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PROJECT PERFORMANCE ASSESSMENT REPORT

UZBEKISTAN

**WATER SUPPLY, SANITATION AND HEALTH PROJECT
(LOAN 4261)**

and

**BUKHARA AND SAMARKAND WATER SUPPLY PROJECT
(LOAN 46650, CREDIT 36200, TF-54224)**

June 24, 2015

... Currency Equivalents

Currency Unit (US\$)=Country Currency (Uzbekistan Sum (UZS))

1997	US\$ 1.00 = UZS	58
2002	US\$ 1.00 = UZS	693
2009	US\$ 1.00 = UZS	1,399
2010	US\$ 1.00 = UZS	1,625
2014	US\$ 1.00 = UZS	2,410

Abbreviations and Acronyms

ADB	Asian Development Bank
CAS	Country Assistance Strategy
CDD	Community-driven development
CPS	Country Partnership Strategy
EIRR	Economic internal rate of return
ESMAP	Energy Sector Management Assistance Program
EU	European Union
FIRR	Financial Internal Rate of Return
HH	Household
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association
ICRR	Implementation Completion and Results Report
IEG	Independent Evaluation Group
KfW	Kreditanstalt für Wiederaufbau
KPI	Key performance indicators
lpcd	liters per capita per day (water use)
M&E	Monitoring and evaluation
O&M	Operation and Maintenance
PIU	Project Implementation Unit
PPAR	Project Performance Assessment Report
QAG	Quality Assurance Group (of the World Bank)
QSA	Quality of Supervision Assessment (by QAG)
RKKP	Republic of Karakalpakstan
SES	Sanitary Epidemiological Services
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
VK(s)	Vodokanal(s) – local government service providers
WSS	Water Supply and Sanitation

Fiscal Year

Government: January 1 –December 31

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This report was prepared by Ms. Midori Makino and Mr. George T. Keith Pitman who assessed the project in October 2014. The report was peer reviewed by Oscar Alvarado and reviewed for the IEG Panel by Robert Lacey. Romyne Pereira provided administrative support.

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Principal Ratings

Uzbekistan: Water Supply, Sanitation and Health Project - P009121

	ICR*	ICR Review*	PPAR
Outcome	Moderately Satisfactory	Satisfactory	Moderately Satisfactory
Risk to Development Outcome	Substantial	Moderate	Moderate
Bank Performance	Moderately Satisfactory	Satisfactory	Moderately Unsatisfactory
Borrower Performance	Moderately Satisfactory	Satisfactory	Moderately Satisfactory

* The Implementation Completion Report (ICR) is a self-evaluation by the responsible Bank department. The ICR Review is an intermediate IEGWB product that seeks to independently verify the findings of the ICR.

Uzbekistan: Bukhara and Samarkand Water Supply Project - P049621

	ICR*	ICR Review*	PPAR
Outcome	Moderately Satisfactory	Moderately Unsatisfactory	Moderately Satisfactory
Risk to Development Outcome	Moderate	Significant	Moderate
Bank Performance	Moderately Unsatisfactory	Unsatisfactory	Unsatisfactory
Borrower Performance	Moderately Unsatisfactory	Unsatisfactory	Moderately Satisfactory

* The Implementation Completion Report (ICR) is a self-evaluation by the responsible Bank department. The ICR Review is an intermediate IEGWB product that seeks to independently verify the findings of the ICR.

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About this Report

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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 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 Bank department. The PPAR is also sent to the borrower for review. IEG incorporates both Bank and borrower comments as appropriate, and the borrowers' comments are attached to the document that is sent to the 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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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 Bank country and sectoral assistance strategies and corporate goals (expressed in Poverty Reduction Strategy Papers, Country Assistance Strategies, Sector Strategy Papers, and 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.

Bank Performance: The extent to which services provided by the 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 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 is a Project Performance Assessment Report (PPAR) of two projects in the urban and rural water and sanitation sectors of Uzbekistan supported by the World Bank and other development partners.

The Water Supply, Sanitation and Health Project was approved in August 1997 for a total cost of US\$ 117.00 million, and was supported by an International Bank for Reconstruction and Development (IBRD) Loan of US\$ 75.00 million. The project was restructured on July 12, 2005 at the request of the Borrower and some disbursements also became ineligible for Bank-financing. In all, US\$16.62 million of the Loan was cancelled. The Kuwait Fund for Arab Economic Development provided parallel financing of US\$19.36 million equivalent. Total project cost was US\$78.80 million and the project closed in June 2008, two-and-a-half years later than planned.

The Bukhara and Samarkand Water Supply Project was approved in March 2002 for a total cost of US\$62.33 million, and was supported by an IBRD Loan of US\$20.00 million and an IDA Credit of US\$20.00 million that grew to US\$23.64 million due to appreciation of Special Drawing Rights against the US\$. It was supported also by parallel financing from the Government of Switzerland in the amount US\$10.00 million equivalent. At closing, three years later than planned in June 2010, US\$0.52 million of the Loan was cancelled and total project costs was US\$ 58.79 million.

The assessment is based on a review of all relevant documentation, interviews of Bank staff at headquarters and in the country office, and the findings of an Independent Evaluation Group (IEG) mission that visited Uzbekistan in October 2014. Project performance was discussed with government, state and municipal officials engaged with the projects, representatives of donors, staff of the Bank resident mission and other stakeholders. The list of persons met during the mission is attached in Annex B and their cooperation and assistance in preparing the report is gratefully acknowledged.

Lessons learned from this assessment will be used as inputs into IEG's forthcoming review of the World Bank Group's assistance to the water and sanitation sector.

Copies of the draft PPAR was sent to government officials and implementing agencies for their review and no comments were received.

Summary

This report provides an assessment of two water supply projects located in western and central Uzbekistan. The Water Supply, Sanitation and Health Project was implemented in the western part of the country over the period 1997-2008, including a two-and-half-year extension, and there have been no follow-on projects. The Bukhara and Samarkand Water Supply Project was focused on urban water supplies in those two cities and was implemented over the period 2002-2010 including a three-year extension.

Water Supply, Sanitation and Health Project objectives were to improve water supply, sanitation, and health in the Project area through: (a) the provision of safe drinking water and sanitation facilities; and (b) the strengthening of the financial, operational, and managerial capacities of water supply and sanitation utilities. It had five components and the primary focus and bulk of project expenditure was on rehabilitating water supplies in three major cities and rural areas in western Uzbekistan. A secondary focus was provision of demand-driven rural sanitation and a program of hygiene education. These efforts were supported by technical assistance, support for project management in the utilities and refinancing of the preceding pilot project.

The relevance of objectives of the Water Supply, Sanitation and Health Project is rated High. Project objectives were straightforward and highly relevant to improving social and productive infrastructure in rural communities and towns most adversely affected by the Aral Sea environmental crisis. The objectives' focus on service provision, and building capacity to ensure sustainable infrastructure, wisely avoided the more complex issue of systemic institutional reform of the sector that the government was still formulating in the mid-1990s. Objectives remain highly relevant to the FY12-15 Country Partnership Strategy that supports the government's objective to reduce regional and rural-urban inequities, including two of four priorities: providing more accessible quality and sustainable health services, especially in the rural areas; and continuing to improve the coverage and sustainability of potable water supply and sanitation services.

The relevance of design is rated substantial. The design included a results framework that provided a logical sequence of inputs, activities and outputs required to mostly achieve the intended outcomes. A Pilot Water Supply Project improved the design and implementation arrangements for the project through a "learning by doing" approach and testing cost recovery schemes. The community-driven development (CDD) model used to design sanitation, health and hygiene component was relevant but required more capacity building efforts for it to work in Uzbekistan. While design of this component was based on the Bank's experience in Nepal, India and Peru, it overlooked the lack of a community self-help culture and state dominance in decision-making. Thus there was insufficient attention to building capacity to enable inclusion of CDD in the local institutions responsible for project implementation and their coordination with the supply-driven approach of the implementing state organization responsible for decision-making. Because of these problems, the hygiene and rural sanitation components were effectively dropped in 2001 when the technical assistance contract was cancelled by the government. Subsequently in 2005 the government

decided to utilize UNICEF and other grant financing instead of the relatively high-cost IBRD Loan to finance these activities.

The project substantially achieved its water supply objective but made little progress on the sanitation and health objectives. The project provided improved water supply and security to about 1.04 million people. This is a third less than the target of 1.5 million as a result of the reduction in expenditure due to cancellation of part of the loan and the poor performance of the rural hand-pump program. About 0.2 million people gained new access to water supplies and 0.8 million people had their water supply rehabilitated. Some 80 percent of all beneficiaries were more securely supplied with water either through pipeline distribution systems or from electrically pumped wells. Rural access rates in the project area increased over the life of the project from 29 percent to 46 percent and urban access rates remained at about 76 percent. Since the end of the project in 2008, rural access rates further increased to 55 percent.

The sub-objective to strengthen financial, operational, and managerial capacities of water supply and sanitation utilities was achieved. A parallel Asian Development Bank (ADB) project (2002-2012) in the same region, with similar institutional development objectives, contributed to the assessed outcomes. Although restructuring of the six separate water utilities took place five years later than scheduled, it was fully implemented by March 2005 at which time the six original water utilities were reorganized into three with significant economies-of-scale. Unaccounted-for-water was significantly reduced and this, with greatly increased water tariffs and improved billing and bill collection systems, enabled the water utilities to increase their incomes.

As a result of reforms and capacity-building, the *urban water utilities* are able now to just balance operating income and operating expenses without subsidies. The income-cost balance is much less sanguine for the *rural water utility* whose operating income only covers 61 percent of its operating costs even with subsidies. When depreciation is taken into account none of the utilities is financially viable in the medium to long-term without central government support for operations, replacement and new investment –support that the central government is able and willing to provide.

On a per-capita cost basis actual costs were US\$45 compared with the appraisal estimate of US\$58. The project's financial rate of return is estimated at 13 percent. The impact of the corruption probes instituted by the government, replacement of the project implementation unit's staff in 2002 and enhanced vigilance on procurement issues almost stopped disbursement for 2.5 years and required an extension of the project's closing date. While these implementation delays allowed governance and procurement to improve and this enabled the disbursement to slowly accelerate from 2005, on balance, the overall efficiency is rated modest.

The overall outcome of the project is rated moderately satisfactory. Risks to development outcomes are rated moderate given the government's strong and continued support for the sector. Notwithstanding these good outcomes Bank performance is rated moderately unsatisfactory because of failure to enforce a Bank's safeguard policy and to restructure the project after cancellation of some of the Loan. Borrower performance is rated moderately satisfactory.

The Bukhara and Samarkand Water Supply Project had three development objectives: to rehabilitate and improve the efficiency of existing water supply facilities and infrastructure in Bukhara and Samarkand; strengthen the institutional capacity of these two cities; and strengthen the utilities' financial capacity through improved financial management and commercial practices. The bulk of project spending was on rehabilitating water supply infrastructure and employment of a private sector Operator under a service contract, and the project included technical assistance and support for the government's project implementation unit. A parallel Swiss Grant provided additional consultants' inputs to aid monitoring and also pumping plant and water meter calibration facilities. Two follow-on projects continue, inter alia, to support institutional capacity-building in those two cities, and have contributed to assessed outcomes.

The relevance of project objectives is rated substantial as they directly addressed the technical and managerial challenges of reversing the rapidly deteriorating water and sanitation services in Uzbekistan in the decade since independence. Project objectives remain relevant to the government's own strategies for the urban water supply sector and the Bank's current Country Assistance Strategy at appraisal and currently. The project was also aligned with government's strategic objective to develop Bukhara and Samarkand into international tourist destinations.

Project design was substantially relevant and logical but it made unrealistic assumptions about the availability of baseline data, the institutional setting and local buy-in to the employment of a foreign private sector Operator to catalyze management reform. Specifically, design underestimated the importance of a learning partnership approach in favor of an externally imposed one, and did not include means to change local perspectives such as twinning and working with sister utilities in Europe or elsewhere.

The desired project outcomes were substantially achieved even though the Operator's service contract was made ineffective by the utilities' legal problems (unrelated to the project) that severely constrained cash flows and emoluments. While the Operator's service contract was not renewed in 2007 they had transferred enough managerial knowledge, skills and computerized financial management and billing systems to enable the utilities, albeit with some delay, to achieve most of the objectives by 2010. Water distribution systems were successfully rehabilitated and the number of connections increased. The targets for reducing unaccounted-for-water were met and water loss per connection was reduced by 30 percent in Bukhara and 73 percent in Samarkand. Energy efficiency targets were unrealistic and could not be achieved.

Institutional and managerial performance was improved. Both water utilities substantially achieved four of the five measures intended to improve their financial capacity. There was an aggressive reduction of system inefficiencies (water losses, energy inefficiency, low revenue collection, and water wastage) to reduce costs of operations. A commercial strategy aimed at eliminating unregistered connections and users, and building trust in the community through better water supply and customer service was successfully rolled-out. A strategic and cost-effective metering policy, linked with a customer relations plan and greatly increased water tariffs, boosted

revenues. Modern financial management, accounting, and commercial systems and procedures allowed the utilities to make better policy and tariff recommendations to the Government and implement effective commercial actions. Although actions to collect better information on the fixed assets were partially implemented, realistic valuation of assets has yet to occur.

The evidence indicates substantial improvement in management of operations and revenue collection. Both Bukhara and Samarkand closed the gap between operating costs and revenue, but Bukhara remains dependent on government subsidies to remain financially viable in the short to medium-term. The utilities financial performance remains heavily influenced by Government directives over which they have no control but which adversely affect their commercial performance. Government directives govern depreciation policies, foreign exchange losses, and interest on borrowings. Thus, financial autonomy remains elusive since they cannot control or influence many key financial parameters.

The overall outcome of the project is rated moderately satisfactory. Risks to development outcomes are rated moderate given government's strong and continued support for the sector.

Bank performance suffered from the problems of poor project design, exacerbated by very high turnover of headquarter supervisory staff that led to lack of proactivity and delayed decision-making. Despite the extraordinary efforts of in-country staff in the latter part of the project these were too late to redress earlier problems. Overall Bank performance is rated unsatisfactory.

Borrower performance was mixed, the lack of consistent implementation support and proactivity of key issues before 2007 was latterly offset by the good performance of the utilities and strong government support for tariff increases. Overall, borrower performance was moderately satisfactory.

Lessons

The key lessons derived, based on the findings of this PPAR, are the following:

- **When designing infrastructure and service provision projects within the context of a regional environmental crisis it is essential to minimize objectives and keep them focused on interventions the borrower will support.** In this case, driven by the Aral Sea crisis, the Water Supply, Sanitation and Health Project overly emphasized the need to mitigate a range of ill-defined public health problems when even provision of basic services like potable water supply was in jeopardy.
- **Adoption of community driven development models in a country where the culture of community self-help lacks prominence may require additional capacity-building efforts.** In the case of Uzbekistan, the well-established community-driven model for implementing the sanitation, health, and hygiene components, based on the experience in Nepal, India, and Peru experienced

difficulties. This was due to the insufficient attention paid to building the capacity in the local institutions responsible for project implementation, especially since the community-centric culture did not exist in the country. The project however benefited from an extensive series of six social assessments, as these assessments clearly demonstrated that consulting communities in the design of pilot projects put pressure on authorities to give greater attention to the scale and cost of projects.

- **The practicality and realism of bringing about institutional strengthening of a developing country’s main utilities through a performance-based management contract needs very careful appraisal.** The Bank needs to adopt a flexible approach that can strengthen operating performance of the utility’s business in key areas without imposing unacceptable foreign management. In the case of the Bukhara and Samarkand, the foreign Operator (with hindsight) did have a very positive impact on modernizing and providing a commercial orientation to the utilities. However, socio-political factors ignored at appraisal, and exacerbated by the imposed Court judgment beyond the control of the implementing agencies, clouded judgment during implementation and at closing about the effectiveness of this arrangement. This is because the private sector model antagonized the implementing agencies and had left a lingering resentment on the value-added by the private sector. This is particularly egregious given that the municipality-appointed utility staff, following capacity-building through the operator, has subsequently demonstrated their ability to manage the utilities effectively and sustainably.
- **Introduction of private sector or NGO participation in a new socio-political environment requires continuity of specialist Bank supervision and the right mix of skills.** In the case of both projects the annual turnover of task team leaders led to a lack of proactivity on critical institutional issues that exacerbated delays and hindered the Bank’s effectiveness and efficiency.
- **Proper tariff setting and demand management efforts are critical factors that lead to expansion in customer base and increased revenues for the utilities.** In the case of Water Supply, Sanitation, and Health project, greater attention was paid to securing financial viability under the new decentralized arrangements. Activities included periodic water tariff increases proposed by the regional government for central government approval, and simplification of tariff structure. The project was also successful in demand management through physical actions to reduce water losses, creating and updating a water user database, metering, and financial incentives to conserve water. Once staff was trained, equipment procured and public awareness was raised, the demand management program was mainstreamed in all three utilities. As a result, the customer base was expanded and revenues were increased, leading to improvements in financial viability of the utilities.

- **Financial autonomy is important for long-term sustainability of water utilities.** The Buhkara and Samarkand Water Supply Project managed to increase water metering significantly through various measures, leading to enhanced collection of revenues. However, due to lack of financial autonomy, the utility is experiencing difficulty collecting the arrears from government institutions. This is likely to adversely affect the utilities' commercial performance if the government does not address the utilities' autonomy issue soon.

Caroline Heider
Director-General
Evaluation

1. Background

Country Context

1.1 Uzbekistan's population increased from 20.5 million in 1990 to 30.7 million in 2014 and accounts for about half of Central Asia's total population. Following independence in 1991, the Government of Uzbekistan's development strategy has delivered consistent economic growth and gradual reforms. In contrast to many other former Soviet Union countries this approach has eased the social costs of transition and reduced vulnerability to external shocks. Poverty has declined steadily, from 27.5 percent of the population in 2001 to 19.5 percent in 2010. Gross domestic product growth has been robust since the mid-2000s—averaging 8 percent annually through 2011, thanks to favorable terms of trade for the country's key export commodities (copper, gold, natural gas and cotton), effective macro-economic management, and limited exposure to international financial markets. Uzbekistan's vision is to become an industrialized, high middle-income country by mid-21st century.

Sector Background

1.2 Soon after independence the Republic of Uzbekistan launched a strategy in 1993 for economic reform in the public utilities sector and to rehabilitate decaying public service infrastructure, particularly in its municipalities. Public infrastructure assets had been systemically neglected by the centralized service providers that relied on government to pay for capital programs and for operations and maintenance. The strategy included sector reorganization, decentralization of responsibilities to the local authorities, new pricing and cost-recovery mechanisms, and encouraging private sector participation in developing the country's infrastructure.

1.3 As a result, the Ministry of Public Utilities was restructured into a State Agency for Public Utilities (*Uzkommunkhizmat*) in 2000. Its goals were commercializing the activities of municipal and rural service providers, coordinating reforms, establishing itself as regulator and monitoring compliance of the local authorities and commercial entities with sectoral legislation. Responsibility for water distribution has been decentralized to local governments and their utilities (*Vodokanals, VKs*), and policies have been enacted in pursuit of better availability, quality, and sustainability of services. Management responsibility for long-distance and inter-provincial bulk water transport and treatment remained with the central government, and inter-regional water allocation remains the responsibility of the Ministry of Agriculture and Water Resources.

1.4 Uzbekistan has a predominantly desert climate and only 10 percent of the land is cultivated, the majority in the fertile valleys of the Amu Darya and Syr Darya rivers that flow some 1,200 km east from the mountains to the Aral Sea depression. Most of the population live near these major rivers and inter-regional pipelines deliver potable water to consumers in cities, towns and some villages. With few exceptions, the more

remote and thinly populated western rural areas rely on groundwater that in the west becomes increasingly saline, thus making local desalination necessary.

1.5 The period 1990-2010 saw the proportion of people with access to improved water supplies decline from 90 to 87 percent even though an additional 5.4 million people gained improved access over that period.¹ Most of the increased number was in rural areas where access expanded from 12.3 million to 17.3 million people. Even so, access rates decreased from 85 to 81 percent of the rural population – as did the proportion with piped household supplies that fell from 37 to 26 percent – because rural population growth outstripped growth of improved water supplies and the ability to maintain them. In contrast, urban access grew from 97 percent to 99 percent over the two decades and household piped connections remained at the 85-86 percent level. Those without household piped connections rely on tankers and wells for water.

1.6 In contrast to water supplies, access to modern sanitation increased in both rural and urban areas. Nationally almost a third of the 2010 population gained access to improved sanitation over the previous 20 years and coverage reached 100 percent.

1.7 Although the country was proactive in attending to infrastructure needs and increased access, the limited capacity of sector institutions to maintain, renew, and expand such assets had led to an effective degradation of access to good quality water supply and sanitation services. The situation was particularly dire in rural areas where previously served communities often have to cope with chronic service breakdown or no service at all. Even when piped water supply is available it is often of low quality.

1.8 In response to these challenges, the World Bank has been active in the water supply and sanitation sectors since the early 1990s mainly under the umbrella of the Aral Sea Program.² The two projects that are the subject of this PPAR were the first two full-scale projects of six Bank projects to assist the sector, Table 1.

1. ICPD 2012. International Conference on Population and Development, Uzbekistan Country Implementation Profile. May 2012.

2. The Aral Sea Program, initiated in 1994, includes all riparians: Kazakhstan, Uzbekistan, Tajikistan, Kyrgyzstan, and Turkmenistan. The Program's four objectives included stabilizing the environment of the Aral Sea Basin, rehabilitating the disaster area around the sea, improving the management of the international waters of the Aral Sea Basin, and building the capacity of institutions at the regional and national level to advance the program. The project area of the Water Supply, Sanitation and Health project lies adjacent to the southern parts of former Aral Sea

Table 1: The World Bank’s Water Supply and Sanitation Portfolio in Uzbekistan

<i>Dates</i>	<i>Project Title</i>	<i>Total Cost US\$ millions</i>	<i>Bank Credit/Loan US\$ millions</i>
1996-2000	Pilot Water Supply	5	3
1997-2009	<i>Water Supply, Sanitation and</i>	79	58
2002-2010		63	43
2010-2015	<i>Bukhara and Samarkand Water</i>	66	55
2011-2017		100	88
2012-2017	Bukhara and Samarkand Sewage	138	82
	Syr Darya Water Supply		
	Alat and Korakul Water Supply		

2. Water Supply, Sanitation and Health Project

2.1 The project planned to reach 1.6 million people who are located in two separate provinces of Uzbekistan that have differing water supply institutions. About 60 percent of the target population lives in the semi-autonomous Republic of Karakalpakstan that accounts for more than a third of the county’s area. Most of these beneficiaries are located in Amu Darya delta at the southern end of the former Aral Sea. The remaining 40 percent of beneficiaries are located in and around the floodplains of the Amu Darya River in the adjacent and relatively densely populated Khorezm Oblast to the southeast.

2.2 Half the population in the Republic of Karakalpakstan (RKKP) and three-quarters of the population in Khorezm Oblast live in very small rural communities associated with former state farms. Average family sizes are larger than the national average of 6.9: ranging from 7.6 in the Republic to 7.1 in Khorezm.

2.3 The project was Component 5.1 of the Aral Sea Program whose aim was to improve the health of the population in the region - 1.2 million people living in rural areas and 0.4 million urban residents. The focus was on providing increased access to improved, adequate, safe, and reliable water supply services. About 50,000 rural and peri-urban inhabitants were to be provided with improved sanitation facilities.

2.4 Inter-regional and provincial bulk water supply was managed by two independently managed agencies that sell their water to the urban and rural utilities for distribution.³ Both bulk suppliers take their water from a common diversion point in the Tuyamuyun reservoir on the Amu Darya River. While they share trunk pipelines, they manage their own pumping plant and water treatment facilities. Tuyamuman Urgench supplies water to Khorezm Oblast and was an organization supported by the government budget within the then Ministry of Communal Services. Tuyamuman

3. Bulk water utilities provided 70 percent of urban water supply and 96 percent of rural water supply in Khorezm Oblast. In contrast, in RKKP bulk water utilities provided 55 percent urban water supply only 13 percent of rural water supply. The balance of water supplies in both areas was mostly from local surface water resources (rivers and canals) and groundwater.

Nukus was the bulk water supplier to the Republic of Karakalpakstan (RKKP) and is overseen by the Republic of KKP's own Ministry of Communal Services.

2.5 The urban water distribution companies are overseen by the provincial governor who is the first gatekeeper for tariff setting. At the time of appraisal, rural water supply distribution utilities were the responsibility of the Ministry of Agriculture in RKKP and the Ministry of Communal Services in Urgench.

2.6 Each bulk supplier received subsidies that covered about 70 percent of its costs of operation. Bulk supply tariffs were subsidized to compensate for high pumping costs, operation and maintenance (O&M), and normal depreciation, the latter being based on historic costs despite rampant inflation. Payment for bulk water from the two water utilities was supposed to make up the difference, but arrears meant that only maintenance of essential plant was undertaken while routine maintenance was postponed.

2.7 Unlike bulk suppliers, water distributors received no central government subsidies. Distributors' water tariffs were reviewed directly by provincial governors before being approved in Tashkent. Special tariffs were levied for different user groups such as teachers and those in the medical services, and for different types of organizations. Universally the revenue from urban water sales was totally inadequate to cover all costs, and this led to deferred maintenance and difficulty in expanding networks to meet the demands of a growing customer base. Consequently, the inclusion of a study to rationalize tariff-policy and introduce global knowledge on institutional strengthening via international consultants was highly relevant.

Objectives

2.8 The Staff Appraisal Report (SAR) states that the project has two objectives:

"The first is the provision of safe drinking water along with improved hygiene education and sanitation facilities for the Republic of Karakalpakstan and Khorezm Oblast. Specifically, this objective would decrease the incidence of water-borne diseases among the population, particularly diarrheal diseases among children. The second objective is to strengthen institutional capacity for management, operation and financial performance of the regional water supply and sanitation utilities as well as the regional Centers of Health and the Sanitary Epidemiology Stations."

2.9 The Loan Agreement provides a less complex description of objectives:

"To improve water supply, sanitation, and health in the Project area through: (a) the provision of safe drinking water and sanitation facilities; and (b) the strengthening of the financial, operational, and managerial capacities of water supply and sanitation utilities."

2.10 This assessment is made against the objectives described in the Loan Agreement.

COMPONENTS AND COSTS

2.11 The project comprised five components as summarized in Table 2.

Table 2: Project Components and Costs

<p>1. Water Supply and Distribution – <i>Planned US\$ 68.2 million; actual US\$ 58.4 million.</i></p> <p>(a) Main Pipeline Supply System. Replacement or rehabilitation of sections of the water distribution systems and water rural distribution centers in the project area, rehabilitation of two and expansion of one water treatment plants and of five ground water sources; and installation of one new trunk pipeline.</p> <p>(b) Development of Local Water Supply and Distribution Systems. Spare parts and training of operators for about 300 desalinization units; rehabilitation and development of ground water sources and expansion of demand-based rural water supplies.</p> <p>(c) Water Demand Management and Loss Reduction. Metering trials to test different approaches to metering water usage, a consumer-awareness program to assist reduction of losses and optimization of water use and design and implementation of leakage reduction program.</p> <p>(d) Equipment for Operation and Maintenance.</p> <p>2. Sanitation, Health and Hygiene – <i>Planned US\$ 11.2 million; actual US\$ 2.3 million.</i></p> <p>(a) Provide Rural Sanitation. Provide about 7,500 improved latrines and hand-washing facilities, covering about 5 percent of the rural population in both regions. 20 percent of the construction costs were to be contributed by beneficiaries. Provide also equipment, transportation, consultant services and training for rural, community-based committee members and other staff in management and low-cost sanitation technologies.</p> <p>(b) Promote Health Promotion and Hygiene Education. This was to complement the community-based sanitation and hand-pumps sub-components. It included also the costs of an inter-sectoral committee to review and assist project activities.</p> <p>(c) Improve Water Quality Monitoring and Strengthen Sanitary Epidemiological Services (SES) for households and communal facilities. Institutional and organizational efficiency to be improved through better M&E and integrating regional data reporting into the project's Geographic Information System on a demonstration basis.</p> <p>3. Technical Assistance Component - <i>Planned US\$8.2 million; Actual US\$5.6 million.</i></p> <p>(a) Institutional Strengthening of Water Utilities and Bulk Providers. To enable a program for regular preventive maintenance, monitoring and reduction of operating costs and reduction and management of accounts receivable. It included design and operation of a utility accounting system, including cost accounting, and local and foreign training programs.</p> <p>(b) Tariff Study. Lay the foundation for the introduction of new water and sewerage tariff rates for the various consumers groups through use of consultancy services and new office equipment.</p> <p>(c) Refinancing Feasibility Study carried out by the Kuwait Fund.</p> <p>4. Management, Design and Supervision – <i>Planned US\$8.4 million; actual US\$9.4 million.</i> This supported the Project Implementation Unit (PIU), consultant services, and support staff.</p> <p>5. Refinance Pilot Water Supply Project - <i>Estimated US\$5.0 million; Actual US\$3.2 million.</i> The Pilot project had funded the construction of a self-managed water supply scheme in the peri-urban areas of Nukus and the preparation of detailed designs and bid documents by foreign consultants.</p>

PROJECT FINANCING

2.12 The project was restructured on July 12, 2005 at the request of the Borrower and some disbursements also became ineligible for Bank-financing. In all, US\$16.62 million of the Loan was cancelled and US\$ 58.38 million was disbursed. Bank lending was to be complemented by co-finance from the Kuwait Fund for Arab and Economic Development and the German Development Credit Institution (KfW). However, KfW executed its financing of US\$19.36 million independently as parallel financing through the Ministry of Foreign Economic Relations, Investment, and Trade. The Kuwait Fund was similarly managed. A parallel UNDP grant of US\$0.45 million in 2000 supported technical and administrative assistance for the Project implementation Unit when recruitment of international consultants encountered delays. The Borrower contributed US\$15.76 million, 24 percent more than planned.

Relevance

OBJECTIVES

2.13 **The relevance of objectives is rated High.** Project objectives were straightforward and highly relevant to improving social and productive infrastructure in rural communities and towns most adversely affected by the Aral Sea environmental crisis.

2.14 The objectives' focus on service provision, and building capacity to ensure sustainable infrastructure, wisely avoided the more complex issue of systemic institutional reform of the sector that the government was still formulating in the mid-1990s. Subsequently, objectives have remained relevant to the government's Welfare Improvement Strategy – the equivalent of a Poverty Reduction Strategy Paper – for the period 2007-2010. Objectives are currently relevant to the updated 2013-2015 Strategy⁴ prepared in partnership with the United Nations Development Programme, the World Bank, ADB, and other international organizations. In 2008 the Government completed a national inventory of water supply and sanitation (WSS) services that has made investment to improve services a priority over the next ten years.

2.15 Project objectives remain relevant to Uzbekistan's National Water Supply and Wastewater System Development and Modernization Plan (2009–2020). This aims to achieve 100 percent water supply coverage in most urban areas and 85 percent in rural areas by 2020. Additionally, the Plan includes improved operational efficiency of WSS services by reforming institutional structures, and operation and management of the water supply and sanitation agencies. Presidential Decree 1446 (December 2010)

4. Section 5.8 of the Strategy outlines the priority actions that include increasing accountability of service providers, clear and accountable tariff setting, improvement of billing and collection, introduction of incentives to improve efficiency by implementing public-private contracts between local authorities and providers, and development of mechanism to provide targeted support to the poor in regards to utility payments.

ordered an investment program involving 38 major water supply and sanitation schemes with an investment requirement of over \$300 million per year over the period 2011-2015.

2.16 The objectives were relevant to the World Bank's 1998 Country Assistance Strategy (CAS), the CAS FY02-04 and the Interim CAS FY06-07 that emphasized supporting long-term actions that would enhance the efficiency of resource allocation for social infrastructure and services with a focus on health, water supply and education. The CAS FY09-11 gave priority under its second objective to improve water supply and health. Objectives remain highly relevant to the FY12-15 Country Partnership Strategy (CPS) Results Area 4 that is supporting the government's objective to reduce regional and rural-urban inequities, including two of four priorities: providing more accessible quality and sustainable health services, especially in the rural areas; and continuing to improve the coverage and sustainability of potable water supply and sanitation services.

DESIGN

2.17 **Relevance of Design is rated Substantial.** The results framework provides a logical sequence of inputs, activities and outputs required to achieve the intended outcomes.

2.18 A Pilot Water Supply Project sought to improve the design and implementation arrangements for a follow-on project through a "learning by doing" approach; speed up the implementation of the full-scale project through early completion of detailed engineering designs and bidding documents; and develop and test cost recovery schemes. The pilot included a technical assistance component to develop a management and supervision arrangement and prepare detailed engineering designs for the full-scale project. The pilot included also an investment component to rehabilitate a water supply scheme in a peri-urban area.

2.19 The focus on improving organizational and institutional efficiency was highly relevant. The organizational set-up was fragmented and inefficient. There were six water supply utilities serving the two provinces, some centrally budgeted and overseen and some where budgeting and management had been delegated to provincial/local control. Rationalization into fewer utilities was expected to bring about more coherent planning and management and increase efficiency through economies-of-scale.

2.20 The inclusion of engineering rehabilitation was highly relevant to increasing distribution system efficiency, reducing costs and providing incentives to pay for the full cost of water. The very large water distribution systems – 1,742 km for urban areas and 4,680 km for rural – were in a poor state of repair due to deferred maintenance and prone to excessive leakage that exceeded 30 percent. In many places, irregular water supplies⁵ enable ingress of poor quality groundwater into pipelines adding to water quality problems, as well as jeopardizing adequate metering. In urban areas, water

5. Regular summer water supply averaged 17 hours per day in urban areas and 3 to 5 hours in rural areas.

pressure was too low to service apartments above ground level, and taps left open to capture water when it came exacerbated water losses. In addition, some rural distribution networks (in one case up to 600 km) were not connected to the bulk supply pipeline due to lack of financial resources and uncoordinated planning.

2.21 The problem of intermittent water supplies was compounded by lack of funds to address the generally poor quality of water treatment facilities that were outdated and difficult to maintain.⁶ While this was particularly the case for urban centers like Urgench and Nukus, it was also true of the 300 Soviet-era small-scale desalination plants that served small communities in the more isolated rural areas of RKKP.

2.22 The design of the sanitation, health and hygiene components using the community-driven development (CDD) model was relevant given that this model had been demonstrated through the Bank's experience in Nepal, India and Peru. However, it overlooked the lack of a community self-help culture and state dominance in decision-making. Thus there was insufficient attention to building knowledge, capacity and acceptance of CDD approaches within the formal water and sanitation utilities responsible for project implementation.

2.23 Even so, the project design benefited from an extensive series of six social assessments. These assessments clearly demonstrated that consulting communities in the design of pilot projects put pressure on authorities to give greater attention to the scale and cost of projects. Thus, for example, one pilot project demonstrated that when asked to pay, beneficiaries requested that service provision be reduced from the utility design of 350 to 150 liters per capita per day (lcpd). Another pilot, internalizing this issue, chose the diameter of the tertiary network to be 100 mm instead of the official design of 150-175 mm.

Monitoring and Evaluation

2.24 **Design.** The results framework in the Staff Appraisal Report included target values for only some of the outcome indicators. Setting up the M&E arrangements and their implementation was only scheduled to take place in 2000, some three years after the project was expected to become effective. As a result, baseline data for agency performance were very patchy making incremental improvements difficult to evaluate. There were no baseline indicators on health status and desired health outcomes.

2.25 **Implementation.** Generally, once organizational reform was complete, the various water supply utilities were assiduous in collecting input and output indicator data driven by increasingly greater demand for accountability of state resources from the central government agencies for planning, finance and economy. Data to assess project impacts on health were supposed to be collected from government health statistics along with periodic knowledge, attitudes, and practices surveys but this did not happen.

6. Satisfaction with urban piped water quality was 60 percent in RKKP and 49 percent in Khorezm. It was higher for hand-pumped groundwater.

2.26 In the final year of the project a beneficiary survey was designed to capture some of the missing outcome data. This survey adopted a single-difference approach given there were negligible longitudinal data. It used a two-stage sampling process to select 400 sequentially selected random project households and 400 similarly sampled control rayon households for comparative analysis. There is no discussion in either the files or ICR Annex of what steps were taken to match the treatment and control groups and it is not clear if there was selection bias. Households may have been randomly selected for the survey but it is unclear if their assignment to the project was random. While the surveys were utilized by the ICR it is unclear, given the above reservations, how much reliance can be placed on the findings.

2.27 The IEG mission found in 2014 that the rigor of M&E implementation was being maintained and that excellent records are systematically and routinely collected on the engineering, efficiency and financial performance of the water supply utilities. Similarly, the indicators on environmental standards and water quality are systematically collected by the government's Sanitary Epidemiological Services (SES).

2.28 **Utilization.** Although data were collected during implementation, they were used almost exclusively to respond to Bank and Borrower supervision demands and needs for project monitoring data. More in-depth evaluation that could have generated lessons and guided refinements to project implementation was given less attention.

2.29 However, IEG found in 2014 that central government agencies routinely scrutinize monitoring data provided by the utilities to inform national policy and decision-making and provide feedback to utilities to improve their performance. SES is very proactive in ensuring water quality problems at the utility level are being addressed.

Implementation

IMPLEMENTATION ARRANGEMENTS

2.30 The Project Implementation Unit (PIU) was located in the State Committee for Forecasting and Statistics (*Goskomprogostat*) under the Ministry of Economy. Given weak local capacity and unfamiliarity with Bank project requirements, the PIU was to be assisted by the internationally-recruited consultants. With this support it was expected that the PIU would coordinate the consultants responsible for the Sanitation, Health and Hygiene component, the Institutional Strengthening Program, and the Demand Management Program.

2.31 In addition to overall coordination, the PIU was responsible for common implementation functions such as project accounting, procurement, disbursements, consolidation of quarterly and annual progress reports, annual work programs and budgets. At the local level the PIU appointed directors and established two regional offices (in Nukus, Karakalpakstan and Urgench, Khorezm) to act as local coordination agencies and facilitate the coordination between different central, provincial and local government agencies involved in water supply and sanitation.

IMPLEMENTATION EXPERIENCE

2.32 The loan became effective in October 1997. However, weak institutional arrangements for project management by the implementing agency led to delays in procurement of key consultants to assist the PIU and failure to meet some loan covenants, a process not helped by substantial turnover of Task Team Leaders and changes to the composition of Bank's task team.⁷ An early mid-term review was held in November 1999 and this led to a technical assistance agreement with UNDP to assist management of the PIU by the end 1999.

2.33 The task team also commissioned a Supervision Enhancement Review by the Bank's Quality assurance Group (QAG) in early 2000 and the Review recommended more intensive use of local staff at the resident mission for procurement advice. Despite these efforts, chronic procurement problems continued to plague the project and led to long delays in finalizing contracts for project activities. Additionally, a recommendation to seek bilateral grant financing to enable enhanced social assessment and stakeholder consultation was not acted upon.

2.34 Lack of agreement within the Government on implementation arrangements for the sanitation, health and hygiene (component 2), despite recruitment of an international consulting firm, led to the cancellation of the consultant's two-year contract in 2001. Eventually, in 2005, the government requested the Bank to cancel this component and reallocate the funds to other activities. Although this nullified achievement of the hygiene education outcomes that were to support the health sub-objective, and undercut achievement of the sanitation sub-objective, the project was not restructured.

2.35 A corruption investigation by the government resulted in replacement of all of the PIU national staff in May 2002, the cancellation of US\$1.7 million of the Loan for misprocurement in 2003 and a hiatus in project implementation for nearly two years. A further case of fraudulent contracting involving US\$11.3 million for construction of the Urgench water treatment plant was investigated by the Bank and the PIU in 2003 and led to the rebidding of civil works that were successfully completed in 2008, albeit four years behind schedule.

2.36 Following the appointment of new PIU staff in 2004 implementation accelerated. Even so, as a result of earlier implementation problems the project was extended twice. The first extension was for two years to December 2007 to allow for completion of ongoing contracts for civil works and completion of delayed institution strengthening. The second extension of six months to June, 2008 allowed completion of the civil works contract for the Urgench water treatment plant and installation of desalination plants.

⁷ Only one member of the original team continued working on the project after 1998. Overall, there were seven task team leaders over the period of implementation.

Safeguards and Fiduciary Compliance

2.37 **Safeguards.** This was classified as a category B project under OP/BP 4.01 Environmental Assessment. According to Bank records, it complied with Bank environmental and social safeguards during implementation. At negotiations it had been agreed that the dam for the Tuyamuyun Hydro System would be inspected annually by independent experts. A satisfactory inspection report was provided to the Bank in 2000 following a detailed engineering and geodetic evaluation. Subsequent reports were not provided to the Bank as they were considered to be of strategic national security importance - the main dam is located on the river Amu Darya and straddles the border of Uzbekistan and Turkmenistan. The Bank took no further action on this non-compliance.

2.38 **Financial Management.** Project financial management arrangements were rated marginally satisfactory in the last financial management supervision (March 2008). Financial management of the beneficiary water utilities remained unsatisfactory throughout the implementation period in spite of efforts made to strengthen accounting and internal controls. Reflecting serious weaknesses in accounting and internal control systems, audit reports were frequently delayed and often qualified. Audited financial statements of the water utilities and tariff structures also showed noncompliance with the financial covenants.

2.39 Notwithstanding these problems, the fiduciary requirement was met by the project audit that was conducted, covering the period up to the closing in June 2008. The government's PIU audit report was submitted in July 2009 and was satisfactory and unqualified. Audit reports for the various water utilities and project financial statements covering the period to December 31, 2007 and June 30, 2008, were submitted. However, utility audit reports for the 2008 were overdue at closing as the last unqualified audit report submitted was for 2007 when the loan was scheduled to close, and before the six-month extension to June 30, 2008. As there was no possibility of getting the utility audit reports for 2008 (since these audits were financed from the loan) a permanent audit waiver for the two utilities (Nukus and Urgench VKs) was granted by the Bank in December 2009.

2.40 Procurement. A corruption investigation by the Borrower resulted in replacement of all of the PIU national staff in May 2002, and some national staff were jailed. Misprocurement of earth-moving equipment was declared in 2003 and the related portion of the loan was cancelled. A case of fraud was proved on another contract. The Bank undertook investigation of these allegations of fraud and misprocurement, the fraud issue was reported to the Bank's Integrity Vice Presidency, and part of the Loan was cancelled.

Achievement of Objectives

2.41 The outcomes discussed below, whilst mostly contributed by the Bank-assisted project, were also boosted by the inputs of the first six years of the parallel and overlapping 10-year (2002-2012) ADB-assisted Western Uzbekistan Rural Water Supply Project that had almost identical objectives. In addition USAID invested in

improvements to water production capacity and physical efficiency in the RKKP and Khorezm Oblast. The EU and bi-lateral partners also engaged in activities affecting governance and public health in the project area.

Objective: To improve water supply, sanitation, and health in the Project area.

2.42 **Overall, this objective was substantially achieved.** Safe drinking water and sanitation facilities were provided and the financial, operational, and managerial capacities of water supply and sanitation utilities were substantially strengthened. The institutional improvements greatly increased cost-recovery and the financial viability of service provision. Achievements of low-cost sanitation and health hygiene education were less than expected but commensurate with the reduced resources following the borrower's cancellation of related technical assistance and financing. No discernable health improvements can be attributed to the project because of the complexity of factors affecting public health beyond the very narrowly-focused project activities.

OUTPUTS

Institutional Outputs

2.43 **Restructuring/Reorganization.** A Plan for restructuring of the six separate water utilities was prepared and approved at the end of 2002, five years later than scheduled. It was fully implemented by March 2005 at which time the six water utilities were reorganized into three.

2.44 In the Republic of Karakalpakstan two of the three utilities, one the bulk water supplier and the other distributing water to the major cities and towns, were merged into one. The bulk water supplier Tuyamuyan-Nukus and the urban water distribution utility Karakalpakstan Vodokanal merged to become the Tuyamuyan-Nukus (hereafter *Nukus*) water and sanitation utility. The Karakalpakstan Agrovodokanal – now known as *Trest* - remained responsible for rural water supplies. In 2014, at the time of IEG's assessment, the government of the Republic of Karakalpakstan stated that it planned to merge the urban and rural water utilities into one. The Nukus and Trest utilities have adopted common financial principles, operating standards, monitoring and accounting systems and this harmonization will enable significant economies of scale when the merger occurs.

2.45 In Khorezm Oblast the bulk water supplier Tuyamuyun-Urgench, the urban water distributor Khorezm Vodokanal and the rural water distribution utility Khorezm Agrovodokanal were merged into a single water and sanitation utility Tuyamuyan Urgench (hereafter *Urgench*).

2.46 **Institutional Strengthening.** New departments on water demand, loss reduction and a computerized system of billing and receipt of payments were established in the water utilities, and these were linked to interactive GIS and computer-based management systems. Knowledge and capacity was increased through a wide range of technical assistance, including upgrading M&E systems and equipment for water quality monitoring and providing improved legal procedures and documentation of contracts between consumers and water supply organization. The

planned Water Tariff Policy Study was completed by international consultants and approved by the Ministry of Finance.

2.47 Governance. While the utilities were rationalized to achieve harmonization and resulting economies-of-scale, their legal status remained essentially unchanged by project interventions. The Cabinet of Ministers sets policy for water supply and sanitation as well as other municipal services, while the Uzkommunhizmat establishes technical and other norms and gives technical support. Regional and local governments manage and regulate services that are mainly provided by regional government-owned water supply companies. Overall sector regulation remains with Uzkommunhizmat that is responsible for water supply standards, and financial regulation remains with the Ministry of Finance.

2.48 Despite the reforms to policies that affect water supply and sanitation, and decentralization to the local level, the water utilities do not have full autonomy on finances. While the utilities have autonomy through their right to provide water supply and sewerage services, and to bill and collect user fees for services provided, their autonomy is still limited by their inability to set water tariffs, vary costs such as depreciation, negotiate power costs from the government monopoly supplier, or to access credit outside central government.

2.49 Water supply and sewerage tariffs remain in the control of Central government although there is a process of consultation on tariff-setting that takes into account locality, costs of supplying water and investment needs. In the first instance the local government authority, in consultation with the utility, recommends a tariff. This tariff is then submitted by the Regional government to the Ministry of Finance for review and approval. Water tariffs were reviewed and reset once a year until 2009 but thereafter tariffs have been reset twice a year in April and October.

2.50 Demand Management. The project addressed this directly through physical actions to reduce water losses, creating and updating a water user database, metering, and financial incentives to conserve water. Physical actions were undertaken on a demonstration basis in each zone of Nukus and Urgench. Actions included installation of manholes and network water flow monitoring equipment, metering of an individual block of apartments in each zone, and repairing or replacing aged pipework and valves. By this means water losses were halved in areas targeted. Once staff was trained, equipment procured and public awareness was raised, the demand management program was mainstreamed in all three utilities.

Engineering Outputs

Republic of Karakalpakstan

Urban water systems:

- The Republic's capital, Nukus, was provided with 11.25 km of improved trunk water pipeline connecting the north and south parts of the city. Within the city 26.74 km of water distribution pipelines (target 24.5 km) were replaced and households connected. Work on leak detection and repair was carried out. As a

result the water pressure increased allowing water supply to multi-story blocks of flats.

- Two rural towns south of the regional Tuyamuyun-Nukus transmission pipeline were connected via 15.8 km of pipelines and water storage, chlorination plants and distribution centers were installed.

Rural water supply:

- Eight group and 20 local water distribution centers were constructed connecting 112,300 consumers.
- Small-scale desalination plants were replaced and an additional 9 were built and replacement parts to rehabilitate 300 existing desalination plants were provided (Figure 1). This benefited 6,000 consumers.

Figure 1: Worn-out small-scale desalination plants (left) were replaced (right)



Source: IEG 2014. Two left images Kangli Electrodialysis plant; right image Shuyit reverse osmosis plant.

- 51 wells were drilled in four district towns (Beruny, Chimbay, Kegeyly and Turtkul) along with water storage and water treatment facilities. This provided 19,400 m³/day enough for 70-80 percent of the population or about 120,000 consumers.
- Demand-based approaches led to the installation of 115 km of water supply network and household connections. Work also included water distribution centers and automation. It was expected to benefit 26,000 consumers.
- 3,326 medium-lift hand pumps were installed on wells surveyed and developed by the Uzbekistan Hydrogeological Survey.
- A 105 km pipeline proposed to connect the Kungrad water treatment works to the town of Muynak and benefit 13,700 people located at the foot of the former Aral Sea was not constructed as it was not seen as cost-effective. Instead, the town relies on water tankers and local wells

Oblast Khorezm

Urban water systems:

- The provincial capital, Urgench, had 32.58 km of pipeline rehabilitated (target 30.80), an unspecified number of new household connections were made and leak detection and repair were carried out.
- The rehabilitation of the old water treatment plant was cancelled and a new treatment complex drawing water from the Shavat Channel of the Amu Darya was constructed with a capacity of 100,000 m³/day (Figure 2.). Commissioned in 2007, when operating at 75 percent capacity it treats enough water to supply 140,000 consumers. In 2014 it was operating at 75 percent capacity and is in excellent condition. Notably the old plant needed 48 staff to run it; the new plant uses 23. In addition energy use was formerly 500 kWh/day; for the same volume of treatment it is now only 400kWh/day.

Figure 2: Urgench Water Treatment Plant Commissioned 2007



Source: IEG 2014.

Rural water supply:

- 5 rural and 26 local water distribution centers were built benefiting 95,000 consumers.
- No demand-based rural water supply was built.
- Construction of the Chalysh Groundwater Intake was cancelled due to declaration of misprocurement.

Provision of sanitation:

- Improved access to low-cost sanitation was partially achieved - 38,000 compared with the target of 50,000.

OUTCOMES

Water Supply Improved

2.51 **Access to water increased.** The project provided improved water supplies and security to about 1.04 million people. This is a third less than the target of 1.5 million as a result of the reduction in expenditure due to cancellation of part of the loan and the poor performance of the rural hand pump program. It includes 0.2 million people who gained new access to water supplies and 0.8 million people that had their water supply rehabilitated. Some 80% of all beneficiaries were more securely supplied with water either through pipeline distribution systems or from electrically pumped wells.

Table 3: Number of project beneficiaries ('000 people)

	<i>Republic Karakalpakstan</i>			<i>Khorezm Oblast</i>			<i>Total</i>		
	Rehab	New	Total	Rehab	New	Total	Rehab	New	Total
Urban	251	7	258	287	-	287	538	7	545
Rural	<u>145</u>	<u>120</u>	<u>245</u>	<u>142</u>	<u>92</u>	<u>234</u>	<u>287</u>	<u>212</u>	<u>499</u>
Total	396	127	503	429	92	521	825	219	1,044

Source: IEG 2015 based on ICR data and field mission.

2.52 About 239,000 people (or 20% of total project beneficiaries) were provided only with new hand pumps that drew on groundwater sources. At project closing about half of these hand pumps may have been non-operational due to their poor quality construction.⁸ At appraisal it was expected under component 1 that 220,000 people would be supplied from hand pumps to access groundwater, and another 592,000 people were to similarly benefit under component 2. However, as most of component 2 was cancelled, it is inferred that only 3% (about 19,000 people) of its access target was achieved.⁹ Thus the total beneficiaries with operable hand pumps may have been about 139,000 people.

2.53 During the 2014 mission IEG was unable to determine the number of hand pump beneficiaries at closing because all the wells had been handed over to the many local administrations. No systematic records were available in the apex agencies/utilities on their location, utilization or status. The few hand-pump wells in rural areas of KKP seen by IEG were being utilized. The rural utility explained that most people have access to very limited volumes (for human consumption and cooking) of desalinated water from very small-scale desalination plants, some of which were rehabilitated or replaced by the project. The balance of water needs for household tasks is provided from private or local authority wells.

2.54 **The project helped poor households.** While most beneficiaries (618,000 or 53 percent) lived in rural areas, this was less than the target of 73 percent.¹⁰ Even so, poverty targeting was successfully achieved. Random sampling of the project and control areas in 2007 found that project beneficiary households (HH) were generally poorer than in the non-project areas. In Khorezm the project's median HH income was Sum 150,000-200,000 compared with control HHs that were Sum 250,000-300,000. A similar difference in median HH income was found in Karakalpakstan.

2.55 **Household water connections increased.** The share of the beneficiary population receiving piped water supplies (via house and yard connections, standpipes and neighbors) increased from 29% in 1995 to 46% in 2008. In comparison only 32% of the population in 'without project' randomly selected districts (*raions*) had access to piped water supplies in 2008. How much of the incremental difference of 16% is

⁸. ICR paragraph 55.

⁹. This inference was made by IEG at the time the ICRR was reviewed. There is no new evidence to either refute or confirm it.

¹⁰. SAR Table 3.7.

attributable to the project is unknown because of deficiencies in project M&E and baseline data.

2.56 Regularity of water supply. The ICR states that ‘households in project areas tend to have mediocre access - with most households having access no more than 10 hours a day.’ In 2014 RKKP’s Nukus urban water utility stated that 7 districts had 24/7 water supplies while 9 districts received water 12-14 hours per day and never less than 8 hours per day. RKKP’s rural water utility reported that in 2014 typical supply for piped systems was 5-6 hours per day mainly because power outages disrupted pump operation. No data were made available for Khorezm Oblast.

2.57 Water consumption was reduced. For the utilities, the aim was to maintain ex-ante residential supply volumes of 280 liters/capita/day (lpcd) plus an annual growth of 1% when conservation and pricing measures became effective. Water conservation measures and pricing impacts, allied with the loss of industrial demand, were so effective that total water consumption fell by 54% over the period 1994-2008. Even so, per capita consumption levels were above the WHO basic consumption levels (basic access is defined as equal to, or better than, 20 liters per capita per day (lpcd); 50 lpcd is defined as intermediate access).

- Average *urban* residential consumption fell between 1994 and 2008 in the Khorezm’s Urgench utility from 551 to 121 lpcd. In 2013 the average consumption was 115 lpcd.
- In the Nukus utility urban demand dropped from 123 to 74 lpcd. In 2013 it was 96 lpcd.
- Average *rural* consumption also registered a decline in Karakalpakstan. Availability fell from an estimated 98 lpcd in 1998 to 30 lpcd in 2008. The rural utility stated the average consumption of billed water was about 36 lpcd in 2013.

2.58 In districts targeted by the project the beneficiary surveys conducted in 2008 found that 72 percent of households sampled were satisfied with the water service provided compared with only 55 percent in without-project control districts.¹¹ The beneficiary surveys also found that only 11 percent of all project households had to rely on an electric pump to boost water pressure to supply them; in the without-project control households 21 percent needed booster pumps.

2.59 Results on water quality were mixed. At the time the project was closed the Bank’s ICR team could not access water quality information and relied on verbal reports from the SES. On this basis the ICR rated 98 percent of water supplied ‘safe’ for domestic consumption. This value is based on piped water supplies (that was treated, 43 percent of the supply) and pumped groundwater (that was desalinated), and hand-pumped groundwater (that was not treated).

2.60 However, the beneficiary survey of 2008 found that 53 percent of all respondents in both project and non-project households reported that they thought water quality was a problem. At the Oblast level 48 percent of the all respondents in

¹¹. ICR Annex 5.

Karakalpakstan thought that water quality was a problem compared with 58 percent in Khorezm.

2.61 All households cope with drinking water quality problems by boiling water, a practice enabled by the universal supply of cheap natural gas to households. In 2014 officials confirmed to IEG – as did inhabitants in the rural households visited – that all sources of water (pipelines and wells) were boiled before drinking this is a universal practice.

Utility Performance Improved

2.62 The managerial and operational capacities of water supply and sanitation utilities was strengthened and their financial management was improved. There is significantly more up-to-date information available on water utility performance in the Republic of Karakalpakstan than in Khorezm Oblast. Accordingly, the outcomes are discussed and assessed for each of these administrative areas separately.

KARAKALPAKSTAN

2.63 **Expanded Customer Base.** The utilities have been successful in planning and expanding their customer base both during the time of project implementation (1996-2008) and in the period to 2013, Table 4.

Table 4: Water utilities in Karakalpakstan increased their customer base 1996-2013

	<i>Urban</i>			<i>Rural</i>			<i>Total</i>		
	<i>1996</i>	<i>2007</i>	<i>2013</i>	<i>1996</i>	<i>2007</i>	<i>2013</i>	<i>1996</i>	<i>2007</i>	<i>2013</i>
Population (000)	632.0	660.5	797.7	722.0	838.0	895.2	1,354.4	1,494.1	1,692.9
Population with piped water supply (000)	487.7	502.0	605.2	298.0	394.3	488.2	787.7	896.3	1,093.4
Number of Connections	63,600	87,633	110,373	-	-	-	-	-	-
Access rate	77%	76%	76%	41%	47%	55%	58%	60%	65%

Source: IEG 2015 based on SAR (1996 baseline), ICR 2007 data and updated operational data provided by the Nukus and Trest water utilities in 2014. There are incomplete data on rural connections as piped supplies serve individual consumers, communes and standpipes.

2.64 Improved management, whose capacity was built by the project, has enabled the water utilities to continually increase the overall access rate to piped water. The number of new urban consumers grew under the project by 1,273 a year; since project completion until 2014 the rate was 21,667 a year. Even so, the connection rate has only kept pace with population growth and the urban access rate, at about 76 percent, remains constant. In marked contrast, new piped water supplies in rural areas not only managed to keep pace with the growing population, they also steadily increased the rural access rate from 41 percent in 1996 to 55 percent in 2014, a notable achievement fully in line with the project's and government's poverty targeting strategy. The

increase in new rural consumers has remained fairly constant at 96,000 a year under the project and 94,000 a year thereafter to 2014.

2.65 Water Production. Production of water declined during the project as physical water losses were reduced and water demand decreased because of the impact of economic restructuring, greater institutional and household accountability through metering and contracts and increased water tariffs. It was only in 2009, in response to population growth and distribution network expansion, that water production slowly started to increase, Table 5.

Table 5: Water production in urban and rural areas of Karakalpakstan 1996-2013 (Mm3)

	Project			<i>Post-Project</i>					
	<i>1996</i>	<i>2006</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>
<i>Production</i>									
Nukus Urban	63.8	29.6	29.5	28.6	29.6	30.2	31.0	31.4	31.8
Trest Rural	*	*	*	*	2.8	2.8	3.1	3.1	2.8 ^a

Source: IEG 2015 based on SAR (1996 baseline) and updated operational data provided by the Nukus and Trest water utilities in 2014. * There are no complete sets of rural water production data before 2009.

2.66 Economic restructuring during the 1990s greatly changed not only water demand but also its balance among consumers. In Nukus in 1996, for example, domestic water users accounted for only 51 percent of demand, state and government institutions 36 percent, and industry and farms 11 percent. The closure of many state-owned enterprises and budget organizations was so substantial before and during the project period that by 2013 domestic use accounted for 86 percent of demand, albeit some of this demand during summer was for unmetered agricultural use. This change had a marked effect on the utilities' income because, in the past, the state and government institutions and industries had always been poor at paying their water bills even though their water use, unlike domestic consumers, tended to be more closely monitored.

2.67 Accountability Increased. Before the project household water use was determined through either block meters monitoring one or several apartment houses or on the basis of the customer's profile and family size. Estimated water consumption was recorded in each customer's water book and paid monthly to the water utility offices. After the success of the water metering pilots, water metering became national policy. By 2014 some 47 percent of urban and 30 percent of rural customers in Karakalpakstan were metered. Unmetered customers pay a flat rate and a penalty charge for not installing a water meter.

2.68 From December 2013 a Presidential Decree made water metering mandatory for all consumers receiving piped water supplies. Unmetered customers have to pay a penalty of 50 percent over and above the flat rate until a meter is installed. Customers in the poorer rural areas having isolated village water supply systems or standpipes and wells are exempt from the penalty charge but are still expected to pay the flat rate. The cumulative impact of better customer registration and classification, metering, computerized accounting systems and a vigilant and trained inspectorate is that water

billings have improved (Table 6). Collection rates in excess of 100 percent include the payment of earlier default billings.

2.69 On the basis of billed production, unaccounted-for-water was 27.5 percent and 23.7 percent for the Nukus and Trest water utilities respectively, slightly below the appraised project target of 28 percent for the original Nukus urban water utility. There was no target for the Trest rural utility.

Table 6: Water billing and collection rates in Karakalpakstan 1996-2013 (%)

	Project			Post-Project					
	1996	2006	2007	2008	2009	2010	2011	2012	2013
Production Billed									
Nukus	67.4	70.0	71.9	71.7	72.2	72.0	71.8	72.8	72.5
Trest	-	-	-	-	80.8	83.7	80.3	80.0	76.3 ^a
Collection Rate									
Nukus	-	106.7	93.1	104.9	97.4	93.3	102.8	93.0	91.2
Trest	-	-	-	-	91.9	105.4	87.5	95.6	94.0

Source: IEG 2015 based on SAR (1996 baseline), and updated operational data provided by the Nukus and Trest water utilities in 2014. Data on rural billings and collection are not available pre 2009. a/ The reason for the significant drop in production was not stated by the water utility.

2.70 Determining improvements in collection rate over baseline conditions is fraught by the lack of comparable statistics.¹² It is, however, clear that there has been only modest improvement in unaccounted-for-water since project closure.

2.71 **Water tariffs were increased.** At the time of appraisal (1996) water tariffs were very low, particularly for urban consumers. In Nukus, for example, the domestic tariff was Sum 0.22/m³ (US\$0.0004), and the commercial and industrial was Sum 9.64/m³ (US\$0.18).¹³ Thus there was a high cross-subsidy from large-scale consumers (who then accounted for almost half of all water use) to small-scale domestic consumers. The average tariff for rural consumers was Sum 6.98/m³ (US\$0.13).

2.72 During the project, greater attention to securing financial viability under the new decentralized arrangements led to increased water tariffs to meet water production and distribution costs and to induce water conservation in line with best international practice. By 2007 the classification for tariffs was simplified from three to two: one for domestic use, and one for others that included government, commerce and industry. By the end of the project (2008) urban domestic water tariffs had increased by 522 times in nominal terms. Other tariffs had increased 114 times and five-fold respectively.

¹². The SAR (Annex J) used cumulative days receivable for each of the six utilities; such data was not made available to IEG for the three current utilities.

¹³. For urban consumers until 2004 there were three water tariffs, the lowest for domestic use at 60 Sum/m³ (US\$0.06) the next at 750 Sum/m³ (US\$0.71) for collectives and government budget organizations, and the highest for commerce and industry, 915 Sum/m³ (US\$0.86). A similar tariff structure applied to rural consumers.

The drive for cost recovery continued after project closure

2.73 Given that domestic demand has grown to be more than 85 percent of water use, domestic water tariffs have been increased in nominal terms between 2007-2014 by over 400 percent in urban and rural areas (Figure 3). In contrast, given their higher starting base, non-domestic tariffs have increased 170 percent in urban and by 275 percent in rural areas.¹⁴

2.74 Even so, water tariffs for domestic users are lower in urban than rural areas. Clearly, the much higher costs of delivering piped water to rural consumers has been reflected in domestic water tariffs since 2009 and non-domestic tariffs since 2011. At current rates of exchange, domestic water costs are US\$ 0.20/m³ for urban users and US\$ 0.33/m³ for rural users.¹⁵ Non-domestic tariffs are US\$0.78/m³ for urban and US\$0.94/m³ for rural consumers. For comparison purpose, average water costs in the USA are US\$0.40/m³.

2.75 Reflecting improved management and accounting, revenues from water sales increased (Figure 4). Improving cost recovery and revenue is only part of the picture as they also have to be offset by containing costs through higher levels of operational and managerial efficiency.

2.76 **The cost structure of utilities changed.** The structure of operational and other cost data show a gradual improvement in some key indicators over the period 2009-2013 for both urban and rural utilities (Figures 5 and 6). Before the project (1995),

Figure 3: Water tariffs have risen sharply (Sum/m³)

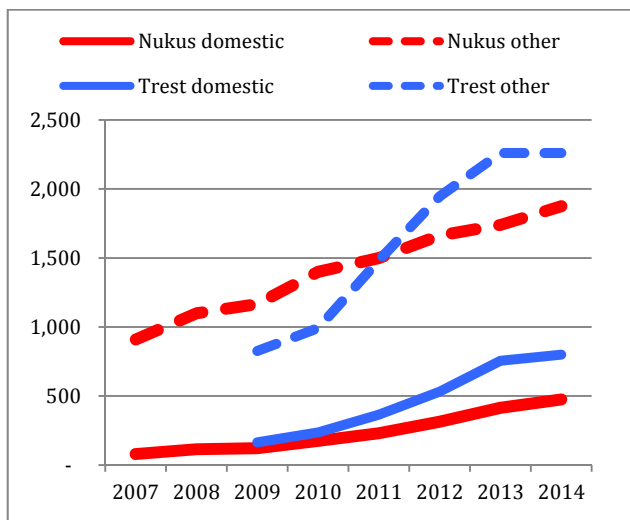
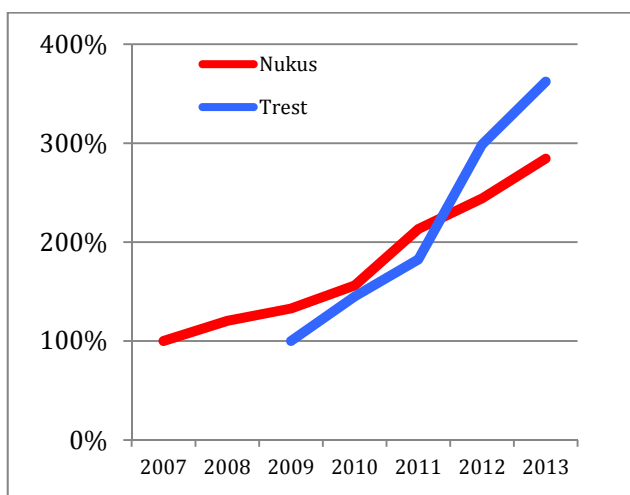


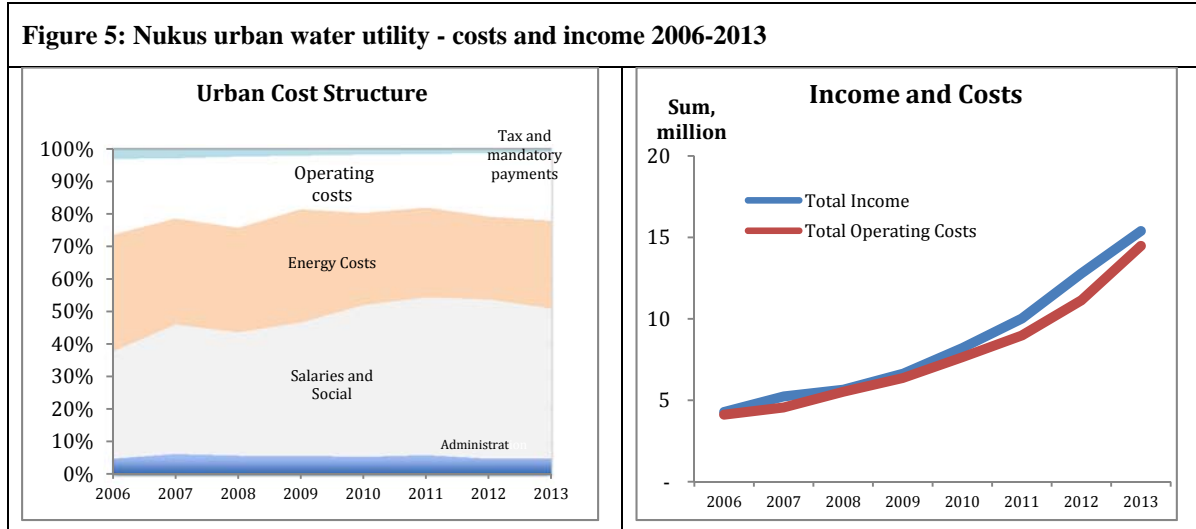
Figure 4: Water revenues have increased significantly



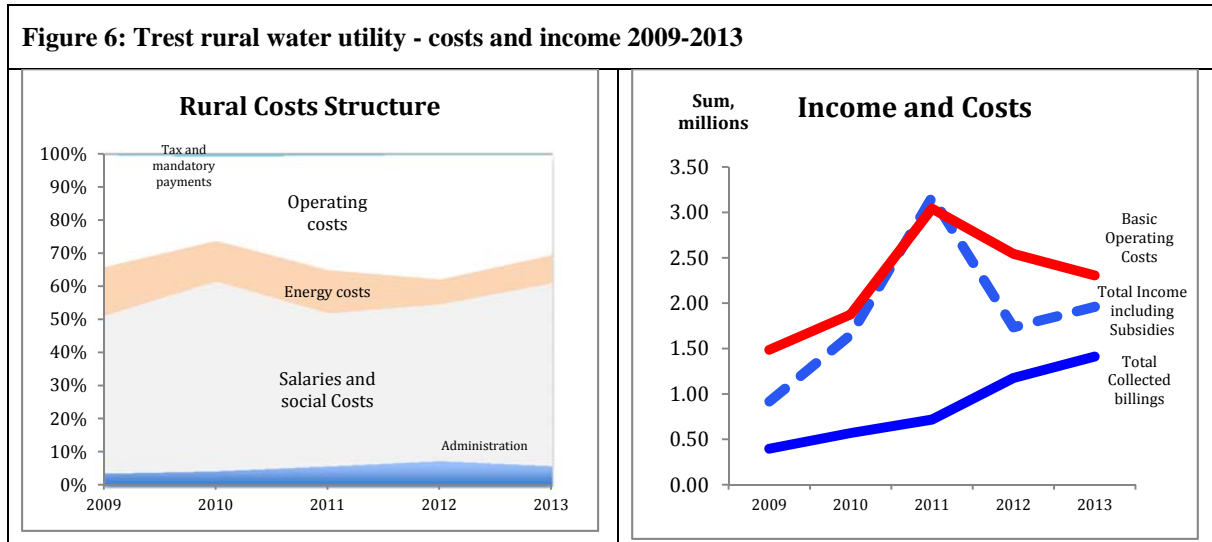
¹⁴. As there are no tariff data for rural areas for 2008, the values for 2009 were taken as a proxy for 'end of project' values.

¹⁵. The factors taken into account when setting water tariffs are not published and, as far as IEG could determine, there is no open public consultation. Additionally, the government's regulatory methodology for establishing utilities costs, investment, level of depreciation, financial margins – all of which will affect the setting of water tariffs – and are not publically disclosed.

energy was 41 percent of total operating costs in Nukus¹⁶ and, since project closure in 2009, these costs decreased from 35 percent to 27 percent by 2013. In the rural utility, while energy is a much smaller share of costs, it too has declined: from 39 percent before the project, to 15 percent in 2009 and 9 percent in 2013.



Source: IEG 2015 based operational data provided by the Nukus urban water utility in November 2014.



Source: IEG 2015 based operational data provided by the Trest rural water utility in November 2014.

2.77 Conversely, the share of urban social and staff costs have increased significantly – from 8% before the project, to 33% at project end, and 46% in 2013. A similar increase in the staff share of costs is seen in the rural utility. It is not known if the apparent increase in staff costs is the result of increased compensation or for other reasons. As with energy, there are no normative data. Notwithstanding these structural

¹⁶. This is the composite value determined from the joint financial information for the rural water supply and the bulk supply pipeline company. This only refers to the share of total costs; it is not known in normative terms if energy use efficiency improved; energy consumption data were not made available to IEG.

changes in the cost mix, in the urban utility total income has marginally exceeded operating costs since 2006 and the working ratio has improved significantly since the project started and has been maintained.¹⁷ Under pre-project conditions, the working ratio was 1.32 and it improved to 0.96 at project end and to 0.94 in 2013. While ideally the ratio could be smaller, the changes during and after the project indicate significantly improved water utility management. A more realistic measure is the operating ratio taking into account depreciation and financing costs, thus showing the actual net income that can be used for O&M, Table 7.¹⁸

Table 7: Depreciation is small and unpredictable in the urban utility (Sum, millions)

	2006	2007	2008	2009	2010	2011	2012	2013
Revenue	4.6	4.9	5.9	6.5	7.7	10.3	11.9	14.0
Depreciation	0.6	0.2	0.9	0.2	0.5	0.4	1.0	3.9
Net Income	3.9	4.6	5.0	6.2	7.2	9.9	10.9	10.1
Net Operating Costs	4.1	4.6	5.5	6.4	7.6	9.0	11.1	14.5
<i>Operating Ratio</i>	<i>1.05</i>	<i>0.99</i>	<i>1.09</i>	<i>1.02</i>	<i>1.06</i>	<i>0.91</i>	<i>1.02</i>	<i>1.43</i>

Source: IEG 2015 based operational data provided by the Nukus urban water utility in November 2014.

2.78 The main finding is that despite much improved management in the urban utility (that indicates that there is little short-term risk to sustaining the current status of water supplies), there is insufficient income to provide investment that ensures longer-term sustainability. There is also no spare finance to cover improvements to operational efficiency. Recent research has recommended that the operating ratio should exceed 1.2 (with depreciation) and 1.5 (without depreciation) to ensure sufficient funds to cover daily expenses, debt service, capital replacement costs, emergencies, and unexpected revenue shortfalls.¹⁹

2.79 The income-cost balance is much less sanguine for the rural utility and it does not cover its costs even with government subsidy. Its working ratio was only 0.61 in 2013. With depreciation more than half of other costs it is not financially viable in the medium to long-term without central government support for operations, replacement and new investment.

2.80 **Depreciation is an issue.** Currently, the amount of depreciation is set by central government, and the amount varies in an unpredictable way from year-to-year that makes its funding difficult. The financial balance sheets for the water utilities do not include a line item under current assets for the value of inventory or short-term investments, and as far as IEG could determine, there has been no systematic assessment of the value or age of sunk investment. Thus the technical basis for depreciation calculations is unclear. There is the problem also that even the historically

¹⁷. The working ratio = operating expenses/operating revenues. The target is to keep this <1.0.

¹⁸. The operating ratio = operating expenses/(revenues – depreciation and finance payments).

¹⁹. Barnes, G. 2015. Key Financial Indicators for Water and Wastewater Systems: Operating Ratio. University of North Carolina, Environmental Finance Center.
<http://efc.web.unc.edu/2015/02/27/operating-ratio/>

large 2013 amount of depreciation (Annex C) would value sunk assets at less than US\$81 million, and this is clearly far too low.²⁰

KHOREZM OBLAST

2.81 The Urgench water utility provides water to both urban and rural water and also exports a very small volume to the Karakalpakstan inter-regional pipeline. Since the reorganization became effective in 2007 the utility has decreased its volume of production, modestly decreased water losses, substantially increased its customer base and become very modestly more energy efficient (Table 8). Comparisons with pre-project indicators are not possible because data were not made available at appraisal; there is also a potential problem with double-counting.²¹

Table 8: Key performance indicators for the Urgench water utility

	2007	2008	2009	2010	2011	2012*	2013
Production Mm³	45.91	40.86	40.39	37.15	35.17	18.00	37.11
Water losses Mm³	17.46	16.19	15.60	13.61	12.37	6.39	12.39
<i>Water losses (%)</i>	38	39.6	38.6	36.6	35.2	35.5	33.4
Number of connections (000)	84.74	91.03	91.03	91.03	91.68	100.90	107.74
Energy consumption MkWh	53.39	45.04	41.67	34.14	35.02	30.87	39.87
<i>Energy Efficiency MkWh/m³</i>	1.16	1.10	1.03	0.91	1.00	1.72	1.07

Source: IEG 2015 based operational data provided by the Nukus urban water utility in November 2014.* No reason was given for the halving of the water production in 2012.

2.82 No financial or managerial data for the Urgench utility were made available to IEG, and thus any impacts of the project on improved managerial and financial performance cannot be determined.

Sanitation

2.83 There were no data at closing on the utilization of the few sanitation facilities provided by the project. However, officials assured IEG that most households with low cost sanitation utilized it; this was certainly the case for the few random households in rural areas visited by IEG.²²

²⁰. Urban water utility *composite* annual depreciation rates in the USA are of the order 2.0% to 2.5%. At these rates the 2013 depreciation of Sum 3.9 billion (less than US\$1.6 million) would value the sunk investment at only US\$ 81million. See Wisconsin Public Services Commission (2009). Rates for individual parts of a water supply system vary from supply mains (1.8%); pumping plant (3.2-4.4%); water treatment plant (3.2-6.0%); transport 13.3%; to computers and communications (15.0-26.7%). <http://psc.wi.gov/utilityinfo/water/depreciationBenchmark.htm>

²¹. Before the project the bulk water pipeline company sold water to both the urban and rural water utilities, and each of those utilities also produced their own water, added it to the bulk supply, and sold this to consumers. Only after 2007 did the Urgench water utility harmonize the database and report aggregated net annual production.

²². Sanitation facilities, be they low or high cost, are essential given the intense winter cold and high summer heat and almost all households have access to some

Health

2.84 There are no data on the health impacts that may have resulted from improved water and sanitation facilities provided by the project. The hygiene education component was not implemented. There were also no analyses at appraisal during implementation to determine potential linkages between improved water supply, sanitation, hygiene education and health outcomes, and there is no counterfactual.

2.85 There are limited data on health statistics. At project closing government health statistics showed the incidence of diarrhea in the project raions (districts) was 2,903 per 100,000 in 2000 and 2,551 in 2004 with significant annual variation in between. Incidence of Hepatitis A also showed annual variation going from 1,575 in 2000 to 653 in 2003 and 1,721 in 2004. During the IEG 2014 mission, SES officials in Nukus showed IEG routinely collected RKKP health data for later years but did not provide it. No data were made available for Khorezm Oblast.

2.86 Independent data indicates that the health objective was probably not achieved.²³ In RKKP the incidence of diarrhea was 3,017 per 100,000 people in 2004 and 3,439 in 2011. However, the incidence of Hepatitis A was reduced: the baseline incidence was 1,926 and the value in 2011 was 1,005 (target 385). There were no data on Typhoid incidence.

2.87 In Khorezm Oblast the 2008 baseline for diarrhea was 1,278 and in 2011 it was 1,518. Incidence of Hepatitis A decreased slightly over the same period from 1,151 to 1,043.

Efficiency

2.88 **Economic and financial efficiency.** The economic analysis at appraisal assumed a set of benefits that did not materialize. One of the major benefits envisaged was increased consumption from increasing access and improving service quality, but the projections underestimated the impact that improved service efficiency and higher water tariffs would have on household water consumption. Although many more households gained access to water, the actual consumption per household decreased. Reduced water consumption, however, is not an adverse outcome. As in this project, the majority of former Soviet Union states increased attention to the efficiency of water delivery and introduced higher tariffs – together these measures generally reduced per capita consumption as wastage and leaks were eliminated.

2.89 At completion the project has a positive net present value primarily due to cost savings. Revenues from residential consumers have been relatively small due to the low

²³. The 2012 ADB Rural Water Supply Project Completion Report provides data for its parallel and overlapping project. The health indicators in the PCR apply to the whole of the RKKP and Khorezm Oblast, not just to the communities assisted by ADB. Therefore these data also include the impact of the Bank's project. The incidence data are spot data – a better test of efficacy would be a time series showing a secular downward trend and a multi-factoral analysis to include other parameters affecting disease incidence.

willingness to pay for water services – although this has increased since 2013 by changes to government incentive policy. Even though water rates have increased rapidly over time – also in real terms – the actual water rates are still very low. The ICR presents a very thorough economic analysis that yielded a financial rate of return (FRR) of 13 percent. And on a per-capita cost basis actual costs were US\$45/capita compared with the appraisal estimate of US\$58/capita.

2.90 **Administrative efficiency.** The period 1998-2002 was problematic because of the procurement problems and unfamiliarity with Bank procedures, but disbursements were made as planned such that 59 percent of the loan was used by early 2002. The impact of the corruption probes instituted by the government, replacement of the PIU staff in 2002 and enhanced vigilance on procurement issues almost stopped disbursement for 2.5 years and required an extension of the project's closing date. Better trained staff enabled disbursement to accelerate from 2005, albeit at a slightly slower rate than planned.

2.91 **On balance, efficiency is rated modest.**

Ratings

2.92 The overall outcome of the project is rated moderately satisfactory. The relevance of objectives is high and design relevance is rated substantial. The objective to increase safe water supply was achieved and the water and sanitation utilities have greatly improved their operational and financial efficiency. These achievements, backed by guaranteed government subsidies, assure water supplies. While there were shortcomings in achievement of sanitation and health objectives, overall efficacy is rated substantial. Efficiency is rated modest. In combination these ratings lead to an overall moderately satisfactory outcome.

Risk to Development Outcomes

2.93 **Risk is rated as Moderate.** At the time of the IEG mission project water tariff issues had been fully internalized by government and are acted upon with increasing attention to closing the financing gap between O&M expenditures and revenues. The Government remains very strongly committed to subsidizing utilities' debt servicing. Even so, while water tariffs are being substantially increased they are still well below costs, and utilities have difficulty in meeting all maintenance needs. Financial risks arising from non-payment of bills by government entities are substantial but backlogs are periodically cleared following government intervention.

2.94 Utility reorganization and consolidation has been successful and utilities' management is working well and delivering accountable water services. Attention to routine monitoring and reporting on performance by all the utilities and SES is assiduous.

2.95 Provision of adequate maintenance of water supply and delivery networks remains problematic. The main constraints are budgets that are too small, insufficient

and outdated equipment for maintenance, and lack of spare parts, particularly for equipment imported by the project that requires access to foreign exchange.

2.96 Staffing ratios may be an issue. There is no use of international staffing norms for the WSS utilities so there is no way of knowing if the greatly increased staffing costs are a drag on commercial efficiency. This needs to be addressed.

Bank Performance

2.97 **Quality-at-Entry is rated Moderately Unsatisfactory.** The Bank underestimated the magnitude of institutional weaknesses in the implementing and executing agencies and the governance challenges. Financial and procurement risks were seriously underestimated. The Bank misjudged the government's support for community-driven development and for sanitation and hygiene education. Given that this was the first operation in this subsector, a more extended period of dialogue, piloting and capacity-building on these challenges may have secured a higher level of government buy-in. A single focus on rehabilitation of water supply infrastructure, utility reorganization and tariff policy – all of which were very thoroughly appraised – would have been more pragmatic.

2.98 While environmental and social safeguard issues were satisfactorily appraised, arrangements for M&E were unsatisfactory, baseline for the utilities were uneven there were no baseline indicators on health status and desired health outcomes.

2.99 **Supervision is rated Moderately Unsatisfactory.** A high turnover of task team leaders (7 in all) made efficient supervision difficult, slowed decision-making and contributed to the failure to enforce agreed safeguard policy. These shortcomings were compounded by variable level of Borrower ownership and frequent changes among key national management and coordination staff within the Ministry of Economy. Recognizing some of these problems one of the Bank's Task team leader (TTL) requested a Supervision Enhancement Review by QAG in early 2000 and also initiated two studies funded through the Bank Netherlands Water Partnership Fund to improve project performance and lessons learning from the experience. This operation was classified as a problem project in the periods 1998-2000 and 2003-2004. As a result, supervision missions were increased to 3-4 per year and total supervision costs became very expensive, totaling US\$1.28 million. Despite this increased attention, supervision missed the opportunity to revise the development objectives to reflect changes resulting from project restructuring and loan cancellation in 2005. It should be noted that the last TTL initiated significant improvements to M&E to inform project completion reporting.

2.100 **Overall Bank performance is rated Moderately Unsatisfactory.**

Borrower Performance

2.101 These ratings relate to Borrower performance during appraisal and implementation. As such, they do not include the improvement in the enabling environment and government's more aggressive policies on water sector regulation,

increasing water tariffs and cost recovery since project closure. Judging from the ability of the two water utilities in Karakalpakstan to produce detailed accounting information for IEG, and Regional government's detailed knowledge of their financial and operational affairs, the performance of these utilities has improved. The same cannot be said of the Urgench water utility where there was a lack of transparency on financing and accounting issues that occurred during project implementation and subsequently.

2.102 Government performance is rated Moderately Satisfactory. The government was fully committed to rehabilitating and building new water supply infrastructure. Its subsequent decision to utilize UNICEF and other grant financing for the sanitation and health aspects of the project was pragmatic given the cost of the IBRD Loan. Government was strongly supportive of rationalization of the six water utilities serving the project areas and facilitated their merger into three agencies.

2.103 Lack of readiness or capacity for implementation led to extended delays in establishing an effective project implementation unit (PIU).²⁴ Financial management, reporting and attention to non-routine M&E were also weak. Subsequently, following government's request for assistance in 1999, UNDP technical assistance improved the performance the PIU substantially. Procurement was initially fraught with difficulties and government disbanded the PIU following corruption allegations; several PIU staff were jailed in addition to some in the responsible Ministry of Economy. While the consequent delays adversely affected implementation, government's actions improved governance and accountability, and the project was successfully concluded.

2.104 Implementing Agencies performance is rated Moderately Unsatisfactory. The regional water utilities that implemented the project demonstrated a high degree of commitment and technical competence and all the desired utility outputs were achieved, and most of the outcomes, albeit with delays as a result of government procurement problems. However, the financial management of the two urban water utilities' accounting and internal control systems remained unsatisfactory throughout implementation. This is despite the financial management action plan developed as part of institutional strengthening inputs.

2.105 Overall Borrower performance is rated Moderately Satisfactory.²⁵

24. The PIU was operated by government staff and was effectively a part of government: therefore, the Government performance rating embraces the PIU.

25. According to the OPCS/IEG Harmonized Evaluation Criteria if one rating is in the satisfactory range and the other in the unsatisfactory range, the outcome rating determines which one applies to overall performance.

3. Bukhara and Samarkand Water Supply Project

Objectives, Design, and Relevance

3.1 The project was expected to benefit 650,000 people living in the cities of Bukhara and Samarkand located in central Uzbekistan on the former Silk Road between China and Europe. Bukhara and Samarkand have been among the main centers of world civilization from their early days in 6th century BC and, more recently, for being Islamic centers for scholarly study. The cities have carefully preserved their unique architecture and traditions; both are on the UNESCO World Heritage List and they are important tourism centers.

3.2 Topographically, the cities pose different challenges for water supply systems. Bukhara is located across a former dried-up and drained wetland and lake in the River Zeravshan valley and has only modest (20 m) topographic variation. In contrast, Samarkand, some 230 km upstream, is built across a number of tributaries that have considerable topographic variation (100+ m). Both cities are in competition for scarce and distant water resources, and operational costs are greatly increased by the need to maintain and operate large diameter pipeline water import systems, particularly Bukhara.

3.3 At appraisal, piped water supply systems, serving 260,000 people in Bukhara and 390,000 people in Samarkand, were facing a rapid deterioration of quality and reliability of their services. Major problems included deferred O&M that was causing accelerating deterioration of the water supply and distribution systems, high unaccounted-for-water, and energy and institutional inefficiencies.

3.4 It was expected that the project would bring about noticeable improvements in the quality, reliability, efficiency and sustainability of water services. A particular aim was to utilize private sector participation to introduce quickly commercial operating principles and modern management approaches.

Objectives

3.5 The Project Appraisal Document stated that the project's development objectives were:

“to improve the safety, quality, reliability, efficiency, financial viability and sustainability of the water supply services in Bukhara and Samarkand.

3.6 The Development Credit Agreement (Schedule 2) gave a more precise description of the objectives:

“to (a) rehabilitate and improve the efficiency of existing water supply facilities and infrastructure in Bukhara and Samarkand; (b) strengthen the institutional capacity of BVK and SVK; and (c) strengthen BVK's and SVK's financial capacity through improved financial management and commercial practices.”

3.7 This Assessment uses the Development Credit Agreement's objectives.

COMPONENTS AND COSTS

3.8 The development objectives were to be achieved through: (a) strategic rehabilitation and efficiency improvement of existing facilities in critical condition; (b) institutional strengthening of the Bukhara and Samarkand Water Utilities (Bukhara City Vodokanal - BVK and Samarkand City Vodokanal - SVK) through a performance-based management contract with an internationally experienced water utility operator (the Operator); and (c) strengthening of the financial capacity of the two urban water utilities through improved financial management and commercial practices. Table 9 gives the component details and costs.

Table 9: Project Components and Costs

<p>Investment Fund. <i>Planned cost: US\$46.88 million; Actual cost US\$49.19 million.</i></p> <p>This component financed essential short-term expenditures (such as materials, equipment, vehicles) and a least-cost capital investment program (including associated engineering and construction supervision services) aimed at improving the operations of the water supply system and the services to the population by achieving the performance improvement targets in the service contract. The Operator, together with BVK and SVK staff, was to propose the investments that are required to optimally re-structure and rehabilitate key components of the systems (such as sections of the water distribution networks and block distribution systems, specific components of the treatment plants, pumping stations), implement a demand management program, and set up financial management, accounting and commercial systems.</p> <p>2. Service Contract. <i>Planned cost: US\$5.20 million; Actual cost US\$2.14 million.</i></p> <p>This component financed the costs related to the Service Contract. These costs included a base fee and a performance-based fee to be paid to the private Operator based on achievement of targets defined in the contract. The Operator was to have full responsibility for managing the investment program, operating the water supply system, and developing and implementing the demand management program and the commercial (billing and collection) and financial management departments.</p> <p>3. Consulting Services and Project Coordination Unit (PCU). <i>Planned cost: US\$1.05 million; actual cost US\$5.64 million.</i></p> <p>This component financed: (a) PCU operations (including salaries, incremental operating expenditures, travel, training, and related expenses) with skilled staff to facilitate project implementation, coordinate project activities between the private operator, the Municipalities of Samarkand and Bukhara, and other government agencies, in addition to supervising the private operator's performance; and (b) project-related consulting assignments on technical, legal, and financial aspects.</p> <p>4. Swiss-Financed Component. <i>Planned cost: US\$9 million; Revised cost: US\$11.23 million; Actual cost US\$10 million).</i></p> <p>The Government of Switzerland provided a US\$9.0 million grant to provide parallel financing to the World Bank-financed project. This grant financed two activities. First, an investment fund (goods and services of Swiss origin) with uses to be determined in parallel to those of the Investment Fund under Project Component 1. Second, it also financed independent technical and financial auditors that would monitor the Operator's performance and prepare the financial project and water utility audits, as well as complementary consulting services to support the PCU.</p>

PROJECT FINANCING

3.9 The Bank provided an IBRD Loan of US\$20.00 million and an IDA Credit of SDR 15.90 million equivalent to US\$20.00 million. The Swiss Development Corporation provided as parallel financing the equivalent of a US\$9.00 million grant. By project closing exchange variations had increased the IDA Credit to US\$25.32 million. Similarly, the Swiss grant for equipment had increased to US\$11.23 million and its closing date was extended to December 5, 2010. Total Bank disbursements amounted to US\$43.80 million and US\$0.27 million of the Credit was cancelled at closing.

3.10 At appraisal the Borrower agreed to contribute US\$13.33 million, in practice this was reduced to US\$8.00 million. In 2003, BVK's and SVK's contribution of US\$5.33 million was omitted due to inability to pay. Eventually, however, SVK contributed US\$5.33 million or 42 percent of the amount originally agreed.

3.11 According to the government, the total project costs in Bukhara was US\$21.82 million plus a Swiss Grant of US\$2.30 million. In Samarkand the total project cost was US\$28.03 million plus a Swiss grant of US\$6.25 million. The larger allocation of the Swiss Grant to Samarkand was because of its greater need for new pumping equipment.

Relevance

OBJECTIVES

3.12 **The relevance of Project objective is substantial.** They were highly relevant to the technical and managerial challenges of reversing the rapidly deteriorating water and sanitation services in Uzbekistan in the decade since independence. At independence infrastructure and centrally supported services were well developed. But in the ensuing decade, highly inefficient operations, poor service levels, creeping disrepair of facilities, financial shortfalls, weak human resource and institutional capacity, lack of adequate information, and local scarcity of water resources threatened service provision and public health.

3.13 Project objectives remain relevant to the government's own strategies for the urban water supply sector (paras 2.13 and 2.14) and the Bank's Country Assistance Strategies at appraisal and currently (para 2.15). The project was also aligned with a strategic government objective to develop Bukhara and Samarkand into international tourist destinations.

DESIGN

3.14 **Design relevance was modest.** The project was designed to change the government's role in infrastructure development and public service provision in these two cities, accompanied by greater autonomy and decentralization of the management of services. The critical problem to be addressed was to improve the capacity of the water utilities so that they could manage the water system more efficiently, and induce people to pay their water bills by providing a reliable service of good quality water.

3.15 If water tariffs were adequate to cover costs, and collection of billings was efficient, it was expected that the utilities would generate enough income to cover operational and maintenance costs and provide a surplus to invest for longer-term replacement investment, thus ensuring system sustainability. A key aim was to improve institutional capacity quickly and at the same time improve water supplies. Given the substantial weaknesses of the utilities in areas other than supply management, and their lack of knowledge of commercial practices and Bank procurement, project design adopted a four-track approach:

1. ***Support the first steps of an institutional reform*** under which BVK and SVK would be able to carry out their responsibilities in accordance with their original charters as autonomous municipal enterprises, following commercial principles, and with greater technical and financial efficiency and improved customer-orientation;
2. ***Use a Private Operator*** to manage key parts of the BVK's and SVK's operation through a Service Contract with the aim of initiating the reform of the operating practices and the improving managerial and technical capacity of BVK and SVK;
3. ***Implement a financial recovery plan*** with a view to have BVK and SVK collect sufficient revenues to cover their operational costs, to ensure a basic level of maintenance of their assets at the end of the project and service their debt; and
4. ***Change the criteria and approach used to select investments in the water and sanitation sector.*** This aimed to broaden the focus from only capacity expansions to include support for adequate maintenance, improvements in operational efficiency, and reduction of wastage.

3.16 The Operator was to have responsibility for management, operation and maintenance of the water supply system in the service area and the commercial operations and financial management of BVK and SVK, including their staff, as specified in the service and incentive appendices of the contract. The Operator's Service Contract included also the authority to recommend hiring and firing of employees. The Operator was expected also to procure, on behalf of BVK and SVK and with their involvement, goods, works and services in accordance with Bank's Procurement Guidelines and to support these clients in contract signature.

3.17 Although this design was substantially relevant and logical, it made unrealistic assumptions about the availability of baseline data, the institutional setting and local buy-in. Specifically, design underestimated the importance of a learning partnership approach in favor of an externally imposed one, and did not included means to change local perspectives, such as twinning and working in sister utilities in Europe or elsewhere. This was based on the appraisal view: *“At present BVK's and SVK's very weak managerial and technical capacity prevents the companies from addressing even the most urgent operational problems and would not allow them to implement the project.”*²⁶

²⁶ PAD, page 6.

3.18 The local technical and financial information available on the water supply system and its operating condition was poor and proved to be an inadequate basis for a results-based Service Contract. Subsequently, and long after the award of the service contract, the state of pumping systems was very thoroughly appraised under the Bank's Energy Sector Management Assistance Program in 2005.²⁷

3.19 Appraisal of the utilities' institutional base and staffing was weak, and targets set at launch were too ambitious and lacked knowledge of the sector. In particular, a sound baseline against which to judge the Operator's performance and financial remuneration was not available at the start of the project - and measuring incremental performance of the Operator proved to be a significant problem during implementation.

3.20 Finally, while financial autonomy of the water utilities was essential for the achievement of objectives, there were no components or conditionality in the project to ensure that central government was made aware of the importance of this concept. Instead it was delegated to the Regional Governments who lacked the ultimate authority for its implementation.

Monitoring and Evaluation

3.21 **Design:** There were only partial baseline data and even they needed correction during implementation as better knowledge emerged. A monitoring framework was in place at the start of the project, and was rated by the Bank's Quality Assurance Group as moderately unsatisfactory. Its design proved ineffective in terms of indicator availability and measurability, and there were several reported problems, including flaws in the indicators covering (1) safety and quality, (2) reliability, (3) efficiency, and (4) financial viability. The methodology for each indicator was not clearly identified or defined and the project results framework was not linked to the Borrower's M&E. The M&E design relied entirely on one entity, the Operator, for implementation, a move that proved problematic when the Operator left the project prematurely.

3.22 **Implementation of M&E:** Delays meant that the Operator was not in place to initiate measurement until more than two years after approval, which undermined and delayed M&E. The Borrower's own M&E framework was largely missing, and M&E was only partially embraced by the VKs, as some indicators were not typically documented in Uzbekistan's water sector and exceeded the VK/PIU capacity to monitor them effectively. After the service contract termination, the VK/PIU entrusted M&E reporting to consultants, who were not fully integrated in VK operations. As part of supervision also, the Bank and the Client agreed to revise some Key Project Indicator definitions, as well as some target values deemed too ambitious. Key performance indicators were audited four times out of the originally planned eight. No final key performance indicator audit was undertaken at closing. Key performance indicator definitions and indicator reporting quality suffered unexplained trends and anomalies, and measurement and data harmonization flaws. Beneficiary surveys were not incorporated for assessment during implementation. However, at the end of the project

²⁷. World Bank. 2005. Uzbekistan Energy Efficiency in Urban water Utilities in Central Asia. ESMAP Technical Paper 083.

impact assessment studies were undertaken. This sampled 120 households in Bukhara and 175 in Samarkand split between 'with' and 'without' project areas.

3.23 Utilization of M&E. Systematic use of the incomplete and unreliable data produced by the M&E was overshadowed by the chronic project management problems and changing demands from the Bank.²⁸ These issues are discussed below.

Implementation

3.24 The project was approved in March 19, 2002 and came into effect in January 2003. The Credit closing date was extended twice for a total of 38 months and closed in June 2010.²⁹

IMPLEMENTATION ARRANGEMENTS

3.25 At appraisal the Ministry of Macroeconomics and Statistics had the lead role in the reform of the water supply sector. Oversight and coordination of the project at the national level was to be the responsibility of a Project Coordinating Committee that was headed by the Ministry. The Committee included key representatives from relevant central government agencies and provincial and local governments. The Ministry had not formed the Committee when government decided to shift project responsibility to the Public Utilities Agency, effective from January 2003.

3.26 A Project Coordination Unit, reporting to the Committee, had day-to-day responsibility for overseeing and implementing the Operator's service contract and coordination with the two municipalities, their water utilities and other service providers, and M&E.

3.27 BVK and SVK operate as legally separate government-owned enterprises and their operations are overseen by the *Khokimiyat*. The *Khokimiyat* is an executive body of state power at the level of oblasts, raions and towns of the republic, and is headed by a *Khokim* (Governor) who ensures implementation of acts of legislation including those related to provision of water supply and sewerage. The VKs, in turn, were the contracting party for the private sector Operator. It was expected that the Operator would manage the water supply services of both utilities under a four-year performance-based Service Contract.

²⁸ . The ICR reports (page 10): "WB supervision of the project M&E was questionable since no specialist was part of the project team over the eight-year period of implementation, which made it difficult to audit or monitor information received from the technical auditor and the PCU/PIU/BVK/SVK. As a result, project M&E could not comprehensively, accurately, and effectively report on the KPI results."

²⁹ . The first extension was in 2007 for 25 months to June 30, 2009, and second for 13 months in May 2009.

IMPLEMENTATION EXPERIENCE

3.28 Project implementation departed significantly from that planned and went through three phases.

3.29 In the first two-year phase, the Public Utilities Agency's limited prior experience in handling World Bank projects and lack of capacity on procurement and contracting slowed award of the Operator's contract. The Service Contract that took 16 months to come to closure was awarded in February 2004.³⁰ However, before it could be signed, a Court Order made in May 2004 seriously undercut the water utility's autonomy and ability to finance their operations, including the Service Contract.

3.30 The Court Order blocked 80 percent of the revenues of SVK and 75 percent of BVK's revenues for the period 2003-2006 in order to pay backlogs of taxes, energy and other liabilities following an independent Economic Court decision in 2003. Obviously this block on revenues significantly curtailed the sound operation of the utilities and compounded the difficulty that Uzbek counterparts had in working with the Operator. The lack of adequate revenues caused the VKs to cease paying salaries and provide counterpart funding. These actions, in turn, led to a depletion of stocks to sustain operations and throttled technology transfer and capacity-building.

3.31 In the second phase a Service Contract was signed and implemented for three years from June 2004, rather than the four years planned. After appointment, the Operator found that the lengthy registration and review of import contracts, which delayed work commencement by three to six months after the contract award, was not mitigated by Committee interventions. The Operator performance was harmed by the high turn-over of international staff which contributed to delays in meeting the terms of the Service Contract, as did lack of baseline information, clients' unwillingness to share some information, difficulties in collecting billings as a result of the Court Order and resultant inadequate cash flows to pay creditors. In addition there were continuous management changes in the VKs, poor oversight of technical design and works, all of which led to growing distrust and miscommunication between the Operator and Uzbek counterparts. While a Presidential Decree led to the unblocking of SVK's accounts in August 2006, and BVK's accounts in February 2007, this was too late to undo the damages done to the relationship between the utilities and the Operator, and latter's ability to perform satisfactorily. The Service Contract was not extended or renewed.

3.32 With the exit of the Operator in June 2007 and the first extension of the closing date, the VKs' operations were focused on implementation of the infrastructure component, not institutions and capacity-building. The second project extension of 13 months enabled the implementing agencies to complete the infrastructure component that required an acceleration of civil works in the last three months.

³⁰. The Service Contract was originally signed in December 2002 but was cancelled when the original Operator's consortium lost a key member and failed to meet pre-qualification requirements. The under-bidder was too expensive and it was retendered.

Safeguards and Fiduciary

3.33 **Environmental issues:** The project was classified as a Category B based under OP 4.01: Environmental Assessment.³¹ An Environmental Management Plan was prepared and approved at appraisal. Environmental Safeguard monitoring was instituted as part of the service contract. Compliance with environmental safeguards was supervised only twice by a Bank specialist during the eight years of implementation. After departure of the Operator, Bank supervision downgraded the rating for the Environmental Safeguards from *satisfactory* to *moderately satisfactory* until project closing. Main issues were management of waste and debris; exercise of appropriate safety measures; fencing/securing of construction sites; and provision of essential safety equipment for workers. Due to the Bank team's supervisory insistence, by project closing improvements in contractor compliance with the EMP were noted, particularly regarding the occupational health and safety of workers.

3.34 **Social issues:** A social assessment was undertaken as part of project preparation. The findings contributed to project design but were not adopted fully during implementation. Recommendations from a 2007 independent social beneficiary assessment for the project were also not integrated in implementation.

3.35 **Financial management issues:** Financial management arrangements were inadequate and internal control systems were weak. Staff were too few and poorly trained. There was poor and non-transparent documentation of contractual work expenditures. Reconciliation of project accounting records with Statements of Expenditures and Expenses was frequently unacceptable to the Bank. Project and VK external audit reports for financial years 2009, 2010 and 2011 were qualified and Bank management letters consistently reported significant weaknesses in accounting and internal control systems.

3.36 **Procurement.** Procurement was generally problematic. In early 2010 an Independent Procurement Review of Bank projects in Uzbekistan assessed a few project contracts as part of a sample spanning several sectors of Bank intervention. Its findings indicated poor governance and transparency for the PCU, PIUs and VKs. The most egregious findings were extensive and unjustified use of the Small Works procedure that deviated from the legal agreement, procurement packages that were improperly managed by splitting contracts without justification, and confidentiality issues and conflict of interest among technical evaluation and tendering committee members. Filing or availability of procurement documents was found to be weak.

Achievement of the Objectives

Objective 1: *Rehabilitate and improve the efficiency of existing water supply facilities and infrastructure in Bukhara and Samarkand*

3.37 **This achievement of this objective is substantial.** This objective focused on two aspects of water supply efficiency: engineering and financial accountability.

³¹. At appraisal invocation of OP 7.50 Projects on International Waterways was considered but rejected as water withdrawal from the Amu Darya River would not be increased.

Engineering measures aimed to cut unaccounted-for-water (UfW)³² by reducing water losses caused by leakage and wastage improvements; to reduce energy use per unit of water produced, treated and pumped; and to improve reliability of water supply and its quality. Financial accountability aimed to reduce the administrative portion of UfW through metering; updating and maintaining a register of all consumers; identifying and stopping unauthorized water diversion and uses, and improving water management accounting and billing systems. Only physical improvements are assessed under this objective, managerial and accounting achievements are assessed under objective 2.

Outputs

3.38 Rehabilitation of existing water distribution facilities in critical condition was fully accomplished. Worn out networks were replaced. Pipeline rehabilitation and replacement focused on the primary and secondary water distribution networks.

3.39 The Swiss grant financed drainage pumps, water meters, welding units, and valves in Bukhara, and energy-efficiency services, water meters, switchboards, and pumps in Samarkand. The grant also supplied independent technical and financial audit services. This component was well-managed and well-supervised, contributing successfully to the rehabilitation of facilities, Figure 7.

Figure 7: Rehabilitation of pumping equipment financed by the Swiss Grant



Source: IEG 2015 Bukhara

3.40 **Bukhara.** Just over 14 km of worn-out water mains was replaced (target 110 km), and water treatment plants and an electro-mechanical plant were upgraded. At

³² . UfW is the difference between the water supplied and sold. It includes losses from physical leakage and administrative losses (illegal connections, tampered meters, non-billing). UfW is generally expressed as a percentage of the total water produced, but also in volume loss per km of pipeline, or volume loss per connection.

project completion the system served 120,000 people, many benefitting from the reconstruction of the Shokhrud water treatment plant after two horizontal sedimentation tanks and a semi-automatic filtering plant with capacity of 100,000 m³ per day were installed. An automatic Chlorine electrolysis plant enabled water treatment to potable standards. The number of water connections increased from 56,891 in 2006 to 60,359 in 2010. The number of new meters installed is not known.

3.41 **Samarkand.** The target of replacing 130 km of worn-out water mains in 147 streets was met and 22 wells, a water-balancing reservoir and replacement of electro-mechanical pumping plant were completed. This then served 392,000 people. Water quality improvement included upgraded testing laboratories and renewing chlorination supplies. The number of water connections increased from 92,657 in 2006 to 102,528 in 2010, and 48,312 water meters and 30 electrical energy meters were installed.

Outcomes

3.42 **Reducing Unaccounted-for-Water.** In 2002 the annual volume of water produced was found to be about 100 million m³ per year in Samarkand and 71 million m³ per year in Bukhara (or about 850 and 660 lpcd). Water networks suffer from excessive leakage and non-domestic use because of the large number of detached houses with gardens, particularly in Samarkand. The annual volume of total water loss was:

- **Samarkand** was about 48 million m³ per year or 48% (37% of network losses and 11% of apartment plumbing losses);
- **Bukhara** was about 28 million m³ per year or about 39% (26% from network losses and 13% from apartment plumbing losses).

3.43 Current data show that while the number of water connections increased, the total volume of water production decreased in both utilities, and continued to do so after project completion, as did absolute water losses, Table 10.

Table 10: Water losses were reduced

	<i>Project*</i>					<i>Post-Project</i>		
	<i>2006</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>
<i>Bukhara</i>								
Number of Connections	56,891	58,883	58,975	60,227	60,359	60,414	60,544	60,698
Water Production, Mm3	68.3	57.2	54.4	52.0	51.4	52.2	51.3	49.6
Water Losses, Mm3	19.1	16.5	15.8	14.7	14.8	15.0	14.7	14.2
<i>Water Losses (%)</i>	<i>28.0</i>	<i>28.8</i>	<i>29.0</i>	<i>28.6</i>	<i>28.8</i>	<i>28.7</i>	<i>28.7</i>	<i>28.6</i>
<i>Losses/connection, m3</i>	<i>336</i>	<i>280</i>	<i>268</i>	<i>244</i>	<i>245</i>	<i>248</i>	<i>243</i>	<i>234</i>
<i>Samarkand</i>								
Number of Connections	92,757	98,155	99,749	101,747	102,528	107,12	109,256	109,409
Water Production, Mm3	96.0	82.3	83.5	72.1	58.6	52.0	46.2	43.2
Water Losses Mm3	61.4	41.8	44.8	34.3	21.6	17.1	14.8	12.4
<i>Water Losses (%)</i>	<i>64.0</i>	<i>50.8</i>	<i>53.7</i>	<i>47.6</i>	<i>36.9</i>	<i>32.9</i>	<i>32.0</i>	<i>28.7</i>
<i>Losses/connection, m3</i>	<i>662</i>	<i>426</i>	<i>449</i>	<i>337</i>	<i>211</i>	<i>160</i>	<i>135</i>	<i>113</i>

Source: IEG 2015 based on operational data provided by the Bukhara and Samarkand VKs in 2014 and the ICR.

3.44 **The targets for reducing UfW were met.** In Bukhara the baseline for UfW was 39 percent and the volumetric target value of 30 percent was achieved before 2006 - but it has remained about 29 percent since then. The Samarkand baseline was 48 percent and, while the 2010 target of 35 percent was only just missed, the target was achieved the year after and water losses continue to decline. Utility staff in Samarkand explained that most of the 28 percent is physical losses (24-25 percent), the balance of about 2 percent being administrative. In both utilities, much longer and more numerous tertiary pipes and household links accounted for most of the leaks. And in Bukhara water losses by the district hot water company's water softening and distribution systems accounted for about 20 percent of its water use.

3.45 The number of water connections has increased by about 7 percent in both cities, mostly by registering former illegal users and some as a result of system expansion to new users. Before the project, water supply coverage in urban areas was 98 percent in Bukhara and 100 percent in Samarkand and reduced water loss per connection –30 percent in Bukhara and 73 percent in Samarkand – is a good indicator of the effectiveness of system rehabilitation and greater accountability.

3.46 **Reliability of water supply and its quality improved.** Before the project, reliability of supplies was 87 percent in Bukhara and only 48 percent in Samarkand. The main reasons were decayed water distribution systems and defective pumps, and low pressure caused by unmetered users leaving water running for irrigation purposes in the summer. The number of hours of daily supply is not reported by the VKs. The ICR's impact survey of project beneficiaries found that water supplies to both cities were almost 100 percent reliable in 2010.³³ In 2014 Bukhara VK had a 24/7 supply but some beneficiaries in Samarkand reported unverifiable disruptions.

3.47 Water quality. In Bukhara in 2005, only 70 percent of water samples met quality standards. By April 2007, 100 percent of samples met the quality standard. Between then and 2010 it varied between 96.0 and 90.5 percent. At project closing that target was 95 percent. In Samarkand in 2005 only 80 percent of water samples met quality standards. By April 2007 this had risen to 97.8 percent. Between then and 2010 it varied between 98.8 and 99.9 percent. At project closing it had met the target of 100 percent. The SES in Bukhara reported that tested water samples there had better quality than national standards in 2014; there was no updated report for Samarkand.

3.48 **Energy use and efficiency outcomes are mixed.** While energy use by Samarkand VK declined significantly since 2007 and continues to do so, in Bukhara it declined until 2009 after which it has gradually increased (Table 11).

3.49 The appraisal expectation was that there would be a 20 percent reduction in energy use in Samarkand and a 15 percent reduction in Bukhara. However, the baseline was not specified. Even so, over the period 2007-2013 the overall energy use

³³. The ICR cautions: "Survey results were, however, received late in the ICR process and certain data anomalies could not be fully reconciled."

in Samarkand was reduced by 31 percent. In Bukhara the reduction 2007-2009 was 21 percent but over the period 2007-2013 the net reduction was only 4 percent.

Table 11: Vodokanal energy use and efficiency 2007-2013

	Project						
	2007	2008	2009	2010	2011	2012	2013
<i>Bukhara</i>							
Water Production, Mm ³	57.2	54.4	52.0	51.4	52.2	51.3	49.6
Energy Use, gWh/yr	28.9	22.7	21.1	22.7	25.7	26.2	27.7
<i>Energy Efficiency, kWh/m³</i>	<i>0.51</i>	<i>0.42</i>	<i>0.41</i>	<i>0.44</i>	<i>0.49</i>	<i>0.51</i>	<i>0.56</i>
<i>Samarkand</i>							
Water Production, Mm ³	82.3	83.5	72.1	58.6	52.0	46.2	44.8
Energy Use, gWh/yr	75.0	75.3	64.6	59.2	60.1	55.4	52.0
<i>Energy Efficiency, kWh/m³</i>	<i>0.91</i>	<i>0.90</i>	<i>0.90</i>	<i>1.01</i>	<i>1.16</i>	<i>1.20</i>	<i>1.20</i>

Source: IEG 2015 based on operational data provided by the Bukhara and Samarkand VKs in 2014. There were no reliable energy data before 2007.

3.50 **In both utilities energy efficiency did not improve.** The ESMAP (2005) study calculated that over 95% of all of the energy use is related to the pumping plant, and other energy uses and inefficiencies are relatively minor. Indeed, the biggest problem faced by the utilities is the large number of Soviet-era pumps still in operation – for example some 130 in Samarkand where declines in energy efficiency have been greatest.

3.51 Importantly, ESMAP found that at energy tariffs prevalent in 2005, with the exception of the refurbishment of the pumps at Ku Mazar, none of the other pump investments could be justified financially on the basis of improving energy efficiency (Table 12). Given the dire financial straits of the utilities before and during implementation, the ESMAP findings underscore the lack of realism when setting the project's energy targets at appraisal.

3.52 A small number of pumping units were replaced, some with frequency invertors and remote control valves.³⁴ Individual plants so renovated have shown much improved energy efficiency – up to 50 percent energy saving was reported in Samarkand. At the Shorud WTP, new pumps allied with filter redesign, reduced energy use per unit of water treated by 30 percent. At the Bukhara's Charkin well field, replacement of old pumps with Grundfoss pumps reduced energy use by 70 percent.

³⁴ The head and discharge of old pumps is controlled by valves that waste energy. Frequency invertors control the pumps by regulating their power supply and speed and thus save energy. Automated valves in the distribution system save energy by being able to respond to pressure changes remotely and avoid pipe blowouts (caused by slow manual response); energy invested in water is thus not wasted. Remote regulation of water flows saves a lot of manual labor too – at Bulhara's Shorud WT plant 25 people now do the work of the former 96 staff.

Table 12: Most potential energy savings were not financially viable

	<i>Bukhara</i>			<i>Samarkand</i>		
	<u>Shokrud</u>	<u>Zaravshan</u>	<u>Ku Mazar</u>	<u>Well Pumps</u>	<u>Booster Pumps</u>	<u>Dahbed</u>
Efficiency Shortfall	18.3%	20.1%	15.2%	37.1%	16.9%	13.0%
Investment Cost (US\$ million)	1.26	0.19	0.18	1.48	1.80	1.60
Energy Saving (gWh/year)	2.66	0.69	3.63	6.20	0.37	2.65
Cost Saving (US\$/yr)	23,866	6,787	30,380	52,232	4,903	36,854
Financial internal rate of return	-22.6%	-15.0%	10.9%	-15.5%	-39.2%	-20.5%

Source: IEG 2015 based on ESMAP 2005, Table 6. At that time US\$1.00 = Sum 700.

Objective 2: Strengthen the institutional capacity of BVK and SVK

3.53 The achievement of this objective is substantial.

3.54 Some of the institutional outcomes assessed in this report may not be fully attributable to the project because of ongoing institutional support and capacity-building by two follow-on Bank-financed projects.³⁵ Even so, the water supply project initiated substantial improvements that have been sustained and built upon.

Outputs

3.55 Despite difficulties over the Service Contract, the knowledge and experience of the Operator established modern engineering and financial management systems in both utilities, and these accomplishments were effectively utilized by the utilities. While state-of-the-art Supervisory Control and Data Acquisition Systems (SCADA) were planned in 2008, their installation and commissioning was not yet complete in late-2014.

3.56 Leak detection units equipped with ultrasonic equipment were established. Departments for water billing, inspection and enforcement were trained and upgraded. Registers for all consumers were updated and linked to GIS network management and maintenance systems installed by the project. A formal complaints system operating through Community Center and Housing Association chairpersons was activated in parallel to increasing rates of meter installation and water use monitoring. The Swiss Grant installed a test facility for meter calibration and it started issuing meter certificates in October 2014.

³⁵. The Bukhara and Samarkand Sewerage Project (P112719) for US\$ 66 million was appraised and approved in 2009 and it included modest support for upgrading institutional capacity of the two utilities. The Alat and Karakul Water Supply Project (P118197), appraised in 2012 for US\$113 million, is being implemented by Bukhara VK and aims to expand the VK to include the two towns

3.57 A community-based urban water conservation pilot project for Bukhara and Samarkand, initiated in 2005, was successfully implemented in collaboration with Housing Owners' Associations for selected low-income apartment buildings.

Outcomes

3.58 The most easily identifiable outcomes of improved institutions were the rapid increases in metering, identifying and stopping unauthorized water diversion and uses, and increasing rates of bill collection. These outcomes were the result of the Operator's modernization of engineering and financial management systems that were mainstreamed before their departure in 2007. Local efforts by BVK and SVR to improve metering and revenue collection continued after project closure. Government's consistent improvement of sector policies raised expectations of utilities' performance as well their ability to increase revenues (Box 1.)

Box 2: Institutional Improvements increased accountability for water use

Metering and bill payment was increased through administrative measures and changing staff incentives. At appraisal, the VK's had block-metering agreements for volumetric use with House Owners' Associations and most large non-domestic consumers.

Staff incentives improved. The first reform introduced was to provide incentives for meter-readers to improve monitoring and collections. Salaries of operators and inspectors in 2006-07 was Sum 35,000 a month and by 2014 salaries were Sum 2.5 to 3.0 million a month; corruption and collusion with customers has been reportedly eliminated.

Legislation provided strong incentives to meter domestic water use. The second reform in 2009 was the termination of all block metering agreements and making individual households responsible for water bills. Under a recent government order, customers are responsible also for installing meters and the cost of recalibrating meters.³⁶ Each customer's meter is registered and meter status is listed in the database. And in 2013, a government order set the consumption norm for unmetered household connections to be 50 percent more than the flat rate metered norm. An additional surcharge is applied if the household has irrigated a garden or has livestock or vehicles. Together these measures provided a strong financial incentive to become metered.

A good example of the project impact on consumer behavior is the Shaifulalam apartment complex in Bukhara which houses 504 people in 214 apartments in 24 blocks. A major problem was irregular water supply and insufficient pressure to service the upper floors. Metering started in 2007 when the Housing Association facilitated pilot metering of the first two blocks accounting for 8 percent of households. According to utility Inspector Mrs. Garurova Zulhumor the high financial penalties for not being metered has increased metering in 2014 to 85-90 percent of the whole apartment complex, the shortfall being empty or vacant apartments. A major impact of metering was to induce repair to interior plumbing, particularly valves in WCs, and dripping faucets. The aggregate impact of metering on the supply system is a 24/7 supply and enough pressure to service all floors most of the year – but sometimes in summer supply cannot meet demand due to home irrigation diversions.

³⁶. Meter purchase and installation costs Sum 25,000 (US\$100); recalibrating of meters cost Sum 7,000 (US\$2.80.)

Metering reduced household costs. In 2014 the flat rate bill for a family of three was about Sum 200,000 per household per year (US\$ 80) for a norm of 300 lcd. The 2013 decree would have increased this to almost Sum 300,000 a year (US\$120). The Palatova family of three, for example, after opting for metering, reduced annual billed water consumption in 2013 to 100 m³ (91 lcd) and paid, in advance, Sum 70,000 (US\$ 28) - a fifth of what they would have paid. Thus the family cost was 30 percent of the old, or only 20 percent of the new (2013), unmetered norm.

Billing systems and enforcement were improved. Inspectors visit households to ensure bill payment and in Bukhara the billing system can send bill reminders by telephone. Payments can be made electronically by credit card, at the VKs office or to the Inspectors at the household. There is also a facility to debit the worker's wage packet at their place of work.

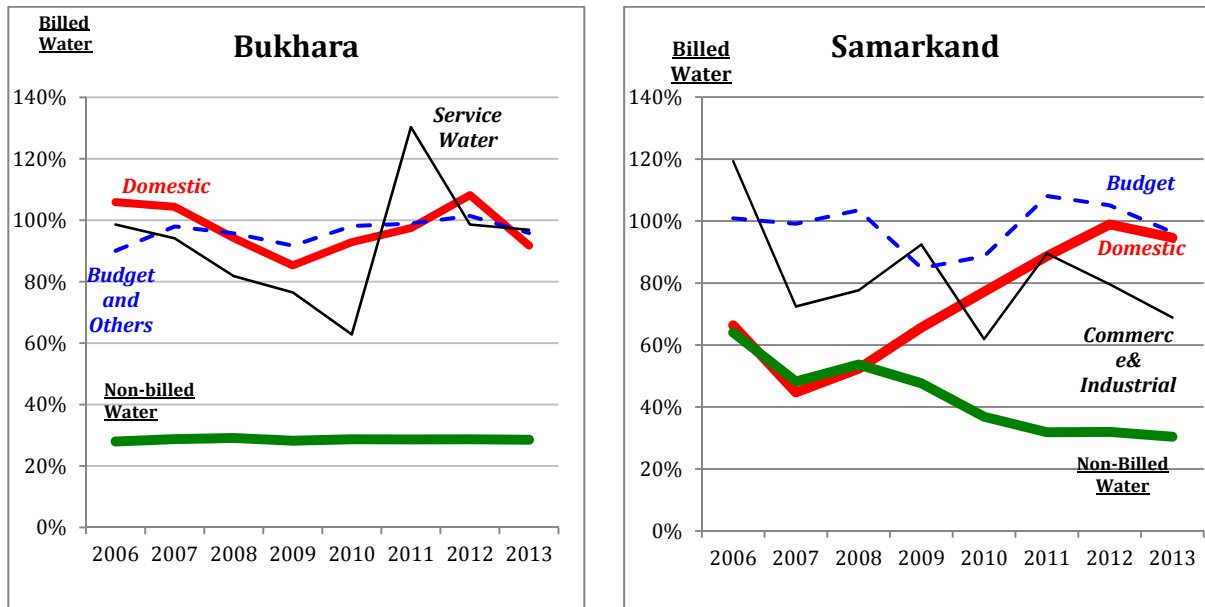
The penalty for non-payment of domestic water bills is rigorous. Following a year of non-payment the VK is authorized to submit a claim to court after 10 days, and the court generally issues a warrant for seizure of property to pay the debt. Special circumstances like illness are taken into account and sometimes the community comes to the rescue.

Source: IEG field interviews, October 2014. In Bukhara the water bill includes a sewerage charge; there is no sewerage in Samarkand.

3.59 Prior to appraisal, none of the two water systems had bulk meters, though Samarkand had installed bulk meters in 2002. Consumers, households, industry and public agencies were not accustomed to water conservation, water tariffs were extremely low and heavily cross-subsidized by commerce and industry, and all consumers wasted significant amounts of water. Most public institutions, industrial firms and commercial customers were supposed to have meters, but poor maintenance and repair had jeopardized accuracy and reliability. By 2014 it was reported that all non-domestic consumers were reliably metered.

3.60 At appraisal very few households were metered - only 2 percent of the total number of customers in Samarkand and 4 percent of those in Bukhara. By the end of 2013, in response to changing incentives, metering of domestic use had increased significantly to include three-quarters of all households in Bukhara and slightly under half of all households in Samarkand. This allied with the leak prevention, better inspection and financial incentives, increased administrative accountability and the collection of water bills, particularly for Samarkand as illustrated in Figure 8.

3.61 The differences between the two VKs were substantial in 2006 but narrowed by the end of the project, and continued to do so thereafter. Samarkand shows the greatest incremental improvement and by 2013 it was on a par with Bukhara in terms of the collected billings ratio for domestic and budget consumers.

Figure 8: Billing collection ratios in Bukhara and Samarkand 2006-2013

Source: IEG 2015 based on financial data provided by the Bukhara and Samarkand VKs in 2014. Bukhara bills includes water and sewerage; there is no sewerage in Samarkand. Ratios more than 100% indicate payment of billing backlogs from earlier years.

3.62 The major difference is in securing repayment of bills from ‘service water’ users in Bukhara and ‘commerce and industrial’ users in Samarkand. Bukhara’s bulk sales of untreated ‘service water’ to the towns of Mubarek and Kagan accounted for 47 percent of water sales in 2013 and, as Figure 8 shows, there is typically a period of reduced payment alleviated by periodic payments (courtesy of the central government) that clears the backlog. Even so, this is clearly a major institutional problem given that the supplies for public use and small state industries cannot be cut off. Thus the VK’s leverage is small no matter how efficient their billing and collection system has become.

3.63 The situation in Samarkand is worse in that ‘commerce and industry’ – mainly public sector district heating and district hot water utilities that accounted for 21 percent of water sales – show a long-term downward trend in repayments. While these debts are relieved periodically by central government, it does not clear the backlog and leaves Samarkand VK in the same position regarding leverage as Bukhara.

3.64 The largest institutional shortfall, despite the notable progress on progressive regulation of water metering and water tariffs by the central government, is the lack of progress towards financial autonomy of the VKs. This aspect was neither in the project objectives nor the Loan/Credit conditions. Thus the apparent institutional shortcoming on securing payment for water from a substantial share of protected public sector consumers is not possible without central government support, and is not shortcoming of water utility management.

Objective 3: Strengthen BVK's and SVK's financial capacity through improved financial management and commercial practices

Outputs

3.65 **The achievement of this objective is substantial.** The project (through the Operator) introduced improved financial and commercial practices that strengthen the financial capacity of each VK. It is clear from the sustained results (after departure of the Operator) that modern financial management principles and good record-keeping were established. During IEG's mission, for example, VK staff were able to produce a whole range of up-to-date detailed records on demand. How reliable these data are is uncertain (see para 3.35). While the VKs strengthened their financial capacity this is within the continuing constraints imposed by central government policy.

Outcomes

3.66 On the basis of forgoing discussion it is clear that both VKs substantially achieved four of the five measures intended to improve their financial capacity:³⁷

- **Aggressive reduction of system inefficiencies** (water losses, energy inefficiency, low revenue collection, and water wastage) to reduce costs of operations;
- **Implementation of a commercial strategy aimed at eliminating unregistered connections and users**, and building trust in the community through better water supply and customer service;
- **A strategic and cost-effective metering policy** linked with a customer relations plan to increase revenues and reducing wastage; and
- **Establishing financial management, accounting, and commercial systems and procedures** that provide indispensable information about costs, revenues, and customers, and allow BVK and SVK to make better policy and tariff recommendations to the Government and implement effective commercial actions.

3.67 The fifth enabling measure was only partially completed:

- **Collection of better information on the fixed assets and current operational situation of the water supply system.** This was an essential first step to realistic assessment of the maintenance and rehabilitation needs, and to making informed recommendations in the tariff reviews during project implementation.

3.68 The current information on the operational state of the water supply system is excellent with extensive GIS locational data linked to data bases showing inventory and working status. These systems are used to plan and schedule repairs and upgrades in a cost-effective and timely way. While there is readily available information about the physical assets of each utility there does not appear to be matching information about

³⁷. PAD, page 21.

the value of each fixed asset and thus the amount of depreciation investment required to keep the systems running.

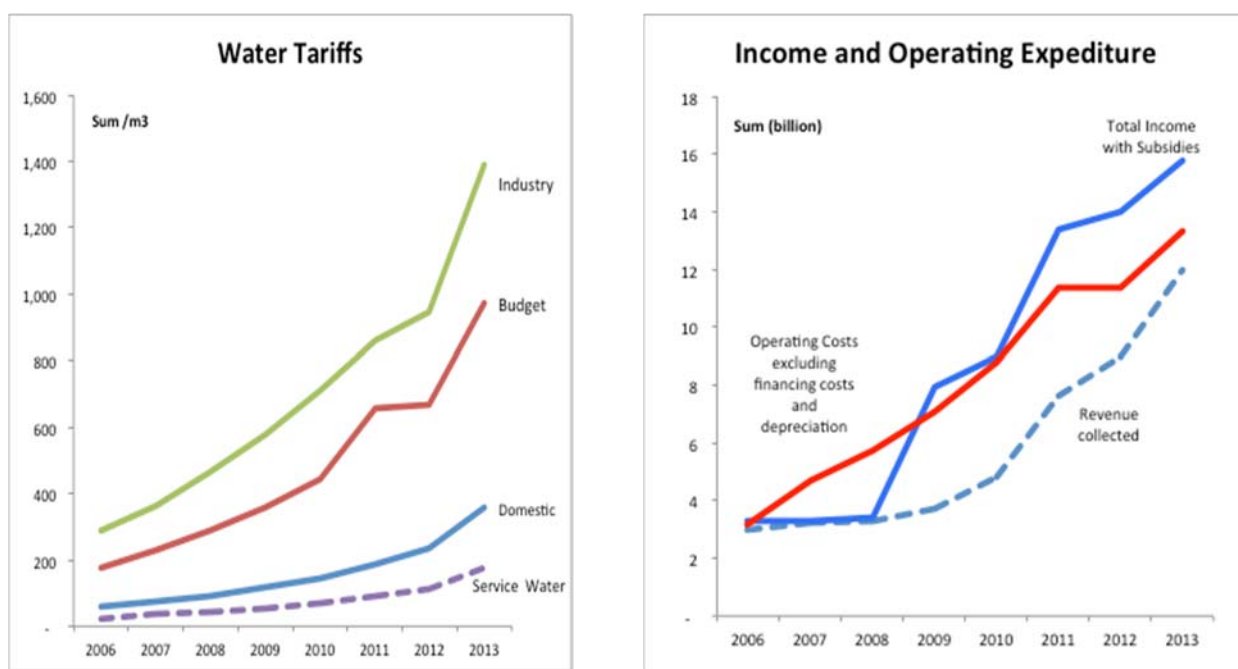
Outcomes

3.69 BVK's and SVK's financial capacity was strengthened through greater accountability and increased water tariffs, both of which led to increased incomes and improved financial capacity. Achievements for each VK are assessed separately below.

Bukhara

3.70 Water tariffs and revenues increased substantially during the project and after project completion, and this led to rapidly increasing income, Figure 9.

Figure 9: Bukhara - Tariffs, Income and Operational Expenditure



Source: IEG 2015 based on financial data provided by BukharaVK in 2014.

3.71 Although revenues from water sales grew very rapidly, particularly after 2010, the growth in operational costs was almost equally rapid and the utility could not cover its costs. However, there does appear to be convergence between income from water sales and expenditure in the last three years. Only when other utility income and a government subsidy (that started in 2009) are included does the utility cover its basic operating costs. This is not the case, however, when other financing costs and the servicing the World Bank debt are taken into account.

3.72 In 2010 water revenue with subsidies was Sum 9 billion, and all expenses including financing costs (but without the Bank debt) were Sum 11.8 billion. Adding the World Bank debt increased expenditures to Sum 12.3 billion or a third more than

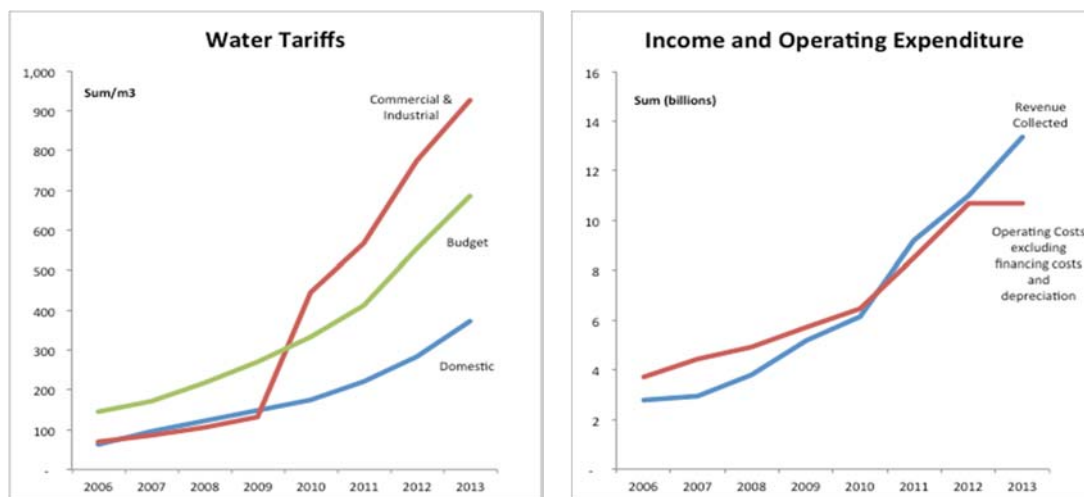
income. The situation in 2013 was worse, as total income was Sum 16 billion and total expenditures Sum 27 billion. While this shortfall in income could be potentially alleviated by collecting outstanding water debts, in 2013 accounts receivable were Sum 4.2 billion and current liabilities Sum 6.5 billion. Unless revenue can be increased through higher water tariffs and costs reduced, the debt of the VK will continue to increase.

3.73 Bukhara VK is well aware of these problems and has various means to address the problem. One of the most critical is that the ‘service water’ tariff is extremely low – half the domestic rate and one fifth the rate of budget organizations – even though it currently accounts for 47 percent of water sales. If all this water were sold at the budget organization tariff it would raise Sum 16 billion and solve the problem. The current tariff is low because it is sold untreated to the two towns (Mubarek and Kagan) that provide their own treatment – this despite the more than adequate excess capacity of Bukhara’s water treatment plant. Such a move requires central government approval and is indicative of inattention to the economies-of-scale possibilities that could be derived from integrated planning.

Samarkand

3.74 Samarkand is in a much better financial situation than Bukhara even though some of its water tariffs are much lower (Figure 10). One of the main reasons is that it sells 26 percent more water but has very similar operational costs. Revenue collected has outpaced basic operational costs since 2010 and just about break even when modest depreciation is included. Unlike Bukhara, Samarkand does not receive a central government subsidy. Also Samarkand has not borrowed appreciably in foreign exchange and does not have the heavy accounting charges that Bukhara incurred under the project and a credit from Spain. Even so, when interest payments and debt are considered the financing gap is large – in 2013 total revenues were Sum 13 billion and total expenditure including debt servicing was Sum 20 billion.

Figure 10: Samarkand - Tariffs, Income and Operating Expenditure



Source: IEG 2015 based on financial data provided by Samarkand VK in 2014

Overall

3.75 The evidence indicates that the VKs have made substantial improvement in management of operations and revenue collection. However, the VKs' financial performance remains heavily influenced by Government directives over which they have no control but which adversely affect their commercial performance. Government directives govern depreciation policies, foreign exchange losses, and interest on borrowings. Also, they cannot obtain financial autonomy since they cannot control or influence some key financial parameters:

- The Central government controls their water supply and sewerage tariffs.
- The VKs must charge for depreciation on fixed, operating assets according to a schedule that is considerably faster than the rate of economic and technical obsolescence.
- They have experienced considerable losses on their foreign exchange borrowings and have no authority to apply mitigation measures.
- Some cost items, such as electric power tariffs, are fixed by the Central government and VKs have little authority to renegotiate them. Thus, they are at the mercy of accrued costs over which they have little control and incur substantial accounting losses without much autonomy to protect themselves.

Efficiency

3.76 **Efficiency is rated Modest.** A largely speculative cost benefit analysis was undertaken at appraisal, and the Operator was to collect data and update the analysis. However this did not occur. Nor was an updated analysis performed after the Operator's termination. The estimated financial internal rate of return at appraisal was 18%. No new cost-benefit analysis was undertaken at project closure because of the flaws in the financial model used at appraisal.

3.77 Administrative efficiency over the life of the project was low. The ministry finally given responsibility for the project was inexperienced in the water sector and there were long government delays in awarding the management contract and procurement. Four years into the five-year project only 14 percent of the Bank financing had been disbursed and the project had to be extended and this increased management costs. Delays in civil works and system management meant water losses continued longer than they should and connecting potential tariff-paying customers was delayed: both represented lost revenue. Both utilities lost significant income because of the delay in implementing the water metering program.

Ratings

OUTCOME

3.78 Project objectives have substantial relevance of objective, but relevance of design is rated modest. There was substantial achievement of both objectives leading to a rating of substantial rating for efficacy. Efficiency was modest. **The overall outcome is rated as Moderately Satisfactory.**

RISK TO DEVELOPMENT OUTCOME

3.79 **Overall risks to development outcomes are assessed as Moderate.** The concern at project completion that project benefits may not be sustainable because of a lack of institutional capacity-building and technical knowledge transfer proved to be unfounded. Current VK management is competent and forward-looking and is delivering reliable water services.

3.80 High levels of inflation continue to erode the positive impact of water tariff increases and this will jeopardize generation of revenues sufficient to ensure sound maintenance. In consequence, there will be increasing reliability on government subsidies.

3.81 While government has pressed forward aggressively with raising water tariffs and tightening the regulations on water metering, the VK's financial performance is hindered by lack of autonomy that does not allow them to take a more commercial stand on utility financing and management. A consequence of this is that utilities' debts are increasing and there appears to be inadequate provision for long-term planning, depreciation and systematic replacement investment.

Bank Performance

3.82 **Quality-at-Entry.** The Bank was over-ambitious and unrealistic in the context of weakened sector governance and capacity. There was limited government ownership to the introduction of a Private Service Contract service contract, and limited market interest given the commercial risks from potential foreign operators. Local institutional capability was underestimated and the overall approach was not participatory. Project design failed to establish a rudimentary indicator baseline before project initiation, leading to unachievable or unrealistic target values for many the key performance indicators. Given these risks, a performance-based management contract was premature. The risk of termination of the service contract/Operator was not assessed during project design and thus no exit strategy was prepared. Quality-at-entry is rated **Unsatisfactory**.

3.83 **Supervision.** There were eight Task Team leaders in the eight-year life of the project and this led to inconsistent attention to key issues, lack of consistent quality, continuity, and internal compliance and delayed responses to requests for "no objections." Generally, supervision was not proactive in resolving implementation problems that were left to fester. As a result there were major shortcomings in supervision. Attention to assessment of progress, constraints, implementation problems, and monitoring of key performance indicators was weak. Supervision effectiveness was also hindered by lack of critical specialist inputs including M&E, institutional development and engineering. Eventually some inputs did add value (such as the ESMAP study) but they were too late to be effective.

3.84 The project underwent two Quality of Supervision Assessments (QSA) by the Quality Assurance Group (QAG), the first in 2004, the second in 2006. Both rated supervision as Moderately Satisfactory. Following QAG recommendations, both the

formal objectives and Key Project Indicators should have been revised as part of a formal project restructuring when the service contract ended in 2007 ahead of project closing. While a technical restructuring was agreed with the implementing agencies and enacted by the government, it was not submitted to the Board.

3.85 The Bank was insufficiently proactive also on discussing/introducing mitigating measures with government during the period 2003-2006 when the performance of the Operator was seriously undermined by the Court decision to block access to 80 percent of revenues. It was only in 2006 that the project was classified as problematic.

3.86 The country-office staff played an invaluable role in ensuring continuity and responsiveness of supervision and of client relationship. Important day-to-day supervision support was provided by the Bank team in the last three months of implementation, facilitating the completion of the critical but lagging contracts for the Mulyion Reservoir in Samarkand and Shokrud water treatment plant in Bukhara. Under the circumstances, there was uncommon commitment and skill deployed by supervision teams but it was too late to make up for earlier problems. Supervision is rated **moderately unsatisfactory**.

3.87 **Overall Bank performance is rated Unsatisfactory.**

Borrower Performance

3.88 **Government Performance.** The government lacked consistent implementation support and proactive responses to problems for the first half of the project. Several issues within the government's control caused delays in implementation. It transferred project responsibility from one ministry to another, and the new group had limited prior experience in handling World Bank projects. The lengthy registration and review of contracts for imports, which delayed work commencement by three to six months after the contract award, might have been mitigated by the government but was not. The government was also weak on ensuring sound sector governance (allowing external agencies to interfere with project management) and paid inadequate attention to fiduciary oversight.

3.89 A court decision (not under the direct control or competence of the government) blocked water and wastewater utility accounts in Samarkand and Bukhara. Government was slow to mitigate the impact of the court decision on the project and it was only in 2005 that actions were taken to solve the problem - a process that took another 19 months to fully resolve.

3.90 More positively, in the second half of the project central government significantly improved sector policies particularly on water tariffs and revenue a process that has continued at an ever-increasing rate. Government performance is rated **moderately unsatisfactory**.

3.91 **Implementing Agency Performance.** Initiation of the project was delayed by almost 24 months and the Court Order blocking the revenues of the VKs over the period 2003-2006 significantly curtailed the sound operation of the utilities. The lack of

adequate revenue led to the VKs ceasing to pay salaries and providing counterpart financing. When the Operator came on board the financially strapped water utilities could not provide support effective operations impeding technology transfer and capacity-building. Until 2007 there were continuous management changes in the VKs and poor oversight of works and technical design, problems accentuated by high turnover of the Operator's staff that compounded the difficulty that Uzbek counterparts had in working with the Operator. The feedback from the VKs about this period is that managerial staff felt they were treated as second-class citizens and that their local technical knowledge and expertise was bypassed in favor of foreign consultants.

3.92 With the exit of the Operator and repeal of the Court Order, the implementing agencies demonstrated their new competence and completed the infrastructure component, including an acceleration of works achieved in the last three months. Performance since project closure appears to have continued to improve with good results being delivered. Implementing agency performance is rated **moderately satisfactory**.

3.93 Overall Borrower performance is rated Moderately Satisfactory according to the Harmonized Evaluation Criteria. If one rating is in the satisfactory range and the other in the unsatisfactory range, overall performance is determined by the outcome rating which, in this case, is rated **Moderately Satisfactory**.

4. Lessons Learned

4.1 The key lessons derived, based on the findings of this PPAR, are the following:

- **When designing infrastructure and service provision projects within the context of a regional environmental crisis it is essential to minimize objectives and keep them focused on interventions the borrower will support.** In this case, driven by the Aral Sea crisis, the Water Supply, Sanitation and Health Project overly emphasized the need to mitigate a range of ill-defined public health problems when even provision of basic services like potable water supply was in jeopardy.
- **Adoption of community driven development models in a country where the culture of community self-help lacks prominence may require additional capacity-building efforts.** In the case of Uzbekistan, the well-established community-driven model for implementing the sanitation, health, and hygiene components, based on the experience in Nepal, India, and Peru experienced difficulties. This was due to the insufficient attention paid to building the capacity in the local institutions responsible for project implementation, especially since the community centric culture did not exist in the country. The project however benefited from an extensive series of six social assessments, as these assessments clearly demonstrated that consulting communities in the design of pilot projects put pressure on authorities to give greater attention to the scale and cost of projects.
- **The practicality and realism of bringing about institutional strengthening of a developing country's main utilities through a performance-based management contract needs very careful appraisal.** The Bank needs to adopt a flexible approach that can strengthen operating performance of the utility's business in key areas without imposing unacceptable foreign management. In the case of the Bukhara and Samarkand, the foreign Operator (with hindsight) did have a very positive impact on modernizing and providing a commercial orientation to the utilities. However, socio-political factors ignored at appraisal, and exacerbated by the imposed Court judgment beyond the control of the implementing agencies, clouded judgment during implementation and at closing about the effectiveness of this arrangement. This is because the private sector model antagonized the implementing agencies and had left a lingering resentment on the value-added by the private sector. This is particularly egregious given that the municipality-appointed utility staff, following capacity-building through the operator, has subsequently demonstrated their ability to manage the utilities effectively and sustainably.
- **Introduction of private sector or NGO participation in a new socio-political environment requires continuity of specialist Bank supervision and the right mix of skills.** In the case of both projects the annual turnover of task team leaders led to a lack of proactivity on critical institutional issues that exacerbated delays and hindered the Bank's effectiveness and efficiency.

- **Proper tariff setting and demand management efforts are critical factors that lead to expansion in customer base and increased revenues for the utilities.** In the case of Water Supply, Sanitation, and Health project, greater attention was paid to securing financial viability under the new decentralized arrangements. Activities included periodic water tariff increases proposed by the regional government for central government approval, and simplification of tariff structure. The project was also successful in demand management through physical actions to reduce water losses, creating and updating a water user database, metering, and financial incentives to conserve water. Once staff was trained, equipment procured and public awareness was raised, the demand management program was mainstreamed in all three utilities. As a result, the customer base was expanded and revenues were increased, leading to improvements in financial viability of the utilities.
- **Financial autonomy is important for long-term sustainability of water utilities.** The Buhkara and Samarkand Water Supply Project managed to increase water metering significantly through various measures, leading to enhanced collection of revenues. However, due to lack of financial autonomy, the utility is experiencing difficulty collecting the arrears from government institutions. This is likely to adversely affect the utilities' commercial performance if the government does not address the utilities' autonomy issue soon.

Bibliography

Barnes, G. 2015. Key Financial Indicators for Water and Wastewater Systems: Operating Ratio. University of North Carolina, Environmental Finance Center. <http://efc.web.unc.edu/2015/02/27/operating-ratio/>

ICPD. 2012. International Conference on Population and Development, Uzbekistan Country Implementation Profile. May 2012.

Ijjaz-Vasquez, Ede Jorge. 2005. *Uzbekistan energy efficiency in urban water utilities in Central Asia*. Energy Sector Management Assistance Programme (ESMAP) technical paper series ; no. 083. Washington, DC: World Bank. <http://documents.worldbank.org/curated/en/2005/10/6805627/uzbekistan-energy-efficiency-urban-water-utilities-central-asia>

Wisconsin Public Services Commission. 2009. Benchmark depreciation rates for municipal water utilities <http://psc.wi.gov/utilityinfo/water/depreciationBenchmark>

World Bank. 1995. *Uzbekistan - Country assistance strategy*. Washington, DC: World Bank. <http://documents.worldbank.org/curated/en/1995/03/727371/uzbekistan-country-assistance-strategy>

World Bank. 1997. Staff Appraisal Report. *Uzbekistan - Water Supply, Sanitation, and Health Project*. World Development Sources, WDS 1997-2. Washington, DC: World Bank. <http://documents.worldbank.org/curated/en/1997/04/694859/uzbekistan-water-supply-sanitation-health-project>

World Bank. 1997. Legal Dept of World Bank. *Conformed Copy - L4216 - Water Supply, Sanitation and Health Project - Japanese Grant Agreement*. Washington, DC: World Bank. <http://documents.worldbank.org/curated/en/1997/08/5083169/conformed-copy-l4216-water-supply-sanitation-health-project-japanese-grant-agreement>

World Bank. 1998. *Uzbekistan - Country Assistance Strategy*. Washington, DC: World Bank. <http://documents.worldbank.org/curated/en/1998/02/727058/uzbekistan-country-assistance-strategy>

World Bank. 1998. Legal Isc Files. *Conformed - TF025632 - Bukhara and Samarkand Water Supply Project - Japanese Grant Agreement*. Washington, DC: World Bank. <http://documents.worldbank.org/curated/en/1998/10/12404592/conformed-tf025632-bukhara-samarkand-water-supply-project-japanese-grant-agreement>

World Bank. 2002. Project Appraisal Document. *Uzbekistan - Bukhara and Samarkand Water Supply Project*. Washington, DC: World Bank.

<http://documents.worldbank.org/curated/en/2002/02/1713321/uzbekistan-bukhara-samarkand-water-supply-project>

World Bank. 2002. Legal Dept of World Bank. *Conformed Copy - C3620 - Bukhara and Samarkand Water Supply Project - Development Credit Agreement*. Washington, DC: World Bank.

<http://documents.worldbank.org/curated/en/2002/04/5085432/conformed-copy-c3620-bukhara-samarkand-water-supply-project-development-credit-agreement>

World Bank. 2002. Legal Dept of World Bank. *Conformed Copy - C3620 - Bukhara and Samarkand Water Supply Project - Loan Agreement*. Washington, DC: World Bank. <http://documents.worldbank.org/curated/en/2002/04/5085434/conformed-copy-c3620-bukhara-samarkand-water-supply-project-loan-agreement>

World Bank. 2002. Uzbekistan - Country assistance strategy (final). Washington, DC: World Bank. <http://documents.worldbank.org/curated/en/2002/11/1713339/uzbekistan-country-assistance-strategy-final>

World Bank. 2003. Republic of Uzbekistan: Country Economic Memorandum. Washington, DC. © World Bank. <https://openknowledge.worldbank.org/handle/10986/>

World Bank. OPCS/IEG. 2006. Harmonized Evaluation Criteria for Implementation Completion and Results Report (ICR) and Independent Evaluation Group (IEG) Evaluations.

World Bank. 2008. *Uzbekistan - Country assistance strategy for the period FY08-FY11*. Washington, DC: World Bank. <http://documents.worldbank.org/curated/en/2008/05/9894611/uzbekistan-country-assistance-strategy-period-fy08-fy11>

World Bank. 2009. Implementation Completion Report. *Uzbekistan - Water Supply, Sanitation, and Health Project*. Washington, DC: World Bank. <http://documents.worldbank.org/curated/en/2009/05/10952020/uzbekistan-water-supply-sanitation-health-project>

World Bank. 2009. Project Appraisal Document. *Uzbekistan - Bukhara and Samarkand Sewerage Project*. Washington, DC: World Bank. <http://documents.worldbank.org/curated/en/2009/07/10809544/uzbekistan-bukhara-samarkand-sewerage-project>

World Bank. 2010. Implementation Completion Report. *Uzbekistan - Bukhara and Samarkand Water Supply Project*. Washington, DC: World Bank. <http://documents.worldbank.org/curated/en/2010/12/13881748/uzbekistan-bukhara-samarkand-water-supply-project>

World Bank OPCS. 2011. "Implementation Completion and Results Report: Guidelines". August 2006, last updated on 10/5/2011.

World Bank. 2011. *Uzbekistan - Country Integrated Fiduciary Assessment*. Washington, DC. © World Bank.
<https://openknowledge.worldbank.org/handle/10986/12557>

World Bank. 2011. *Uzbekistan - Country Partnership Strategy for 2012-2015*. Washington, DC: World Bank.
<http://documents.worldbank.org/curated/en/2011/11/15470023/uzbekistan-country-partnership-strategy-2012-2015>

World Bank. 2014. 0000A8056. 2014. *Uzbekistan - Uzbekistan Bukhara and Samarkand Sewerage Project : P112719 - Implementation Status Results Report : Sequence 08*. Washington, D.C. : World Bank Group.
<http://documents.worldbank.org/curated/en/2014/12/23081312/uzbekistan-uzbekistan-bukhara-samarkand-sewerage-project-p112719-implementation-status-results-report-sequence-08>

Annex A. Basic Data Sheet

WATER SUPPLY, SANITATION AND HEALTH PROJECT (CREDIT 4216-UZ) (P009121)

Key Project Data (amounts in US\$ million)

	Appraisal estimate	Actual or current estimate	Actual as % of appraisal estimate
Total project costs	117.0	78.8	67.3
Loan amount	75.0	58.	77.9
Cofinancing	29.2	-	
Cancellation	-	16.62	21.0

Cumulative Estimated and Actual Disbursements

	<i>FY98</i>	<i>FY99</i>	<i>FY00</i>	<i>FY01</i>	<i>FY02</i>	<i>FY03</i>	<i>FY04</i>	<i>FY05</i>	<i>FY06</i>	<i>FY07</i>	<i>FY08</i>	<i>FY09</i>
Appraisal estimate (US\$M)	1.50	5.00	12.50	25.50	43.50	60.50	70.50	75.00	75.00	75.00	75.00	75.00
Actual (US\$M)	3.14	6.25	13.9	24.17	35.6	37.4	37.8	39.7	47.7	53.1	58.7	58.4
Actual as % of appraisal	209.3	125.0	111.2	94.8	81.8	61.8	53.6	52.9	36.6	70.8	78.3	77.9
Date of final disbursement: January 2009												

Project Dates

	Original	Actual
Begin Negotiations	02/28/1997	02/28/1997
Board Approval	08/21/1997	08/21/1997
Signing	08/29/1997	08/29/1997
Effectiveness	02/10/1997	02/10/1997
Closing date	12/31/2005	06/30/2008

Staff Inputs (staff weeks)

Stage of Project Cycle	Staff Time and Cost (Bank Budget Only)	
	No. of staff weeks	USD Thousands (including travel and consultant costs)
LENDING		
FY92		5.97
FY93		2.20
FY94		0.70
FY95		123.13
FY96		166.98
FY97		165.53
FY98		3.91
FY99		0.00
FY00		0.00
FY01		0.00
FY02		0.00
FY03		0.00
FY04		0.00
FY05		0.00
FY06		0.00
FY07		0.00
FY08		0.00
Total Lending:		468.42
Supervision/ICR		
FY92		0.00
FY93		0.00
FY94		0.00
FY95		0.00
FY96		0.00
FY97		0.00
FY98		85.63
FY99		171.40
FY00	52	175.56
FY01	30	93.21
FY02	31	100.93
FY03	40	182.13
FY04	43	143.00
FY05	40	97.57
FY06	28	54.81
FY07	23	53.94
FY08	29	70.26
FY09	10	51.00 [estimate]
Total:	293	1,279.98

Mission Data

Names	Title	Unit	Responsibility/ Specialty
Lending			
Roger Batstone	Principal Environmental Engineer	EC3IV	TTL
Rita Cesti	Economist	TWUWS	Economic appraisal
Rinat Iskhakov	Operations Analyst	EC3IV	Operations
Joana Godinho	Public Health Specialist	EC3HR	Health
Johanngeorg Renkewitz	Consultant	EC3IV	Financial analysis
Mike Blackburn	Consultant	EC3IV	Engineering
Craig Leisher	Consultant	EC3IV	Environment
Supervision/ICR			
Richard Pollard	Senior Water & San. Specialist	ECSSD	TTL (2008)
Yoko Katakura	Senior Infrastructure Specialist	CSFDR	TTL (2005 -2007)
Jonathan Kamkwala	Lead Financial Analyst	ECSSD	TTL (2004)
Jan Drozd	Senior Water & San. Specialist	ECSSD	TTL (2003)
Ede Ijjasz-Vasquez	Senior Environmental Specialist	EC3IV	TTL (2001 - 2003)
Bernardo Gomez	Senior Infrastructure Specialist	EC3IV	TTL (1999 - 2001)
Nirmala Saravat	Environmental Specialist		Envir. Safeguards
Fasliddin Rakhimov	Procurement Specialist	ECSPS	Procurement
John Ogallo	Senior Financial Mgmt. Specialist	ECSSD	Financial Mgmt.
Sana Kh.H. Agha Al Nimer	Sr Water & Sanitation Spec.	MNSSD	Engineering
Rinat Iskhakov	Operations Analyst	ECSSD	Operations

Other Project Data

Borrower/Executing Agency:

Follow-on Operations

<i>Operation</i>	<i>Credit no.</i>	<i>Amount (US\$ million)</i>	<i>Board date</i>
None			

BUKHARA & SAMARKAND WATER SUPPLY PROJECT (CREDIT 3620-UZ) (P049621)

Key Project Data (amounts in US\$ million)

	Appraisal estimate	Actual or current estimate	Actual as % of appraisal estimate
Total project costs	62.33	63.11	101.25
Loan amount	40.0	43.8	109.5
Cofinancing	-	-	
Cancellation	-	-	

Cumulative Estimated and Actual Disbursements

	<i>FY02</i>	<i>FY03</i>	<i>FY04</i>	<i>FY05</i>	<i>FY06</i>	<i>FY07</i>	<i>FY08</i>	<i>FY09</i>	<i>FY10</i>	<i>FY11</i>
Appraisal estimate (US\$M)	0.50	9.00	18.00	27.25	36.25	40.00	40.00	40.00	40.00	40.00
Actual (US\$M)		0.20	1.03	6.99	14.30	21.08	28.8	35.3	42.9	43.8
Actual as % of appraisal	0.0	2.2	5.7	25.7	39.4	52.7	72.0	88.3	107.0	109.5
Date of final disbursement: June 2011										

Project Dates

	Original	Actual
Begin Negotiations	12/17/2001	12/17/2001
Board Approval	03/19/2002	03/19/2002
Signing	12/04/2002	12/04/2002
Effectiveness	01/17/2003	01/17/2003
Closing date	06/30/2007	06/30/2010

Staff Inputs (staff weeks)

Stage of Project Cycle	Staff Time and Cost (Bank Budget Only)	
	No. of Staff Weeks	USD Thousands (including travel and consultant costs)
Lending		
FY98		28.44
FY99		122.42
FY00	46	115.71
FY01	35	101.07
FY02	29	69.88
FY03		0.07
FY04		0.00
FY05		0.00
FY06		0.00
FY07		0.00
FY08		0.00
Total:	110	437.59
Supervision/ICR		
FY98		0.00
FY99		0.00
FY00		0.00
FY01		0.00
FY02	1	4.16
FY03	29	156.78
FY04	44	167.49
FY05	47	121.91
FY06	36	91.83
FY07	36	141.27
FY08	36	105.47
FY09	24	0.00
Total:	253	788.91

Mission Data

Names	Title	Unit	Responsibility/ Specialty
Lending			
Ede Jorge Ijjasz-Vasquez	Sector Manager	ECSCS	TTL
Walter Stottmann	Retired		Ex-Sector Leader
Motoo Konishi	Country Director	ECCU8	Sector Leader
Rinat Iskhakov	Operations Officer	ECSS6	Operations
Janis D. Bernstein	Senior Environmental Specialist	ECSS4	Social
Takao Ikegami	Senior Sanitary Engineer	EASIN	Procurement
Hiran Heyat	Consultant	ECSPF	Financial Mgt.
Christophe E. Bosch	Sector Leader	AFTUW	Economics
Hannah Koilpillai	Senior Finance Officer	CTRFC	Disbursement
Zoe Kolovou	Lead Counsel	LEGOP	Legal
Piotr Krzyzanowski	Senior Environmental Specialist		Environment
Tamara Noel		ECSIN	Project Support
Supervision			
Pier Francesco Mantovani	Lead Water and Sanitation Specialist	ECSS6	TTL
Takao Ikegami	Senior Sanitary Engineer	EASIN	Ex-TTL
Jonathan Kamkwalala	Sector Leader	AFTUW	Ex-TTL
Christophe E. Bosch	Sector Leader	AFTUW	Ex-TTL
Anna Cestari	Water Resources Specialist	ECSS6	Ex-co-TTL
Yoko Katakura	Senior Investment Officer	CSFDR	Ex-TTL
Jan Drodz	Senior Water and Sanitation Specialist	AFTUW	Ex-TTL
Sana Kh.H. Agha Al Nimer	Senior Water & Sanitation Specialist	MNSWA	Technical
Galina Alagardova	Financial Management Specialist	ECSS3	Financial
Irina Babich	Financial Management Specialist	ECSS3	Financial
Janis D. Bernstein	Senior Environmental Specialist	ECSS4	Social
Loup J. Brefort	Country Manager	ECCYU	Management
Alexander V. Danilenko	Senior Water & Sanitation Specialist	ETWWP	Technical
Ruxandra Maria Floroiu	Environmental Engr.	ECSS3	Environmental
Simone Giger	Social Development Specialist	ECSS4	Social
Luz Maria Gonzalez	Consultant	LCSUW	Technical
Rinat Iskhakov	Operations Officer	ECSS6	Operations
Ma Dessirie Kalinski	Finance Analyst	CTRDM	Financial
Elena Klementyeva	Program Assistant	ECCUZ	Project Support
Kishore Nadkarni	Consultant	ECSS2	Financial
John Otieno Ogallo	Sr. Financial Management Specialist	ECSS3	Financial
Fasliddin Rakhimov	Procurement Specialist	ECSS2	Procurement

Klas B. Ringskog	Consultant	ECSS6	Technical
Leila Talipova	Consultant	ECSSD	Technical
Alexandru Ursul	Consultant	ECSSD	Technical
ICR			
Pier Francesco Mantovani	Lead Water and Sanitation Specialist	ECSS6	ICR Team Leader
Roohi Abdullah	Consultant	ECSS6	Primary Author

Other Project Data

Borrower/Executing Agency:

Follow-on Operations

<i>Operation</i>	<i>Credit no.</i>	<i>Amount (US\$ million)</i>	<i>Board date</i>
Bukhara and Samarkand Sewerage Project	IDA 463301	55.00	08/04/2009
Alat and Karakul Water Supply Project	IDA 51890	82.00	12/13/2012

Annex B. List of Persons Met

PPAR Mission to Uzbekistan – List of People Met

Ministry of Finance, Tashkent

Mr. M. Abdullaev, Deputy Minister of Finance

Mr. Bakhtiyor Umarov – Deputy Head, Main Department of Foreign Exchange Assets and Liabilities

Mr. Bobomurod Ruziev – Head, Housing and Municipal Service Department

Mrs. Sajida Rustemova – Lead Economist, Housing and Municipal Service Department

Mr. Anvar Rizaev – Deputy Head, Housing and Municipal Service Department

Ms Kseniya Khodova - Deputy Head, Main Department of Foreign Exchange Assets and Liabilities

Ministry of Economy, Tashkent

Mr. Botir Khodjaev, First Deputy Minister, Ministry of Economy

Mr. Jakhongir G. Normukhamedov, Head of International Cooperation Department, Ministry of Economy

Mr. Jamalov. Head of Communal Department, Ministry of Economy

Uzkommunkhizmat, Tashkent

Mr. U. Khalmukhamedov, General Director, Uzkomminkhizmat

Mr. Akhmedov Yu. Olimjon, Deputy General Director

Mr. Rakhmatullaev Rifkat, Head of Department of Foreign Economic Relations and Investment

State Committee on Geology and Mineral Resources, Tashkent

Mr. Aslon A. Mavlonov, Deputy Chairman

Dr. Botirjon D. Abdullaev, Director State Corporation Institute of Hydrogeology and Engineering Geology

UNICEF, Uzbekistan

Dr. Svetlana Stefanet, Chief of Health

List of people met during the Uzbekistan Field Trip

Samarkand

Mr. Akbar Shukurov – Mayor (*Hokim*) of Samarqand

Mr. Salahuddin Isaev – Manager, PCU Branch, Samarqand

Mr. Akbar Bakhriev Isomiddinovich – Director, Samarqand Municipal Water Utility

Mr. Aziz Shamsiev – Chief Accountant, Samarqand Municipal Water Utility

Mr. Mirzoanvar Butaev – Chief Engineer, Samarqand Municipal Water Utility

Mr. Ibrohim Shermatov – Head, Mulsion Water Reservoir & Pumping Station

Mr. Olim Rasulov – Head, Charkhin Water Reservoir & Pumping Station (for Khimiki village)

Bukhara

Mr. **Fazlitdin Ataev**, Deputy Governor, Bukhara Regional Khokimiyat
Mr. Abdurakhmon Karimov – Director, Bukhara Regional Water Utility
Mr. Sh. Nurov – Head, Department of Capital Construction, Bukhara Regional Water Utility
Mr. Bakhshillo Temirov – Lead Engineer, Investment Department, Bukhara Regional Water Utility
Mr. Robert Tsoy – Specialist, Department of Capital Construction, Bukhara Regional Water Utility
Mr. Alisher Jamalov – Head, Investment Department, Bukhara Regional Water Utility
Mr. Ubaydullo Juraev – Head, Department of Municipal Hygiene, Bukhara Regional SES
Mr. D. Rustamov. Chief Accountant
Mrs. Gafrova Zulhumor, Meter Inspector
Mrs. Shariofat and Ms. Matlab Pulatova, Householders, Shaifulalam 24 Apartment Complex
Mrs. Ahmedova Negra, Chairperson, Makhumed Narshakir No.1 Housing Association

Urgench

Mr. Madiyar Kalandarov – Director, Tuyamuyun-Urgench Water Transmission Pipeline Administration
Mr. Ruzmet Atajanov – Chief Engineer, Tuyamuyun-Urgench Water Transmission Pipeline Administration
Mr. Odylbek Jumaniyazov – Deputy Director for Investments, Tuyamuyun-Urgench Water Transmission Pipeline Administration
Mr. Berdimurad Tursunov – Deputy Head, Department of Water Transmission Pipelines, Uzkommunkhizmat Agency
Mr. Omonbay Saidmuradov – Head of Department, Urgench Water Treatment Plant

Nukus

Mr. Jenis Embergenov Saginbaevich – 1st Deputy Chairman, Council of Ministers, Republic of Karakalpakstan
Mr. Gafur Atakhanov – Head, Department for Capital Construction, Industry, Transport, and Communications, Council of Ministers, Republic of Karakalpakstan
Mr. Kamal Avezov – Chief Engineer, Tuyamuyun-Nukus Water Transmission Pipeline Administration
Mr. Rakhmetulla Khabibullaev – Deputy Director for Customer Service, Tuyamuyun-Nukus Water Transmission Pipeline Administration
Mr. Manghitbay Niyetullaev - Deputy Director for Economic Issues, Tuyamuyun-Nukus Water Transmission Pipeline Administration
Mrs. Gulsara Sultanova – Head, Central Laboratory, Tuyamuyun-Nukus Water Transmission Pipeline Administration
Mr. Makhmed Jalalov – Director, Karakalpakstan Rural Water Supply Trust
Mr. Urazbay Yeshmuratov – Chief Engineer, Karakalpakstan Rural Water Supply Trust
Mr. Bairam Baitmuratov - Deputy Director for Economic Issues, Karakalpakstan Rural Water Supply Trust

Mr. Uralbay Yerembetov – Chief Accountant
Mr. Aitbay Kurbanazarov – Head, Production and Technical Department, Karakalpakstan Rural Water Supply Trust
Mr. Vakhid Yusupov – Head, Kisketken Water Distribution Center
Mr. Jaksibek Boboniyazov – Head, Nukus Water Treatment Plant
Mr. Khudaiberghen Utiniyazov – Mayor of Muynak
Mr. Abdujabar Tleuov – Head, Muynak municipal water utility
Mr. Joldasbay Nurullaev – Head, Kegheili municipal water utility
Mr. Uzakbay – Head, Kegheili rural water supply unit

World Bank Country Office

Mr. Country Director (Acting)
Mr. Rinat Iskhakov, Operations Officer
Ms. Country Economist
Ms. Rinat Garipova, Program Assistant.

Annex C. Production and Financial Data for Water Utilities

A. Nukus Urban Water Supply Utility

WATER PRODUCTION	2006	2007	2008	2009	2010	2011	2012	2013
<u>Water Produced and Sold, 000 m3</u>	<i>PROJECT PERIOD</i>							
Production	29,364	29,545	28,608	29,554	30,228	30,964	31,425	31,803
Losses (Unaccounted-for-water)	8,852	8,296	8,097	8,164	8,408	8,696	8,496	8,702
Losses	30.1%	28.1%	28.3%	27.6%	27.8%	28.1%	27.0%	27.4%
SALES, 000 m3								
Domestic	17,205	17,853	17,459	18,278	18,439	18,496	19,561	19,793
Budget	2,286	2,003	1,744	1,697	1,869	1,807	1,648	1,645
Other	1,261	1,393	1,308	1,367	1,463	1,927	1,675	1,621
Total	20,752	21,249	20,511	21,342	21,771	22,230	22,884	23,059
<u>Wastewater Collected, 000m3</u>								
Domestic	2,101	2,126	2,102	2,196	2,049	2,124	2,128	2,014
Budget	1,788	1,598	1,338	1,256	1,497	1,451	1,273	1,242
Other	210	208	208	234	245	265	254	274
Total	4,099	3,932	3,648	3,686	3,791	3,840	3,655	3,530
Wastewater/Water Sales (%)	20%	19%	18%	17%	17%	17%	16%	15%
WATER CONNECTIONS								
Domestic	85,827	86,797	90,971	98,711	100,304	100,872	104,263	108,747
Budget	356	362	473	576	576	598	685	688
Other	469	474	635	782	782	805	886	938
Total	86,652	87,633	92,079	100,069	101,662	102,275	105,834	110,373
WATER TARIFFS, Sum/m3								
Domestic	60	80	115	122	175	230	315	415
Other	750	910	1,100	1,166	1,400	1,500		1,740
Industry	915							
Wastewater Tariff, Sum/m3								
Domestic	45	54	78	83	116	144	266	300
Other	320	394	465	494	660	730	1,030	1,030
Industry	400							
<u>REVENUES, 000 SUM</u>								
<u>Billed Water and wastewater</u>								
Domestic	1,126,949	1,471,773	1,825,454	2,384,513	2,903,956	3,882,022	5,840,448	7,788,463
Budget	2,288,311	2,804,388	2,768,609	3,076,042	3,814,753	4,310,488	4,691,388	4,890,330

Others	727,085	857,310	872,020	1,046,817	1,283,197	1,701,309	2,004,050	2,248,905
Other revenue	138,860	96,568	181,440	125,804	209,104	125,313	249,436	463,094
TOTAL REVENUE	4,281,205	5,230,039	5,647,523	6,633,176	8,211,010	10,019,132	12,785,322	15,390,792
Collected Water and wastewater								
Billed Water and wastewater								
Other Revenues	138,860	96,568	181,440	125,804	209,194	125,313	249,436	463,094
Domestic	1,084,431	1,355,419	1,811,314	2,168,983	2,777,355	3,859,602	5,352,233	6,507,536
Budget	2,424,655	2,660,401	2,969,061	3,144,058	3,413,006	4,605,374	4,378,653	4,911,993
Others	920,616	756,476	962,223	1,025,087	1,263,138	1,713,458	1,916,084	2,148,283
<i>Total</i>	<i>4,568,562</i>	<i>4,868,864</i>	<i>5,924,038</i>	<i>6,463,932</i>	<i>7,662,693</i>	<i>10,303,747</i>	<i>11,896,406</i>	<i>14,030,906</i>
Collection Ratios (%)								
Billed Water and wastewater								
Domestic	96.2%	92.1%	99.2%	91.0%	95.6%	99.4%	91.6%	83.6%
Budget	106.0%	94.9%	107.2%	102.2%	89.5%	106.8%	93.3%	100.4%
Other	126.6%	88.2%	110.3%	97.9%	98.4%	100.7%	95.6%	95.5%
<i>Overall</i>	<i>106.7%</i>	<i>93.1%</i>	<i>104.9%</i>	<i>97.4%</i>	<i>93.3%</i>	<i>102.8%</i>	<i>93.0%</i>	<i>91.2%</i>
OPERATING COSTS								
Salaries	1,085,607	1,454,030	1,672,041	2,072,550	2,798,874	3,404,591	4,229,917	5,199,368
Social	267,383	345,865	398,787	495,187	696,310	852,908	1,078,629	1,311,347
Materials	28,363	72,000	88,475	66,625	43,128	38,540	47,922	64,185
Energy	1,288,559	1,257,556	1,444,962	1,896,365	1,821,332	2,015,206	2,305,801	3,355,233
Fuel	186,679	219,126	310,472	285,121	300,513	403,808	452,851	447,634
Routine Repairs	376,811	399,044	396,084	259,365	356,593	373,713	521,315	688,363
Other operating costs	263,929	193,543	509,384	424,409	580,954	731,935	1,102,283	1,224,475
Administration	204,625	289,324	320,990	366,555	417,208	527,753	536,530	696,332
Other operating costs	288,639	171,345	199,088	280,311	364,309	299,039	449,074	996,960
Tax and mandatory payments	123,471	153,844	177,920	214,505	262,146	325,564	413,225	501,403
Total Operating Costs	4,114,066	4,555,677	5,518,203	6,360,993	7,641,367	8,973,057	11,137,547	14,485,300
Interest Repayment	80,819	43,610	24,576	19,479	18,841	10,673	18,334	12,009
Depreciation	587,993	235,275	857,602	220,627	464,232	384,613	994,080	3,894,022
TOTAL COSTS including depreciation and Interest Payments	4,782,878	4,834,562	6,400,381	6,601,099	8,124,440	9,368,343	12,149,961	18,391,331
Operating expenses (net)	4,114,066	4,555,677	5,518,203	6,360,993	7,641,367	8,973,057	11,137,547	14,485,300
Revenue	4.6	4.9	5.9	6.5	7.7	10.3	11.9	14.0
Depreciation	0.6	0.2	0.9	0.2	0.5	0.4	1.0	3.9
Net Income (revenue-depreciation)	3.9	4.6	5.0	6.2	7.2	9.9	10.9	10.1
Operating expenses (net)	4.1	4.6	5.5	6.4	7.6	9.0	11.1	14.5
Operating ratio	1.05	0.99	1.09	1.02	1.06	0.91	1.02	1.43

B. Trest Rural Water Supply Utility

<i>WATER PRODUCTION</i>	<i>2009</i>	<i>2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>
<u>Water Produced and Sold, 000 m3</u>					
Production	2,807	2,804	3,131	3,135	2,768
Losses (Unaccounted-for-water)	540	456	616	627	657
Losses	19.2%	16.3%	19.7%	20.0%	23.7%
<u>SALES, 000 m3</u>					
Domestic	2,191	2,281	2,447	2,432	2,062
Budget	77	67	67	76	48
Other					
Total	2,268	2,348	2,514	2,508	2,110
<u>CONNECTIONS</u>					
Domestic	na	na	na	na	na
Budget	na	na	na	na	na
Total	na	na	na	na	na
<u>WATER TARIFFS, Sum/m3</u>					
Domestic	162	204	295	470	656
Budget and Other	816	932	1,220	1,883	2,118
Industry	-	-	-	-	-
<u>REVENUES, 000 SUM</u>					
State Subsidy	394,782	463,454	485,530	513,096	549,013
Other revenue	125,777	617,469	1,964,833	47,609	-
<u>Billed Water</u>					
Domestic	355,867	465,051	721,414	1,141,986	1,353,129
Budget	75,220	74,821	98,545	170,599	122,941
<u>TOTAL BILLING</u>	<i>431,087</i>	<i>539,872</i>	<i>819,959</i>	<i>1,312,585</i>	<i>1,476,070</i>
<u>Collected Water Bills</u>					
Domestic	320,992	494,349	618,973	1,004,605	1,288,179
Budget	75,220	74,821	98,545	170,599	122,941
Others					
Total	396,212	569,170	717,518	1,175,204	1,411,120

	2009	2010	2011	2012	2013
<u>Collection Ratios</u>					
Domestic	90.2%	106.3%	85.8%	88.0%	95.2%
Budget	100.0%	100.0%	100.0%	100.0%	100.0%
Overall	91.9%	105.4%	87.5%	89.5%	95.6%
<i>OPERATING COSTS, 000 Sum</i>					
Salaries	568,964	705,037	836,788	888,142	998,023
Social	136,396	176,259	209,197	221,658	249,234
Materials	264,175	333,580	773,082	192,417	42,273
Electricity	81,331	92,985	119,553	104,079	175,807
Fuel	137,205	95,552	176,153	71,651	16,138
Depreciation	256,223	807,617	1,483,780	946,929	969,181
Other operating costs	238,821	393,130	785,573	884,018	682,266
Administration	56,065	68,812	134,405	177,604	136,403
Tax and mandatory payments	3,325	9,371	8,212	4,004	4,844
Total Operating Costs	1,742,505	2,682,343	4,526,743	3,490,502	3,274,169
Interest Repayment					
TOTAL COSTS	1,742,505	2,682,343	4,526,743	3,490,502	3,274,169
<u>Cost Summary</u>					
Tax and mandatory payments	3,325	9,371	8,212	4,004	4,844
Operating Costs	1,486,282	1,874,726	3,042,963	2,543,573	2,304,988
Depreciation	256,223	807,617	1,483,780	946,929	969,181
Total Costs including depreciation	1,742,505	2,682,343	4,526,743	3,490,502	3,274,169
<u>Revenue Summary</u>					
Revenue (including other)	521,989	1,186,639	2,682,351	1,222,813	1,411,120
Income (Revenue + other + subsidy)	916,771	1,650,093	3,167,881	1,735,909	1,960,133
<u>FINANCIAL INDICATORS</u>					
Revenue/Costs	0.35	0.63	0.88	0.48	0.61
Revenue/(total costs including depreciation)	0.53	0.62	0.70	0.50	0.60

na = not available

C. Bukhara Water Supply Utility

<i>PRODUCTION</i>	Project Period				Post-Project			
	2006	2007	2008	2009	2010	2011	2012	2013
<i><u>Water Produced and Sold, 000 m3</u></i>								
Production	68,337	57,243	54,410	51,986	51,426	52,172	51,234	49,606
Losses (Unaccounted-for-water)	19,118	16,460	15,842	14,686	14,763	14,953	14,703	14,174
Losses	28.0%	28.8%	29.1%	28.2%	28.7%	28.7%	28.7%	28.6%
<i>SALES, 000 m3</i>								
Domestic	15,668	13,311	12,462	13,403	14,202	14,695	15,101	15,055
Budget	2,682	2,448	2,298	2,305	2,295	2,427	2,230	2,150
Other	3,639	2,486	1,719	1,468	1,584	1,690	1,707	1,604
Service Water	27,230	22,538	22,107	20,124	18,582	18,407	17,493	16,623
Total	49,219	40,783	38,586	37,300	36,663	37,219	36,531	35,432
<i>CONNECTIONS</i>								
Domestic	57,225	57,442	57,995	58,647	58,750	58,801	58,922	58,962
Budget	256	286	296	300	329	332	334	342
Other	1,170	1,220	1,254	1,280	1,280	1,281	1,288	1,394
Total	58,651	58,948	59,545	60,227	60,359	60,414	60,544	60,698
<i>WATER TARIFFS, Sum/m3</i>								
Domestic	60	75	93	117	146	188	235	361
Other	177	232	290	361	443	656	670	973
Industry	287	366	464	577	709	863	944	1,392
Service water	23	36	46	56	69	89	111	176
<i><u>REVENUES, 000 SUM</u></i>								

		2006	2007	2008	2009	2010	2011	2012	2013
<u>Billed Water</u>	Domestic	940,070	1,003,407	1,157,331	1,567,605	2,078,061	2,764,759	3,547,999	5,440,620
	Budget	474,672	567,977	665,215	832,834	1,017,151	1,372,156	1,493,250	2,092,136
		2006	2007	2008	2009	2010	2011	2012	2013
	Non-budget	1,044,388	910,529	797,908	847,144	1,123,648	1,458,164	1,697,396	2,231,948
	Service Water	625,225	809,402	1,011,266	1,135,058	1,284,391	1,646,428	1,943,508	2,924,723
	Total Billed	3,084,355	3,291,315	3,631,720	4,382,641	5,503,251	7,241,507	8,682,153	12,689,427
<u>Billings Collected</u>									
	Domestic	995,534	1,047,316	1,090,470	1,337,535	1,930,155	2,693,960	3,838,935	4,994,489
	Budget	467,552	557,185	634,615	730,069	1,012,665	1,352,945	1,511,169	2,081,676
	Non-budget	901,306	891,658	766,407	811,585	1,088,575	1,447,466	1,726,252	2,064,552
	Service Water	616,472	761,648	827,681	868,320	806,598	2,145,562	1,916,299	2,834,056
	Total Collected	2,980,864	3,257,807	3,319,173	3,747,509	4,837,993	7,639,933	8,992,655	11,974,773
<u>Collection Ratios (%)</u>									
		2006	2007	2008	2009	2010	2011	2012	2013
	Domestic	105.9%	104.4%	94.2%	85.3%	92.9%	97.4%	108.2%	91.8%
	Budget	98.5%	98.1%	95.4%	87.7%	99.6%	98.6%	101.2%	99.5%
	Other	86.3%	97.9%	96.1%	95.8%	96.9%	99.3%	101.7%	92.5%
	Service water	98.6%	94.1%	81.8%	76.5%	62.8%	130.3%	98.6%	96.9%
	Overall	96.6%	99.0%	91.4%	85.5%	87.9%	105.5%	103.6%	94.4%
<u>OTHER INCOME</u>									
	Subsidy				4,086,423	4,096,687	5,617,709	4,866,166	3,680,800
	Other Income	329,660	35,502	71,294	96,178	73,564	107,269	164,771	86,782
	Total	329,660	35,502	71,294	4,182,601	4,170,251	5,724,978	5,030,937	3,767,582
	Total Revenue and Income	3,310,524	3,293,309	3,390,467	7,930,110	9,008,244	13,364,911	14,023,592	15,742,355
<u>OPERATION COSTS</u>									

	Other								
Total		92,757	98,155	99,749	101,747	102,528	107,120	109,256	109,409
<u>WATER TARIFFS, Sum/m³</u>									
Domestic		62	95	122	149	176	222	285	374
Commercial/Industrial		70	86	105	132	445	567	774	925
Budget		145	172	218	270	332	412	554	686
Overall Average		80	107	136	169	206	436	342	449
<u>REVENUES, 000 Sum</u>									
<u>Billed</u>									
Domestic		1,395,121	2,804,357	3,228,322	4,013,971	4,481,000	5,214,588	5,823,838	7,922,492
Commercial/Industrial		1,005,541	1,374,071	1,631,655	1,832,423	2,379,057	3,020,099	3,670,703	4,422,545
Budget		648,015	720,809	792,124	1,021,920	1,382,114	1,748,519	2,227,845	2,913,500
TOTAL BILLED (including VAT)		3,048,677	4,899,237	5,652,101	6,868,314	8,242,171	9,983,206	11,722,386	15,258,537
TOTAL BILLED (excluding VAT)		2,775,807	4,555,355	5,253,917	6,393,270	7,617,861	9,273,556	10,739,295	14,016,215
<u>Collected</u>									
Domestic		925,590	1,253,758	1,690,579	2,633,578	3,460,149	4,623,674	5,760,949	7,498,743
Commercial/Industrial		1,199,804	995,271	1,267,374	1,693,772	1,473,279	2,704,440	2,921,905	3,046,952
Budget		654,110	714,604	820,164	867,034	1,225,339	1,889,913	2,341,389	2,808,754
TOTAL COLLECTED (including VAT)		2,779,504	2,963,633	3,778,117	5,194,384	6,158,767	9,218,027	11,024,243	13,354,449
TOTAL COLLECTED (excluding VAT)		2,470,519	2,678,654	3,430,194	4,767,583	5,708,998	8,452,301	10,147,028	12,378,499
<u>Collection Ratios (%)</u>									
Domestic		66.3%	44.7%	52.4%	65.6%	77.2%	88.7%	98.9%	94.7%
Commercial/Industrial		119.3%	72.4%	77.7%	92.4%	61.9%	89.5%	79.6%	68.9%
Budget		100.9%	99.1%	103.5%	84.8%	88.7%	108.1%	105.1%	96.4%
OVERALL (including VAT)		91.2%	60.5%	66.8%	75.6%	74.7%	92.3%	94.0%	87.5%
OVERALL (excluding VAT)		89.0%	58.8%	65.3%	74.6%	74.9%	91.1%	94.5%	88.3%

<u>OPERATION COSTS</u>								
Wages	315,147	405,262	558,968	743,959	770,781	1,047,302	1,293,499	1,534,911
Social	78,232	98,929	132,491	174,154	204,996	262,873	317,344	377,712
Materials & Repair	178,189	270,643	174,392	236,808	190,173	401,165	251,480	391,406
Electricity	2,362,138	2,762,660	3,171,312	3,553,936	3,596,023	4,482,432	4,680,946	5,077,843
Fuel	48,657	79,319	89,225	118,431	155,896	173,174	189,814	198,588
Taxes and Mandatory Deductions	222,207	282,372	383,865	500,325	272,374	334,911	388,899	518,378
Administration	20,241	10,320	113,760	27,418	19,681	41,450	26,764	16,092
Other cash operating costs	495,576	513,431	307,257	385,022	1,250,715	1,728,805	3,534,068	2,576,421
All Cash Operational Expenditures	3,720,387	4,422,936	4,931,270	5,740,053	6,460,639	8,472,112	10,682,814	10,691,351
Depreciation	634,133	1,064,796	1,516,865	1,106,881	1,497,640	2,229,661	2,751,720	2,932,889
Total Operational Expenditures	4,354,520	5,487,732	6,448,135	6,846,934	7,958,279	10,701,773	13,434,534	13,624,240
Financing Costs	1,737,176	2,572,455	3,710,206	4,354,819	3,368,504	4,725,143	5,480,537	6,422,255
TOTAL COSTS	6,091,696	8,060,187	10,158,341	11,201,753	11,326,783	15,426,916	18,915,071	20,046,495
<u>FINANCIAL INDICATORS</u>								
Total Revenue & Income/Operating Costs	0.57	0.49	0.53	0.70	0.72	0.79	0.76	0.91
Total Revenue & Income/Operating Costs & Debt Repayment	0.41	0.33	0.34	0.43	0.50	0.55	0.54	0.62
<u>CURRENT ASSETS & LIABILITIES</u>								
<u>Current Assets</u>								
Domestic	2,998,437	4,565,607	6,082,376	7,488,939	8,578,460	9,211,268	7,529,637	7,397,300
Budget Consumers	77,122	83,702	54,133	178,790	353,248	227,528	137,166	226,728
Other Users	775,244	1,098,177	1,522,992	1,821,344	2,772,979	3,301,987	4,095,405	5,863,701

Other Accounts Receivable	1,225,140	2,353,680	1,061,406	1,742,986	619,919	608,822	639,398	533,169
Total Accounts Receivable	5,075,943	8,101,166	8,720,907	11,232,059	12,324,606	13,349,605	12,401,606	14,020,898
Other Current Assets	650,523	2,404,038	2,239,559	1,311,043	419,786	441,764	769,806	801,339
Total Current Assets	5,726,466	10,505,204	10,960,466	12,543,102	12,744,392	13,791,369	13,171,412	14,822,237
<u>Liabilities</u>								
Payable to Suppliers	888,483	1,109,434	3,287,995	1,285,332	5,216,953	1,166,750	1,632,409	925,419
Other Credit Debt	1,475,239	3,196,054	3,650,664	966,482	3,522,816	3,082,759	3,217,469	3,651,821
Other Liabilities			2,464,592	9,101,338	6,193,073	11,741,839	11,864,801	12,959,887
Total Current Liabilities	2,363,722	4,305,488	9,403,251	11,353,152	14,932,842	15,991,348	16,714,679	17,537,127
Current Ratio (Current Assets/Current Liabilities)	2.42	2.44	1.17	1.10	0.85	0.86	0.79	0.85