277,000 customers in 27 towns and 271 villages. Under the MWP, the selected service areas included the towns of Masis, Ashtarak, and Echmiatsin and their surroundings.

The MWP was the fourth International Development Association (IDA)- then IBRD-financed project under the PPP program and supported a shift in focus to investments in existing and new infrastructure to reduce NRW. The first IDA-financed project involved a PPP management contract; the second project, also IDA-financed, had a lease contract with the Yerevan Water and Sewerage Enterprise (YWSE). For the MWP, the AWSC was managed by a management contractor under an Enhanced Management Contract (EMC), who was required to prepare the total management plan (TMP)—a business plan and financial forecast for a long-term sector funding strategy. The TMP, which was published in 2014, served as the basis for the 2017 National Lease Contract. At the same time, the World Bank financed a Water Sector Tariff Study in preparation for planned tariff increases, as enunciated in the Deputy Prime Minister's 2012 policy letter. Actual tariff increases, however, were postponed until after the closing of the MWP.

Ratings

The relevance of the project development objective (PDO) is **substantial**. At the time of appraisal, the PDO directly supported Strategic Objective II of the Country Partnership Strategy (CPS) for Armenia (2009–13), which focused on strengthening competitiveness and post-crisis growth. Its primary objective was to support completion of important infrastructure investments to improve access to water services in small towns and surrounding rural areas. At project closing, the MWP's PDO remained relevant to the most recent CPS (2014-2017), which continues to highlight the objective of improving access and quality and sustainability of key infrastructure facilities in Armenia.

The relevance of the project's design was also **substantial**. The MWP's three components were designed to build upon the progress made under the preceding Municipal Water and Wastewater Project (MWWP) by further improving water supply and sector sustainability. The three MWP components were complementary and addressed key factors that contributed to the high levels of NRW. It also financed part of the EMC to further improve AWSC's operations. The activities designed to improve the efficiency of operations and maintenance at AWSC were part of the higher-level objective of enhancing AWSC's readiness for the next steps in the PPP program.

The achievement of the MWP's objectives of improving water quality and water availability is **substantial**. Project investments resulted in improved water quality outcomes: water quality is now almost 100 percent controlled and disinfected for bacteriological impurities as it enters the distribution network, compared to 93 percent at appraisal. Customer satisfaction has also improved, based on the PPAR mission's survey. These improvements were the result of MWPs outputs in terms of replacement of intakes, mains, pumps, chlorination stations and distribution networks. Water availability outcomes were significant: The weighted average daily supply of drinking water in the project area had increased from 12.3 hours per day (the appraisal baseline) to 17.6 hours per day. The number of people with access to improved water sources in urban parts of the project area had increased by 100,987 at project closing, while 31,089 people in rural areas also gained access. Previously, those people received water from traditional sources, such as wells and standpipes. Operation and maintenance of the water supply in the project area had improved. Stolen water has been reduced, and metering, billing, and tariff collection has improved as a result of staff training, meter installation, and improved collection rates.

The project's efficiency, however, is **modest**. The implementation of the project itself was efficient, having been completed within the three-year timeframe and with budget savings, which have been invested in additional infrastructure and equipment. However, the financial sustainability of AWSC did not improve, and the annual financial results were getting more negative each year, thus requiring increases in subsidies for the company as tariffs had not changed since 2009.

Overall, the project's development outcome is **moderately satisfactory**.

Lessons

In terms of lessons, the implementation of the MWP suggests the following:

- **The sustainability of development outcomes is enhanced when the World Bank maintains its strategic and operational engagement over time, especially when social and political risks are high.** The World Bank has played a pivotal role in reforming the water sector in Armenia since the late-1990s by helping to create the environment to bring in private operators, achieve operational efficiency, and improve financial sustainability as part of a PPP program. Given the remaining challenges, the World Bank can continue to play a key role in the sector in terms of lending, but especially so through sector analysis and advice, to help ensure that the improvements in management, operations, finance, and water supply for customers can be sustained.
- **The World Bank’s continuous advice and technical assistance, provided in parallel with lending and in coordination with other donors, can result in effective partnership with the government and the private sector.** The experience in Armenia across four World Bank-financed projects since the late-1990s shows that the PPP program achievements resulted from the sustained partnership involving the government, private operators, other donors, and the World Bank. Although the World Bank and donors financed most of the investments under PPP contracts, the technical and advisory assistance during preparation and supervision were especially important as Armenia became increasingly open and sought advice on the implementation of PPPs. The World Bank played a lead role in this process during the early years and slowly retrenched as PPP reforms became more mature and other donors financed the second generation of improvements.
- **Tailoring the Enhanced Management Contract to the conditions of the local service area can help achieve results.** The project’s activities show how, under the EMC, approaches to improving access and availability were adapted to local conditions. In some towns and villages where people had been getting water for free from wells and public standpipes, the AWSC was able to increase metering and collection by instituting a very popular lottery where only paying customers can purchase a ticket and win a monetary prize. The lottery increased the number of paying customers from 30,000 to 200,000. Improved metering also laid the groundwork for improved leak detection and a full-scale NRW reduction plan that tackles technical losses. In approaches to deal with paying-for-service provisions, local conditions and opinions must be taken into account.

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1. Background and Context

1.1 Armenia is a landlocked country located in the Southern Caucasus Mountains. The country is mountainous with fast flowing rivers and the second largest lake in the world—Lake Sevan. Lake Sevan and other lakes that serve as sources for the water supply are situated at 1,900 meters (6,234 feet) above sea level, like most of Armenia's continental highland. The climate is highland continental with dry and sunny summers and cold winters with plenty of snow. Armenia is rich in springs and wells. Water levels are the highest when the snow melts in the spring, and during autumn rains.

1.2 Armenia enjoys abundant water resources averaging 10.2 billion m³ per year, of which 2.4 billion are used for drinking water. Drinking water is provided by five state water companies. Demands on water production are high because of excessive levels of non-revenue water (NRW) of up to 85 percent. In 2012, at the time of appraisal of the MWP, Armenia had recorded significant legislative and institutional achievements in terms of water resources management in cooperation with international institutions, including the World Bank. Water sector reforms were aimed at decentralizing the water resources management function for the benefit of water users and best use of resources. However, tariffs have been low since 2009¹ and revenues insufficient for asset rehabilitation to reduce NRW. In 2000, the Government of Armenia introduced private partners to manage the utilities as part of a public-private partnership (PPP) program. The PPP program and investment in networks and systems have been financed by donors.

1.3 Drinking Water Supply, Institutions and Policies. About 2.4 billion of the 10.2 billion m³ of annual water resources are used for drinking water. At the time of appraisal of the MWP in 2012, drinking water was provided by five state water companies, namely:

- The Yerevan Water and Sewerage Company (YWSC), which served 1.2 million subscribers in the national capital of Yerevan,
- The Armenian Water and Sewerage Company (AWSC), which provided water service to 277,000 customers in 36 towns and 286 villages outside Yerevan
- Three other small regional utilities in the cities of Lori, Shirak, and Nor Akunq

The production of drinking water was (and remains) high because of very high levels of NRW of up to 85 percent. By 2012, Armenia had recorded significant legislative and institutional reforms in terms of water resources management in cooperation with international financial institutions including the World Bank. The water sector reforms were aimed at decentralizing the water resources management function to increase sector efficiency in distribution and use to the benefit of water users and use of water resources. However, tariffs had been kept low (US\$0.38/m³) to be affordable for poor households and revenues were insufficient for the much-needed asset rehabilitation to reduce NRW.

1.4 More than a decade earlier in 2000, the government introduced private partners to manage the finances and operations of the water utilities as part of a PPP program. In parallel to the PPP program, and the ensuing management contracts, the government sought funds from other donors to finance investment in system and network extensions and rehabilitation and financing of water utilities operations. With the signing of the National Lease Contract in 2017, the five utilities were merged into one called Veolia Djur. The principal difference between the management and lease contracts is that under the management contract, the contractor is paid a fixed fee, while under the lease contract, the contractor is allowed to make a profit.

2. Objective, Design, and their Relevance

Objective

2.1 At MWP's appraisal in 2012, the World Bank had for about two decades taken an active role in supporting a shift from a "social service" model to a public/private services provision approach that focuses on efficiency and sustainability. The MWP was a next step in the ongoing PPP program in that it included a transition from the management contract under the preceding Municipal Water and Wastewater Project (MWWP) to an enhanced management contract (EMC). The EMC included additional performance indicators, including for reducing NRW and the development of strategies for improving sector financial self-sufficiency. It is worth pointing out that the in 2011 at the closing of the MWWP, the government was considering the transition to a lease contract (as had been done a the Yerevan utility), but because AWSC's financial position had not improved sufficiently under the MWWP (and parallel projects), the government opted for an (enhanced) management contract. AWSC's revenue increases and cost reductions achieved under these projects were insufficient to enable the management operator to make a profit under a lease contract.

2.2 As mentioned, the MWP was a continuation of the preceding MWWP. MWWP's objective had been to improve: (i) the quality of services provided to customers in AWSC's service area; and (ii) the sustainability of AWSC. Although the MWWP focused on improving the utility's financial discipline and expenditure management, customer service, and systems rehabilitation, the MWP (and the three parallel projects) supported a shift in focus to investments in existing and new infrastructure to reduce excessive NRW. The MWP supported rehabilitation of branch systems including rehabilitation of water supply and sewerage networks in the three towns and adjacent villages, which would help reduce NRW in that (small) project area. MWP's rehabilitation works were supplemented by the much larger US\$59.5 million parallel investment in system rehabilitation and extensions by the Asian Development Bank (ADB) and the European Bank for Reconstruction and Development (EBRD).

Relevance of Objective

2.3 The MWP's project development objective (PDO) was to support improvement of the quality and availability of the water supply in selected areas of the AWSC . The selected service areas included the towns of Masis, Ashtarak and Echmiatsin and their surroundings.

2.4 The MWP's PDO supported and was directly relevant to Strategic Objective II of the Country Partnership Strategy (CPS) for Armenia (2009-2013), which focuses on strengthening competitiveness and post-crisis growth. Its primary objective was to support completion of important infrastructure investments to improve access to water services in small towns and surrounding rural areas. In particular, the MWP supported the modernization of Armenia's water supply and sanitation sector by financing part of the EMC for AWSC. The MWP's PDO remains relevant to the most recent CPS (2014-2017), which continues to highlight the objective of improving access and quality and sustainability of key infrastructure facilities in Armenia.

2.5 The PDO was also relevant in that the MWP, by financing two years of the EMC, supported the continued participation of a private partner in Armenia's water sector. As with the earlier three projects, the participation of the private partner brings with it market-based financing and the latest industry knowledge. The private partner, SAUR, had been engaged in the sector since 2004 and had acquired substantial knowledge of the water sector. With the EMC, the government added the condition that SAUR develop the total management plan using the latest industry knowledge, which gave the government the choice of selecting the most efficient strategies for operation and maintenance approaches, for customer service, and for further investment options for systems rehabilitation.

2.6 The MWP's objective of improving availability and quality of the water supply in the three cities and their eight adjacent villages was relevant in 2012 at appraisal and remained relevant in 2015 at MWP's closing. Even though as a result of the preceding MWWP, the hours of water supply in the AWSC's service area had almost doubled from 7.4 hrs/day in 2005 to 15 hrs/day in 2012, it was well below the 22.2 hrs/day in Yerevan at that time. As to water quality in 2012, bacteriological safety compliance had reached 98 percent in the MWP project area. Improvements, particularly in water availability in the project area (and the larger AWSC service area), were relevant at MWP appraisal.

2.7 At MWP's closing in 2015, the supply of drinking water had increased on average to 17.6 hrs/day. As to water quality, although chlorination had been installed in the project area, customers in 7 of the 11 cities and villages had complained in 2014 about poor water quality. At the time of the Project Performance Assessment Report (PPAR) in 2018, access to the water supply had increased by an average of 20 percent in 7 of the 11 cities and villages as a result of the MWP investments. Thus, at the time of MWP closing in 2015 and in 2018, further improvements in availability and quality of water supply remained relevant.

2.8 There are two areas, however, where the relevance of the PDO falls short. One is the sustainability of AWSC and the other is wastewater treatment. As was known at the time of MWP appraisal, the utility was in an unsustainable financial state. As a matter of fact, AWSC's financial position was so bad that the government was unable to transition to a lease contract as planned and had been done with the Yerevan utility. But, despite this situation, neither the appraisal team nor the government choose to include AWSC's financial sustainability in the MWP's PDO or include specific measures to address that in the design. The MWP's ICR noted this fact and pointed out that although the MWP included a financial covenant concerning AWSC's finances² and the supervision staff in 2014 sought advice from World Bank management on how to deal with the continued unsustainable state of AWSC's finances—no additional measures, restructuring, or other actions were taken to address this issue. AWSC's financial situation at MWP's closing was still unsustainable.

2.9 Even though MWP's PDO focused on water availability and quality, the AWSC was also responsible for wastewater treatment. In 2012, the AWSC began operating the three wastewater treatment plants built under the EBRD Armenia Lake Sevan Basin Environmental Project and in 2015 two more plants were repaired and built under the EBRD/European Union/European Investment Bank Armenia Small Municipalities Water Project. The AWSC operated these five plants without an increase in tariffs to cover the operations and maintenance costs which are high for these plants, especially in terms of energy costs and the cost of chemicals (lime). Tariffs were not increased during the MWP implementation, despite the fact that second-generation reforms under MWP to improve the utilities sustainability included tariff increases beginning in 2014 (policy letter of 2012 issued by the Deputy Prime Minister). The World Bank's dialogue with the government neither resulted in the proposed tariff increases nor improved the AWSC's financial situation. The government dealt with the financial problems through subsidies, anticipating that under the current lease contract, the national revenues would allow repayments of these subsidies without major tariff increases.

2.10 The relevance of the objective is **substantial**.

Relevance of Design

2.11 The MWP's three components were designed as activities to continue the progress made under the MWWP towards improved water supply and sector sustainability. The three complementary components addressed key factors that contributed to the high levels of NRW and finance the EMC for two years to further improve AWSC's operations (component 3).

- Component 1: Investments in Water Supply Systems (International Bank for Reconstruction and Development [IBRD]: \$8.6m; borrower: \$1.72m): Design, implementation and supervision of the rehabilitation of water systems in the towns of Masis, Echmiadsin, and Ashtarak, including their adjacent villages. The work included rehabilitation of water networks linked to operational efficiency and reduction of non-revenue water. The goals of the investments were to finance

physical infrastructure that was technically sound, cost effective, reliable, and that reduces technical losses.

- Component 2: AWSC Investments (IBRD: \$1.76m; borrower: \$0.36m): This component financed: (i) water meter replacement and installation of meter chambers in several towns and villages throughout the AWSC service area to reduce commercial losses; (ii) automation of pumping stations and reservoirs; and (iii) procurement of equipment and machinery for the improvement of the AWSC's operations and maintenance system.
- Component 3: AWSC Management Strengthening (IBRD: \$4.6m; borrower: \$0.92m): This component financed: (i) about two years of fees for an EMC to improve AWSC administration, operations, and maintenance, and to ensure optimal implementation of the program investment fund; and (ii) technical studies and project management and monitoring, including independent technical audits, financial audits, and operating costs.

2.12 The activities designed to improve the efficiency of operations and maintenance at AWSC as part of the MWP's higher objective were relevant at appraisal and closing. The extension of the EMC gave the management contractor the mandate to continue managing operations and maintenance, including managing the four investment projects in an efficient manner. The design was relevant in that it furthered AWSC readiness for the next step in the PPP program. What was not made clear in the project design, however, was that with the MWP's financing of the EMC, the MWP was, in effect, financing the management of all of AWSC's operations in the service area for two years. This included not only the rehabilitation works in the three towns and adjacent villages financed by the MWP and the much larger rehabilitation works in the ADB, EBRD and Kreditanstalt für Wiederaufbau (KfW) project areas, but operations in the rest of the AWSC's service area as well.

2.13 At the level of the PDO, the design was relevant in that the component activities of improving quality and availability of water in the project area were closely aligned with the PDO and made it possible to achieve this at closing. Moreover, the activities designed to rehabilitate water networks and reduce NRW were also relevant given the dilapidated state of the network and the high NRW. Water meter replacement would help reduced commercial losses while repair and replacements of mains and distribution networks would reduce technical NRW. In addition, both would contribute to reductions in energy and maintenance costs and to improvements in billing and revenue collection.

2.14 While the reduction of NRW in AWSC's service area that was included in the MWP can be attributed mostly to the project, the reduction of NRW in the wider AWSC's service area was the result of the parallel investment in systems rehabilitation by the EBRD and ADB. In many cases, the rehabilitation activities financed by these IFIs (IFIs) were adjacent to those financed by the World Bank and at times going on at the same time. The IFIs also contributed to activities to improve the efficiency of AWSC's operations and maintenance. As a matter of fact, EBRD and KfW financed the EMC when MWP's financing ended in 2013.

2.15 The project also had a two-year stop-gap financing of the EMC under the MWP. Although, the management contractor was responsible for the implementation of the MWP, the fact that the MWP would finance only two years of fees of the EMC lessens the relevance of the design. As a matter of fact, the EMC had to be extended until 2017 to get the AWSC service area ready for the National Lease Contract (NLC). It would seem difficult to assume at appraisal in 2012 that the AWSC could become operationally and financially sustainable in two years, given the long history of unsustainable finances. This design aspect was not addressed by the World Bank during MWP's implementation.

2.16 The relevance of the project's design is **substantial**.

3. Implementation

Institutional Framework

3.1 The implementation of the MWP (and the three parallel projects) was managed within AWSC's corporate structure at the time—a closed joint stock company with headquarters and branches. Day-to-day management was the responsibility of the management contractor whose team leader was the utility's general director. Top-level (strategic) project management and supervision was done by the Company Board of Directors (CBD) chaired by the State Committee for Water Efficiency (SCWE) chairman (the SCWE owned all shares of AWSC). Ministerial stakeholders in the project were represented on the CBD. Operational monitoring and supervision of the projects was carried out by the Contract Monitoring Unit (CMU) housed in the SCWE. The CMU monitored progress towards objectives; reviewed subprojects and proposed investments; prepared monitoring reports; and liaised with the World Bank, the utility/management contractor and sector stakeholders.

3.2 The AWSC maintained a Project Implementation Unit (PIU) to manage the day-to-day coordination and implementation of the MWP and parallel projects. The PIU, in coordination with the CMU, was responsible for: (a) approving subprojects' feasibility studies; (b) ensuring proper preparation of detailed engineering designs and tender documents; and (c) undertaking construction supervision of all subprojects, with the support of project consultants. The PIU had experience in implementing ADB and EBRD projects since 2007 in addition to experience with implementing World Bank projects in the sector. The PIU key staff included engineers, construction supervisors, and procurement, financial, and social impact specialists. Most of these staff had worked on the preceding MWWP and other donor projects.

Implementation Experience

3.3 Planned versus Actual Expenditure, by Component. The original project costs were US\$18 million, financed by a US\$15 million EBRD loan and US\$ 3 million in government counterpart funding. Actual costs at closing were US\$17.93 million due to savings.

3.4 The project accumulated savings of about US\$2 million as a result of changes in the exchange rate between the Armenian dram and the U.S. dollar. The savings were used to: (a) extend water supply system rehabilitation works in Echmiatsin and Ashtarak (US\$1.11 million under Component 1); (b) procure chlorination equipment (US\$0.22 under Component 2); and (c) procure vehicles to implement a new methodology of water meter data collection and processes to improve billing accuracy.

Table 3.1. Planned versus Actual Expenditure, by Component

<i>Component</i>	<i>Appraisal Estimate (US\$ million)</i>	<i>Actual/Latest Estimate (US\$ million)</i>	<i>Actual as % of Appraisal Estimate</i>
Component 1: Investments in Water Supply Systems	10.32	10.46	101.4%
Component 2: AWSC Investments	2.12	1.98	93.4%
Component 3: AWSC Management Strengthening	5.52	5.22	94.6%

3.5 Implementation of the MWP progressed smoothly, guided by the annual investment program and annual procurement plan for the entire AWSC service area both prepared and implemented by the management contractor. The contractor also prepared the sub-project designs and undertook construction supervision and the certification of completed works. MWP's implementation was closely monitored by the World Bank, assisted by the AWSC composite quarterly project reports prepared for the World Bank and the SCWE. These reports described the physical progress in all service perimeters of the ASWC, including in the MWP project area, as well as, outputs and outcomes delivered by the investment program highlighting successes, constraints, and whether planned targets had been achieved or otherwise. The contractor also prepared the total management plan (TMP), an annual business plan proposing different financing and investment strategies based on an inventory of the country's water and sewerage assets and operations. The TMP's planning formula and model provides a comprehensive planning tool allowing the selection of the most needed rehabilitation investments and the most efficient institutional utility model and operations and maintenance plan to deliver the desired service level.

3.6 Implementation was guided by the targets and conditions of the EMC. The EMC differed from the preceding management contract among others in that it included for the first time, penalties for not achieving targets. This was the case with NRW. SAUR, the contractor, had been reluctant to agree to targets for lowering NRW because it was not in control of the investments in repairs and rehabilitation to reduce losses. These investments were managed by the SCWE. The government decided, however, to institute the penalty to force the contractor to do more to reduce NRW. Although the contractor made every effort to reduce NRW, it could not achieve the targets set in the EMC and ended up paying penalties for two years. The EMC included two other targets—one for water availability and the other

for tariff adjustments. The initial target for availability in the EMC was set at 24 hrs/day, but was amended to 19 hrs/day since, in some places, the baseline was as low as 6 hrs/day. As for tariffs, the EMC required that the contractor prepare a submission justifying tariff adjustments annually, however, the EMC did not oblige the government to accept and institute such adjustments, and no adjustments have been made during implementation.

3.7 The project provided guidance on the tariff issue for the government as the World Bank obtained funding from the Public-Private Infrastructure Advisory Facility (PPIAF) to prepare the 2015 Armenia Water Sector Tariff Study (AWSTS). The AWSTS—based on a study of affordability—enabled the government to select a tariff and a delivery model (one, two, or three utilities) to achieve revenue-cost recovery that would include funds for rehabilitation investments, debt service, and subsidy repayment. An outline of the AWSTS is provided in Box 1, including the study’s major findings and recommendations.

3.8 As noted, the AWSC/contractor was not only implementing sub-projects financed under the MWP, but, in parallel, those of the EBRD and ADB. This meant dealing with different contractors, supervisors, and supervision missions from the three IFIs, sometimes at the same time. The AWSC’s PIU also had to efficiently coordinate with the SCWE-CMU which monitored works and services on behalf of the SCWE and the government. The extensive implementation experience of the management contractor and the PIU acquired since 2004 enabled the MWP’s timely implementation. The project was closed on time at the planned closing date of June 30, 2015, after three years of implementation.

Safeguards Compliance

3.9 According to the project appraisal document (PAD) and ICR, the project was classified as a Category B project for environmental assessment purposes. One safeguard policy was triggered: Environmental Assessment (OP/BP 4.01). The environmental management framework (EMF) was prepared at appraisal and publicly disclosed. Compliance with safeguards requirements were reported as satisfactory during implementation. The AWSC employed safeguards staff with the mandate to conduct environmental and social oversight of works under the project. In addition, the AWSC engaged Consulting Engineers Salzgitter (CES), a German company, to conduct technical supervision of works under the MWP, including environmental oversight. CES prepared monthly reports for each of the work sites, which included reporting on adherence to the EMF and any instance of acquisition of land or resettlement. On the latter, the AWSC confirmed that there were no cases of temporary or permanent land acquisition or resettlements during project implementation. This was confirmed during the PPAR mission by former AWSC staff. In the last year of the project, the World Bank’s supervision team made specific recommendations to improve the quality of environmental supervision reports, which was done.

3.10 Both the PAD and ICR mentioned that the EMF included mechanisms for beneficiary feedback and grievance redress. Beneficiaries and customers had multiple ways of giving feedback on project activities and services, including through AWSC service centers, a

telephone hotline or by email. There are no reports of grievances in the ICR, but a beneficiary survey conducted in March 2014 found that only about a third of the subscribers interviewed reported being fully satisfied with the operation of the water supply. In the sub-project area of the town of Masis, the survey found that almost half of the interviewees complained about low water pressure and about the poor quality of the water there. At the time of the PPAR in 2018, a repeat of the expert opinion survey conducted in May that year found that problems with water pressure had been reduced by 50 percent since 2014. Similarly, the survey found that problems with water quality had been reduced also by 50 percent, except in two communities where people continue to suffer from poor water quality.

Financial Management and Procurement

3.11 The financial management arrangements at AWSC included budgeting and financial planning, accounting, and reporting. The accounting system included internal controls. External audits were conducted annually and the auditor opinions in the audit reports have been un-qualified. Financial management staffing was adequate and acceptable according to the supervision of financial management staff and financial reports have been rated satisfactory throughout the project, according to the ICR. As to financial management, the final rating was moderately satisfactory at closing. This reflected the satisfactory performance of the project financial management staff and procedures while acknowledging the weak financial situation of AWSC at that time. This issue at the time of the PPAR no longer existed as the utility has been merged into the national utility Veolia Djur with the signing of the NLC in 2017.

3.12 Procurement administration under the project was generally found to be satisfactory. Fiduciary support was provided by qualified procurement and financial staff, according to the ICR. The procurement specialist for the project had substantial experience with World Bank procedures and regularly attended procurement trainings and workshops organized by the World Bank.

4. Achievement of the Objective

Assessment of Sector-Level Results

4.1 The MWP results need to be evaluated within the larger context of the two decades of involvement by the World Bank Group (specifically the International Development Association (IDA) and IBRD) and other official financing sources in supporting Armenia's water and sanitation sector. The evolution of the Bank Group's role and contribution since the late 1990s can be better understood if the MWP (2012-2015) is not assessed in isolation. To date, the Bank Group has financed four projects to support Armenia's water and wastewater sector:

- The Municipal Development Project (MDP) was approved in 1998 for an IDA credit of US\$28 million and closed in 2006.
- The Yerevan Water & Wastewater Project (YWWP) was approved in 2005 for an IDA credit of US\$23 million, with additional financing of US\$20 million, and closed in 2011.
- The Municipal Water & Wastewater Project (MWWP) was approved in 2004 for an IDA credit of US\$43 million and closed in 2011.
- The Municipal Water Project (MWP) was approved in 2012 for an IBRD loan of US\$15 million and closed in 2015.

4.2 Among the public services in Armenia, water and sanitation services have seen major improvements in access and quality since the first IDA project in 1998. Over the ensuing two decades, access to water and sewerage improved as a result of initiatives by the government in partnership with the Bank Group. In 2000, government launched a PPP program intended to introduce private partners into the management of the finances and operations of Armenian water utilities. In parallel, the government also mobilized funds from IFIs— notably ADB and the Bank Group—to extend and rehabilitate systems and networks and finance the operations of the water utilities. Under the PPP program, private partners were mandated to manage public utilities and move towards sector financial sustainability and operational efficiency. To prepare the PPP program, IDA assisted the government toward passing legal acts related to metering and revenue collection; moreover, the government created two key institutions:

- The SCWE as the sole shareholder of the five public water utilities (see paragraph 1.3)
- The Public Services Regulatory Commission (PSRC) to issue permits and approve tariffs.

4.3 Sector-level improvements have resulted from the Bank Group’s parallel support as the government entered into management contracts that involved private partners in managing water utilities—both YWSC and AWSC. These results are evident in the case of three management contracts from 2000 to 2012, i.e., prior to the implementation period of the MWP under review. These management contracts and the parallel IDA projects are discussed below:

(a) YWSC and ACEA of Italy (2000–05)

4.4 In 2000, the YWSC entered into a four-year management contract (2000-2005, with a one-year extension) with ACEA of Italy. In parallel, IDA provided US\$28 million through the MDP to finance capital investments to rehabilitate the water system in Yerevan. ACEA took over operations and maintenance and helped bring about a limited improvement in YWSC’s financial performance, but not enough to substantially improve the utility’s financial situation and reduce NRW.

(b) YWSC and Veolia of France (2005-2016)

4.5 Based on its experience with the ACEA management contract, YWSC entered in 2006 into a ten-year lease contract (2006-2016) with Veolia of France, which required Veolia to manage and maintain operations as well as finance minor investments. Again, IDA financed a parallel project—the YWWP for a total of US\$43 million—at the same time that two other IFIs funded water projects in Yerevan. EBRD financed the Yerevan Water Supply Improvement Project (US\$21 million) and France funded the Yerevan Water Sector & Wastewater Improvement Project (US\$27 million). The lease contract resulted in financial and operational improvements in YWSC’s performance. Water service in Yerevan became fully self-financing by 2011 and 60 percent of subscribers that were surveyed indicated that water services had improved. But no improvements had been made in NRW. The latter reflected the dilapidated state of the water system and network in Yerevan (and the rest of the country) that had been built in the 1930s, but not maintained or rehabilitated since.

(c) AWSC and Saur of France (2004 to 2012)

4.6 Outside Yerevan, improvements in water supply quality and access also resulted from three IFI-financed projects to the AWSC. In 2004, AWSC had entered into a management contract with SAUR of France. The management contract was extended twice until 2012. IDA’s third water sector project in Armenia was the MWWP for US\$43 million, approved in 2004. The MWWP improved AWSC’s financial discipline and cash generation; expanded water supply and customer services in 16 towns in AWSC’s service area; and increased the efficiency of water distribution and use. Two years later in 2006, EBRD financed the Lake Sevan Basin Environmental Project (US\$9.5 million) to repair two wastewater treatment plants, and in 2008, ADB financed the Water Supply and Sanitation Sector Project (US\$50 million). The ADB project upgraded and rehabilitated the water and wastewater systems in 16 towns (other than those in the IDA project) and 125 villages in AWSC’s service area; it also improved AWSC’s management and efficiency.

4.7 As part of the management contract, the three AWSC projects led to improvements in operational efficiencies, staff productivity, and customer services. Moreover, the projects resulted in increased access and improved water quality in 32 towns and 125 villages (out of 36 towns and 286 villages in AWSC’s service area)³. Major reductions in energy costs had been achieved through: (i) new pumps equipped with automatic controls and (ii) the replacement of old mains with gravity-fed new ones. In addition, major parts of the AWSC’s service area benefitted from significant repairs and rehabilitations of reservoirs and intakes, installation of chlorination stations and water meters, and rehabilitation of distribution networks.

4.8 All of the 32 towns and 286 villages are now connected to the central improved water supply. A survey of 400 randomly selected households in the 32 towns found that 95 percent of the households mentioned a substantial improvement in the constancy of their water supply. All households in the towns now receive the minimum 12 hours/day of water supply, while 39 percent received water for 24 hours/day. In addition, all households mentioned a perceived improvement of water quality. As to interruptions in the water supply caused by systems failures, the survey reported that the incidence of system failure had decreased from

65 percent in 2006 to 35 percent in 2011, and households reported a major improvement in the utility's responsiveness to system failures.

4.9 Since the late 1990s, the World Bank has provided sustained advice and technical assistance, in parallel with lending and in coordination with other donors, which has resulted in an effective partnership with the government and the private sector, including private investments. The experience in Armenia, across the four World Bank-financed projects discussed earlier, shows that the PPP achievements resulted from a sustained partnership involving the government, private operators, other donors, and the World Bank. While the World Bank and donors financed most of the investments under the PPP contracts, the technical and advisory assistance during preparation and supervision were especially important as SCWE became increasingly open and sought advice based on international experiences with the challenges and mechanisms for implementing PPPs. The World Bank played a lead role in this process in the initial decade of PPP reforms and gradually retrenched as the initial wave of reforms became more mature and other donors became willing to support the second generation of reforms.⁴

Project-Level Achievements of the MWP

Objective: To support improvement of the quality and availability of water supply in selected areas of the Armenian Water and Sewerage Company. The selected service areas are the towns of Masis, Ashtarak, and Echmiatsin, and their surroundings.

4.10 It is within the foregoing sector context that the MWP—the subject of this assessment report and the Bank Group's fourth project (again in parallel with other IFIs)—was appraised and implemented. The MWP was designed to extend the improvements in water supply achieved under the previous MWWP (and its parallel ADB project) to three towns and their adjacent villages. The MWWP was also intended to finance two years of the EMC, support a shift in focus toward reducing NRW, and improve sector financial sustainability. Estimates at appraisal for the short-to medium-term systems rehabilitation investment requirements (2012-2016) were US\$100 million. With IBRD support, the government leveraged US\$85 million in parallel financing from the: (i) ADB, which approved the Water Supply and Sanitation Sector Project in 2012 for US\$40 million; and (ii) EBRD/EU/EIB, which jointly financed the Armenia Small Municipal Water Project for US\$26 million, also in 2012; and (iii) KfW for the Community Infrastructure Project II-Phases 1 and 2 for US\$19 million, covering the 2005-2015 period. The IBRD loan of US\$15 million was a stop-gap to fill the expected two-year gap in financing the EMC and to finance systems rehabilitation in three towns and their adjacent villages that were not included in the ADB and EBRD projects.

4.11 The outputs and outcomes achieved by the MWP are discussed below, with recent updates up to 2018 obtained by the PPAR mission, which conducted an expert opinion survey (the survey instrument and results are presented in Appendix C). Regarding data on results, it is important to note that AWSC was merged into a new national utility called Veolia Djur (a French company) when the latter won the competition for the NLC in 2017. Veolia Djur, which manages the second contract for the Yerevan utility as well, does not publish or provide public access to their data on water access, quality efficiency, and NRW.

4.12 For this evaluation, the PDO has been assessed as two separate PDOs on water quality and water availability, as indicated below.

(a) **PDO 1 – To improve water quality in selected areas of AWSC**

4.13 At MWP’s closing in June 2015, the achievement of the objective of improving the water quality in the selected towns and their surroundings was **substantial**.

4.14 Outputs. The MWP’s outputs related to improving water quality included the replacement of 74 km of water mains, 117 km of network pipes, and 57 km of inlet lines. The old pipes were rusting and leaking, thus causing impurities that contaminated the water supply. Another project output is the installation of chlorinating stations with electronic controls at the three main pumping stations. The project also rehabilitated two boreholes and two new water intakes at reservoirs that included screens to keep out impurities.

4.15 Outcomes. These project investments resulted in improved water quality outcomes in the network. Water quality in the project area was almost 100 percent controlled in that 99.3 percent of the water supply was disinfected and controlled for bacteriological impurities as it entered the distribution network. This compares to the baseline of 93 percent of the water supply disinfected in 2012 at MWP’s appraisal. Customer satisfaction with water quality also improved as a result of the MWP. Compared to 80 percent of customers having problems with water quality before the MWP replaced mains, pumps and networks, and installed chlorinating stations, the IEG mission’s expert opinion survey found that in 2018, this had been reduced to 40 percent. The IEG mission also observed that in the Masis pumping station renovated under the project, the chemist employed by the utility took water samples to test for quality every hour. The results of the tests were sent by computer to the central laboratory in Masis where decisions were taken to adjust the chlorination at the pumping station to ensure proper water quality. However, in two communities (Ayntap and Hayanist) where pipes had not been replaced, customers continue to suffer from poor water quality causing illnesses and costly expenses for medicines and for the purchase of safe drinking water.

(b) **PDO 2 – To improve water availability in selected areas of AWSC**

4.16 The achievement of the objective of improving water availability in the project area was also **substantial**.

4.17 Outputs. The MWP’s outputs related to improving water availability include: the rehabilitation of the two borehole intakes; the reduction in (technical) NRW resulting from the rehabilitation of mains, networks and inlet lines; and the installation of new pumping units in the three towns. The pumps have been equipped with automatic controls to maintain proper pressure in the water supply and ensure availability. Availability has also improved through the installation of improved water meters at 19,500 customers. The meters measure the amount of water available and consumed by customers and have led to a reduction in commercial losses. The old meters did not measure the first 75 liters consumed and could be

tampered with. The new meters can be read electronically and have been encased in meter chambers to prevent tampering.

4.18 **Outcomes.** MWP's investments have resulted in significant outcomes related to water availability. At project closing in June 2015, the weighted average daily supply of drinking water in the three towns and their surroundings had increased from 12.3 hours per day (the 2012 appraisal baseline) to 17.6 hours per day. In addition, the number of people provided with access to improved water sources in the urban parts of the project area had increased by 100,987 at project closing while 31,089 people in rural areas had been provided with access. The water source for these more than 132,000 people had been changed from wells, lakes, and standpipes in 2012 to improved sources that are part of the central water supply system. An important outcome has been the reduction in stolen water, as well as improved metering, billing, and tariff collection. Metering has been further improved through a lottery introduced under the project where paying customers can purchase a ticket and win a monetary prize. The popular lottery has increased the number of paying customers from 30,000 to 200,000.

4.19 In 2018, the IEG mission's expert opinion survey found that, on average, the percentage of people connected to the improved water supply in the 11 beneficiary communities had increased by 20 percent. All of the 11 towns and villages are now connected to the improved water supply. Moreover, the frequent interruptions in the supply due to network breakdowns before the MWP rehabilitation works have been reduced by almost 40 percent, further improving availability. In addition, earlier problems with water pressure due to these breakdowns have been reduced by 50 percent. The reduction in NRW has further improved the availability of water in the system by 13 percent, i.e., from the baseline of 70 percent to 83 percent.

Improving Sector Sustainability

4.20 There were early signals about the government's intentions to implement a second wave of reforms. The MWP's loan agreement included a covenant to monitor the financial sustainability of AWSC. The covenant set a limit for the project implementing entity's (i.e., AWSC) indebtedness at 1.2 times the estimated maximum debt service requirements of the implementing entity for any succeeding fiscal year on all debt, including the debt to be incurred. Exceeding this level of indebtedness would require prior World Bank approval. In 2012, as reported in the management letter from the external auditor, the government fell into non-compliance. In a letter dated July 18, 2013, the World Bank requested to meet with the government to "assess remedial measures." However, the government responded that to cover AWSC's short-term indebtedness, it would provide subsidies, while for the longer-term sustainability, it would move forward with the second wave of reforms, including a national lease and nationwide tariff. The World Bank accepted the government's efforts to address the short-term indebtedness during that difficult economic period when economic growth was weak, just following the 2010 global financial crisis.

4.21 **Institutional Strengthening.** The MWP's financing of two years of the EMC was a key factor in achieving the water quality and availability improvements in the MWP project area

and in the wider (former) AWSC's service area. Veolia, the management contractor, rationalized the networks in the service area to improve operational efficiency and service sustainability. The contractor trained the utility staff in operations and maintenance, systems rehabilitation, meter reading and billing, and customer support, for which the MWP financed the purchase of 15 small vehicles. Staff productivity improved substantially at the former AWSC utility, thus enabling the reduction in staff from the baseline of 1,609 in 2012 to 1,273 at closing in 2015. The project also supported improvements in staff remuneration and the compensation of redundant staff. At closing, sector efficiency had improved substantially, although it cannot be fully attributed to the MWP's financing, since ADB and KfW financed the years after the initial two years funded by IBRD.

4.22 Tariff-setting. The MWP's financing of the EMC also resulted in the preparation and submission to the government of the TMP in 2014. The TMP's planning formula and model provides a comprehensive planning tool allowing the selection of the most needed rehabilitation investments and the most efficient institutional utility model and operations and maintenance plan to deliver the desired service level. The TMP helped the government decide in 2017 to select a single utility institutional delivery model and a cross-subsidization tariff model to achieve (limited) cost-recovery, as well as debt and subsidy repayment from nationwide revenues. The project also obtained funding from the PPIAF and delivered in 2015 the "Armenia Water Sector Tariff Study" (see Box 1) which, based on a study of affordability, would enable the government to select a tariff and a delivery model that achieves cost-recovery tariffs while including funds for rehabilitation investments, debt service, and subsidy repayment. After MWP closed in June 2015, the government decided to extend the EMC until 2017 to reach a level of operational efficiency in the project service area that would enable the merging of the five utilities into one national utility under the NLC.

Box 4.1. Findings and Recommendations from the “Armenia Water Sector Tariff Study” February 2015. The World Bank, PPIAF

The study includes an analysis of the current affordability of WSS and the results of the Willingness-to-Pay survey that was conducted as part of the study. It also analyzes the costs of WSS, estimates the revenue requirements for the service providers, and provides optional structures for cost-recovery level water and sanitation tariffs. The tariff options were evaluated in consultation with stakeholders in June 2014. In addition, the study analyzed three institutional arrangements models of the current five, two, or one national operators. The Republic of Armenia’s water and sanitation services (WSS) sector has seen impressive improvements over the last decade.

Main Findings of the report are:

- **Affordability.** Water and sanitation services were affordable. WSS tariffs were some of the lowest in the region. In 2012, the average monthly household per capita expenditure for water for the poorest quintile was 2.3 percent of total household per capita consumption. This was far below the commonly-used threshold for affordability in the region (The World Bank uses a threshold of 4 percent).
- A **Willingness-to-Pay** survey conducted as part of the study found that most customers were satisfied with service and willing to pay for improvements. The average customer’s maximum willingness to pay for water supply improvements was 17.7 percent above current expenditures.
- **Revenue and Costs.** However, sector revenues fell well short of costs. Revenue from tariffs covered only 67.3 percent of the sector total costs in 2012. For example, in the AWSC service area, revenue from tariffs covered 35 percent of the utility costs (in Yerevan, however, revenues exceeded costs by nine percent). Service providers consequently were unable to finance necessary maintenance, rehabilitation, or expansion of services (in 2015, 800,000 people had no connection to the water and sanitation network).
- Costs were likely to increase primarily due to debt service.
- **A Cost-Recovery Tariff.** Transition to cost-recovery tariffs would require subsidies to poor households and careful phasing to avoid rate shock. The rate change options presented in the study required a rate increase of 76 percent between 2014 and 2019 to reach cost-recovery tariffs.

The study concludes with three **recommendations for reform:**

1. Provide highly targeted subsidies for vulnerable households.
2. Gradually phase in cost-recovery tariffs.
3. Conduct transparent and sustained communications with the public.

Affordability was based on the Financial and Human Resource Impact Report: Water Sector Study Armenia, The World Source: Bank 2014. The institutional model options were investigated in a study funded by the KfW - “Present State of Water Sector: Water Sector Study Armenia – Sector Review and Strategy, 2014

5. Efficiency

5.1 Sector-level Efficiency. With the merging of AWSC into Veolia and the adoption of a national tariff, the issue of the project's efficiency and economic and financial benefits can only be looked at in how these factors at the closing of the MWP affect the current operation of the sector. Two MWP benefits, the increased availability, metering, consumption, and, consequently, increased revenue, have helped increase efficiency in the sector. The other, decreased electricity consumption and water production, helped reduce operating costs. Efficiency gains under the MWP seemed to have advanced enough for the government to decide to move to an NLC arrangement. In addition, the current situation of cross subsidization may also have been a factor in this decision: dense urban areas, especially Yerevan, generate proportionally more revenue and lower operating costs, and compensate for the lower revenues collected in the dispersed and thinly populated AWSC service areas of small towns and rural areas that consequently have higher operating costs.

5.2 Otherwise, the efficiency situation in the sector has not changed since the MWP's closing in 2015. Tariffs have not changed since 2009 and Veolia Djur is required as part of the NLC to invest in repair and rehabilitation to reduce NRW and further improve operational efficiency. Veolia Djur is only in the second year of its 15-year lease contract and is operating at a profit. The question is if operating the national utility at a profit can be sustained in the next decade, and whether that will assist the government to decide to go to a next stage in the PPP program with regards to public-private operations or ownership⁵ of sector assets.

5.3 Efficiency at the Project and Entity Levels. Physical investments implemented under the project contributed to improved revenues and reduced costs for AWSC. Indicators showed improved service efficiency (e.g., reduced energy consumption and water production) and improved revenues in the project area. It was known at closing that AWSC would likely cease to exist soon, thus making future assumptions and calculations of the estimated economic internal rate of return (EIRR) and financial internal rate of return (FIRR) seem irrelevant. Nonetheless, the EIRR was calculated using similar assumptions as in the PAD. The EIRR calculated at closing was 25.5 percent and the net present value was Dram 4,269 million (or approximately US\$9 million at the 2015 exchange rate), assuming a discount rate of 10 percent and 30 years of asset life, with corresponding benefits to be realized starting in 2016. As in the PAD, the calculation was done only for component 1. The economic benefits from component 1 investments were considered to be satisfactory with respect to its economic efficiency. However, given the fact that AWSC's financial situation was unsustainable overall despite the project's financing of the management contract, the overall results were modest.

5.4 At appraisal, the financial benefits of the project would be based on AWSC managing to increase collection from increased sales and collection rates. However, the challenge of estimating the financial benefits of the project at closing was the issue of determining if the AWSC was a going concern. The going concern accounting principle is the assumption that an entity will remain in business for the foreseeable future. An entity is assumed to be a

going concern in the absence of significant information to the contrary. In the latest audited financial statements of the company (FS 2014), note 3.2 stated that "in accordance with decree No1366-A, dated 05.12.2013, the Government of the Republic of Armenia approved the approach to transfer water system operating rights from "Armenian Water and Sewerage CJSC to a lessee on tender basis." However, the implementation of the decree was postponed, and it was decided to extend the contract with SAUR organization by prolonging the functions of the executive body in the company until the end of May 2016. With this in mind, the ICR team decided that it did not make sense to project future financial benefits from the project using the company's future revenue stream.

5.5 Overall, the efficiency of the project is rated as **modest**. The implementation of the project itself was efficient, having been completed within the three-year timeframe and with budget savings, which have been invested in additional infrastructure and equipment. However, the financial sustainability of AWSC did not improve, and the annual financial results were getting more negative each year, thus requiring increases in subsidies for the company as tariffs had not changed since 2009.

6. Ratings

Outcome

6.1 The relevance of the PDO was substantial as was the relevance of the project design. The achievement of the objectives related to improved quality and availability of water supply in the project areas was also substantial. Overall efficiency was modest. The ratings on these criteria lead to an overall outcome rating of **moderately satisfactory**.

Risk to Development Outcome

6.2 **Political Risk:** Progress in the sector in terms of water availability and quality, wastewater treatment, and overall sector efficiency as a result of MWP and predecessor projects has resulted in a strong commitment to PPPs in the sector. The recent transition to the NLC has partially transferred to the lease operator the risks and responsibilities for operations and maintenance and for the associated rehabilitation investments. The risks that the economic and political winds will change this situation in the future remain modest. It is also likely that further innovations in service delivery by the lease operator will contribute to stability in the sector.

6.3 **Social Risk.** However, planned or sudden tariff adjustments could bring with it significant social risk. This was the case earlier in 2015 when the intention to raise energy tariffs caused unrest and demonstrations. The risks with tariff adjustments have been known for years and plans to mitigate that risk were mentioned in the 2011 Water Sector Note as well as in the 2015 Water Sector Tariff Study. At the same time, tariff increases may become

necessary given the fragile and dilapidated state of much of the distribution system that has not been rehabilitated under the IFI-financed investment projects. Also, NRW remains high, and while the government may decide that this is not an economic issue in view of the abundant water resources in the country, climate change-induced increases in temperatures and evaporation, reductions in rain fall, and lingering problems with pollution (biological or otherwise) may require larger investments in systems rehabilitation to reduce NRW, potentially to be financed from tariff increases.

6.4 The risk to development outcome is rated **high**.

World Bank Performance

Quality at Entry

6.5 Since 1998, the World Bank had taken a lead role in the sector in advancing the PPP program to improve financial and operational efficiency. In 2012, at MWP's appraisal, the World Bank had just completed the preceding MWWP—the 3rd World Bank-supported project in the sector. It had therefore considerable experience in project design, particularly since the MWP was to be a continuation of the MWWP (albeit with a focus on water quality and availability and NRW—as opposed to quality of service and AWSC's sustainability under the MWWP). However, only one World Bank staff at MWP's appraisal had been involved with the MWWP, the others were new to the water sector in Armenia. Moreover, while the MWWP-ICR mentioned the inadequacy of MWWP design in terms of addressing AWSC's financial sustainability, the same omission was made in the design of the MWP. This is the case while the MWP-PAD referenced the sector note prepared by the World Bank in 2011, which discussed the financial situation of AWSC and possible scenarios to improve its viability. A more robust analysis of the government's constraints or ability to pursue tariff increases to strengthen AWSC's financial sustainability should have been done at appraisal to ensure quality at entry.

6.6 Quality at entry is rated **moderately unsatisfactory**.

Quality of Supervision

6.7 According to the ICR, the World Bank supervised the project twice a year with teams staffed with technical, engineering, procurement, financial, management and safeguards specialists. The task team leader (TTL) was based in Yerevan facilitating regular contact with the supervising government agencies and project units. The TTL and team organized meetings with other donors active in the sector and worked with the consulting firm that prepared the Armenia Water Sector Tariff Study funded by the PPIAF. The PPIAF Tariff Study was published in 2014 in time to inform the national lease contract strategy. However, concerning the study, the PPAR mission found that neither the SCWE nor the PSRC seemed to be familiar with the study.

6.8 Furthermore according to the ICR, the problems with the financial sustainability of AWSC was raised by the team repeatedly both in World Bank reporting and in communication to the borrower, as it was linked to the financial covenant and the commitment to adjust tariffs in 2014. However, the 2014 decision by the government to eventually move to a national lease, shifted the focus from tariffs and cost recovery to the broader discussion of moving to homogenized services for the entire country to improve efficiencies and equity in water service delivery. In the meantime, the government committed to cover the revenue gap for AWSC with subsidies, which the World Bank accepted as a plausible medium-term solution. Hence the World Bank decided not to suspend disbursement. Later, in view of the overall fiscal situation in Armenia, the World Bank decided to shift its support from specific investments to a reform-focused approach and targeted technical assistance, such as the PPIAF tariff study, to help the client further its reform agenda.

6.9 Quality of supervision is rated **moderately satisfactory**.

6.10 Together, these ratings lead to an overall rating of World Bank performance of **moderately satisfactory**.

Borrower Performance

Government Performance

6.11 The government had been a pioneer in water sector reform in the region by bringing in private operators to improve efficiency since the late 1990s. The management and lease contract with the Yerevan utility, followed by the management contracts with the AWSC utility are the only examples of early private sector engagement in former Soviet Union countries. Steps to implement reforms included legal reforms to allow meter installation and start billing based on consumption, and laws enabling the disconnection of non-paying customers, which provided incentives for customers to pay their bills to the utility. The government took steps to limit AWSC debt and improve sustainability. However, on the tariff side, the slow recovery from the economic crisis and high lingering unemployment constrained the willingness and ability of the government to act decisively on tariffs. Even with the NLC, the government would need to consider tariff reform, decouple tariffs from social assistance programs, and limit borrowing on concessional loans to replace aging infrastructure without a plan for repayment.

6.12 Government performance is rated **moderately satisfactory**.

Implementing Agency Performance

6.13 During project implementation, the AWSC managed quality construction works in a timely fashion and within budget, while meeting fiduciary and safeguard requirements. It was, however, very dependent on the government for operating subsidies. The utility submitted the International Financial Reports (IFRs) on time and acceptable to the World

Bank. One IFR had to be re-submitted and there was a delay in submitting the 2014 technical audit. The PIU, operating from within the AWSC, implemented the project on time and within budget while simultaneously managing the implementation of parallel donor projects. At the time of the 2018 PPAR mission, the AWSC had ceased to exist, but, as mentioned the mission, talked to former AWSC and PIU staff confirming the fact that the utility and PIU effectively implemented the project.

6.14 Implementing agency performance is rated **satisfactory**.

6.15 Overall borrower performance is rated **moderately satisfactory**.

Monitoring and Evaluation

6.16 Design. The design of the monitoring and evaluation (M&E) system was given little attention in the PAD. Of the three PDO indicators, only one was designed to monitor improvements in the availability of water. None of the PDO indicators monitored improvements in water quality. The other two PDO indicators monitor NRW and revenue collection. Of the 10 Intermediate Results Indicators (IRIs) only one monitored improvements in water quality by monitoring the percentage of water disinfected. Possibly another three IRIs monitored quality indirectly in that they monitored increased access to improved water resources in urban, rural and piped connections. The majority of the indicators were designed to monitor changes in the efficiency of AWSC's operations and were related to the performance indicators of the EMC. PDO indicators 2 and 3 measured decreases in NRW and increases in billing and collection, respectively, while IRIs 1 to 6 measured different service aspects, such as decreased electricity consumption, increased metered consumption, decreased arrears, automated pumps, and decreased water production. Monitoring data was to be gathered through periodic (quarterly and annual) monitoring reports that were to be discussed with AWSC management and with the SCWE.

6.17 Implementation and Utilization. According to the ICR, the methods to collect data on the M&E indicators were adequate and added to the know-how of the PIU. The PIU already had significant experience with M&E in World Bank and other donor-funded projects. Separately, data was collected, and performance monitored, by the CMU within the SCWE. Data was collected on time and submitted to the World Bank on a quarterly basis. The data was also used to report on the key performance indicators of the EMC, which were submitted (some monthly, some quarterly) to the AWSC Company Management Board as the results were linked to the contractor's performance bonuses and penalties. The quality and reliability of data was verified by the annual independent audit, which included, in addition, several other key performance indicators of the AWSC. The independent audits continued to measure performance after the project had closed until the termination of the contract with SAUR in 2017.

6.18 Monitoring and evaluation is rated **modest**.

7. Lessons

The sustainability of development outcomes is enhanced when the World Bank maintains its strategic and operational engagement over time, especially when social and political risks are high. The World Bank has played a pivotal role in reforming the water sector in Armenia since the late-1990s by helping to create the environment to bring in private operators, achieve operational efficiency, and improve financial sustainability as part of a PPP program. Given the remaining challenges, the World Bank can continue to play a key role in the sector in terms of lending, but especially so through sector analysis and advice to help ensure that the improvements in management, operations, finance, and water supply for customers can be sustained.

The World Bank’s continuous advice and technical assistance, provided in parallel with lending and in coordination with other donors, can result in effective partnership with the government and the private sector. The experience in Armenia across four World Bank-financed projects since the late-1990s shows that the PPP achievements resulted from the sustained partnership involving the government, private operators, other donors, and the World Bank. While the World Bank and donors financed most of the investments under the PPP contracts, the technical and advisory assistance during preparation and supervision were especially important as Armenia became increasingly open and sought advice on the implementation of PPPs. The World Bank played a lead role in this process during the early years and slowly retrenched as the PPP reforms became more mature and other donors financed the second generation of reforms.

Tailoring of the EMC to the conditions of the local service area can help achieve results. The nature of several activities shows how, under the EMC, approaches to improving access and availability were adapted to local conditions. In some towns and villages where people had been getting water for free from wells and public standpipes, the AWSC was able to increase metering and collection by instituting a very popular lottery where only paying customers can purchase a ticket and win a monetary prize. The lottery, according to the ICR, increased the number of paying customers from 30,000 to 200,000. Similarly, to reduce illegal connections, the AWSC introduced a program that identified customers who purchased energy and were not water customers. The AWSC then installed thousands of new, more accurate meters. This led to an increase in average domestic metered consumption from 88.5 l/c/d to 119 l/c/d. Improved metering also laid the groundwork for improved leak detection and a full-scale NRW reduction plan that tackles technical losses. The lesson that can be drawn from these efforts is that approaches to deal with paying-for-service provisions, must take into account local conditions and opinions.

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¹ Since 2009, the average water and wastewater tariff has been kept at Dram 180/m³ (US\$0.38/m³).

² The loan agreement included a covenant which set a limit for AWSC's indebtedness at 1.2 times the estimated maximum debt service requirements for any succeeding fiscal year on all AWSC debts, including debts to be incurred—Section II.B.4 of Schedule 2 of Loan Agreement IBRD 8129. In 2012 net revenue was negative, thus the covenant was not met in 2013.

³ See project completion reports for the MWWP and the EBRD- and ADB-financed parallel projects.

⁴ For an in-depth analysis of this process and the World Bank's contribution, see: Philippe Marin, Dambudzo Muzenda, and Andranik Andreasyan. Review of Armenia's Experience with Water Public-Private Partnerships. World Bank Water Practice, World Bank. Washington D.C., 2017

⁵ It is interesting to note that the SCWE may be considering the privatization of the recently built Yerevan wastewater treatment plant since the SCWE considers that it could be operated at a profit.

Appendix A. Basic Data Sheet

SECOND POLLUTION ABATEMENT PROJECT (EPAP II)

Key Project Data (amounts in US\$ million)

	Appraisal estimate	Actual or current estimate	Actual as % of appraisal estimate
Total project costs	18	18.03	100
IDA/IBRD	15	14.97	100
Cofinancing			
Cancellation	0	0	-

Cumulative Estimated and Actual Disbursements

	<i>FY12</i>	<i>FY13</i>	<i>FY14</i>	<i>FY15</i>
Appraisal estimate (US\$M)	2	7	13	15
Actual (US\$M)	0	7	13.5	15
Actual as % of appraisal	0	100%	103.8%	100%
Date of final disbursement:				

Project Dates

	Original	Actual
Initiating memorandum		
Negotiations		
Board approval		Feb 21, 2012
Effectiveness		June 23, 2012
Closing date		June 30, 2015

Staff Time and Cost

Stage of Project Cycle	Staff Time and Cost (World Bank budget only)	
	Staff Weeks (number)	US\$ 000s (including travel and consultant costs)
Lending		
FY12	18.90	85,486.55
Total		85,486.55
Supervision/ICR		
FY12	0.90	4,707.98
FY13	20.92	100,049.34
FY14	19.73	84,300.61
FY15	11.82	35,027.10
FY16	3.35	20,908.31
Total:		244,993.41

Other Project Data

Task Team members

Name	Title (at time of appraisal and closure, respectively)	Unit	Responsibility /Specialty
Lending			
Ahmed A.R. Eiweida	Lead Urban Specialist	GSURR	TTL
Zaruhi Tokhmakhyan	Senior Infrastructure Specialist	GSUOA	TTL
Darejan Kapanadze	Senior Environmental Specialist	GENDR	Safeguards
Xavier Cledan Mandri-Perrott	Lead Financial Officer	GCPDR	
Chukwudi H. Okafor	Senior Social Development Specialist	GSURR	
Jyoti Bisbey	Infrastructure Finance Specialist	GCPDR	
Christopher Schmandt	Consultant	GSURR	
Petre Manjgaladze	Consultant	ECCGE	
Supervision/ICR			
Ahmed A.R. Eiweida	Lead Urban Specialist	GSURR	
Anna Cestari	Sr. Water Resources Specialist	GWADR	TTL
Zaruhi Tokhmakhyan	Senior Infrastructure Specialist	GSUOA	TTL
Tatyana Shadrnova	Senior Operations Officer	GSURR	
Darejan Kapanadze	Senior Environmental Specialist	GENDR	Safeguards
Ronnie W. Hammad	Senior Operations Officer	GGODR	
Kirsten Hommann	Senior Economist	GSURR	
Sarah G. Michael	Senior Social Development Social	GSURR	
David Stiggers	Consultant	GWAWP	
Aleko Maisuradze	Temporary	ECCGE	
Nora Mirzoyan	Consultant	GSU18	
Philippe Marin	Sr. Water & Sanitation Specialist	GWADR	
Amanda Joan Goksu	Operations Officer	GWADR	
Ivaylo Hristov Kolev	Sr. Water & Sanitation Specialist	GWADR	

Appendix B. List of Persons Met during IEG Mission

Gagik Khachatryan, Director - Green Pact (former Vice Chairman State Committee for Water Economy (SCWE)).

Arsen Harutyunyan, Chairman of SCWE.

Soghomoonyan Mikayel, Deputy Chairman, Public Services Regulatory Commission (PSRC).

Mushegh Koshetsyan, Commissioner – PSRC.

Garegin Baghramyan, Head of the tariff policy department, PSRC.

Sergey Aghinyan, Head monitoring department, PSRC.

Sylvie Bossoutrot, Country Manager for Armenia – Europe and Central Asia Region, the World Bank Group.

Anna Minasyan, President – Advanced Social Technologies NGO, Yerevan.

Zara Chatinyan, Local Representative, *Kreditanstalt fur Wiederaufbau* (KfW) Development Bank.

Christian Lefaix, General Manager, Veolia Djur (CJSC).

Nairuhi Jrbashyan, Senior Consultant, AVAG Solutions Ltd.

Melik Gasparyan, CEO, AVAG Solutions Ltd.

Andrea Baggioli, International Aid/Cooperation Officer, Delegation of the European Union (EU) to Armenia.

RudiK Tadevosyan, Associate, Framework Monitoring, European Bank for Reconstruction and Development (EBRD).

Cesar Llorens Alvarez, Deputy Country Director, Armenia Resident Mission, Asian Development Bank (ADB).

Armen Martirosyan, former Finance and Administrative Director, Armenian Water and Sewerage Company (AWSC).

Edik Chilakobyan, former IFI's Project Manager, Armenian Water and Sewerage Company (AWSC).

Gevork Grigoyan, Engineer, Veolia

Philippe Marin, former Managing Director SAUR/AWSC

Irina Tevosyan, Sr. Operations Officer, The World Bank Group, Yerevan.

Appendix C. Results from the Expert Opinion Survey

Expert opinion survey on community drinking water supply and sewage system in Masis, Echmiatsin and Ashtarak Sub-Project areas

By: Yuliana Melkumyan

April 18, 2018

1. Survey Methodology

1.1 The goal of the Expert Opinion Survey in 2014 was to obtain expert opinions from authorities, local government representatives and specialists on the quality and availability of water supply in the three towns and eight villages covered by the Municipal Water Project (MWP) with regard to the impact of the specific features of service delivery on socio-economic conditions and living standards in the communities. The 2018 survey aims to contribute to a better understanding of the changes that have occurred within the last four years by comparing the expert opinions on the quality and duration of water supply in the project towns and villages. Since 2015/2016 the centralized drinking water supply has undergone general changes and the water supply was transferred from the former utility AWSC to “Veolia Djur” CJSC.

1.2 At both stages 25 experts in the three towns and eight villages were interviewed. To provide a relevant comparison basis between data collected in 2014 and in 2018 the goal was to interview the same experts. In case of the experts not being available anymore, they were replaced by persons in the same or similar position. The same tool as in 2014 was used in 2018 with minor changes. Ten additional questions on the changes expected in water supply system and adjustments in the water and wastewater tariff were added (See Attachment I).

1.3 The fieldwork of the survey started on April 16, 2018 and lasted until May 8, 2018. The fieldwork was done by three interviewers. The breakdown of the experts interviewed according to area and settlements in 2014 and in 2018 is presented below in Table 1. The list of experts interviewed in 2014 and in 2018 is presented in Attachment II.

Table 1. Distribution of Experts interviewed for the Expert Opinion Survey by Sub-Project Areas

Sub-Project Area 1 and 2	Town Villages	Number of experts interviewed in 2014 and in 2018
Ashtarak sub-project area 1	Ashtarak Town	3
	Sasunik	2
	Ohanavan	2
	Karbi	2
	Mughni	2
Total for Sub-Project Area 1		11

Echmiatsin sub-project area 2	Echmiatsin Town	3
Total for Sub-Project Area 2		3
Masis sub-project area 3	Masis Town	3
	Aintap	2
	Dashtavan	2
	Darbnik	2
	Hayanist	2
Total for Sub-Project Area 3		11
Total		25

1.4 At both stages nine heads of divisions and specialists of water supply utilities and 16 representatives of towns and villages were interviewed as experts. Due to the more than three year break between the first and second stages of the survey and changes in water supply utility it was possible to reach the same persons for expert interviews only in ten cases. Eight respondents from “Veolia Djur” CJSC and seven respondents from communities were different persons than sampled in 2014. In 2014 heads of six villages, deputy head of one town and nine other officers, directors, eight heads of divisions and specialists of AWSC field offices as well as one director of a Non-Government Organization (NGO) participated in the survey as experts. In 2018 heads of seven villages, deputy head of one village, deputy head of one town, six other community officers and one director of an NGO participated in the survey as experts.

2. Basic findings on changes in water supply system

2.1 Water supply of the towns and villages was not always fully covered by AWSC services in 2014. On average in the former AWSC/MWP service area between 61 and 80 percent of the population in the 11 towns and villages were connected to the water supply. The survey data collected show substantial improvement: average coverage of the population connected to water supply system in the 11 towns and villages increased from 61-80 percent in 2014 to 81-100 percent in 2018. All of the 11 towns and villages are now connected to the central water supply that used to be managed by AWSC and now by “Veolia Djur” CJSC.

2.2 There is a slight difference between the answers given by “Veolia Djur” CJSC representatives and from community representatives. “Veolia Djur” CJSC representatives report more coverage (See Table 2.).

Table 2. Q1. Please assess the share of your community's population that is served by centralized water supply system (comparison of the answers of “Veolia Djur” employees and community representatives given in 2018)

Answers	“Veolia Djur” employees	Town/Village representatives	Total
61-80%	22.2%	31.2%	28.0%
81-100%	77.8%	68.8%	72.0%
Total	100%	100%	100%

2.3 The data on the main and most common sources of water supply in the towns and villages show substantial improvements as well. In 2014 according to the majority of experts (84%) the centralized water supply system was the main and the most common source of water supply in their communities. In 2018, of the 25 experts who reported that the centralized water supply was the primary source of drinking water in their communities – 20 mention it as the main and the most common source of water supply in their communities. Four of the 25 experts^{vi} reported that natural spring water was the main source of water. Most of the Sasunik village in Ararat marz is not connected to the central water supply. The water from the nearby water reservoir was mentioned by the head of the village as the main source of drinking water.

2.4 In 2014, two of the 25 experts noted that the most widely used source of water was artesian/deep wells. In 2018 none of the experts mentioned artesian/deep wells as a source for water. In 2014, nine of the 25 experts in four villages mentioned deep wells as the main source of drinking water in the village. In 2018, two out of nine experts rated it as the second source for drinking water.

2.5 In 2014, two of the 25 experts believed that purchased bottled water was the main source of drinking water. In 2018, none of the experts listed bottled water as a source of drinking water in their villages (9 of 25 experts in 5 villages). Only seven experts in five villages rated the purchased bottled water as the secondary source of drinking water.

2.6 At both stages, experts were asked to highlight the main problems of water supply in their towns and villages and classify them by the level of importance. Analysis of the results in 2014 suggested that according to the absolute majority of experts (96%) the biggest problem in their towns or village was the poor conditions /depreciation of the system and the subsequent frequent breakdowns, 92 percent have mentioned low water pressure in the system, and 84 percent mentioned the seasonal unequal supply and poor quality of the water. Seventy two percent reported problems with water meters and payment of fees. The situation had significantly improved by 2018. The experts reported occurrence of these problems much less often than in 2014 (See Table 3.).

Table 3. Q3. In your opinion, are the following problems present in the centralized water supply of your community.

Problems	Is a problem as of 2014 survey results	Is a problem as of 2018 survey results
Poor conditions/depreciation of the system, frequent failures	96.0%	68.0%
Seasonal unequal supply/interruptions	84.0%	48.0%
Low water pressure in the system	92.0%	44.0%
Problems of water quality	84.0%	40.0%

2.7 Customers in the 11 towns and villages in 2018 experienced on average 36 percent less interruption in their water supply compared to 2014. In addition, problems with water pressure in the 11 towns and villages has been reduced by 50 percent since 2014. Similarly, problems with water quality in the three sub-service areas have also been reduced by 50 percent since 2014. However, in two villages (Ayntap and Hayanist) customers continue to suffer from poor quality water causing illnesses and costly expenses for medicines and purchase of safe drinking water.

2.8 There is still a significant difference between answers of the employees of “Veolia Djur” CJSC and community representatives. The issues related to unequal supply, interruptions, low water pressure and poor quality of water were mentioned more often by the community representatives. The employees of “Veolia Djur” CJSC mention the poor conditions/depreciation of the system, frequent failures, incomplete coverage of services, problems related to water meters and payments - more often than the experts representing the community’s administration (See Table 4.).

Table 4. Q3. In your opinion, are the following problems present in the centralized water supply of your community. (2018)

Problems	Is a problem according the “Veolia Djur” employees	Is a problem according community representatives	Total
Poor conditions/depreciation of the system, frequent failures	88.9%	56.2%	68.0%
Not full coverage of the residence with services	33.3%	12.5%	20.0%
Problems related to water meters	33.3%	6.2%	16.0%
Seasonal unequal supply/interruptions	44.4%	50.0%	48.0%
Frequent/daily or weekly interruptions	11.1%	18.8%	16.0%
Short duration of water supply per day	22.2%	31.2%	28.0%
The supply schedule hours are not convenient for residents	11.1%	18.8%	16.0%
Low water pressure in the system	22.2%	56.2%	44.0%
Problems of water quality	11.1%	56.2%	40.0%
Problems with the payments of fees	33.3%	12.5%	20.0%

2.9 In 2014, experts mentioned positive changes in the system over the last years. The majority of experts (17 of the 25 experts) mentioned that some improvement of the centralized water supply in their towns and villages had taken place over the last two years. In 2018, six of the 25 experts (all employees of “Veolia Djur” CJSC) mentioned significant improvements in centralized drinking water supply since 2015/2016, and ten experts mentioned that the system was somewhat improved. Seven experts reported no changes.

2.10 The comparison of the data collected in 2014 and in 2018 show that there are ongoing improvements in the water supply system. In particular, the technical condition of the system and the situation with water meters had significantly improved since 2014 and further improvements were evidenced by the experts in 2018. Also in 2018, more experts than in 2014 mentioned the improvement of the pressure of the water in the system and of the quality of the supplied water. (See Table 5.).

2.11 Furthermore, in 2018 service coverage for residents and problems with seasonal supply/interruptions of water supply had improved somewhat or significantly according to 13 of the 25 experts. The situation with daily interruptions of water supply had improved according to 12 of the 25

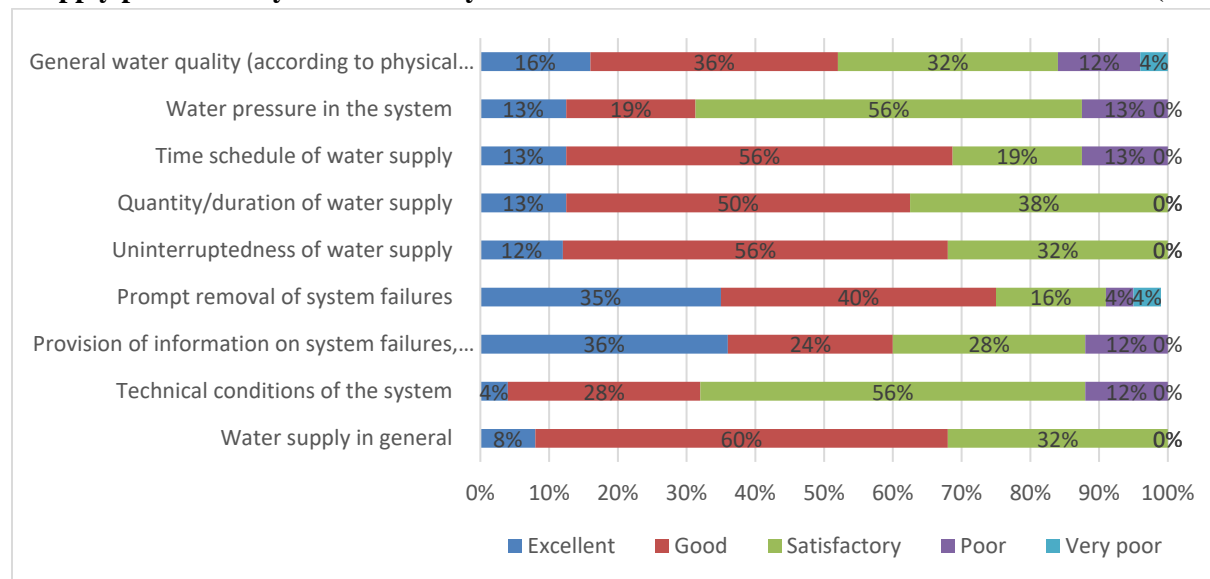
experts interviewed. Twelve experts also reported improvements with payments of fees, and improvements in the availability/duration of water supply was reported by 11 of 25 experts.

Table 5. Q7. In your opinion, has the community centralized drinking water supply undergone general changes since 2015/2016 when the former utility AWSC was supplying water and currently when that is done by Veolia Djur.

Improvements	As of 2014 survey results	As of 2018 survey results
of the technical condition of the system	52%	12%
of the situation with water meters	56%	36%
of pressure of the water in the system	44%	56%
of the quality of the supplied water	24%	48%

2.12 The evaluation of centralized drinking water supply provided to the towns and village ' residents and the conditions of the water supply in 2018 are presented in Diagram 1. In general experts rated the principle conditions of the water supply as between excellent and satisfactory.

Diagram 1. Q6. Please evaluate the current (general) condition of centralized drinking water supply provided to your community's residents and some of its individual characteristics. (2018)



2.13 A worsening of the water supply system was, however, reported in the two villages in the Ararat marz (Hayanist and Ayntap villages). The head of Hayanist village reported worsening of: (i) service coverage; (ii) general water quality; and (iii) daily interruptions of water supply. In Ayntap village the: (i) general quality of water; and (ii) seasonal supply/interruptions of water supply had worsened:

“Water is available only when scheduled, the water has a bad taste, the pressure is low, and accidents are common.” (Ararat marz, Ayntap village, community administration secretary)

“The centralized water supply system is very poor. The water is dirty and useless.” (Ararat marz, Hayanist village, community leader)

“The residents see that there are water losses, the pipes are of poor quality, the water leaks and can’t be used, but the resident is charged nevertheless.” (Ararat marz, Hayanist village, executive director of community association)

2.14 In these villages that have problems with water supply, the hygienic conditions and health of the population are affected. Both villages (Ayntap and Hayanist) reported that the consequences of the problems with the centralized water supply affect the residents’ living standards. Experts from Ayntap and Hayanist villages reported that the health of the residents is affected as a consequence of the problems with the water supply:

“Children get stomach infections because of the bad water quality.” (Ararat marz, Hayanist village, community leader)

“The water is very bad, some people say that they found worms in their water, which obviously affects their health.” (Ararat marz, Ayntap village, community leader)

“The water pressure is very weak, and a pump is required to use it, showering is impossible, of course this is a hygiene issue.” (Ararat marz, Hayanist village, executive director of community association)

2.15 The expert from Ayntap village mentioned that the problems with water supply also affect the financial situation of the households:

“Population has financial problems since drinking water has to be purchased. The children get sick easily because of the bad quality water.” (Ararat marz, Ayntap village, community administration secretary)

2.16 In addition, the lifestyle of the population is also affected because of the frequently interrupted water supply. In Sasunik village it is inconvenient, in the Mughni village supply is very limited:

“Water is available from 12:00 to 17:00, it’s not convenient. During that time most of the community residents are at work and can’t collect the water, this severely affects the living conditions.” (Aragatsotn marz, Sasunik village, economist at community administration)

2.17 Nevertheless 18 of the 25 experts mentioned that the situation with water supply does not affect the residents’ living standards. According to the qualitative data collected in 2018 the situation related to drinking water differs in different towns and villages. The town of Masis and the village of Dashtavan – have seen major improvements in their water supply since 2014. For example, the pipes in Dashtavan village (Ararat marz) have been changed recently, which improved the water supply in the community. Masis town is supplied with spring water since 2017, when the drinking water supply underwent general changes and is now coordinated by “Veolia Djur” CJSC. Before 2017 the Masis sub-project area was supplied only with artesian well water. Now the area is supplied with spring water for about eight months of the year. In summer the water quality is poorer because it still comes from artesian wells. The artesian water is harder and tastes and smells worse. The experts from “Veolia Djur” were stressing the changes and improvements in the water supply system, but were aware of the necessity of further improvements:

“Today the situation is quite good, there have been some changes concerning both the quality of water and the water schedule.” (Armavir marz, Ejmiatsin city, “Veolia Djur” West branch manager)

“When “Veolia Djur” started to manage the community water supply the conditions got better, they developed real improvement programs, the quality increased, the schedule got better and some pipes got fixed.” (Armavir marz, “Veolia Djur” Ejmiatsin branch manager)

“Apart that we inherited the system in bad condition from the past, “Veolia Djur” fixed a lot of the problems, there are many improvements at the end of the year: increase in water quality, decrease in accident rate, water schedule improvements. I think that we need to change the whole system.” (Armavir marz, Ejmiatsin city, “Veolia Djur” West branch administrator)

2.18 The experts from “Veolia Djur” also stressed the interrelation between electricity and water supply:

“There are water supply problems in some districts of Ashtarak city. The pumps are working bad because the power outages are often.” (Aragatsotn marz, Ashtarak city, specialist at “Veolia Djur” Ashtarak branch)

2.18 Ten of the 25 experts in eight^{viii} (two cities and six villages) report the poor quality of the pipes. In these towns and villages, between five and 20 percent of the service area cope with the issue of poor quality of the pipes. In some cases, the pipes are old, in other communities the pipes are very thin. In both cases the situation results in frequent failures and accidents if the water pressure is too high. While if the pressure is too low, the population does not receive water at all. Two of the 25 experts from Masis city and Aintap village mentioned that the pipes were seriously damaged, and people were forced to change the pipes themselves. In such cases the quality of the pipes is usually not satisfactory. Furthermore, the bad quality of the pipes results in water wastage:

“The pipes are of the bad quality, if the pressure increases there are more accidents, the pipes explode and when it’s lower the water doesn’t get to us.” (Ararat marz, Darbnik village, Chief of community staff)

“The water pressure is low because the pipes are thin, the pipes are only 2 inches thick, thicker pipes are needed to achieve higher water pressure.” (Ararat marz, Dashtavan village, community leader)

“The pipes are seriously damaged. Most of the population are forced to change the pipes themselves.” (Ararat marz, Ayntap village, community administration secretary)

2.19 Problems concerning water fees were also discussed. In some cases, there are misunderstandings caused by the transition period of the water supply system from AWSC to “Veolia Djur”, but in most cases the problems are caused by water losses. On the other hand, the representatives of “Veolia Djur” reported that it is difficult to charge fees for water while many residents claim that there are delays with addressing their complaints about water supply or quality. The population of Hayanist and Aintap villages are not satisfied because they have to pay for bad quality water and for the water that leaks from the system. The residents of Ayntap village have paid the January and February fees to AWSC. But “Veolia Djur” which started to work in January and considers the January and February fees unpaid:

“The community paid the January and February fees to AWSC, but Veolia started to work in January and considers the January and February fees unpaid. But the people have their coupons and they say that they have already paid the fees.” (Ararat marz, Ayntap village, community leader)

“There are water leaks because of the bad pipes, but we still have to pay.” (Ararat marz, Ayntap village, community leader)

3. Basic findings concerning the sewage systems

3.1 Only five (three towns and two villages^{viii}) have a sewerage systems. There is a complete or partial coverage of households by the centralized sewage system in these towns and villages. This situation has

not changed since 2014. However, in Masis town and two villages (Sasunik and Karbi) the state and working of the sewerage system is described as poor or broken. No significant changes in sewage system were mentioned by the respondents.

3.2 There are severe problems with the sewage system. Most of the problems are caused by damages and wear in the system. Drainage pipes don't work, cleaning stations are not working:

“The system is worn, the sewage pipes should be changed.” (Aragatsotn marz, Ashtarak city, specialist at “Veolia Djur”Ashtarak branch)

“The sewage collector is in very poor condition; the cleaning station doesn't work. These are important problems that have to be fixed.” (Aragatsotn marz, Ashtarak city, engineer at “Veolia Djur”Ashtarak branch)

“Most part of Masis city has a sewage system, but the water cleaning station doesn't work now, it has been rummaged. The collector of the cleaning station is corroded and can't be used. The first pumping station of the cleaning station is in very poor condition. The waters are spilled into different open pools before reaching the cleaning station. Sewage spillages into open fields result in sanitary problems.” (Ararat marz, Masis city, “Veolia Djur”, Ost branch deputy director)

“The sewage pipes are very old, the cleaning stations aren't managed, the community pays itself to have the pipes cleaned.” (Aragatsotn marz, Sasunik village, economist at community administration)

“Veolia Djur” supplies the water, but water drainage, according to them is not their responsibility, as a result the community gets no financial support for the services and is forced to clean the drainage pipes himself 2 times a year so that the residents can have clean water.” (Aragatsotn marz, Karbi village, community leader)

“Drainage pipes don't work, cleaning stations are not working.” (Aragatsotn marz, Ashtarak city, Mughni district, director of the “Improvement” community organization)

3.3 The situation is somewhat better in Echmiatsin town, where the sewage system was not properly maintained until January 2017. But, after that “Veolia Djur” started to operate the sewage system and some improvements were made:

“It took us 4-5 months to clean the sewage system. Now the system is significantly better.” (Armavir marz, Ejmiatsin city, deputy director at “Veolia Djur” West branch)

3.4 Some of the experts also highlighted that the residents are not using the sewage system properly, which results in accidents:

“Most of the sewage problems are caused by the residents, they might throw diapers in it, or plant trees right on top of the sewage pipes, their roots grow into the pipes and damage them.” (Aragatsotn marz, Ashtarak city, Mughni district, Ashtarak community deputy mayor)

4. Data on additional questions concerning expectations

4.1 In 2018, several questions regarding planned or expected changes/improvements in the water supply system, and water and waste water tariffs had been added to the questionnaire. Only two experts (both employees of “Veolia Djur” CJSC) mentioned that they were aware of future adjustments and

changes (increases) in the water and wastewater tariff. In their opinion the changes in tariffs depend on the electricity tariffs and inflation. If the electricity tariffs increases, which is highly possible, the water and waste water tariffs will consequently have to be increased. Inflation will also result in an increase of water and waste water tariffs.

4.2 Only three experts (all employees of “Veolia Djur” CJSC) mentioned that they were informed about future changes in the water supply services. In particular, in meter reading, billing system and in water fee collection. The expectations are that water meters will be sealed. The further automation of the water meters is also expected.

Attachment I. Questionnaire for Expert Opinion Survey

Expert Assessment Questionnaire for Community Drinking Water Supply and Sewage System

Questionnaire number

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Marz

<i>Title</i>	<i>Marz code</i>

Settlement

<i>Title</i>	<i>Settlement code</i>

Settlement type

	<i>1. City 2.Village</i>

Respondent

	<i>Name, surname</i>
	<i>Position</i>

Interviewer

--	--

Name, surname

Code

Responsible

/ /

 Name, surname Signature

Date of interview

				2	0	1	
day		month		year			

Dear respondent, your community residents use centralized drinking water supply services provided by "Veolia Djur" CJSC. You, ex officio, are well aware of the situation and problems related to drinking water in your community and its residents. Thus, we kindly request you to provide some evaluations on centralized drinking water supply and sewage, access to drinking water, its sources and quality and some other relevant issues.

1. Please assess the share of your community's population that is served by centralized water supply system.

1. Up to 20%
2. 21- 40%
3. 41-60%
4. 61-80%
5. 81-100%

2. Please mention the sources of drinking water in your community and evaluate them based on the extent of their use among community residents. Interviewer: for the first column, obtain answers to all sub-questions. Then, classify the lines in the second column, where the answer to the first column is "1", by the extent of use through ascribing the value "1" to the most important one and continuing accordingly.	1. Yes 2. No	Classification by extent of use, 1 for most widely used
1. Centralized water supply system	1	2
2. Well		
3. Deep/artesian well		
4. Natural spring		
5. Collected rainwater		
6. Purchased bottled water		
7. Water purchased from vehicles with tankers		
8. Open/surface water: lake, river, water reservoir, stream, etc.		
9. Other _____/mention/		

<p>3. 3_1. In your opinion, are the following problems present in the centralized water supply of your community? 3_2. Please, classify the existing problems by their level of importance for your community and its inhabitants.</p> <p><i>Interviewer: for the first column, obtain answers to all sub-questions. Then, classify the lines in the second column, where the answer to the first column is "1", by the level of importance through ascribing the value "1" to the most important one and continuing accordingly.</i></p>		<p>1. Is a problem 2. Not a problem</p>	<p>Classification of existing problems by level of importance, 1 as the most important.</p>
		3_1	3_2
1	Poor conditions/depreciation of the system, frequent failures		
2	Not full coverage of the residence with services		
3	Problems related to water meters		
4	Seasonal unequal supply/interruptions		
5	Frequent/daily or weekly interruptions		
6	Short duration of water supply per day		
7	The supply schedule hours are not convenient for residents		
8	Low water pressure in the system		
9	Problems of water quality		
10	Problems with the payments of fees		
11	Other _____/mention/		

4. Now, please describe the following in more detail: a) general situations related to drinking water in the community; b) general situation related to centralized water supply system in the community; c) its existing problems (their causes, forms of manifestation).

***Interviewer:** this is an open question, summarize the answer immediately or make notes and record the answer to make a summary later.*

5. In your opinion, what are the consequences of the existing problems of centralized water supply from the viewpoint of residents' living standards?

***Interviewer:** this question has to be asked if for at least one sub-question of the question 3 has the answer "1". This is an open question, summarize the answer immediately or make notes and record the answer to make a summary later.*

6. Please evaluate the current (general) condition of centralized drinking water supply provided to your community's residents and some of its individual characteristics. Interviewer: <i>obtain answers to all sub-questions.</i>		Evaluation 1. Excellent 2. Good 3. Satisfactory 4. Poor 5. Very poor
1	Water supply in general	
2	Technical conditions of the system	
3	Provision of information on system failures, interruptions and operation of the system to the population/customers.	
4	Prompt removal of system failures	
5	Uninterruptedness of water supply	
6	Quantity/duration of water supply	
7	Time schedule of water supply	
8	Water pressure in the system	
9	General water quality (according to physical properties. Taste, smell, cleanliness, simplicity, warmth, etc.)	

7. In your opinion, has the community centralized drinking water supply undergone general changes since 2015/2016 when the former utility AWSC was supplying water and currently when that is done by Veolia Djur?	1. Yes, significantly improved 2. Yes, somewhat improved 3. No, not changed → 9. 4. Yes, somewhat worsened 5. Yes, significantly worsened	<input type="checkbox"/>
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8. In your opinion, especially what characteristics changed, and in what way? Interviewer: <i>obtain answers to all sub-questions.</i>		Evaluation 1. significantly improved 2. somewhat improved 3. not changed 4. somewhat worsened 5. significantly worsened
1	Technical conditions of the system	
2	Coverage of the residence with services	
3	Situation related to water meters	
4	Situation with seasonal supply/interruptions of water supply	
5	Situation with daily interruptions of water supply	

6	Time schedule of water supply	
7	Water pressure in the system	
8	General quality of water (taste, smell, cleanliness, clarity, etc.)	
9	Situation with the payments of fees	

9. Have you been informed about future adjustments (increases) in the water and wastewater tariff?	1. Yes	<input type="checkbox"/>
	2. No → 12.	

10. Do you expect any changes in the water and wastewater tariff in the near future?	1. Yes	<input type="checkbox"/>
	2. No → 12.	

11. What kind of changes do you expect?

Interviewer: this is an open question, summarize the answer immediately or make notes and record the answer to make a summary later.

12. Have you been informed about future changes in the water supply services?	1. Yes	<input type="checkbox"/>
	2. No → 19.	

13. Have you been informed about future changes in meter reading?	1. Yes	<input type="checkbox"/>
	2. No → 15.	

14. What kind of changes in meter reading do you expect?

Interviewer: this is an open question, summarize the answer immediately or make notes and record the answer to make a summary later.

15. Have you been informed about future changes in billing system?	1. Yes 2. No → 17.	<input style="width: 30px; height: 30px;" type="checkbox"/>
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16. What kind of changes in billing system do you expect?

Interviewer: this is an open question, summarize the answer immediately or make notes and record the answer to make a summary later.

17. Have you been informed about future changes in water fee collection?	1. Yes 2. No → 19.	<input style="width: 30px; height: 30px;" type="checkbox"/>
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18. What kind of changes in water fee collection do you expect?

Interviewer: this is an open question, summarize the answer immediately or make notes and record the answer to make a summary later.

19. Is your community connected to the centralized sewerage system?	1. Yes 2. No → End	<input style="width: 30px; height: 30px;" type="checkbox"/>
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20. Please assess the share of your community's population that is served by centralized sewerage system.	1. Up to 20% 2. 21- 40% 3. 41-60% 4. 61-80% 5. 81-100%	<input style="width: 40px; height: 40px;" type="checkbox"/>
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21. Please evaluate the current general condition of centralized sewerage system of your community.	1. Excellent 2. Good 3. Satisfactory 4. Poor 5. Very poor	<input style="width: 40px; height: 40px;" type="checkbox"/>
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22. In your opinion, has the community centralized sewerage system undergone general changes since 2015/2016 when the former utility AWSC was supplying water and currently when that is done by Veolia Djur?	1. Yes, significantly improved 2. Yes, somewhat improved 3. No, not changed 4. Yes, somewhat worsened 5. Yes, significantly worsened	<input style="width: 40px; height: 40px;" type="checkbox"/>
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23. Now, please describe in more detail the general situation related to sewerage system in the community, its existing problems (their causes, forms of manifestation).

Interviewer: this is an open question, summarize the answer immediately or make notes and record the answer to make a summary later.

Thank you

Attachment II. List of the Expert interviewed for the Expert Opinion/Evaluation Survey

	2014		2018	
Experts from water utilities				
Settlement	Expert's name	Expert's position	Expert's name	Expert's position
Ashtarak	Shahen Udumyan	Ashtarak town municipality staff member	Shahen Udumyan	“Veolia Djur” CJSC, Ashtarak branch, specialist
	Arsen Abrahamyan	AWSC Ashtarak branch, team leader	Alvard Khojoyan	“Veolia Djur” CJSC, Ashtarak branch, specialist
	Artem Khachatryan	AWSC Ashtarak branch deputy head	Ashot Grigoryan	“Veolia Djur” CJSC, Ashtarak branch, engineer
Echmiatsin	Aleksan Petrosyan	AWSC Echmiatsin branch, team leader	Edgar Hayrapetyan	“Veolia Djur” CJSC, West branch, deputy director
	Khosrov Babayan	AWSC Echmiatsin branch, team member	Arthur Poghosyan	“Veolia Djur” CJSC, Ejmiatsin branch, manager
	Arthur Tumanyan	AWSC Echmiatsin branch, head	Qnarik Hayrapetyan	“Veolia Djur” CJSC, West branch, administratot
Masis	Andranik Gevorgyan	AWSC Masis branch, team member	Gabriel Meliksetyan	“Veolia Djur” CJSC, Ost branch, deputy director
	Vardan Karakhanyan	AWSC Masis branch, team member	Vardan Margaryan	“Veolia Djur” CJSC, team leader
	Samvel Hambardumyan	AWSC Masis branch, team leader	Nshan Minasyan	“Veolia Djur” CJSC, Masis branch, operations manager
	2014		2018	
Community leaders and other officers				
Settlement	Expert's name	Expert's position	Expert's name	Expert's position
Sasunik	Arman Margaryan	Community leader	Arman Margaryan	Community leader
	Sveta Gevorgyan	Community council member	Sveta Gevorgyan	Economist at community administration

Ohanavan	Aleksan Aleksanyan	Community leader	Aleksan Aleksanyan	Community leader
	Paruir Matevosyan	Community council member	Paruir Matevosyan	Deputy head of the community
Karbi	Karo Bagdasaryan	Community leader	Karo Bagdasaryan	Community leader
	Grigor Gasparyan	Community council member	Grigor Gasparyan	Accountant at community administration
Mughni	Harutun Baghdasaryan	Ashtarak Community deputy head	Vardan Safaryan	Ashtarak Community deputy head
	Petros Zorabyan	Head of community-based non-profit organization «Improvement»	Petros Zorabyan	Head of community-based non-profit organization «Improvement»
Aintap	Samvel Sahakyan	Community council member	Karen Sargsyan	Community leader
	Karine Arzumanyan	Community council staff manager	Astghik Sargsyan	Community council staff manager
Dashtavan	Serozha Khachatryan	Community leader	Vardges Khanagyan	Community leader
	Anna Kocharyan	Community council member	Anna Kocharyan	Accountant at community administration
Darbnik	Azat Khachatryan	Community leader	David Gziryan	Community leader
	Ira Arakelyan	Community council member	Alik Harutunyan	Community council staff manager
Hayanist	Balabek Sarkisyan	Community leader	Balabek Sarkisyan	Community leader
	Movses Stepanyan	Community council member	Armine Khanoyan	Director of community associatio

^{vi} The experts meant that the natural spring water is supplied through the centralized water supply system.

^{vii} The problems with pipes were mentioned in eight cities and villages: Ashtarak city, and Sasunik, Karbi, and Mughni villages, Masis city and Aintap, Hayanist, and Darbnik villages.

^{viii} 5 out of 11 beneficiary communities - Ashtarak, Masis, Echmiatsin towns and Karbi and Sasunik villages - are connected to the centralized sewerage system.

Appendix D. Armenia's Experience with Water Public-Private Partnerships (2000-2017)

Seventeen Years (2000-2017) of Private Public Partnerships (PPPs) in the Water Sector^{ix}			
The first PPP with the Yerevan Water & Sewerage Enterprise (YWSE) in 2000 was preceded by two years of preparation assisted by the World Bank and a Consulting Firm that prepared the bidding documents and process. During that time the Government of Armenia also passed some 20 legal acts regarding metering; billing; revenue collection and taxation to support the PPP program and the move toward financial sustainability and operational efficiency. The Government of Armenia also created the State Committee for Water Economy (SCWE) as the sole shareholder of the five public water utilities. Subsequently in 2003, the Public Services Regulatory Commission (PRSC) was created with responsibilities for issuing permits and approving tariffs.			
PPP Contract	Key Features	Parallel Capital Expenditure Program	Remarks
(1.1) 2000-2005. The Yerevan Water & Sewerage Enterprise (YWSE) entered into a 4-year management contract with ACEA of Italy. The contract was extended by one year. This was the first of the first-generation PPP arrangements (1.1).	The YWSE serves 1.2 million subscribers in the capital Yerevan. ACEA took over operations and maintenance in June 2000. The contract included 93 Key Performance Indicators (KPIs) monitoring among other: supply duration; fee collection; meter installation; staff productivity; customer debt forgiveness and, electricity consumption. Even though Armenia had one of the highest Non-Revenue Water (NRW) losses (up to 85%) as a consequence of the dilapidated network build in the 30 th – no indicators for NRW were included.	Municipal Development Project (MDP) IDA US\$28 Million – 1998-2006. The MDP financed the management contract and capital investment for the rehabilitation of water systems and an Operating Investment Fund to support short-term expenditures	YWSE registered improvements in operational and financial performance including a major reduction in electricity costs, but made no dent in NRW. It failed also in delivering the hoped-for improvement on the financial situation of the utility.
(1.2) 2006-2016. The YWSE entered into a 10-year lease contract with CGE/Veolia of France	The contract required the operator to finance minor investments by setting aside portion of the tariff revenues and had to pay a leasing fee to SCWE. The operator had flexibility in implementing the Capex. The contract required greater emphasis on subscriber service.	(i) Yerevan Water & Waste water Project (YWWP) – IDA US\$20 Million. (ii) EBRD-EIB-EU Yerevan Water Supply Improvement – US\$21 Million (iii) Yerevan Water Sector & Waste water Improvement – France – US\$27 Million	No improvement in NRW were made, but water service in Yerevan became fully self-financed by 2011. Sixty five percent of subscribers said that water system management had improved.
(1.3) 2004-2008. The Armenia Water & Sewerage Company (AWSC) entered in to a management contract with SAUR of France. The contract was extended to 2012.	The AWSC serves about 0.62 million subscribers in 320 cities 37 urban centers and 283 urban communities located to the west of Yerevan. AWSC's network was dilapidated and assets had been poorly maintained. In 2002 the Government of Armenia restructured AWSC balance sheet through write off of debt and reduced liabilities. The contract comprised fixed fees and performance incentives.	(i) Municipal Water & Waste water Project IDA – US\$43 Million - 2004-2011. (ii) Armenia Lake Sevan Basin Environmental Project (ALSEP) US\$9.5 Million 2006-2017	Continuity and quality of the water supply improved significantly as a result of repairs of leaks, modernizing reservoirs, efficient pumps and reducing illegal connections.
(1.4) 2012-2015. The SCWE in late 2011 changed the management contract for AWSC with SAUR into an enhanced	The EMC provided strong monetary incentives to enhance performance. In addition, second generation reforms (in support of	(i) Municipal Water Project (MWP) – IBRD – US\$15 Million – 2012-2015	The MWP is the subject of the IEG/PPAR. The focus of the PPAR is to assess the reasons and

<p>management contract (EMC) adding performance incentives</p>	<p>improving the utility's sustainability) would be undertaken in parallel with MWP's implementation including tariff increases beginning in 2014 (policy letter of 2012 issued by the Deputy Prime Minister)^x. Moreover, also parallel with MWP's implementation, the World Bank continued to support sector reform with two operations. A US\$75 million Development Policy Operation signed in 2014 which was contingent upon the Government of Armenia's adoption of an Action Plan on Drinking Water Sector Reform and tender of a transaction advisor for a national lease contract. The Action Plan was adopted in the August 2014 Government Decree No. N883-N. In addition, the World Bank's Public-Private Infrastructure Advisory Facility (PPIAF) financed a Water Sector Tariff Study which was published in 2014.</p>	<p>(ii) EBRD-EIB-EU Armenia Small Municipalities Water Project (AMWP) 2011-2015. US\$22,15Million? (iii) KfW - Credit - US\$13 Million (iv) ADB – Credit – US\$38.5 Million? (Total US\$88.65 Million)?</p>	<p>consequences of transitioning from a management to an enhanced management contract and derive lessons from this experience for PPRs in the water sector.</p>
<p>(1.5) 2009-2016. The three regional utilities of Shirak, Lori & Nor Akung that served some 0.3 million subscribers in regional parts of the country entered into a management contract with <i>Kreditanstalt für Wiederaufbau</i> (KfW) of Germany</p>	<p>KfW financed the contract to the tune of US\$74 million. The management contract included 10 KPIs. Municipalities were represented on the board and management of the utilities causing (undue) interference. A 2013 amendment introduced penalties. In 2014 the contract was renegotiated and SAUR joined as lead private operator.</p>	<p>KfW financed the communal infrastructure programs with US\$70.0 Million.</p>	<p>Progress was made on duration, bill collection and meters, but smaller than under other contracts.</p>
<p>(2.1) 2017-2032. The Government of Armenia entered into a national lease contract covering all five utilities serving some 2.2 million subscribers. This is the first of the second-generation PPPs.</p>	<p>The contract features a new national tariff for water and sewerage.</p>	<p>In parallel with the national lease the Government of Armenia prepared the Water Supply & Sanitation Strategy & Finance Program 2017-20132 costing US\$628 Million. So far Donors have committed US\$200 Million for the first year of the program. In contrast to earlier contracts where the management partner managed the capital expenditure (Capex) programs financed by the Government of Armenia and Donors under the national lease, the SCWE will manage the Capex.</p>	

^{ix} The Annex is derived from "Marin, Philippe, Dambudzo Muzena and Andranik Andreasyan 2017 *Review of Armenia's Experience with Water Public-Private Partnerships* World Bank, Washington, DC.

^x Tariff reforms were, however, postponed till after MWP's closing.

Appendix E. Borrower Comments

Dear Ms. Makino,

In response to your letter dated June 14, 2018 to the Ministry of Energy Infrastructure and Natural Resources requesting to review the World Bank draft Project Performance Assessment Report on Municipal Water Project (IBRD -P126722) we would like to inform you that Ministry has no comments and suggestions within its jurisdiction.

Sincerely,

Arthur Grigoryan
Minister of Energy Infrastructure and Natural Resources

Dear Mrs. Makino,

Hereby I refer to your letter No. WB-116/18, dated June 14, 2018 on "Municipal Water Draft Project Performance Assessment Report". Taking this opportunity, the RA Ministry of Finance would like to highlight the importance of the World Bank financed projects in development of different sectors of the Armenian economy. In particular, projects addressed to the rehabilitation of water systems (irrigation system, water supply, drainage) are considered as one of the priorities for the communities of the Republic of Armenia. As for the RA Ministry of Finance, we have reviewed the Draft Project Performance Report and hereby inform you that we are responsible only for the financial aspect of the mentioned project, that is the co-financing of the project, disbursements and debt obligations and we do confirm that the MoF obligations have been done in a duly manner. Please accept our highest consideration.

Keen regards,

Larisa Harutyunyan, PhD
Head of Foreign States and International Organizations Cooperation Division
International Cooperation Department
Ministry of Finance
Republic of Armenia