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PROJECT PERFORMANCE ASSESSMENT REPORT



ZAMBIA

# Water Sector Performance Improvement Project

**Report No. 111134**

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**Report No.: 111134**

**PROJECT PERFORMANCE ASSESSMENT REPORT**

**REPUBLIC OF ZAMBIA**

**WATER SECTOR PERFORMANCE IMPROVEMENT PROJECT  
(IDA-42330 AND IDA-45500)**

**December 19, 2016**

*Financial, Private Sector, and Sustainable Development  
Independent Evaluation Group*

## Currency Equivalents (annual averages)

*Currency Unit =Zambian Kwacha ZKW*

2007	US\$1.00	ZMK4,413.95
2008	US\$1.00	ZMK3,830.00
2009	US\$1.00	ZMK4,785.00
2010	US\$1.00	ZMK4,640.99
2011	US\$1.00	ZMK4,780.00
2012	US\$1.00	ZMK5,115.00
2013	US\$1.00	ZMK5,207.82

## Abbreviations and Acronyms

CAS	Country Assistance Strategy
CP	Cooperating Partners
FGD	Focus Group Discussion
ICR	Implementation Completion Report
IDA	International Development Corporation
IEG	Independent Evaluation Group
LCC	Lusaka City Council
LWSC	Lusaka Water and Sanitation Company
MCC	Millennium Challenge Corporation of the United States of America
MLGH	Ministry of Local Government and Housing
NWASCO	National Water and Sanitation Council
PPAR	Project Performance Assessment Report
PRSP	Poverty Reduction Strategy Paper
WSS	Water and Sanitation Services

## Fiscal Year

Government: January 1 to December 31

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This report was prepared by Joseph Bredie, Consultant, who assessed the project in May, 2016. Ramachandra Jammi was the task team leader. The report was peer reviewed by Vijay Jagannathan and Oscar Alvarado and panel reviewed by Robert Lacey. Grace Ingrid Chilambo and Romaine Pereira provided administrative support.

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## Principal Ratings

	<i>ICR*</i>	<i>ICR Review*</i>	<i>PPAR</i>
Outcome	Moderately Satisfactory	Moderately Satisfactory	Moderately Unsatisfactory
Risk to Development Outcome	Substantial	Significant	High
Bank Performance	Moderately Satisfactory	Moderately Satisfactory	Moderately Satisfactory
Borrower Performance	Moderately Satisfactory	Moderately Satisfactory	Moderately Unsatisfactory

\* 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.

## Key Staff Responsible

<i>Project</i>	<i>Task Manager/Leader</i>	<i>Division Chief/ Sector Director</i>	<i>Country Director</i>
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**IEG Mission: Improving World Bank Group development results through excellence in independent evaluation.**

**About this Report**

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

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

Each PPAR is subject to technical peer review, internal IEG Panel review, and management approval. Once cleared internally, the PPAR is commented on by the responsible Bank country management unit. 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.

**About the IEG Rating System for Public Sector Evaluations**

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

**Outcome:** The extent to which the operation's major relevant objectives were achieved, or are expected to be achieved, efficiently. The rating has three dimensions: relevance, efficacy, and efficiency. *Relevance* includes relevance of objectives and relevance of design. Relevance of objectives is the extent to which the project's objectives are consistent with the country's current development priorities and with current 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 is not applied to development policy operations, which provide general budget support. *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 Project Performance Assessment Report (PPAR), prepared by the Independent Evaluation Group (IEG), evaluates the Water Sector Performance Improvement Project (WSPIP) (2007-2013) in Zambia.

The project was approved on October 5, 2006 with an IDA Credit (IDA-42330) of US\$23 million. On April 16, 2009, the Bank's Board approved an IDA Grant (IDA-45500) of US\$10 million in Additional Financing to scale up the project. The Project closed on June 30, 2013, thirty-six months after the planned completion date of June 30, 2010 (The IDA Grant was also closed on June 30, 2013).

The Project supported the Government's on-going commitment to the urban and rural water sector by improving access and sustainability of water supply and sanitation services for consumers in Lusaka city and by supporting a more comprehensive institutional structure for sector-wide investments. IEG selected the project for assessment because of potential lessons from the experience of improving access to water and sanitation services (WSS) for urban consumers through a commercially oriented utility. In addition, the findings and lessons from this assessment would be inputs to IEG's major sector study on the Evaluation of the World Bank Group's Support for Water Supply and Sanitation Services, FY2007-2016.

This report draws on documentation for relevant Bank-funded projects including the Project Appraisal Document, Implementation Completion and Results Report, legal agreement, project files and archives. The report also benefitted from eight Focus Group Discussions (FGDs) with local consumers, conducted by the IEG field mission during May 16-28, 2016 in Lusaka, Luangwa, Chongwe and Kafue. The mission had discussions with Bank staff in Washington and Zambia. Interviews and discussions were also held with government and utility officials and representatives of the group of Cooperating Partners (CPs) that invest in the sector in Zambia. The mission visited three water treatment plants in Luangwa, Chongwe and Kafue that had been rehabilitated under the project.

The mission expresses its appreciation for the generous time and attention from the Borrower and all concerned parties. A list of persons met by the mission is in Appendix C.

Following IEG practice, copies of the draft report were sent to government officials and implementing agencies but no comments were received.

## Summary

This Project Performance Assessment Report (PPAR) assesses the development effectiveness of the Water Sector Performance Improvement Project (WSPIP) in Zambia. The project's original objectives were: (i) the improvement of access to, and sustainability of, the water supply and sanitation services for consumers in Lusaka; and (ii) development of a comprehensive institutional structure supporting a coordinated approach to water supply and sanitation investments. In 2009, Additional Financing was approved, and the objectives were revised to (i) improve the technical efficiency and financial sustainability of Lusaka Water and Sanitation Company and improve access to water supply and sanitation services for urban consumers in Lusaka, Kafue, Chongwe, and Luangwa districts, and (ii) strengthen the effectiveness of national water supply and sanitation planning.

### Project performance and ratings

With regard to the *first original objective* – improving access and sustainability of water supply and sanitation services in Lusaka – the project helped about 5,000 people obtain access to safe water through 100 new kiosks in peri-urban areas. Water availability increased from 210,000 to 230,000 cubic meters (per day); coverage of beneficiaries for water supply (64 percent to 87 percent) and sanitation services (64 percent to 71 percent); water supply duration in peri-urban areas (15 hours/day to 20 hours/day); and water quality (bio-content from 17.7 to 2 percent). However, IEG's PPAR mission found deterioration in these outcomes since project closure. Water supply at 10 of the 100 water kiosks has decreased from earlier levels due to low pressure during most of the day. The focus group discussions indicated reduced levels of satisfaction regarding the adequacy, reliability, and quality of water supply and sanitation services. The efficacy of this objective is rated *modest*.

Progress was made in achieving the *second original objective* of developing a comprehensive institutional structure supporting a coordinated approach to water supply and sanitation investments. MLGH prepared separate Water and Sanitation Policies and coordinated sector investments with the Cooperating Partners (CPs) on a regular basis by 2013. In 2016, MLGH continued to conduct regular reviews of sector performance and investments with the CPs to further improvements in the institutional structure and investments. Overall, the efficacy of this objective is rated *substantial*.

The efficacy of the *first revised objective* – to improve the technical efficiency and financial sustainability of Lusaka Water and Sanitation Company and improve access to water supply and sanitation services, for urban consumers in Lusaka, Kafue, Chongwe, and Luangwa districts – is rated *modest*. While LWSC's technical and financial efficiency parameters had improved by closure, they have deteriorated since. Non-revenue water losses increased from 41 percent in 2013 to 47 percent in 2015. Water service coverage dropped from 87 percent in 2013 to 82.9 percent in 2015, and hours of water supply from 20 to 17. Staff cost in relation to billing and collection increased from 0.48 percent to 0.63 percent, and operation and maintenance costs coverage by collection dropped from 123 percent to 88 percent. Access to water supply had improved by 11,800 m<sup>3</sup>/day in the three districts of Chongwe, Kafue and Luangwa by 2012/13, increasing

provision to 4,150 households from less than eight hours to an average of 17 hours per day. However, the number of additional people connected amounted to 9,000, which was far short of the target of 40,000. Intake to the water treatment plant at the Chongwe River is dry from June till November and water has to be brought in by tanker trucks. Similarly in Luangwa, water supply is interrupted sometimes for days on end due to electrical power cuts. Moreover, the output of the thirteen boreholes drilled under the project had dropped by 35 percent in 2015 compared to 2012.

Efficacy of the *second revised objective* – strengthening the national water supply and sanitation planning – is rated *modest*. The planning capacity of the sector ministry remains weak. The ministry has no clear mechanism to coordinate with the City Councils that own and manage the utilities nor does it have a clear role in enforcing regulations for WSS with regard, for instance, to bore-hole drilling by public, commercial or private consumers. The project provided technical assistance to strengthen policy and planning capacity at the Ministry. While modest improvements in capacity had been made at project closing in 2013, ministry staff informed the PPAR mission that there are no specific plans to improve or expand the ministries capacity or role in the sector.

**Efficiency is rated *modest*.** At closure, the Economic Rate of Return (ERR) was estimated at 19 percent and the Financial Rate of Return (FRR) at 24 percent. However, this assessment takes into account the significant delays in project implementation and shortcomings in administrative and operational efficiency that can be attributed to factors that were reasonably under the control of the Government and implementing agency.

**Overall Development outcome is rated *moderately unsatisfactory*.** Relevance of objectives is rated *high* and that of design *substantial* for both the original and revised objectives. Efficacy of the first and second original objectives is rated *modest* and *substantial* respectively, while both the revised objectives are rated *modest*. Given *modest* efficiency and weighting by the 20 percent/80 percent split in disbursement under the original and revised project objectives, the overall project outcome is rated as *moderately unsatisfactory*.

**Risk to development outcome is rated *high*** due to a combination of institutional, operational, sectoral and exogenous factors. While there are substantial financial commitments from the Cooperating Partners (CP/Donors) to address pressing infrastructure, rehabilitation and capacity issues, investment coordination by the sector ministry is in need of improvement. The incentive to address shortcomings in M&E, planning and enforcement of regulation, appears to be low due to a lack of sufficient pressure from consumers on the utility and elected officials for improvement in water and sanitation services. Insufficient training and motivation of LWSC's technical staff affects the drive to repair broken meters, replace faulty parts and install sensors to monitor meter performance. The national power crisis – for which there appears to be no immediate solution – is strongly impacting utility operations. Drought is predicted to become more serious in the near future, hence affecting the supply and quality of groundwater. Macroeconomic difficulties are likely to persist until copper prices strongly recover.

**Bank Performance is rated *moderately satisfactory*, while Borrower performance is rated *moderately unsatisfactory*** The Bank appropriately built in the use of incentivized

performance agreements into project design and secured buy-in from the Government and the regulator. The Bank showed flexibility with additional financing half way through implementation of the original investment loan to ensure that the development objectives of the project would be achieved. Supervision missions repeatedly flagged major weaknesses and threats to progress with implementation and discussed solutions for improvement with the implementing entities. While the project was high in the country's priorities for the water and sanitation sector, there were governmental delays in paying a lapsed loan soon after project effectiveness, and in meeting the conditions of effectiveness for additional finance. Both implementing agencies (LWSC and MLGH) exhibited constraints in procurement and financial management capacity during implementation.

## Lessons

**Maintaining the financial viability of a service provider requires strategies to deal with exogenous factors in addition to securing technical and commercial efficiency of operations.** The financial viability of utilities supported by the project faces pressure from reduced availability and increased cost of energy (with the crisis in hydropower), thus adding to the effects of shortcomings in operational and technical efficiency and a reduction in annual budget allocation for utility operation, maintenance, rehabilitation and expansion, making it difficult to maintain the quality of water and sanitation service delivery.

**Sustainable provision of water supply services in the face of growing population and demand requires active coordination between the authorities responsible for long-term water resource planning, and service providers.** In the case of Zambia, the growing urban and rural population and recurrent droughts have strained surface and ground water resources. In the project area, unregulated drilling of bore holes by public agencies and public and private organizations and businesses is putting pressure on the utilities. It is necessary for the Ministry of Water Development which is responsible for water resources and the Ministry of Local Government and Housing responsible for the water supply to coordinate in developing further strategies to manage the extraction and use of river and surface water for competing users.

**Alternative approaches need to be actively explored and adopted for urban and rural sanitation, especially when conventional sewerage may not be financially feasible.** In the project areas, reliance on existing on-site sanitation facilities poses problems, especially in the rainy season when run-off rainwater floods these facilities which are not emptied or properly managed. Zambia could learn from countries that have similar geographic, economic and demographic patterns, and have developed more effective approaches to improving and managing sanitation facilities.

Stoyan Tenev  
Acting Director  
Financial, Private Sector, and  
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Independent Evaluation Group

# 1. Background and Context

1.1 After a decade of sustained economic growth - averaging 5.7 percent per year – Zambia attained lower-middle income status by 2013 with a per capita income of US\$1,810. Growth in 2014 was 5.5 percent. On the political front, Zambia has successfully held seven peaceful national elections since independence in 1964.

1.2 More recently, Zambia is faced with difficult economic challenges. Growth is estimated to have dropped below 4 percent in 2015 for the first time since 1998 resulting in only marginal growth of per capita income. External challenges include slower regional and global growth (crucially in China which is a major consumer of copper which accounts for a large share of Zambia’s economic activity), and the strengthening of the US Dollar against the Zambian currency Kwacha (making imports including oil more expensive). Domestic pressures include a power crisis impacting all sectors of the economy, repeated fiscal deficits that have reduced investor confidence, and low and poorly-timed rains that have reduced agricultural incomes of the 62 percent of the population living in poverty.<sup>1</sup>

1.3 The high poverty levels and prevailing inequality (with a 0.52 Gini coefficient), are a reflection of the high concentration of growth in the urban and mining sectors coupled with persistent low productivity in the mostly subsistence-based agricultural sector. Zambia’s rural poverty rate was as high as 78 percent in 2010. Moreover, 42 percent of the population was living in extreme poverty with insufficient consumption to meet their daily minimum food requirements. Although the poverty rate has declined marginally over time, the absolute number of poor has increased from approximately 6.0 million in 1991 to 7.9 million in 2010 due to population growth.

1.4 Key measures of human development are worse than in many low-income countries. Under 5 mortality is 119 per 1000 live births, life expectancy is 49, and malnutrition in children under five is 45 percent (compared to respective low-income country averages of 108, 50 and 36 percent). Malnutrition closely tracks poor sanitation. Zambia ranks 141 out of 187 countries in the UN’s Human Development Index in 2014. The prevalence of HIV/AIDS has remained at about 15 percent for the 15-49 age cohort for the last decade. Zambia is lagging on various Millennium Development Goal (MDG) targets, including those for water and sanitation.

1.5 Sixty-three percent<sup>2</sup> of Zambians had access to clean drinking water supply compared to an MDG target of 75 percent by 2015 as defined by the United Nations Children’s Program (UNICEF)/World Health Organization (WHO) Joint Monitoring Program (JMP). There is a stark contrast in water supply between urban areas (about 90 percent access in 2010 according to the UN) and rural areas (46 percent access). In urban

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<sup>1</sup> in 2010 (using Purchasing Power Parity at US\$1.25 per day)

<sup>2</sup> Source: Calculated from ZDHS 2013/14 dataset. The statistical data in this report suffers from substantial inconsistencies between the data from the Joint Monitoring Program (JMP), Zambia’s Central Statistics Office (CSO), Bank reports and government agencies. Water and sanitation data is produced primarily by consultants and university researchers since the sector ministry has no in house monitoring and evaluation function.

areas, 41 percent have access to water connections in their house or yard and 49 percent rely on water kiosks and standpipes. Water kiosks are operated by private individuals who have an agreement with water utilities and community based organizations. Kiosk operators buy piped water in bulk and sell it at a regulated price of about one US cent per 20 liters. There were about 270 water kiosks in Lusaka (100 constructed under the project) in 2013. Water quality that year was good, according to the National Water and Sanitation Council (Nwasco) - 97 percent of water samples collected in urban areas were in compliance with drinking water standards. However, in the Copperbelt, pollution from the mines affects the drinking water supply negatively, and in some cases the concentration of manganese was beyond treatable limits and water had to be brought in by tankers to several mining towns.

1.6 Water supply in urban areas is presently (2016) intermittent and worsening to an average of 17 hours supply a day in recent years due to electrical power cuts and dwindling water resources. Zambia is nonetheless rich in rivers and lakes and only an estimated 1.5 percent of the annual renewable water resources are being used at present. During the dry season water resources are scarce especially in the south of the country (due to insufficient reservoirs and dams and competition between agricultural and industrial users). Annual rainfall averages between 1,400 mm in the north and declines to 700 mm in the south (including in Lusaka province). As a result, groundwater resources are unevenly distributed.

1.7 Forty-three percent of the population had access to adequate sanitation<sup>3</sup>, (56 percent in urban areas and 34 percent in rural areas) compared to an MDG target of 70 percent. Zambia loses 1.3 percent of GDP due to the public health impact of poor sanitation (Water and Sanitation Program - 2012) which results in child malnutrition, illness and premature death. The economic burden of inadequate sanitation falls most heavily on the poor who are less likely to have adequate sanitation facilities and access to health services.

1.8 The adverse impact of poor sanitation is most acute in Lusaka, Zambia's capital and largest city. The population of the city was estimated at 1.7 million in 2008. With a population growth rate of 4.5 percent, one of the highest in Sub-Saharan Africa, the city's population was estimated at 2.3 million in 2015 and is estimated to grow to 5 million by 2035. Lusaka is suffering from a sanitation crisis that claims lives<sup>4</sup> through regular occurrence of cholera, typhoid and dysentery, and causes severe environmental pollution. An estimated 70 percent of Lusaka's urban residents live in 33 "peri-urban areas", where roughly 90 percent of the population relies on pit latrines, most of which are "unimproved"<sup>5</sup>. One percent defecate in the open. 50 percent of Lusaka's water supply is derived from fairly shallow groundwater abstracted within the city, which is prone to contamination through fissures in the underlying rock. Decreasing annual rainfall, poor

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<sup>3</sup> Adequate sanitation is defined as a sanitation facility used by only one household and separating fecal waste from human contact.

<sup>4</sup> In 2012 it was estimated that, approximately 87,000 Zambians, including 6,600 children die each year from diarrhea. Nearly 90% of incidences are attributed to poor water, sanitation and hygiene.

<sup>5</sup> That is, they do not comply with the Joint Monitoring Program definition of adequate sanitation.

management of solid waste and storm water drainage and the generally flat terrain further compound these problems.

### **Sector Policies and Institutional Arrangements**

1.9 In November 1994, the Government adopted the National Water Policy that aimed at promoting a sustainable water resources development with a view to facilitating equitable provision of adequate quantity and quality of water for all competing groups of users at acceptable costs while ensuring security of supply under varying conditions. The seven principles of this reform program laid out in the 1994 National Water Policy called for: (i) separation of water resources functions from water supply and sanitation; (ii) the separation of regulatory and executive functions; (iii) the devolution of responsibilities for water supply to local authorities and private enterprises; (iv) achievement of full cost recovery for water supply and sanitation (WSS) services through user charges in the long run; (v) human resources development for effective institutions; (vi) the adoption of technology in line with local conditions (and ability to pay); and (vii) increased Government priority and budget spending for the sector. The 1994 policy was revised in 2010 and split into separate policies for water supply and sanitation. These policies are expected to be approved by Parliament in 2016.

1.10 A 1995 Strategy and Institutional Framework for the Water and Sanitation Sector set out the institutional arrangements for providing water and sanitation services by local authorities. The 1998 sanitation strategy promotes awareness of sanitation in basic social services and outlines the strategy to provide sanitation services. The 2004 Peri-urban Water Supply and Sanitation Strategy formulates recommendations for increasing access to WSS services for peri-urban low-income communities. The 2004 National Decentralization Policy aims at decentralizing government responsibilities and functions to lower levels of government through “devolution”. It reaffirms that local authorities are the institution responsible for water and sanitation services.

1.11 Zambia was one of the first countries in Africa to establish an independent regulatory agency for the urban water sector (the National Water Supply and Sanitation Council - Nwasco) under the 1997 Water Supply and Sanitation Act No. 28. The Act devolved the authority for water service provision from central government to local authorities which were instructed to form autonomous water and sanitation Commercial Utilities that were expected to be financially self-sufficient with respect to operation and maintenance costs. It gave Nwasco the authority to ensure that these utilities produce sustainable water supply and sanitation service and safe drinking water for a specific number of hours of supply per day at a fair price. Nwasco regulates eleven utilities, established between 1989 and 2009, that provide water and sanitation services to urban areas across the country.

1.12 While the creation of utilities serving the urban population has progressed over the last two decades, the task of building an institutional structure for rural water supply and sanitation provision lagged. Despite the fact that the 2006 revised institutional framework for rural water supply and sanitation re-emphasized the role of local authorities, and provided for strengthening of these functions at the provincial and district

levels including the establishment of regional program support units, rural areas continue to lag behind in creating effective local water and sanitation institutions.

1.13 The 1994 National Water Policy also stipulated the separation of water resources management from water supply and sanitation. The 1997 Act made the Ministry of Energy and Water (MEW) responsible for the water sector and the Ministry of Local Government and Housing (MLGH) responsible for water supply and sanitation. In addition, the Act devolved responsibility for controlling environmental pollution to the Zambian Environmental Management Agency.

### **Project Background**

1.14 The Lusaka Water and Sewerage Company (LWSC) is responsible for the provision of water and sanitation services in Lusaka. LWSC was established in 1988 and started operating in 1990. The utility is wholly owned by the Lusaka City Council (LCC). At appraisal, LWSC provided water services directly to about 45,880 connections (of which 33,370 were domestic connections) for the 1.5 million residents of Lusaka with a coverage rate of about 80 percent on the network. Less than 30 percent of LWSC's connections were metered and the rest were billed on assessed values. LWSC produced 210,000 m<sup>3</sup>/day of water, lost 50 percent of production (20 percent through technical losses and 30 percent through commercial losses). The water supply service provided in conventional areas was reasonable (most customers received a 16 to 24 hour supply). The extent and quality of service provided to the unplanned peri-urban compounds where most of the poor reside was limited to a few hours a day for about 50 percent of compound dwellers.

1.15 LWSC also served about 20,000 sewer connections. The main domestic sewage treatment plant was designed to receive 36,000m<sup>3</sup>/day, but received 65,000 m<sup>3</sup>/day. Since the plant could only treat a small amount of this, the rest was discharged. The plant was in need of major rehabilitation and expansion.

1.16 The project aimed to respond to the need to improve access to water supply and sanitation in Lusaka, improve sector planning, develop the institutional structure for investment in the sector, and improve the operational performance of the commercial utility - LWSC. The Bank had been involved in the urban water and sanitation sector through two operations - the Urban Restructuring and Water Supply Project (URWSP) (1996-2000) and the Mine Township Services Project (MTSP) (2000-2005). Both the 2002 Poverty Reduction Strategy Paper (PRSP) and the 2004 Country Assistance Strategy (CAS) emphasized that water resources needed to be developed to contribute to poverty reduction and that the provision of water supply was critical to improved quality of life. In addition, Zambia was lagging behind in meeting the Millennium Development Goals (MDG) in the water sector. The project was included in the 2003-2007 CAS and sought to add to human capacity development and improvements in the quality of life through sustainable access to clean water supply and improved sanitation that would assist Zambia in meeting the water supply and sanitation MDG.



## 2. Objectives, Design, and their Relevance

2.1 The original objective of the project (as stated in the Financing Agreement) was *to support the Recipient's efforts towards the: (i) improvement of access to, and sustainability of, the water supply and sanitation services for consumers in Lusaka; and (ii) development of a comprehensive institutional structure supporting a coordinated approach to water supply and sanitation investments.* The wording in the Project Appraisal Document is slightly different: “The project development objective is to support the Government’s on-going commitment to urban and rural water sector reforms by improving access and sustainability of WSS services for consumers in Lusaka and by supporting a more comprehensive institutional structure which will lead to a sector wide approach for WSS investments.”

2.2 The project development objective (PDO) and Key Performance Indicators were revised when Additional Financing (AF) was approved by the Board on 16 April, 2009. The revised PDO, according to the March 18, 2009 Project Paper for Additional Financing, is to support the Recipient’s effort to (i) improve the technical efficiency and financial sustainability of LWSC and improve access to water supply and sanitation services, for urban consumers in Lusaka, Kafue, Chongwe, and Luangwa districts, and (ii) strengthen the effectiveness of national water supply and sanitation planning.

2.3 This report assessed the project based on the original PDO in the Financing Agreement, and on the revised PDO from the Project Paper in a split evaluation.

2.4 The original and revised Key Performance Indicators are listed in the table below.

**Table 1. Key Performance Indicators: Original and Revised**

	Original	Revised
1	LWSC achieves coverage of operational costs through its operational revenues	LWSC achieves 100% coverage of operational costs through its operational revenues
2	Investment program for WSS agreed by MLGH and contributing donors	An additional 40,000 people in the 3 districts - Kafue, Chongwe, and Luangwa - have access to safe water by end of project
3		A common WSS Financing mechanism agreed by MLGH and contributing donors

### Relevance of Objectives

2.5 The project objectives were in line with the strategic priority 2 of the 2004 Country Assistance Strategy (CAS) for Zambia which aimed to improve lives and protect the vulnerable. Reliable provision of water supply is critical to improved quality of life. The project would add to human capacity development and supported an improved quality of life through sustainable access to clean water supply and improved sanitation. The project would also assist in Zambia meeting the Millennium Development Goals (MDGs) in the water sector.

2.6 The project was closely aligned with Zambia's priorities laid out in the Poverty Reduction Strategy Paper (PRSP), 2002. The PRSP emphasized the role of infrastructure in growth and diversification. One of the major issues, identified in the PRSP, was to ensure that water resources were effectively developed to contribute to poverty reduction. Lack of effective development of these resources was evidenced by large populations in poor urban communities not served adequately by water utilities.

2.7 The relevance of the original objective remains high some three years after project closing. The Government Vision 2030 – Becoming a Prosperous Middle-Income Nation - has as one of its socio-economic development objectives - to provide secure access to safe potable water sources and improved sanitation facilities to 100 percent of the population in both urban and rural areas. The Bank's 2013-2016 Country Partnership Strategy (CPS) mentions continued inadequate access to clean and safe water and sanitation as one of the obstacles to reduce poverty and vulnerability and accelerating human development. The CPS noted that despite progress, Zambia remains behind schedule in meeting the clean water and sanitation MDG targets of 75 percent access to water and 73 percent access to sanitation by 2015 (according to the Central Statistical Office in 2015 access to both water and sanitation was 72%).

2.8 The revised objectives also remained highly relevant to the Government's goal for the water sector and the 2013-2016 CPS. At a time when the LWSC is facing difficulties in maintaining the supply and quality of WSS services in the face of electrical power cuts, persistent drought and population pressures, and the objective of improving LWSC's technical and financial capacity continue to be highly relevant.

## **Design**

2.9 The original project included two components. Component A: Support to LWSC – Appraisal Estimate US\$18.50 million- Actual Estimate US\$31.90 million. This component aimed to improve access to water supply and sanitation services in Lusaka and introduce performance improvements and modern management methods for LWSC to become a financially sustainable and efficient utility and to be able to finance new investments from its own cash flows in the longer term. It included emergency goods and works to improve access and sustainability of water supply and sanitation services in Lusaka. It also included: support for the introduction of the Development Financing Agreement for Performance Enhancement (DFAPE) program; support for the Human Resource strategy, training and performance payments; and, the preparation of designs, feasibility studies, and an Environmental Impact Assessment (EIA) for capital works.

2.10 Component B: Institutional capacity building in MLGH- Appraisal Estimate US\$1.10 million – Actual Estimate US\$1.10 million. This included capacity building in the MLGH to manage their water and sanitation (WATSAN) responsibilities; and, development of the sub-sector financing mechanism for rural water supply and sanitation.

2.11 The revised components were: Revised Component A: Support to LWSC, and improve water supply and sanitation services in four district towns in Lusaka province - Appraisal Estimate US\$18.5 million - Actual Estimate US\$ 31.9 million. This included: the provision of consultants' services, goods, works and Operating Costs, for the

implementation of the Development Financing Agreement for Performance Enhancement (DFAPE); Rehabilitation works for bulk water production, repair of distribution systems, repair of sewer networks and plants and boreholes, including related studies, design and supervision services for the water supply in Lusaka province: Design and implementation of a human resources strategy, through the provision of technical assistance and Performance Payments; and, Support towards the restructuring of LWSC aimed at integrating the management of the additional districts within the LWSC's corporate structure.

2.12 Revised Component B: support to MLGH – Appraisal Estimate US\$1.1 million – Actual Estimate US\$1.1 million. Support for the preparation of a coordinating mechanism for water supply and sanitation sector, including: Provision of technical assistance for the development of a national water supply and sanitation policy; provision of technical assistance for the development of a financing mechanism for the water supply and sanitation sector; and development of the sanitation and hygiene component of the National Rural Water Supply and Sanitation Program including strengthening the capacity of staff.

### **Relevance of Design**

2.13 The original project design was substantially relevant to achieve the original PDO. The project was designed as a three year Sector Investment Loan to improve the water supply and sanitation services delivery in Lusaka and simultaneously address the underlying institutional weaknesses and financial viability of LWSC while providing support to the parent ministry (MLGH) in addressing strategic sector issues. The components were directly linked to the objective of improving the performance of LWSC with the introduction of the Performance Enhancement Agreement between LWSC and the Ministry of Finance represented by MLGH. They also supported additional access to water supply in the poor peri-urban areas and improvements in water quality.

2.14 The revised project design was also substantially relevant to the revised objective to strengthen the Lusaka utility further so that it could take over the water supply and sanitation for the Kafue, Chongwe, and Luangwa districts; and, enhancing national water supply and sanitation planning as part of the additional financing. The design included technical assistance activities to up-date the customer database, and improve collections and improve customer relations. Equipment to improve efficiency and operations in the four satellite towns was provided including water testing, office equipment, vehicles and Supervisory Control and Data Acquisition (SCADA) systems in the four satellite towns. The project provided significant operational, management and technical training and assistance to design a common WSS financing mechanisms for approval by the MLGH and the Cooperating Partners (CPs/Donors). In addition, technical assistance was provided to improve bill collection from government and public agencies which (probably) had the single biggest impact on the financial turn-around of LWSC.

2.15 There were some moderate design shortcomings. The project was originally designed as an Adjustable Program Loan with the first phase focused on institutional reforms and the second phase on investments to improve service delivery. Late in the preparation phase, the project was changed to a Sector Investment Loan (SIL), but some

key elements of the project design were not fully adjusted. There was no PDO indicator for increased access, while the PDO included increased access and the intermediate indicators focus on achievements that are not related to and do not add up to the key performance indicators.

### **3. Implementation**

#### **Project Costs**

3.1 The original estimated project cost was US\$23 million, including approximately US\$3.4 million for physical and price contingencies. The additional financing increased the project amount by US\$10 million, for a total cost of US\$33.0 million. The actual project cost at closing was US\$31.6 million. The project was fully funded by IDA. The Government made no financial contribution to the project.

#### **Implementation Experience**

3.2 The project became effective in March 2007, but implementation did not begin till November 2007, due to delays in payment of a lapsed World Bank Loan by the Government which hampered flow of credit funds into the project designated accounts. To make up for lost time, the Bank agreed to an extension of the Credit Closing Date by one year, from June 30, 2010 to June 30, 2011.

3.3 In 2008, a ministerial directive that the districts of Kafue, Chongwe, Luangwa and Lusaka (district) itself should fall under one regional utility – LWSC - posed an unexpected challenge to the on-going project efforts to make LWSC financially sustainable. Estimates showed that revenues from these new districts were well below operating costs. The December 2007 supervision mission had projected that 2007 would be the first year in which LWSC would record an operating profit, but incorporating the new districts would reverse that. In order to further progress toward financial sustainability, LWSC would need to continue to exercise strict limits on cost escalation. The operating costs and revenue structure of the additional three districts would likely result in LWSC not being able to reach its objective of financial sustainability. It became clear that LWSC would no longer be able to achieve 100 percent cost coverage of operations and maintenance (O&M) unless additional financial support to rehabilitate the water infrastructure in the three districts was provided to lower operating costs.

3.4 The Government therefore requested Additional Financing (AF) on February 1, 2008. This was approved on April 16, 2009, and the project was restructured to include the townships in the three additional districts (Kafue, Chongwe, and Luangwa). The AF was to be used to finance infrastructure rehabilitation and expansion in the four townships and strengthen the capacity of LWSC to shoulder the additional responsibility through training and technical assistance. The PDO was revised along with the outcome indicators to reflect the restructuring. In order to provide sufficient time to implement the additional activities, the project closing date was extended to June 30, 2012. Up to the time that the AF was approved implementation had been slow and only about 20 percent of the total credit had been disbursed. However, the Government delayed in meeting the effectiveness conditions (payment of outstanding arrears of water and sewerage services

owed to LWSC by ministries, departments and agencies), and the AF only became effective on 29 March 2011, two years after approval. Implementation then accelerated, although a further restructuring was necessary to extend the closing date to June 30, 2013 and to reallocate funds. At closure, almost all planned activities had been completed and 95 percent of the credit had been disbursed. Shortfalls were due to shortcomings in technical specifications, cost estimates and preparation for works contracts related to the provision of safe water to additional households. Delays were also caused by weak contract management and late delivery of key materials and equipment.

3.5 Capacity building in MLGH suffered from high staff turnover. MLGH procurement and contract management was also weak: consequently, the consultancy for development of a National WSS Policy was only partially completed. However, MLGH did develop a joint financing arrangement for both urban and rural water supply and sanitation in part as the result of the capacity building activities.

## **MONITORING AND EVALUATION (M&E)**

3.6 **M&E Design.** The project was monitored using two M&E tools: (i) the Results Framework that was developed during project preparation for monitoring the performance of the project in meeting the development objectives, and (ii) the Development Financing Agreement for Performance Enhancement (DFAPE) that was developed and signed between the Government (represented by MLGH) and LWSC as an incentivized tool for monitoring the performance of LWSC. The Results Framework included indicators to monitor the implementation of the DFAPE. The three PDO indicators were: LWSC's performance on cost coverage; and, on increasing access to safe water; and, MLGHs performance on developing the financing mechanisms. There were nineteen intermediate outcome indicators covering: water access and service improvements in Lusaka, Kafue, Chongwe and Luangwa districts; financial and technical performance of LWSC; and, policy and donor coordination performance of MLGH. The performance audits of LWSC in meeting the targets in the DFAPE set for each year were prepared by an independent auditor and were submitted to an autonomous Development Financing Agreement Review Committee (DFARC) set up for this purpose. The Bank also monitored LWSC's performance under the DFAPE during implementation.

3.7 **M&E Implementation and Utilization.** Throughout implementation, DFAPE proved to be a useful monitoring and management tool for LWSC. Four annual audits were carried out. LWSC met the aggregated minimum performance targets in three years and incentive bonuses were paid to participating staff. The Agreement set tangible goals and targets for staff, monitored change in services over time and enabled the utility to react to any negative forewarnings. The periodic quarterly reporting to IDA and the annual independent audit with public disclosure created an effective evaluation instrument that allowed for a dialogue between agencies and between the client and the Bank. LWSC chose to continue using the Performance Agreement after its initial three year period and continues to use it today. Nwasco, refined the DFARC in 2015 and it is used to monitor the performance of the three district utilities managed by LWSC. Monitoring of the indicators that were not part of DFAPE took place through the semi-annual supervision missions by Bank staff. An M&E consultant worked at MLGH during project implementation (MLGH continues to outsource periodic M&E exercises using

local consultants). The consultants used data from the National Census Bureau, the Cooperating Partners and other agencies to produce periodic data on access, quality and sustainability of WSS in the country.

3.8 Overall, M&E is rated *Substantial*.

## **SAFEGUARDS**

3.9 At appraisal, the project was classified as Category B for environmental assessment purposes. In addition to Environmental Assessment (OP/BP 4.01), the Involuntary Resettlement (OP/BP 4.12) and International Waterways (OP/BP 7.50) were triggered. According to project documents, the Borrower completed the Environmental and Social Impact Assessment (ESIA) in compliance with the relevant Zambian and World Bank standards. The Environmental and Social Management Framework, including the Environment Management Plan (EMP) and Resettlement Policy Framework were approved and disclosed in the Infoshop, as well as in Zambia in April 2006.

3.10 Since project works were not expected to adversely affect the quantity or quality of water flows to other riparians, an exception to the notification requirement under the OP/BP 7.50 was approved by the Bank on August 19, 2008. The Borrower updated the existing Environmental and Social Management Framework, Environment Management Plan and Resettlement Policy Framework to include the four townships in the three new districts that were brought under LWSC to be supported by the Additional Financing. LWSC engaged an environmental specialist (consultant) to supervise and ensure compliance with environmental standards and safeguards. The project documents reported that LWSC ensured that upgrades, rehabilitation, and drilling of new boreholes causes minimal impact on surrounding communities and their assets. A Bank safeguards specialist conducted a dedicated safeguards mission in April 2013 and found the project in compliance with all safeguard policies. Safeguard compliance was rated Satisfactory in all Bank Implementation Status Reports and in the Implementation and Completion and Results Report (ICR).

3.11 However, the PPAR mission found that the likely impacts of climate change together with management weaknesses and equipment failures at the Chongwe and Kafue plants had affected the quality of the intake and waste water at these plants. The Environmental Management Plan (EMP) had not been updated by LWSC. Consumers in these two cities complained about water quality and color, suggesting environmental pollution. At Chongwe, the intake of the water treatment plant is at the Chongwe River. However, climate change effects and droughts have resulted in the river drying up for four months from August to November. Attempts to drill bore holes nearby to secure a water supply during this period have not been successful till mid-2016. Water quality deteriorates when the flow in the river diminishes because the concentration of the impurities from upstream water treatment and sewerage plants and the run off from farms along the river increases. The plant lacks the capacity and operational efficiency (sludge removal and filter cleaning are inefficient) to treat the water adequately, resulting in the complaints about quality, taste and color. In addition, electric power outages lead to plant shut downs because there is insufficient fuel for the generator.

3.12 The mechanical grill at the (rehabilitated) intake of the Kafue water treatment plant has broken down and the plant has problems with intake pumps, and difficulties with sludge removal from the sedimentation and filtration tanks. Due to the efforts of the technical staff, the plant has thus far been able to produce safe drinking water. However, repairs and refurbishing are necessary. The Millennium Challenge Corporation Compact of the United States includes a provision to address these matters.<sup>6</sup>

3.13 Once the issues at the Chongwe and Kafue plants have been addressed, it would be necessary to undertake an environmental assessment to determine that OP/BP 4.01 standards are being met.

### **FIDUCIARY COMPLIANCE**

3.14 Financial management was rated satisfactory in supervision reports and at completion. The project financing system was computerized and staff trained to use the system. Disbursement of the original and additional financing improved over time and withdrawal applications submitted regularly. The project documents do not report on external audits of project accounts.

3.15 Procurement improved during implementation, though issues such as inadequate knowledge of the market and prevailing market prices by the LWSC engineering staff persisted. Procurement problems continued after project closure, for instance, regarding replacement parts for the pre-paid meters and equipment for the water treatment and sewerage plants.

## **4. Achievement of the Objectives**

4.1 This evaluation assesses the outputs and outcomes to achieve the original objectives of: (i) improving access to and sustainability of WSS in Lusaka; and (ii) develop a comprehensive institutional structure supporting a coordinated approach to WSS investments. Next it assesses the outputs and outcomes to achieve the revised objectives of: (i) improving the technical and financial sustainability of LWSC and improve access to WSS for urban customers in Lusaka province; and (ii) strengthen the effectiveness of national WSS planning.

### **OUTPUTS AND OUTCOMES**

#### **Outputs for the Original Objectives**

4.2 For the first original objective of improving access and sustainability of water supply and sanitation services to consumers in Lusaka, the project inputs included goods, works, and operating costs. These inputs resulted in the following outputs: 100 new water kiosks in Lusaka's peri-urban areas; installation of 30,000 domestic meters and 180 bulk meters; installation of 200 pre-paid meters at government agencies; rehabilitation of Iolanda water works including power factor correction equipment at major pumps; rehabilitation of the sewerage plant and network; drilling of 10 new bore holes;

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<sup>6</sup> <https://www.mcc.gov/where-we-work/program/zambia-compact>

rehabilitation of Lusaka Water Works plant including boosters, reservoir and distribution systems; and, acquisition of laboratory equipment for assessing water quality.

4.3 For the second original objective of developing a comprehensive institutional structure supporting a coordinated approach to WSS investments, the inputs included technical assistance, training and equipment for MLGH. The outputs included two drafts of the revised 1994 National Water and Sanitation Policy and a final version by end 2013, and the national rural sanitation and hygiene program; and a financing mechanism for water supply and sanitation services. Outputs delivered by the LWSC included: a financial business enterprise resource planning program; a Geographic Information System; and procuring Global Positioning System survey equipment. The LWSC also instituted the Development Finance Agreement for Performance Enhancement (DFPAPE) and paid deserving employees performance incentives. It prepared the design for sewer network and treatment plants and conducted a study to improve efficiency of the sedimentation and filtration systems at the Iolanda treatment plant at Kafue.

### **Outcomes of the Original Objectives**

4.4 In respect of the *first original objective*, an estimated 5,000 people obtained access to safe water at the 100 new kiosks in Lusaka's peri-urban areas at project completion in 2013. In terms of LWSC's overall performance, water supply increased from a pre-project amount of 210,000 cubic meters (m<sup>3</sup>) /day to 230,000 m<sup>3</sup>/day. Coverage of water and sanitation services increased from 64 percent for either in 2007 to 87 percent and 71 percent respectively in 2013. Water supply duration increased in the peri-urban areas from 15 hours/day in 2007 to 20 hours in 2013. Also, water quality had improved by 2013, in that bio-content fell from 17.7 to 2 percent. However, the mission's findings indicate that these outcomes have deteriorated since project completion. Significantly, water supply at 10 of the 100 water kiosks had decreased from earlier levels due to low pressure during most of the day.

4.5 To get a structured understanding of the sustainability of service outcomes for water supply as well as sanitation, the mission organized eight focus group discussions (FGD) of project beneficiaries, with five FGDs in Lusaka, and one each in Chongwe, Luangwa and Kafue (the last three districts being covered by additional financing and under the revised objective), between May 17 and 27, 2016. The findings from the FGDs are presented in detail in Appendix B. While the FGDs were not statistically representative of all the customers that benefited from the project, they point to a decrease in the level of satisfaction with adequacy, reliability, and quality of water supply and sanitation services. This is discussed for Lusaka as well as other districts in the following sections on outputs and outcomes of the revised objectives.

4.6 Achievement of the first original objective is rated *modest*

4.7 In respect of the *second original objective*, MLGH had prepared separate Water and Sanitation Policies and coordinated sector investments with the Cooperating Partners (CPs) on a regular basis by 2013. In addition, the MLGH and Nwasco had guided the establishment of two additional commercial utilities in the Western and Luapula provinces by 2009. In 2016, the MLGH continued to conduct regular reviews of sector



performance and investments with the CPs to further improvements in the institutional structure and investments. There was a distinct improvement in important technical and financial efficiency parameters of LWSC by project completion, but these indicators have deteriorated somewhat since then, as discussed below in the context of the first revised objective.

4.8 Achievement of the second original objective is rated *substantial*.

### **Outputs of the Revised Objectives**

4.9 The inputs for the first revised objective of improving the technical and financial sustainability of LWSC, and improving access to water and sanitation in Lusaka, Chongwe, Kafue and Luangwa included works, consultant services, operating expenses and technical assistance. The outputs at LWSC were the continued performance incentive payments to staff for achieving work related goals and the installation of the SCADA system to monitor the outputs of the Lusaka, Iolanda and Kafue water treatment plants. The outputs also included improved access to water and sanitation in the townships of Lusaka province, repairs of the water and sewer distributions systems, repair of the sewerage plant, and installation of 6,143 pre-paid meters in Chilanga, Chongwe, Kafue and Luangwa.

4.10 The inputs for the second revised objective of strengthening effectiveness of national water supply and sanitation planning included further technical assistance to the Ministry of Local Government and Housing. In accordance with the Performance Enhancement Agreement, LSWC has instituted a Performance Enhancement and Management Program (PEMP) throughout the company and implemented a financial and business enterprise resource planning model. It constructed a customer service center for Central Branch in Lusaka. A second version of the revised national water and sanitation policy was completed at project closing in 2013.

### **Outcomes of the Revised Objectives**

4.11 In respect of the *first revised objective*, the technical efficiency and financial sustainability of LWSC had improved by project closing based on relevant performance indicators. But, by 2016 several of these indicators were showing a downward trend. Non-revenue water losses increased from 41 percent at closing in 2013 to 47 percent in 2015. The water service coverage dropped from 87 percent in 2013 to 82.9 percent in 2015, and hours of water supply from 20 to 17 over the same period. Staff cost in relation to billing and collection increased from 0.48 percent to 0.63 percent, and operation and maintenance costs coverage by collection dropped from 123 percent to 88 percent over the same two year period. There are major issues with the power supply for its plants and distribution system due to the country-wide problems with load shedding. LWSC is facing major issues with the installed pre-paid meters while it has not come-up with a technical solutions that would address this problem. LWSC is slow in repairing the installed pre-paid meters and the water kiosks that have been closed due to low water pressure. Urban customers served by LWSC find that the utility pays little attention to sanitation. Customer complained about blocked flush toilets or sewers that take LWSC a long time to repair.

4.12 Access to water supply improved by 11,800 m<sup>3</sup>/day in the three districts of Chongwe, Kafue and Luangwa by 2012/13 increasing water supply to 4,150 households from less than eight to an average of 17 hours a day. However, the number of additional people connected amounted to 9,000, which was far short of the target of 40,000. In retrospect, this target was ambitious given that sufficient corresponding provision had not been made for distribution and connections. Water quality showed improvement by 25 percent and water service and sanitation coverage by respectively 23 and nine percent.

4.13 However, it was indicated to the mission that the intake to the water treatment plant at the Chongwe River is dry from June till November and water has to be brought in by tanker truck. Similarly in Luangwa, water supply is interrupted sometimes for days on end due to electrical power cuts. Moreover, the output of the thirteen boreholes drilled under the project had dropped by 35 percent in 2015 compared to 2012.

4.14 The eight focus group discussions (FGD) organized by the mission comprised five in Lusaka, and one each in Chongwe, Luangwa and Kafue, with 8-16 participants in each group. The eight locations included a cross-section of peri-urban communities with functional and non-functional water kiosks, and individual yard connections; and formal communities with individual connections and prepaid meters. Three of the eight settlements benefitted from the new kiosks and three from new metered house connections. (Table 2.)

**Table 2. Focus Group Discussion Locations**

District	Settlement	Water Supply Type	Toilet Type
PERI-URBAN COMMUNITIES			
Lusaka	John Laing	fully functional water kiosk	Pit latrines and pour flush
	Chawama	non-functional water kiosk	Pit latrines
	Bauleni 1	fully functional water kiosk	Pit Latrines
	Bauleni 2	non-functional water kiosk	Pit latrines
	Kalingalinga	individual yard connections and condominial sewer system	External Flushing toilets
FORMAL COMMUNITIES			
Kafue	Kafue Estates	individual connections with prepaid meters	Internal Flushing toilets
Chongwe	Town	individual connections with prepaid meters	Flushing toilets and pit latrines
Luangwa	Town	individual connections with prepaid meters	Pit Latrines

4.15 A detailed report on the FGDs is presented in Appendix B. While the FGDs were not statistically representative of all the customers that benefitted from the project, they do provide indications of the level of satisfaction with access, adequacy, reliability, quality, and affordability of service. The participants in Lusaka and the townships in the three districts expressed satisfaction with the provision of access and increased hours of supply under the project relative their earlier situation. However, FGD participants in all eight settlements complained about daily interruptions due to electrical power cuts. In

Luangwa and Chongwe these interruptions ranged from up to a few days in the first and up to four months at a stretch in Chongwe. In respect of water quality, participants commented on a lingering taste of chlorine in most locations, while high calcium content to brown color and floating particles was noted in Chongwe. The majority boil their water before drinking. Half of the participants reported incidents of diarrhea which required medicines. People were aware of the connection to hygiene besides water quality. Most reported using soap when washing hands after toilet use, but not among children.

4.16 Based on feedback from focus groups organized by the mission in all four locations, there was significant incidence of faulty pre-paid meters which continued to run even in the absence of water supply, or would stop running altogether. These problems are said to be caused by regular power cuts or defective parts. Beneficiaries reported that LWSC staff are yet to address these metering problems to any significant extent.

4.17 Participants generally stated that the cost of water was affordable or even considered cheap in some cases. The price of a typical 20 liters jerry can ranged from 10 to 50 Kwacha cent (0.01-0.05 US\$). The cost of individual connections ranged from 15 to 150 Kwacha cent per month. On the question of satisfaction with metering, participants preferred pre-paid meters, but noted substantial technical problems with these meters and inadequate response from LWSC in repairing these problems. Finally, participants mentioned the limited role of local ward committees and LWSC staff and relied mostly on tap attendants to manage their access to water.

4.18 The FGD participants were also asked about their access to sanitation facilities. The majority of the participants that live in six of the eight settlements have access to on-site sanitation facilities in the form of pit latrines. These pit latrines dug often close to living quarters are mostly shallow and fill-up quickly, provide little security, smell badly, and are plagued by flies, mosquitoes and maggots. The majority are not, and cannot be emptied by vacuum trucks because of access (streets in peri-urban areas are mostly not paved). The Kalingalinga and Kafue Estate have internal or external flushing toilets connected to sewers, but participants complained that LWSC does not service the toilets and people throw diapers and solid waste in them causing sewage blockages and only in some cases will LWSC unblock the sewage system. Most participants are unhappy with both access and sustainability (service) of sanitation services.

4.19 Outcome of the first revised objective is rated *modest*.

4.20 Regarding the *second revised objective* of strengthening the national water supply and sanitation planning, the capacity of the sector ministry remains weak. The ministry staff is able to organize a minimum level of coordination with other ministries, the Co-operating Partners, utilities and the regulator, but has no developed in-house M&E function which hampers planning and policy guidance. The ministry also has no clear mechanism to coordinate with the City Councils that own and manage the utilities nor does it have a clear role in enforcing regulations for WSS with regard, for instance, to bore-hole drilling by public, commercial or private consumers. The project provided technical assistance to strengthen policy and planning capacity at the Ministry. Modest

improvements in capacity had been made at project closing in 2013. Feedback from officials to the PPAR mission suggests that there are no specific plans to improve or expand the ministries capacity or role in the sector.

4.21 The achievement of the second revised objective is rated *modest*.

## 5. Efficiency

5.1 At project completion, the project had an estimated financial rate of return of 24 percent (against 17 percent at appraisal) and an Economic Rate of Return of 19 percent (29 percent at appraisal). The economic analysis at completion followed a different methodology from that used at appraisal. While it took into account the benefits from time savings, it did not include consumer cost savings – which were not considered to be significant factor – and also did not include the value of health benefits from improved water quality, without assigning any specific reason.

5.2 However, this assessment takes into account the significant delays in project implementation and shortcomings in administrative and operational efficiency. The project took three years to prepare. During this time support was developed for the PEAs, thereby ensuring that they would be in place at board presentation. However, because the investment component was a late addition to the project, technical specifications, cost estimates and preparations for works contracts were not adequately prepared at the time of project effectiveness. Poor project management by LWSC resulted in contract lapses and failure by consultants and contractors to adhere fully to contract provisions, including deployment of staff and equipment specified in the contract. These problems caused implementation delays, several changes orders and addendum to implementation contracts and several standoffs between the consultant and the contractors. Other inefficiencies were related to the high turnover of senior staff assigned to the MLGH project component which affected timely decision making. MLGH also lacked adequate capacity for procurement and contract management. Related delays led to only partial completion of the consultancy for development of a National WSS Policy.

5.3 Taking into account all these factors, the overall efficiency under the original project objectives is *modest*. Since those delays affected the project from preparation through to project implementation, overall efficiency under the revised project objectives is also rated as *modest*.

## 6. Ratings

### Outcome

6.1 Relevance of objectives is rated *high* for both the original and revised objectives due to their alignment with national strategies for the sector as well as the Bank's country

partnership strategy. Relevance of design is rated *substantial* for both the original and revised objectives due to the logical link between inputs and outcomes while there were moderate shortcomings in the M&E framework. Efficacy of the first original objectives is rated *modest*, and that of the second *substantial*. Both the revised objectives are rated *modest*. Efficiency remained modest under both the original and revised objectives. Since under both sets of objectives outcome would be *moderately unsatisfactory*, this is also the rating of overall outcome.

6.2 Overall Development outcome is rated *moderately unsatisfactory*.

## **Risk to Development Outcome**

6.3 The overall risks to the development outcome of improved WSS access had increased in 2016 compared to the situation at completion due to the national power crisis, the effect of climate change on water supply, and the challenges to the economy. The risk is rated as high in 2016 compared to substantial at completion. There appears to be no immediate solution to the national power crisis<sup>7</sup>. Drought is predicted to become more serious in the near future affecting rainfall and hence the supply and quality of groundwater. Macroeconomic difficulties are likely to persist until copper prices strongly recover. The increase in the overall risk rating in 2016 was also based on the increased risks to the achievements with the improvements in the institutional structure for investments and planning, and with the performance of the Lusaka utility. Although some issues with investment coordination by the sector ministry remain, the financial commitments of the Cooperating Partners (CP/Donors) for the near future are considerable, and the CP coordinating committee is effective. Enforcement of regulations and attention to consumer demands are still seriously deficient, although beginning to improve in Chongwe.

6.4 The risks to the improvements in performance the Lusaka utility faced in 2016 call for technical and financial solutions. First, the utility has to address the concerns from its customers for a more timely and efficient response to the problem with the pre-paid meters. This would require better training and motivation of LWSC's technical staff to repair broken meters, replace faulty parts and install sensors to monitor meter performance. LWSC management informed the PPAR mission that they were seized of these issues. Power outages and water quality improvement require both financial and technical solutions. These include adequate supply of fuel for power generators and investments in O&M and in further replacement and rehabilitation of plants and networks. Feedback to the mission suggests that the utility has plans to ensure fuel supply and undertake priority O&M. The utility is working with the Millennium Challenge Corporation to rehabilitate the Kafue treatment plant, ten distribution centers, and almost 300 km networks in Lusaka. LWSC acquired the capacity and tools to do the planning and preparations for these investments under the project. Close coordination with the

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<sup>7</sup> The problems are with the hydro power situation including the repairs at the Kariba dam, and with the exploitation of water resources which while they may be plenty require substantial investments to be exploited.

MLGH and between MLGH and the City Councils that manage LWSC to ensure the release of budget allocations is, however, needed to secure the required local funding.

6.5 The 2015 sector report from the regulator confirms the issues faced by the utilities and the ministry. The report stated that “The year was indeed a challenging one owing to extensive load shedding, dwindling water resources and generally the economic downturn that was experienced particularly in the latter half of the year. These challenges resulted in supply restrictions, escalated cost of doing business, low billing and revenue collection”. These factors may be endogenous to the project objective and outcomes on institutional strengthening at the ministry and the utility, but issues such as drought and reduced rain were occurring before project closing. Also, inadequate budget allocations to the sector for repair and rehabilitation of infrastructure to reduce, for instance, non-revenue water, and low disbursement of budget allocations occurred well before closing.

6.6 The continued weaknesses at the sector ministry after project closing, especially in 2015/16 with the economic downturn and hydropower crisis, poses a challenge to sector management and investments. The on-going US\$355 million MCC project eases the challenge with sector investments till at least 2018, and supports LWSC with training, technical assistance and rehabilitation works to improve management and operations. However, there does not appear to be sufficient evidence to show that the Joint Water Sector Reviews with the ministry and the Partners/Donors are yielding results in terms of improvements that need to be made by the Government in the sector.

6.7 Overall, Risk to Development Outcome is rated *high*.

## **Bank Performance**

6.8 The rating of Quality at Entry remains *moderately satisfactory*. The Bank facilitated preparation and appraised the operation such that it was most likely to achieve planned development outcomes and was consistent with the Bank’s fiduciary role. The Quality Enhancement Review that was carried out by the Bank before project appraisal found agreement on the use of incentivized performance agreements and secured the buy-in from the Government and the regulator, and confirmed the implementation capacity of the implementing agencies. The project was consistent with the Government’s development priorities and the Bank demonstrated flexibility when the Government requested a Specific Investment Loan (SIL) even though the project had been prepared as a two phase Adjustable Program Loan. The Bank continued to show this flexibility with additional financing half way through implementation of the original SIL to ensure that the development objectives of the project would be achieved.

6.9 The rating of the quality of supervision is rated *moderately satisfactory*. Bank staff ensured continuity in technical support and advice to the implementing agencies even though the implementation of activities under the original credit was delayed due to delayed payment by Government on settlement of the lapsed loan of completed projects. The project had three Task Team Leaders (TTLs) which had an impact on continuity and institutional memory. For instance, the last two TTLs had not been part of the preparation of the technical studies which may have been an issue in that climate change and drought were not taken into consideration when the decision was made to rehabilitate

the Chongwe plant in 2009. Supervision missions repeatedly flagged major weaknesses and threats to progress with implementation and discussed solutions for improvement with the implementing entities. These led to reorganization of the Project Implementation Unit (PIU) and training and designation of dedicated staff to key sub-projects which in turn resulted in improvements in implementation and completion of these sub-projects.

6.10 The overall Bank performance is rated *moderately satisfactory* based on the moderately satisfactory rating in both quality at entry and quality of supervision.

## **Borrower Performance**

6.11 The Government's performance is rated *moderately unsatisfactory*. The project was high in the country's priorities for the water and sanitation sector and the Government was committed to improve water and sanitation services in Lusaka during preparation. However, once the original credit was approved and became effective, it took the Government nine months to pay the lapsed loan payment of US\$680,000, during which project implementation virtually stalled. The Government requested an extension of the closing date by one year to make up for the lost implementation time which was subsequently approved by the Bank. The Government took 23 months to meet the effectiveness condition for Additional Financing (payment of arrears of water and sewerage services billed by the Lusaka utility to government ministries and departments). Both these delays held up on-going efforts to improve access to water and sanitation during project implementation.

6.12 Implementing agencies performance is rated *moderately unsatisfactory*. Both implementing agencies (LWSC and MLGH) exhibited procurement, financial management capacity and implementation constraints during implementation. As discussed in the section on Efficacy, there was a decline in both operational and financial performance of LWSC. Challenges during implementation included weak coordination between technical and procurement staff as well as weak contract management capacity and inability to maintain sufficient staff throughout the life of the project. Despite these challenges, the implementing agencies displayed committed to the project and to achieving the project objectives. The Lusaka utility embraced and implemented the DFAPE instrument and brought about improved performance, both technical and financial. With regard to the sector ministry, the high turn-over of higher management staff had a negative impact on implementation of the capacity development activities to the extent that the consultancy to draft a comprehensive sector policy could be completed only partially during the project implementation period. As project implementation advanced and the implementation agencies gained experience with Bank procedures, the agencies performances improved enabling an improvement in implementation, nearly full disbursement of the loan, and substantial achievement of the objectives.

6.13 The continued weaknesses at the sector ministry after project closing, especially in 2015/16 with the economic downturn and hydropower crisis, poses a challenge to sector management and investments. The on-going US\$355 million Millennium challenge corporation (MCC) project is, however, lessening the challenge with sector investments till at least 2018. Also, the regular Joint Water Sector Reviews with the ministry and the Partners/Donors focus on decisions that need to be made by the

Government to continue improvements in the sector. The reviews also discuss the contributions the Partners bring to these efforts.

6.14 Overall Borrower performance is rated *moderately unsatisfactory*.

## 7. Lessons

**7.1 Maintaining the financial viability of a service provider requires strategies to deal with exogenous factors in addition to securing technical and commercial efficiency of operations.** The financial viability of utilities supported by the project faces pressure from reduced availability and increased cost of energy (with the crisis in hydropower), thus adding to the effects of shortcomings in operational and technical efficiency and a reduction in annual budget allocation for utility operation, maintenance, rehabilitation and expansion, making it difficult to maintain the quality of water and sanitation service delivery.

**7.2 Sustainable provision of water supply services in the face of growing population and demand requires active coordination between the authorities responsible for long-term water resource planning, and service providers.** In the case of Zambia, the growing urban and rural population and recurrent droughts have strained surface and ground water resources. In the project area, unregulated drilling of bore holes by public agencies and public and private organizations and businesses is putting pressure on the utilities. It is necessary for the Ministry of Water Development which is responsible for water resources and the Ministry of Local Government and Housing responsible for the water supply to coordinate in developing further strategies to manage the extraction and use of river and surface water for competing users.

**7.3 Alternative approaches need to be actively explored and adopted for urban and rural sanitation, especially when conventional sewerage may not be financially feasible.** In the project areas, reliance on existing on-site sanitation facilities poses problems, especially in the rainy season when run-off rainwater floods these facilities which are not emptied or properly managed. Zambia could learn from countries that have similar geographic, economic and demographic patterns, and have developed more effective approaches to improving and managing sanitation facilities.



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## Appendix A. Basic Data Sheet

### ZAMBIA WATER SECTOR PERFORMANCE IMPROVEMENT PROJECT (IDA 42330, IDA 45500)

#### Key Project Data (amounts in US\$ million)

	<i>Appraisal estimate</i>	<i>Actual or current estimate</i>	<i>Actual as % of appraisal estimate</i>
Total project costs	23.0	33.0	143.0
Loan amount	23.0	23.0	100.0
Additional Finance Grant	-	10	100.0
Co-financing	-	-	-
Cancellation	-	-	-

#### Project Dates

	<i>Original</i>	<i>Actual</i>
Concept Review*	-	08/26/2003
Appraisal*	-	05/02/2006
Board approval*	-	10/05/2006
Effectiveness	03/22/2007	03/22/2007
Restructuring	-	04/25/2012
Closing date	06/30/2010	06/30/2013

\* Original dates not provide in ICR and project portal.

#### Staff Time and Cost 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)
<b>Lending</b>		
FY01	2.45	9.33
FY02	10.01	69.09
FY03	19.55	115.99
FY04	18.61	84.39
FY05	57.38	248.20
FY06	21.15	83.78
<b>Total</b>	129.15	610.78
<b>Supervision/ICR</b>		
FY07	15.92	72.49
FY08	38.93	140.37
FY09	43.70	156.70

FY10	20.09	94.32
FY11	17.38	141.91
FY12	16.05	130.68
FY13	11.95	100.39
FY14	0.50	26.55
<b>Total</b>	<b>164.52</b>	<b>863.41</b>

### Task Team Members

Names	Title	Unit	Responsibility/ Specialty
<b>Lending</b>			
N. Jane Walker	Lead Water & Sanitation Specialist	AFTU1	Task Team Leader
Devendra Bajgain	Senior Water & Sanitation Specialist	AFTU1	
Fook Chuan Eng	Senior Water & Sanitation Spec.	EASIS	
Belinda Lorraine Asaam	Program Assistant	AFTU1	
Bwalya Mfula Mumba	Contracts Officer	GSDCP	
Said Al Habsy	Chief Counsel	LEGAF	
Edith Ruguru Mwenda	Senior Counsel	LEGAM	
Marjorie Mpundu	Senior Counsel	LEGES	
Jonathan Pavluk	Senior Counsel	LEGOP	
Joseph Gedek	Consultant	EASCS	
Kazimbaya Barbra Senkwe	Water & Sanitation Specialist	EWDAF	
Sudeshna G. Banerjee	Sr. Economist	SEGEN	
Modupe A. Adebawale	Senior Finance Officer	LOAG2	
Fenwick M. Chitalu	Financial Management Specialist	AFTFM	
Wedex Ilunga	Senior Procurement Specialist	AFTPE	
Banu Setlur	Environmental Specialist	MNSEE	
Kristine Schwebach	Social Development Specialist	AFTCS	
Clarissa Brocklehurst	Social Scientist (Consultant)		
Archer Davis	PSP Consultant		
Knud Lauritzen	Financial Analyst (Consultant)		
<b>Supervision/ICR</b>			
Michael John Webster	Senior Water & Sanitation Specialist	AFTU1	Task Team Leader
Luiz Claudio Martins Tavares	Lead Water & Sanitation Specialist	AFTU1	Task Team Leader
Solomon Alemu	Consultant	AFTU1	ICR Author
LingsonChikoti	Financial Management Specialist	AFTME	
Chloe Oliver Viola	Infrastructure Economist	AFTSN	
Theresa Marissa J. Gamulo	Procurement Analyst	AFTU1	
Belinda Lorraine Asaam	Program Assistant	AFTU1	
Wedex Ilunga	Senior Procurement Specialist	AFTPE	

Mohammed Kumbakumba	Consultant	AFTN1	
Midori Makino	Lead Evaluation Officer	IEGPS	
Dennis Daniel Mwanza	Senior Water & Sanitation Specialist	TWIAF	
Kazimbaya Barbra Senkwe	Water & Sanitation Specialist	TWIAF	
Elisabeth Sherwood	Senior Financial Specialist	AFTU1	
Neta Mulenga Walima	Program Assistant	AFCS3	
Zvikomborero Hoko	Consultant	AFTU1	
William Muhairwe	Consultant	AFTU1	

## Appendix B. Report on the Focus Group Discussions Conducted in May 2016

### Methodology

1. A total of eight focus group discussions (FGD), five in Lusaka, and one each in Chongwe, Luangwa and Kafue were held between May 17 and 27, 2016. The eight locations included the seven settlement listed in Table 1 below.

**Table 3. List of Settlements by District and Type**

<i>District</i>	<i>Settlement</i>	<i>Settlement Descriptors</i>
Lusaka	John Laing	Peri-urban community served by fully functional water kiosk
	Chawama	Peri-urban community served by non-functional water kiosk
	Bauleni 1	Peri-urban community served by fully functional water kiosk
	Bauleni 2	Peri-urban community served by non-functional water kiosk
	Kalingalinga	Peri-urban community served by individual yard connections and condominal sewer system
Kafue	Kafue Estates	Formal community served by individual connections with prepaid meters
Chongwe	Town	Formal community served by individual connections with prepaid meters
Luangwa	Town	Formal community served by individual connections with prepaid meters

2. All settlements except Kalingalinga benefited from water supply improvements under the project. Kalingalinga has been included because even though it was not directly supported under WSPIP, it benefited from a related WSP-Africa activity linked to WSPIP which had a particular emphasis on assisting LWSC to define a mechanism for providing water borne sanitation in peri-urban areas.

3. The FGDs were based on a questionnaire administered mainly in vernacular with some English and were recorded on tape. The questionnaire focused on three themes namely health (incidence and response to diarrhoea), water supply and sanitation. The results of the FGDs are structured around these three themes.

### Key Findings

#### Access to Water

4. As indicated in Table 1 above, the sources of water supply were mainly kiosks in John Laing, Chawama and Bauleni; yard taps in Kalingalinga; and house connections in Kafue, Luangwa and Chongwe. For the participants in Chawama where the kiosk was non-functional, their main water source was other kiosks in the settlement and other people's yard taps. In Bauleni 2 the main source was other people's yard taps. All communities reported interruptions in water supply with electrical power cuts being the most common reason. There are however also regular interruptions due to maintenance works. In Kafue, some

participants reported daily interruptions, whilst in Chongwe and Luangwa, interruptions were reported to occur over a number of days. Daily rationing was also reported in Chongwe. In Chawama, the kiosk had been without water since 2014 whilst in Bauleni 2 they had no water at the Kiosk since 2015. Participants in Luangwa stated that their main alternative source of water during power cuts, is the back wash water released by LWSC from their treatment plant. A major complaint from participants was that LWSC rarely notifies them of water supply interruptions, although some said they occasionally receive SMS or radio announcements.

5. Despite the interruptions, participants in Luangwa, Kalingalinga and Bauleni 1 reported that they have a constant water supply throughout the year. In the other settlements however, there is either no water or there is reduced water pressure in the dry season between August and November each year. The situation is worst in Chongwe where LWSC is compelled to bring in a water bowser from Lusaka. The challenge with the bowser is that the consumers do not seem to have information on when it will be in town and where it is situated once in town.

6. Although all participants know that their water is treated by LWSC, it is however common practice for households to treat the water again either by boiling or adding chlorine. This is especially the case in the rainy season when the country anticipates cholera outbreaks and the Ministry of Health distributes free chlorine to households.

7. Participants reported the taste of their water as generally good although there was a complaint that sometimes there is too much residual chlorine and that there is a difference in taste in some months of the year especially in Chongwe. Participants also complained of the brown colour of water especially after major works and at the beginning of the rainy season. High calcium content was also noted as problem. Participants in Kafue and Chongwe had the most complain about dirty-brown water with a lot of particles. Generally participants felt the water did not smell except in Chongwe where the smell is said to be very bad in some months of the year. There was no complaint of water hardness at all. There was however a complaint of the water having too much chlorine in Luangwa, Chongwe and Bauleni. Participants in Kafue were not sure whether any chlorine is added to the water.

### **Satisfaction with Water Supply**

8. All participants in Luangwa and John Laing reported that they liked their water supply. Similarly in Bauleni 1 and Kalingalinga, participants were happy with their water supply. Those who liked their water supply indicated good water quality, improved pressure, constant supply, affordability and convenience as the main reasons for their satisfaction. They further indicated that the water supply had improved their lives in that they could now also do some gardening, had less disease burden and were safer. Safety was a particularly big issue for women in John Laing who said they no longer had to wake up in the middle of the night to look for water nor did they have to cross the dangerous Kafue road as they had done prior to the kiosk. The water is now closer and cheaper than before.

9. The picture was mixed in Kafue with some participants happy and others not happy at all. The few who were happy indicated improved supply and drop in cost as the major

reasons for satisfaction. Nonetheless, the majority were unsatisfied mainly due to poor pressure, unreliable supply and disputed bills.

10. All participants in Chawama and in Bauleni 2 were very unhappy with their water supply. The main reasons were the fact that the kiosks though constructed near their homes, are no longer functional. This means they must get their water from alternative sources which according to the discussions involve long walks of up to 15 minutes; long queues, and higher expenses on water. In some cases, participants indicated that they have to beg for water or go looking for water in the night.

11. Chongwe had the worst outcome on satisfaction with water supply. Almost all participants highlighted inadequate supply especially between August and November when the Chongwe River from which LWSC draws its water runs dry. They also cited poor water quality due to the poor raw water, rationing of supply by LWSC, low pressure, leaking pipes around the town, interruptions in supply for days, bad smell and poor colour of water as major challenges. Whilst the participants indicated that LWSC does provide a bowser in the dry season, they however also complained of the lack of a clear timetable, specific location for the bowser and limited water in the bowser.

12. Regardless of how satisfied people were with their water supply, every FGD indicated that there are some serious problems related to management and maintenance of the water. For the kiosks this is partly due to the design in which the tap is elevated making it difficult for the limited water in the system to reach the taps. Long waiting queues, including consumers having to give each other turns when drawing water was also a common problem. This also means that consumers must walk to and from the kiosks several times as they cannot draw enough water in one visit. Other problems were related to the slow pace at which LWSC attends to faults and repairs. In Chawama, the kiosk had been non-functional for two years and similarly in Bauleni. In almost all cases, participants also complained of the lack of materials at the LWSC branches for repairs as well as for new connections. The challenge of power cuts by Zambia Electrical Supply Company (ZESCO) was also noted. This problem seems to have much bigger impact in Luangwa where the town is not on the national ZESCO grid and can therefore go for days without power and hence without water. In the meantime, LWSC does not have a back-up power supply at the treatment plant. In Kafue, participants were also concerned about the old infrastructure most of which has not yet been revamped. In the case of Bauleni 1, whilst the water supply is good, the participants were however concerned about the inability of the kiosk to generate sufficient revenues as there are only about 10 families using the kiosk. According to the participants, this situation has arisen due to the fact that many households have made illegal connections to their yards. The long term viability of this kiosk and possibly others, could therefore be in jeopardy. At the same time, if the households are indeed connection themselves illegally, then LWSC is and stands to lose a lot of revenue through non-revenue water.

### Satisfaction with Water Metering

13. As shown in Table 2 below, apart from the peri-urban areas served by kiosks and Kalingalinga which is not yet metered, all other settlements were connected through prepaid meters.

**Table 4. List of Metering Type by District and Settlement**

District	Settlement	Metering Type
Lusaka	John Laing	Bulk metered kiosk
	Chawama	Bulk metered kiosk
	Bauleni 1	Bulk metered kiosk
	Bauleni 2	Bulk metered kiosk
	Kalingalinga	Not metered
Kafue	Kafue Estates	Prepaid meters
Chongwe	Town	Prepaid meters
Luangwa	Town	Prepaid meters

14. Almost without exception, participants even those who are not yet metered prefer the prepaid to the post-paid meter. The main reasons given were that these meters allow consumers to control consumption and also that there is no dispute with LWSC over bills. However, this satisfaction with the prepaid meters is tempered by a catalogue of problems some technical and others administrative. There are obvious technical issues with the meters which in all three towns were reported to be faulty - move too fast, sometimes do not give water even when it has been paid for, the user interface (remote control) breaks down meaning the consumer cannot get water unless LWSC comes to recharge the meter manually; the user interfaces are also not easy to repair but must be replaced; give free water (continue running even when the consumer has not paid). Participants also indicated that the meters can easily be bypassed which apparently has been done before by LWSC to assist consumers who have issues with the meters. Participants were also concerned about the large and conspicuous nature of the meters which make them rather vulnerable to being kicked down by playing children. A significant number of participants also observed that the LWSC staff themselves generally are not sure what technical issues they are dealing with when it comes to the meters. Thus, whilst the concept of prepaid metering is very much welcomed by the communities, there is still a lot of technical and support services that LWSC needs to develop for the sake of ensuring both access to water for the consumers and keeping the company afloat.

### Cost of Water

15. In all cases where LWSC is providing water, participants had no problem with the price of water. In John Laing participants indicated they were happy with the 1 Ngwee per 20 litre jerry can of water that they are charged. In Bauleni 1, whilst participants knew that the price should be 1 Ongwee, they however indicated that they did not mind paying the 2 Ongwee per 20 litre jerry can, as there were too few households using the kiosk. As would be expected, price difference was very marked in the communities where the kiosks are not functional. In Bauleni 2 and Chawama, the price of a 20 litre jerry can varied from 1 Ngwee to 5 Ngwee, i.e. 5 times the price in areas served by LWSC. An important finding is that the



participants using the LWSC kiosks found the price affordable partly because they were comparing to the situation prior to the improvements in water supply where they had to walk long distances to get their water. For the individual connections in Luangwa, Kafue and Chongwe, typical monthly bill was given as starting from a low of ZMW15 to a high of ZMW 300. Reported average monthly bills were around ZMW 40 per month in Luangwa, ZMW 60 in Kafue, and ZMW 150 in Kalingalinga and Chongwe. It is worth noting that in these FGDs price of water was not seen as an issue. In John Laing, participants felt that water was cheap, whilst those in Luangwa, Chongwe, Bauleni 1 and Kafue felt the price was fair. The major complaint of the price being high was in the two peri-urban areas where the kiosks were non-functional. There were also a few complaint from those on post-paid meters about the high cost of water, mostly associated with the fact that they must pay regardless of whether they have water or not. In general however, participants felt that their water bills had reduced as a result of the prepaid meters.

16. The modes of payment for water are cash at the time of getting water at the kiosks, as well as for those with pre-paid meters. Only the participants in Kalingalinga and those on post-paid meters pay on a monthly basis.

### **Health**

17. The highest incidences of diarrhoea in the month prior to the survey were reported in Luangwa and Chongwe districts with more than half of the FGD participants reporting cases at their households. This is not surprising given that Chongwe has the worst water supply situation of the four districts. In the case of Luangwa, it could be related to the fact that whilst the water is available, the town does tend to have water problems associated with power cuts. LWSC has no generator in Luangwa meaning that if there is no power supply from ZESCO, then the town also has no water supply. The FGDs seem to suggest a very low incidence of diarrhoea cases in Lusaka including in the areas where water supply is not good e.g. in Bauleni 2. Kafue was an interesting case in that even though only 2 participants reported cases of diarrhoea, the disease, however, affected every member of the household. The episodes of diarrhoea tended to last over a few days with the highest reported duration of seven days in Bauleni. The FGDs suggest that the people generally understand that diarrhoea is related to water supply although a few indicated food and weather as the main cause. Quite a few participants thought diarrhoea is a normal/ good way of cleansing the body.

18. The response to diarrhoea is generally either self-medication with off the counter medicine and Oral Rehydration Salts as well as going to the clinic. It was evident that the concept of rehydration as a way to treat diarrhoea is quite well understood and appreciated. So too was the idea that diarrhoea is a lethal and potentially fatal disease. Common methods of preventing diarrhoea that were identified included boiling and chlorinating drinking water, warming and covering food and general hygiene behaviours including washing hands and keeping surroundings clean.

19. Most participants reported that their household members do wash their hand with soap after using the toilet. However, further discussions showed that the practice may not necessarily be widespread amongst children, whilst in some cases, the non-availability of water makes it difficult.

20. The main source of information on health and hygiene is clearly the Ministry of Health through their health extension officers as well as via media namely radio and television. Other sources with potential included school children and the church. It was however also clear that the ministry is normally very active during cholera outbreaks and not as active in the dry season.

### **Stakeholder Roles**

21. It is worth noting that none of the participants perceived the local authorities or the ward development committees as playing any role in water supply and sanitation issues. In places served by kiosks, the communities are sometimes involved in maintaining the area around the kiosk including making contributions for repairs. They also report faults to LWSC and play some role in securing the infrastructure, particularly the meters. Tap attendants play the biggest role, managing the kiosks, reporting faults and collecting money and remitting to LWSC. Participants were quite categorical about LWSC as the major actor responsible for infrastructure maintenance and repairs. However, in general participants were not happy with the service provided by LWSC in this regard. Major complaints included delays in responding to faults and or requests, lack of materials for repairs or network extension, poor customer relations especially amongst the young employees, manpower shortages at the branches and poorly trained technical personnel.

### **Proposed Improvements**

22. The major areas of improvement proposed by the participants focused on improving or changing water sources in Chongwe, improving pressure at kiosks by lowering the taps, expanding the water network to allow for yard connections in the peri-urban areas, provision of an alternative or back up power source in Luangwa, improving customer experience by increasing the number of point of sale for the prepaid meter units and also upgrading the prepaid meter technology.

### **Access to Sanitation**

23. WSPIP's contributions to improving access to, and sustainability of sanitation services in Lusaka are minor – limited to the replacement of 12 pumps at six sewage pump stations. In general, LWSC involvement in sanitation has been limited to the operation and maintenance of the 20,000 sewer connections the company serviced at the time of project appraisal in 2007. However, the FGD included questions for participants on their views on and issues with sanitation. Table 3 below summarizes the type of sanitation facilities the participants in the eight locations have access to.

**Table 5. Types of Sanitation Facilities by District Settlement**

District	Settlement	Toilet Type
Lusaka	John Laing	Pit latrines and pour flush
	Chawama	Pit latrines
	Bauleni 1	Pit Latrines
	Bauleni 2	Pit latrines
	Kalingalinga	External Flushing toilets
Kafue	Kafue Estates	Internal Flushing toilets
Chongwe	Town	Flushing toilets and pit latrines
Luangwa	Town	Pit Latrines

### Types of Sanitation Facilities and Role of Consumers

24. Pit latrines are the most common facility for sanitation. This is not surprising given that the majority of the FGDs were held in peri-urban areas which are not connected to the sewer system. The participants in Chongwe had the highest combination of pit latrines and flushing toilets connected to septic tanks mainly because the inadequate water situation there does not make it possible to install flushing toilets. Participants in Kalingalinga and Kafue were the only ones connected to sewer systems. It is worth noting that almost all toilets there have been paid for by the landlords except a few in Kalingalinga where consumers got help from LWSC. All repairs done on toilets are undertaken by private individuals except in Kalingalinga where the team working on the Bank's Lusaka Sanitation Project is currently providing support. For those who have pit latrines and want flushing toilets, the main reason they do not have a flushing toilet was affordability. All participants except those in Kalingalinga indicated that they do not receive any support from LWSC for their sanitation issues. In almost all FGDs, participants indicated that under five children generally use a chamber pot which is then emptied by the mother in the toilet. A few parents indicated that the children use the ground and then the mothers collect and takes it to the toilet. Participants in John Laing and Kafue indicated that baby diapers are a big problem for the sewer system as they are thrown in the toilets together with other household solid waste.

### Satisfaction with Sanitation facilities

25. All participants in John Laing and Chongwe said they like their toilets whilst those in Kalingalinga liked them very much. For the participants in Kalingalinga, their main reason for liking the toilets is that they were a big improvement from the pit latrines- they are comfortable, flushable and do not need replacement as do pit latrines. Participants from Chawama, Luangwa, Kafue and Bauleni were not happy with their sanitation facilities. For those with pit latrines, the main reason is that they have to dig a new pit latrine every time one gets full. Moreover, faecal matter is often visible due to shallow or full pits, and flies, mosquitoes and maggots pester latrine users. In addition, participants complained about the theft of manhole covers, the lack of security especially at night, bad smells, lack of roofs and closeness to the living units. Pit latrines fill up quickly and most pit latrines cannot be serviced by vacuum tankers to empty them due to lack of access roads, When pit latrines are full, participants indicated that they either dig another pit or use chemicals to reduce the volume of faecal matter in the pit. For participants with flushing toilets their main complaint

is that LWSC does not repair toilets even though LWSC charges sewer fees. Participants also complained about poor use of toilets including dumping stuff that cause sewer blockages like diapers and bottles. In addition, LWSC primary focus is on water with seemingly little interest in sanitation. The participants in Kalingalinga expressed concern about the slow rate of connections by LWSC as well as potential problems with blockages due to limited water supply and lack of dedicated sewer teams in LWSC. The participants were, however, quite happy with the team that is presently undertaking connections which also deals with blockages as they arise. All participants in John Laing and in Bauleni were happy with the location of their toilets whilst those in Chawama were not happy.

### **Improvements Required**

26. Almost all participants with pit latrines indicated that the improvement they would like to see is to get flushing toilets. Those with flushing toilets in the meantime want to see improvements in water supply, including giving households individual house connections.

### **Conclusion on Sanitation**

27. It is clear from the discussion that unlike water supply, sanitation remains very much a household/ private responsibility with LWSC having little involvement. At one level this fits within the national policy where sanitation is treated as the responsibility of private individuals. On the other hand, the discussion also shows that there are major institutional shortcomings affecting the (poor) quality of existing pit latrines and the absence of emptying services. The impact of inadequate water supply on sanitation was also noted especially in the case of Chongwe where consumers have had to dig pit latrines to cope with the lack of water during part of the year. Whereas much progress has been made with water supply, LWSC needs to utilise the funding provided under the Lusaka Sanitation Program to develop effective mechanisms for delivery and maintenance of sanitation services across the city including back up and public services for consumers of onsite sanitation.

## Appendix C. List of Persons Met

NAME	FUNCTION/ROLE	ORGANISATION	E-MAIL
Kunda Wycliff	Manager	IPD	
Musaibaila Mwiche	Senior Planner	MLE	
Ngoma Tamara	Engineer – Peri Urban		
Chiyombe Jilly	Director Infrastructure Planning and Development	LWSC	jchiyombwe@lwsc.com.zm chiyombwehaamaya@yahoo.com
Phiri Wanzi	Manager – Prepaid	LWSC	pwanzi@lwsc.com.zm
Shane Wilson	Director Engineering	LWSC	mshane@lwsc.com.zm
Kambita Musole R	Senior Eng. Urban Water Supply & Sanitation	MLGH	musolem@ yahoo.co.uk
Singanga Douglas	PEUWSS	MLGH	dsinganga@yahoo.com
Chibamba Marcel	Treasurer LWWG	NWASCO	marcelchibamba@gmail.com
Chitumbo Kelvin	Director	NWASCO	kchitumbo@nwasco.org.zm
Hara Kasenga	Senior Inspector – Tech	NWASCO	khara@nwasco.org.zm
Mutale Peter	Chief Inspector	NWASCO	pmutale@nwasco.org.zm
Mwendapole Chanda	Member LWWG	NWASCO	mwencha@yahoo.com
Ndhlovu Mike	Coordinator Lusaka Water Group	NWASCO	Mikendhlovu40@gmail.com