ZIMBABWE

Technical Assistance to City of Harare for the Greater Harare Water and Sanitation Strategic Plan

SUMMARY NOTE

on Technical Assistance provided in support of the Greater Harare Water and Sanitation Strategic Plan

January 2015
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Preface

The severe conditions in Zimbabwe, which reached a nadir in 2008 and 2009, led to a collapse of basic systems including the reliability and safety of water supply and sanitation services, leading to an outbreak of cholera with more than 4,000 deaths and over 90,000 people infected.

In this context, the City of Harare requested the World Bank to provide technical assistance to support the city to improve water supply and sanitation services. The request followed technical assistance provided to the city to improve the operational efficiency of water and wastewater treatment plants and the Harare Water Summit, held on 30 March 2012, to discuss the water and sanitation situation in Greater Harare, encompassing the City of Harare, Epworth, Ruwa, Chitungwiza, and Norton.

The support activities had three key goals: (1) to improve the operational performance of water and sanitation services in Greater Harare; (2) to create the institutional platform through which these improvements could be achieved and sustained; and (3) to create conditions conducive to raising financial resources for the necessary investments.

This Summary Note summarises the key elements of the work undertaken and makes a set of recommendations to the City of Harare, the adjacent local authorities of Chitungwiza, Epworth, Norton and Ruwa, and Government of Zimbabwe to inform a strategic plan to improve water and sanitation services in the greater Harare area.

The following reports are available:

Working papers:

1. Context, Diagnosis, and Approach to Improving Water and Sanitation Services in Greater Harare
2. Institutional Options for Improved Water and Sanitation Services in Greater Harare
3. Rapid Appraisal of Water and Sewerage Investment Priorities
4. Sanitation in Greater Harare: Current Situation and Future Directions
5. Improving Revenues Through Low Cost and Effective ICT

Reports:

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Henry Oliver, Len Abrams and Rolfe Eberhard took the photographs.
Introduction

The World Bank provided Technical Assistance (TA) to the City of Harare to improve water and sanitation services in the period October 2012 to June 2014 to the value of approximately $600,000. The budget was primarily for the provision of advisory services, with a limited amount set aside for leadership and management training. The TA was unable to provide funds for small investments or for more extensive training, which, together with other reasons explained in this report, turned out to be limiting factors for the success of the TA. This Summary Note sets out the context at the commencement of the TA, summarises the work undertaken in the TA and the outcomes from this work, and makes recommendations for the way forward.

1 Context

The context in Harare specifically, and in Zimbabwe more broadly, found at the commencement of the technical assistance work is set out in this section. This context informed the design of the technical assistance program.

1.1 A fragile economy

Zimbabwe suffered an economic reversal in the period 2000 to 2009, with nearly a decade of negative growth (Figure 1) and a 50% decline in per capita GDP from $700 to $350, setting the economy back to a level of development that the economy had achieved in the late 1950s. The economic reversal was associated with a period of hyperinflation that peaked at over 200,000,000 per cent in 2008, leading to a collapse in the value of the Zimbabwe dollar. As a result, the tax revenues vanished and Zimbabwe became highly dependent on foreign inflows. The domestic use of multiple foreign currencies was legalised in January 2009 and the Zimbabwean dollar was abandoned in April 2009. This stabilized inflation. The changes in policy and economic conditions coincided with the formation of the Government of National Unity in February 2009.

The economy experienced a rebound in 2010 and 2011, with growth rates above 5% per annum and low inflation. However, economic growth subsequently declined to 1.8% in 2013 and contracted in early 2014. Government expenditures exceed income and there is a significant current account deficit of close to 30% of GDP. The financial sector is vulnerable with poor liquidity, low levels of confidence, high non-performing loans and high interest rates.

Zimbabwe was in arrears to multilateral Institutions (World Bank, IMF, AfDB, EIB and others) amounting to approximately $2 billion at the end of 2013. The IMF and the World Bank started a joint debt reconciliation process to estimate HIPC eligibility, and a loan-by-loan reconciliation will be concluded at the end of financial year 2014. Zimbabwe serviced loans for a total of US$97 million, mostly loans from China Exim Bank, in 2013. Employment costs account for 76 percent of current expenditure leaving little resources for capital and social spending.
1.2 Changing politics

Elections in 2008 were closely contested. The accompanying violence led to an agreement to form a government of national unity (GNU) in early 2009. The resulting macro-economic policies, together with increased development partner assistance, resulted in a stabilisation of the economy as described above. It was in this context that the World Bank was requested to provide technical assistance to the City of Harare.

The elections in July 2013 were won by ZANU-PF. The newly formed government developed the Zimbabwe Agenda for Sustainable Socio-Economic Transformation (ZimAsset) programme. ZimAsset’s focus is on the full exploitation and value addition to the country’s own abundant resources. Infrastructure and utilities is one of the four identified clusters (others are social services and poverty eradication, food security and nutrition, and value addition and beneficiation). Fiscal reforms, improvements in public administration and governance, and the introduction of results-based performance management measures underpin the programme. The programme is to be financed through a variety of sources including tax and non-tax revenue, leveraging resources, a Sovereign Wealth Fund, issuance of bonds, accelerated implementation of Public Private Partnerships, securitization of remittances, re-engagement with the international and multilateral finance institutions and other financing options, focusing on Brazil, Russia, India, China and South Africa.6

A recent review of the Zimbabwe’s pathways to international reengagement concluded as follows: “The past year [2013] has seen more business closures in Zimbabwe than at any time since 2008; emigration has increased, as has the cost of living; and poor service delivery remains a national bone of contention. In order to improve the economy, the government needs to engage and partner with local stakeholders. It must also upgrade its portfolio of international economic relations. Although Zimbabwe had engaged with the international financial community under the GNU, the latest economic crisis is pushing the government to try to accelerate progress on the ‘re-set’ with the World Bank, the International Monetary Fund, the African Development Bank, the Paris Club and other international financial institutions” (own emphasis)7.

1.3 New policies

The economic collapse led also to a severe collapse in the functioning of water services. Overall access to urban water supply decreased from 97% in 1990 to 60% in 2008. The specific case of Harare is detailed in the following section.

A constitutional right to water

A new constitution was approved in March 2013. The constitution created a right for every person to safe, clean and potable water and created an obligation on the state to take reasonable legislative and other measures, within the limits of available resources, to achieve the progressive realisation of this right (Section 77).

A new water policy

Within this context, a new National Water Policy was formally adopted in March 2013. The policy envisaged restoring infrastructure and institutional viability during a recovery phase and thereafter further developing the country’s water resources and infrastructure during a
normalised phase.

**Responsibility rests with urban councils with flexibility on who provides services**

This policy designates Urban Local Authorities (Urban Councils) as Water Services Authorities who have a duty to ensure efficient, affordable and sustainable access to water services are provided for all their current and potential consumers. Water Services Authorities may delegate operational responsibility, through a contract, to a Water Services Provider, that is, any legal entity (public or private) capable of carrying out water supply and sanitation services on behalf of the Urban Council. Service Providers will be legal entities (public, private or mixed) that have the capacity to provide water supply and sanitation services to Service Authorities.

**Provision for an independent regulatory unit**

The policy provides for the establishment of an independent Water and Wastewater Services Regulatory Unit to monitor sector performance, receive and assess tariff applications and oversee the licensing of Water Service Providers by Water Services Authorities.

**A right to primary water**

‘Primary Water’ is defined as the water required to meet basic human needs, and is given the status of a right for all Zimbabweans in the National Water Policy.

**Ring-fenced revenues**

The policy states that “local Authorities will undertake cost accounting and will ring-fence revenue from water sales.”

**Cost recovery and financing**

Water services revenues are dependent on water and sanitation tariffs and user charges. These revenues were wiped out by the hyperinflation. Although there has been some recovery after the dollarization of the economy, revenues have not been restored to pre-crisis levels. The government is not able to provide operating subsidies to the water services sector due to its weak fiscal position, hence the sector had no choice but to implement a policy of full recovery of operating costs for urban water and sanitation services, while providing for capital subsidies (in the form of grants and concessionary loans) for investments in rehabilitation and expansion of infrastructure. Over time, it is envisaged that the sector will again be fully financially self-sufficient as it had been in the past. However, this is dependent also on a full economic recovery. This is stated in the policy as follows:

Water pricing will reflect the full costs of provision of water for all uses (capital and recurrent costs), except for primary water where the price will at least reflect the operation and maintenance costs during the recovery period and gradually shift towards full cost recovery during normal development.

During the recovery period, Government will provide special grant financing to UWSS and RWSS. Thereafter Central Government will allocate money on a loan basis, based on the performance of Urban and Rural Councils against agreed performance benchmarks.

**Pricing of primary water**

The policy states that, in urban settings, “because water treatment, transmission, storage and distribution through networks is expensive, primary water needs are based on lifeline
tariffs and only in cases where people cannot afford to pay, can free life saving water per household of 10m3 per month be supplied.

**Affordable standards**
The policy provides for appropriate service standards that will not compromise the benefits of basic water supply and sanitation and for which the recurrent costs are affordable to users, in particular during the recovery phase.

**Promotion of public-private partnerships**
The policy promotes PPPs as a vehicle for improved financing of WSS and states that the Government will continue to work with Development Partners to provide safety nets for communities who are in vulnerable situations with respect to WSS.

**The recovery period – towards sustainable services**
The Water Sector Investment Analysis report concludes that “the key elements of returning the sector to sustainability are to deal with the accumulated debt burden in the sector, establish cost recovery tariffs which customers are willing to pay as service levels improve, and ensure efficient revenue collection.”

**Legislation**
The Urban Councils Act ([Chapter 29:15], 1996) gives Urban Councils the power to construct and manage urban water supply systems, and to collect, convey, treat and dispose of sewage and stormwater.

The National Water Policy notes that a number of different pieces of legislation will have to be updated in order to accommodate the new National Water Policy, in particular, the ZINWA Act, Urban Councils Acts, Rural Council Act and Public Health Act need to be synchronized with this policy.

### 1.4 An increasingly metropolitan region

The Greater Harare Metropolitan Area includes the five settlements of Harare, Chitungwiza, Epworth, Ruwa and Norton. Each of these centres is managed by an independent urban authority: the Harare City Council, Chitungwiza Municipality, the Epworth Local Board, the Norton Town Council and the Ruwa Local Board. Each town has its own unique history and pattern of development and, to date, there has been little in the way of coordinated planning between the individual towns. However, to a large extent, these centres are part of single urban entity. In particular they are linked together on the basis of sharing a common water supply system and a common destination for their wastewater into the supply dams.

The four centres of Harare, Chitungwiza, Epworth and Ruwa form a single contiguous urban area whilst Norton is located some 45 km to the west of Harare. Norton and Ruwa are both situated alongside primary access roads and railway lines, to the west and east respectively, and both were developed specifically to provide opportunity for industrial expansion outside of Harare. Chitungwiza has a limited industrial area and, together with Epworth, primarily...
serve as satellite residential areas for Harare.

Harare is situated at the headwaters between the Manyame catchment to the south and west and the Mazowe catchment to the north and east. Other than the small parts of Harare to the north and east (Hatchcliffe, Borrowdale, Highlands, Greendale and Caledonia) which drain north into the Mazowe River, the remainder of the city together with all of Ruwa, Epworth, Chitungwiza and Norton drain to the west into the Manyame River. This leads to the unfortunate position whereby Harare, Chitungwiza, Epworth and Ruwa are all situated upstream of the main water supply dams of Lake Chivero and Lake Manyame, and even for Norton drainage is to the north directly into Lake Manyame.

As the capital of Zimbabwe, Harare strongly dominates Greater Harare in terms of area, population and development of commerce and industry. Harare has a well defined Central Business District (CBD) but this is lacking for the other centres of Chitungwiza, Epworth, Norton and Ruwa. In each case plans exist for development of a town centre but these have yet to be developed. As the capital city, Harare also supports the bulk of the institutional development, in particular hosting a large number of national organizations. For the other centres, institutional development is limited, the most numerous organizations being schools and churches.

Harare also includes the largest industrial areas. Chitungwiza, Norton and Ruwa each have some industry; indeed the modern development of Norton and Ruwa was specifically in order to reduce pressure on industrial areas in Harare. Despite previous industrial development in these smaller centres, many of the large companies have now ceased operation or have relocated. This is largely due to the prevailing national economic malaise, but has been compounded by erratic water supplies to these towns.

Population growth in Ruwa, Norton and Epworth has been higher than for the City of Harare itself due to land release policies and practices (Table 1).

Table 1: Population in Greater Harare (thousands)

<table>
<thead>
<tr>
<th>Year</th>
<th>Harare</th>
<th>Chitungwiza</th>
<th>Epworth</th>
<th>Ruwa</th>
<th>Norton</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td>1,479</td>
<td>274</td>
<td>na</td>
<td>na</td>
<td>20</td>
<td>na</td>
</tr>
<tr>
<td>2002</td>
<td>1,436</td>
<td>323</td>
<td>114</td>
<td>24</td>
<td>44</td>
<td>1,941</td>
</tr>
<tr>
<td>2012</td>
<td>1,469</td>
<td>354</td>
<td>162</td>
<td>56</td>
<td>58</td>
<td>2,099</td>
</tr>
</tbody>
</table>

Growth rate %pa (2002 to 2012) 0.2% 0.9% 3.6% 8.8% 2.8% 0.8%

*Source: Zimbabwe national census data. na = not available.*

### 1.5 Dilapidated infrastructure

#### City of Harare

The City of Harare supplies bulk water to the Greater Harare area. The Harare water supply scheme consists of two water treatment works – Morton Jaffray WTW with a nominal design capacity of 614 Ml/day (one of the largest in Africa at the time of its construction) and Prince Edward WTW with a nominal design capacity of 90 Ml/day intended for peak season use. Actual water production is around 75% of nominal capacity. Water must be pumped from the treatment works into reservoirs supplying the distribution network and there are 16 treated water pumping stations,
27 reservoir sites, 5,400 km of transmission and distribution pipelines and over 200,000 service connections. Water service coverage is around 82%, but the supply hours are very low in many places.

The City of Harare operates a number of wastewater treatment facilities with total installed capacity around 220 ML/day. These include Firle WWTW (144 ML/day), Crowborough WWTW (54 ML/day), Donnybrook Stabilisation Ponds (12 ML/day), Hatcliffe WWTW (2.5 ML/day) and Marlborough Stabilisation Ponds (7 ML/day). The sewerage system has over 5,000 km of sewer collection and transmission pipes. Present sewerage service coverage is around 75%.

**Chitungwiza**

The Municipality of Chitungwiza utilizes bulk water from the City of Harare’s water treatment facilities. The transmission system is designed in such a way that water can be drawn from both Prince Edward WTW and Morton Jaffray WTW. Overall, the city provides services to a population of 357 000 (2012 National Statistics). At present, the system has 55,669 connections. Water service coverage is around 94% but supply is very intermittent.

The wastewater infrastructure in Chitungwiza consists of both on-site and off-site sanitation systems. Building and housing guidelines, by-laws and standards stipulate that low density properties depending on soil conditions, are not connected to the sewerage system. They are serviced with on-site septic tanks and soak-away pits. High and medium density properties, on the other hand, are all connected to the sewerage system. The sewerage system in Chitungwiza consists of sewers, pump stations and trunk mains that collectively convey wastewater to Zengeza Sewage Treatment Works.

**Epworth**

Epworth relies on piped water from the City of Harare via the Vengersberg Tanks. Supply is highly intermittent. The Local Board has an ongoing programme to supply water through strategically located boreholes. Coverage is estimated to be around 38%. A small area of Epworth has a sewerage network. Ponds were constructed to collect and treat the sewage from the area but were quickly overbuilt and were never commissioned. Therefore the sewerage network was never commissioned either. Hence people rely on on-site sanitation.

**Norton**

Norton currently obtains all of its water from Morton Jaffray WTW. The water system currently supports around 12,500 service connections. Norton Town Council operates two sewage treatment plants at the same location. The old works has a nominal capacity of 3.2 ML/day, while the new works has a nominal capacity of 4 ML/day. Service coverage is around 41% mainly because people in low density areas are on septic tanks and the population in the western wards do not receive water.

**Ruwa**

Ruwa currently utilises water from Nora Dam via a supply line that feeds into Green Sykes dam and on to the water treatment works (capacity 7.5 ML/day), City of Harare (treated water supply) via a supply line from the Donny Brook tanks to the ZIMRE estate and onwards.
into the supply network for Ruwa and a supply line from the Vengersberg tanks which feeds the Mutare Road Ground Tanks via a booster station on the western outskirts of Ruwa. The system supports 12,500 service connections.

Ruwa has a single sewage catchment served by 3 sewage pump stations and the Adelaide Ponds. Adelaide stabilization ponds are in an area under the jurisdiction of Epworth Local Board, which has zoned the ponds area for development and has told Ruwa town council to find another place to dispose of their sewage. Hence the sewage from Ruwa is currently discharged to the natural watercourses untreated.

1.6 Poor water services outcomes

Reduced water production
The reduction in water production for Greater Harare in 2008 and 2009 was dramatic (Figure 5). Water production was subsequently restored to close to earlier levels during 2010 to October 2012.

An intermittent supply to customers
A majority of residents receive intermittent water or no water at all. This was not the case before – most people in Harare with water connections received a 24/7 supply prior to 2005.

Compromised water quality
An intermittent supply results in contamination of water in pipes and further degradation of the network. Even if the water supplied by the treatment works is safe to drink, an intermittent supply results in low pressures in pipes and consequent risks of contamination by ground water. In addition, the hydraulic shocks arising from refilling pipes accelerate network degradation. An intermittent supply is much more difficult to manage. There are therefore compelling reasons to restore the network to a continuous 24/7 supply.

High non-revenue water
Non-revenue water is very high at an estimated 50–60 percent.

Poorly performing sewer network and wastewater treatment
There was a parallel collapse in the sewer network and wastewater treatment over the same period (2008–09). Consequently, sewer spills into streets were frequent, and a large volume of untreated sewage ran into the water sources on which Greater Harare is reliant. Emergency works involved getting pump stations working, doing emergency repairs at the treatment works, and addressing the worst of the spills.

Heavily polluted water sources
Raw water sources are heavily polluted. Harare has four raw water sources all on the Manyame River.
The main water sources are downstream of the city and as a result are heavily polluted from the raw sewage from settled areas, industries and farming activities (Figure 6). The result is that it is very expensive to treat the water and there is a potential risk to consumers if the water treatment process breaks down.

**Insufficient treatment capacity**

Even if the existing works were to be fully restored, they do not have the capacity to treat all of the sewage generated. Heavily constrained financial resources means that it will be important to take a strategic view on how best to proceed with improving sanitation, so that available resources are wisely spent for maximum benefit.

**Billed revenues had increased**

The data made available at the commencement of the technical assistance indicated that the billed revenues had increased from about $6.5 million per month in February 2009 to over $10 million per month at the end of 2011 (Figure 7). However it was noted that the billing data was inaccurate due to the poor condition of meters, large proportion of estimated readings, absence of quality control on meter readings and other system shortcomings.

**Cash collections had improved**

Similarly, the available data showed that cash collections had increased from close to zero at the time of dollarization of the economy in January 2009 to $4 million per month at the end of 2009; further increasing to $6 million per month at the end of 2011 (Figure 8). This represented a collection efficiency of about 60 percent.

**The situation in satellite towns was worse than in the City of Harare**

In Chitungwiza, all water was supplied from Harare, but Harare did not deliver sufficient water for Chitungwa's needs so large numbers of people received little or no water; and 10,000 stands were not connected to water or sewers. In Norton, raw sewage flowed directly into Lake Manyame. The town was reliant on its bulk supply from Harare water but received insufficient water. Norton had been identified as a potential Cholera hotspot. In Ruwa, there was minimal supply from Harare and the town's own production facilities were insufficient to meet demand. Consequently most consumers did not have piped water, and relied on boreholes, many of which were unprotected. In Epworth, supply from Harare was almost non-existent and most consumers relied on unprotected water sources that were at high risk of being contaminated. Households in Epworth used on-site sanitation facilities and open defecation was also practiced.
2 Methodology and approach

2.1 Diagnostic

The diagnostic phase was launched in October 2012. The purpose was to appreciate the current conditions (symptoms) and fully understand the underlying causes of these symptoms. The work focused on the City of Harare on the understanding that the service conditions in the other four towns were at least as poor as those experienced in the City of Harare area, and that service improvements in Greater Harare were dependent on improvements in the performance of Harare Water, the bulk water supplier for the region. The work involved site visits, presentations, reviews, and workshops and culminated in a management team diagnostic workshop with Harare Water and a meeting with the Mayor in January 2013.

The core diagnostic was summarized in the diagnostic workshop in January 2013. A combination of poor reliability and lack of water services resulted in high public health risks (typhoid, cholera, and diarrhea). Lack of reliability of services led to low levels of credibility on the part of the water providers (Harare Water and the other towns providing water in Greater Harare) and low levels of trust by customers. This contributed to poor payment levels. Harare Water had a substantially incomplete customer database leading to the under-realization of revenues. The low revenues meant that the service provider did not have the resources to maintain and operate the services, leading to a further deterioration in services. The low level of resources together with low levels of trust on the part of customers contributed to poor working conditions and an unmotivated staff. This was a vicious cycle leading to worsening conditions over time. The strategy needed to break this cycle, creating instead a virtuous cycle of improving revenues and services over time, increasing levels of trust and improving staff working conditions and motivation. This would require that all key aspects of the business be addressed: customer management, revenue management, investments, rehabilitation and maintenance of existing assets, and human resources management.

2.2 Assumptions informing the design of the technical assistance

A much lower population than previously estimated

The strategy process commenced prior to the release of the population census data. At that time, city officials estimated the population in Greater Harare to be about 4.5 million, although it was recognized that this was uncertain. The census data released in early 2014 showed that the population was much lower (Table 1).

Sufficient water to provide a 24/7 supply

The request at the Harare Water Summit in March 2012 was for the urgent building of Kunzvi Dam in order to increase water supplies, based on an assumed demand of 1200 ML/day. However, the nominal production capacity of 600 ML/d is able to provide a water supply into the network of 285 litres per person per day for a population of 2.1 million people (more than 3000 litres per connection per day). This is sufficient water to maintain a 24/7 supply in the distribution network. This suggested that investment priorities should be focussed on restoration of production capacity and non-revenue water reduction rather than on increasing supply.

Figure 9: Manual entry and calculation of water production
A strategic approach to improving system knowledge

In October 2012, water production was estimated to be about 600 Ml/day. However, no bulk meters were installed, and pumping volumes were estimated based on pump running time and pump efficiency. Similarly, not a single meter was working for the 26 reservoir outlets. The City of Harare had 177,000 customers on their database, but it was acknowledged that it was likely that there were many unregistered or illegal connections. Knowledge of the location and status of meters, service connections and the state of the distribution network was poor.

An improved knowledge of actual production, reservoir balances, the number of active customers, key services gaps and water consumption patterns would improve the accuracy of future water demand forecasts and determination of investment requirements.

Practical approaches that improve understanding with available resources are preferred to detailed studies that are deferred due to a lack of resources. It is not that detailed studies are not valuable, rather that there is a danger that these will defer important decisions or, alternatively, that short-term investment decisions are made in the absence of an overall strategic view. What is needed is a practical and strategic approach to filling the data gaps. Priority should be given to putting bulk water meters in place and in understanding reservoir balances. It is also possible to get a much better understanding of the current base demand (distribution of population, connections and consumption) relatively quickly with available financial resources.

A need to standardize

The standards used are obsolete and need to be updated. There is a problem with equipment being specified by financiers (and their engineers) based on own-country knowledge and experience rather than what is appropriate and part of a common standard for Zimbabwe and/or Harare.

Alternatives to investment in existing wastewater treatment plants should be explored

The treatment of a small proportion of wastewater to a high standard may not be the best use of scarce investment resources. Alternatives should be considered.

It is possible to significantly raise revenues and cash collection in the short term

It is important to determine realistic revenue and cash collection targets for the medium term. For example, if water production of 600 Ml/d is attained and sustained, if sales are increased to 60 percent of water produced and if collection efficiency is increased to 80 percent, then cash collected for water and wastewater services could increase to over $140 million per annum — three times the current rate of cash collection. More work will be required both to set realistic targets and to work out the detailed strategies to achieve these. In the meantime, every effort needs to be made to continue to bring unregistered customers onto the billing data base, and to increase billing and cash collection. Without additional resources, sustained gains in the improvement of services will not be possible.
**Improved services must be linked to increased payments and vice versa**

Increase in cash revenues need to be accompanied by investments in improving water distribution (across geographic areas and in terms of reliability). As services are improved, customers need to contract to pay for the improved service. This creates a virtuous circle where increased revenues leads to improved services which in turn leads to increased revenues. The study tour to eThekwini Municipality showed how practical strategies can be developed and applied to increase revenues, and that good customer management is key.

**It is possible to reduce losses and move towards a 24/7 supply**

With available investment resources, and through increasing cash collections, it may be possible to extend 24/7 coverage to a much larger proportion of the population. This will require a practical and strategic approach, making the best use of available resources.

**The satellite towns are dependent for water on Harare Water**

Satellite towns may cooperate and align interests if Harare Water can demonstrate improved performance and good faith in distributing water more equitably across the region. The timing and sequencing of the discussion with satellite towns on cooperation and combined strategies are therefore important. Services need to be paid for in order to support the financial viability of the utility and enable ongoing sustainable provision of services. In October 2012, Norton was not collecting any revenues for water services and Chitungwiza was not paying for the water that they received from the City of Harare.

**Attracting investment finance**

The ability of the towns of Greater Harare to attract new investment financing for water and sanitation will be significantly enhanced if significant operational improvements are achieved during the process of developing the strategy. For this reason, a strong emphasis was placed during the strategy development on measures that support practical improvements in actual operations on the ground. These improvements are a much more powerful message than a ‘paper perfect’ plan that is disconnected from what is actually happening in practice.

**Fiscal reforms will be necessary before ring-fencing of water can be achieved**

Local authorities are understandably reluctant to let go of water revenues because this is one of their few sources of funds. For this reason, the creation of a water utility for Greater Harare is unlikely until local government is allowed alternative sources of local revenues to sustain services. This will require local government financial reforms that are the remit of the ministry in charge of local government.

**Availability of funds for investments**

The City of Harare had access to investment resources in the form of a $14 million grant and a $144 million loan that could be used to support the necessary short-term improvements in water and sanitation services with further funding possible to support the necessary medium and longer term investments.

**Working with management to improve services**

The observed improvements in performance from January 2009 up October 2012 showed that a capable management team was in place and that further performance improvements could be achieved through the provision of advisory services and technical support to this team.

**Basic management structure adequate**

The management structure comprised a Director of Harare (with overall responsibility for Water and Sanitation in the City of Harare) and managers for bulk water production, wastewater collection and treatment, the water reticulation network, maintenance, investments/projects, finance and human resources. The separation of the maintenance
function from the three technical operations managers was considered to be a problem and, as a result of a recommendation made in the TA project, maintenance responsibilities were moved to the three operations managers (bulk water, wastewater, and water network). The management structure, thus reformed, was considered an adequate basis to proceed with operational improvements in the short-term pending the consideration of more significant institutional reforms (also to be investigated as part of the TA).

2.3 Approach

The strategy was developed at two levels: first, at an operational level, to support the management team of Harare Water to improve operations through an organizing goal of reestablishing a 24/7 supply; and secondly, at a strategic level to do the necessary research work to understand and advise on the key questions that would inform future investments, institutional arrangements, and the overall medium- and long-term strategic plan. The support activities were organized in four distinct but interrelated work-streams:

**Work-stream 1: Harare Water 24/7 strategy.** The diagnostic process led to the realization on the part of Harare Water that it may be possible to achieve a 24/7 supply to a significant (or at least a much greater) proportion of residents living in Greater Harare using the existing bulk water treatment capacity. The management team adopted a “24/7 strategy” as the organizing focus of their work to improve water supply and sanitation services more broadly. This was an operational strategy that was aimed to achieve improvements in performance within the available human and financial resources. The intention was to undertake improvements through management action plans and to prepare for a public launch of the 24/7 strategy, at which time Harare Water would commit publically to the achievement of identified performance goals, especially the key goal of reestablishing a 24/7 water supply.

**Work-stream 2: Leadership, management and strategy support.** World Bank staff and consultants worked closely with the management team of Harare Water. The performance of the management team (within a suitable political authorizing environment) is key to the success of the strategy. Work with the team involved the diagnosis of problems, development of preliminary reform goals, development of preliminary action plans and an iterative review of these plans, development of a deeper understanding of the system within which the reforms were taking place by mapping stakeholder influences, the introduction of the concepts ‘adaptive challenges’ and ‘adaptive leadership’, and the design of a fuller management and leadership intervention. It was also intended to use a rapid results methodology in the development and implementation of the 24/7 strategy. This work was carried out in collaboration with the World Bank Institute and their Leadership for Results program.

**Work-stream 3: Institutional reform.** The possible institutional options to improve water and sanitation provision in Greater Harare over the medium to long term were researched and a report prepared. These options were presented and discussed through a facilitated process with the key officials in the five towns and recommendations on the preferred options were made to take forward through political process.

**Work-stream 4: Investment plan.** A water and sanitation investment plan for Greater
Harare was developed. This plan was informed by: (1) the data obtained during the diagnostic phase, (2) the learning developed during the implementation of the 24/7 strategy, (3) a strategic sanitation investigation, (4) a rapid assessment of investment needs and strategic investment considerations, and (5) other available and relevant information. These activities, and their outcomes, are elaborated in the sections that follow.

3 Harare 24/7 strategy

3.1 Purpose
The key purpose of the technical assistance in this stream of work was to provide practical support to the management and staff of Harare Water to improve operational performance. The World Bank arranged for Neil Macleod, Head of Water and Sanitation at the eThekwini Metropolitan Municipality in South Africa, and members of his management and technical teams, to visit the City of Harare on a number of occasions, and for the management of Harare Water to visit eThekwini. During and through these visits, a set of action plans were developed by the Harare Water management team. Practical advice and assistance was provided on the specification and procurement of equipment, chemical costs, the development and roll-out of a rapid customer survey using handheld GPS loggers, credit control policy, standard operating procedures and related matters. These activities took place in a context of investment funding being provided by ZIMFUND ($14 million) for emergency rehabilitation work, mainly at Morton Jaffray treatment works and the availability of a $144 million loan from China Export Import Bank (Exim Bank). In addition, leadership training was provided to the management team with the support and involvement of the World Bank Institute. Sessions were held on adaptive leadership and on influence mapping.

3.2 Action plans
The management team of Harare Water developed a set of action plans with World Bank support. These plans were developed in terms of the priority goal of restoring a 24/7 supply, and in terms of three broad areas – securing production, moving to a 24/7 supply in the network and engaging customers (Figure 13). Preliminary action plans were developed and three phases of review and revision undertaken in the period January to June 2013.

Secure production
Although Harare Water has managed to restore production back to about 600 Ml/day after the crisis in 2008 and 2009, production was vulnerable to breakdowns. Therefore, a key priority of improving services was to stabilise and secure reliable production at the level of 600 Ml/day or above. Over and above planned short-term investments in rehabilitation of Morton Jaffray and Prince Edward water treatment works (including pump replacements, using resources from ZIMFUND and the Exim Bank loan), the following actions were identified: improve housekeeping, improve the logistics of moving and storing chemicals, prioritise installation and commissioning of bulk flow meters, get the clarifiers working as soon as possible, introduce standard operating procedures for pump operations and

![Figure 13: Key areas of action for the 24/7 strategy](image-url)
maintenance, improve overall maintenance procedures and practices, get the laboratory working properly and improve chemical and pumping efficiencies. It was recommended that the sludge processing plant be put out to a public-private contract. Chemical contracts were coming to an end and there was a need to review chemical dosing regimes and to secure new procurement contracts at competitive prices.

**Efficient and effective spending on chemicals**

In light of concerns about the high cost of chemicals, a review of chemical procurement was undertaken and the following findings and recommendations made:

1. It was recommended to appoint an independent expert to carry out testing of alternative chemical dosing regimes to find the most appropriate and cheapest option for treating Harare’s water supply given the complexities involved. This person needs to be independent of any particular chemical supplier.

2. The manufacturer of liquid aluminium sulphate in Harare is selling its product for much more than its counterpart in Durban. In fact, it is cheaper to coagulate using imported granular aluminium sulphate than to use the local product. Harare should seek to negotiate a more competitive price with the supplier. Failing success with this strategy, it should consider switching to the imported granular product.

3. The prices paid by Harare for granular aluminium sulphate, HTH, lime and chlorine gas are similar to what is paid by eThekwini after correction for transport and import tax.

4. The price currently paid by Harare for powdered activated carbon is lower than the price for this product imported from China under the contract with CMEC but the quality should be checked.

5. The price paid by Harare for locally manufactured sulphuric acid is less than it would cost to import.

6. Harare’s monthly costs will be lower if alternative coagulants to aluminium sulphate are used. The lowest cost would be obtained with polyaluminium chloride imported from China. However, monthly costs are very sensitive to the applied dose and Harare is strongly advised before committing to a product to confirm the optimum dose and performance with jar tests and full-scale trials.

7. At Morton Jaffray there are deficiencies in raw water metering and inlet control valves that must be resolved in order to ensure accurate chemical dosing.

8. Harare should pay for chemicals from cash generated from the sale of water and not use loan finance for an operational expense. Borrowing money to pay for operational expenses is more expensive and is not financially sustainable.

**Progress**

The City of Harare was unable to restore production to 600 M/day (Figure 14). Contributing factors included the lack of cash to purchase chemicals and undertake maintenance, the poor state of the pumps and other infrastructure and the need to take units off-line for rehabilitation. Until production had been restored it was considered unwise to publicly launch the 24/7 strategy (described below). An independent expert to test chemical dosing options and to

![Figure 14: Harare Water production 2005 to 2013](image-url)
advise the City of Harare was not appointed.

**Moving to 24/7 in the network**
Five key areas were identified for restoring the network to a 24/7 supply – mainline integrity, rehabilitation of Warren control pumpstation and the associated reservoirs, reestablishment of supply zones and improved reservoir management, replacement of existing pressure reducing valves and introduction of new ones at strategic points, prioritised leak reduction activities, and prioritise meter replacement. Progress in these areas could be made with existing resources even though more substantial investments would be required over time to replace the piped network in many areas. Action plans for each of these areas were developed (Figure 15).

**Warren Control rehabilitation and 24/7 launch**
Warren Control pumpstation is the main pump station used to supply the distribution reservoirs. If this pumpstation is not functioning, no water can be distributed to much of the network. This pumpstation was in need of major rehabilitation and would have to be brought off line for 2 to 3 days. The maintenance activities would have to be carefully planned and clearly communicated with the public. In discussion with Harare Water staff it was realised that this ‘low point’ in the production would be an opportune time to launch the 24/7 strategy publicly, with a view to progressive improvement of the water supply situation thereafter, as all of the action plans get implemented. (See Customer Engagement below.)

**Improved reservoir management**
Management of the 29 reservoirs was being done manually, with written level recordings being communicated once or twice daily after the fact. The lack of ‘real time’ data made reservoir and distribution network management reactive and much less effective than it could be. Mechanisms to use simple cell phone-based technology to communicate reservoir levels on a more timely basis were discussed and practical support to set this system up was given. The action plan for improved reservoir management included the following actions: Implement cell phone and web-based monitoring of reservoirs, inspect and repair reservoir outlet meters, get meter agent out to assess, isolate reservoir zones and prioritise zones for pressure reduction and leak repair.
Progress

The maintenance department was separate from the three main operations departments – water production, network management and wastewater treatment. It was recommended that the maintenance teams be integrated back into these three key operational areas and this recommendation was implemented.

Some progress was made on a 24/7 action plan, but this plan was not fully operationalized. Detailed planning for a Warren Control pumpstation shut down, to coincide with the launch of the 24/7 strategy was not undertaken. Basic maintenance tasks were hampered due to the lack of cash flow.

A process to use cell phones to monitor reservoirs was developed and piloted (Figure 16). (See Working Paper 5.)

Customer engagement and revenues

Trust with customers needed to be rebuilt. This would depend on honest communications in a context of practical actions that were leading to service improvements over time. Three key areas were identified: improved knowledge of customers through a rapid GIS-based survey; improved meter reading, billing, and cash collections packaged together in a revenue enhancement strategy, and communications, including the establishment of a call centre.

Management of the customer services function

It was strongly recommended that a suitably skilled (non-technical) person be appointed as a dedicated customer services manager for water, and that a customer services strategy be developed, encompassing these three activities. However, an appointment was not made and the revenue enhancement and customer services strategies were not developed.
A rapid GIS-based survey

The World Bank and eThekwini teams worked with Harare Water management and officials to guide them in undertaking a rapid survey of their customers. The aim was to transform the meter reading system to achieve greater accuracy, transparency and feedback by implementing a simple cell-phone based reading system with the following features: meter readers to locate and position all meters, meter readers to update customer data, meter readers to document all leaks they see (photograph with location, report back). At the same time, the water distribution network was to be placed on GIS. The City would purchase satellite images. Using the visual overlay, the existing piped network, active meter positions, and software from eThekwini to digitise physical structures (houses etc.), it would then be possible to understand the extent of service gaps and likely locations of illegal connections. This would enable a much more accurate estimate of demand to be developed. The City preferred to use dedicated GPS units rather than cell-phones for this exercise and adopted a more detailed and slower suburb-by-suburb strategy. Progress was also delayed by procurement and funding issues and the City was therefore not able to achieve the progress and outcomes that were originally hoped for – a more informed strategic overview of their customer base. (See Working Paper 5 for further detail.)

Revenue and cash collections

Raising sufficient revenues (billing), and collecting this efficiently as cash, lies at the heart of any successful strategy to improve services. At the commencement of the technical assistance, the available data had showed positive trends for both billing and collection (Figures 7 and 8). However, new data made available during the course of the TA showed that both of these important indicators were deteriorating (Figures 17 and 18). Billings appeared to be on a declining trend from a peak in December 2011 and cash collections dropped from around $6 million per month before September 2012 to below $4 million per month after January 2013.11 The reason for the drop in cash collections in September 2012 and the following months is not clearly understood. Contributing factors may have been the political environment (in which people were encouraged not to pay with no action being taken) and a proliferation of “informal money flows” to capture and divert existing official money flows (see Section 3.4).

The City was encouraged to develop and implement an effective credit control policy. This was placed on hold prior to the elections when the Minister of Local Government announced a debt moratorium in June 2013.

The City was also encouraged to develop a comprehensive revenue enhancement strategy but this strategy has not been developed.

Cash collection efficiency is very low at about 40%, and has dropped from about 60% (Figure
Status of action plans

Although achieving the 24/7 supply goal involves significant technical/engineering challenges (for example, reestablishing reliability of production, reducing system pressures, fixing leaks, replacing pipes), these actions on their own are not sufficient to achieve 24/7 supply. In addition to meeting the engineering challenges, the revenue management and customer service functions needed to be substantially overhauled and improved.

The action plans, however, remained incomplete and needed to be further integrated, with clearer priorities, targets, deadlines, and resources attached. A customer services action plan still needed further elaboration and the revenue enhancement strategy needed development. These actions could be further improved through a Rapid Results Initiative. At the time it was considered prudent to launch the 24/7 strategy after the elections. It was also recognized that an action plan for the launch of the 24/7 strategy needed to be developed. In the end, the action plans were not improved, an action plan for the launch of the 24/7 strategy was not developed, the Rapid Results Initiative methodology was not taken up and the 24/7 strategy was not launched.

3.3 Managing finances

In a context of scarce resources (both operating revenues and investment funds) it is especially important that existing resources are used wisely and efficiently. Reviews were undertaken of Harare Water Finances and the short-term investments being made in terms of the Exim Bank loan. This work was undertaken in parallel to the work on the action plans described above, but did not lead to a specific action plan. Key findings are therefore reported separately below.

Table 2: Money owed by Harare Water to its creditors

<table>
<thead>
<tr>
<th></th>
<th>May 2012 ($million)</th>
<th>May 2013 ($million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZESA</td>
<td>21.5</td>
<td>38.2</td>
</tr>
<tr>
<td>ZIMRA</td>
<td>7.6</td>
<td>9.8</td>
</tr>
<tr>
<td>LAPF</td>
<td>4.7</td>
<td>7.1</td>
</tr>
<tr>
<td>Chemicals</td>
<td>3.5</td>
<td>7.8</td>
</tr>
<tr>
<td>HMMAs</td>
<td>1.6</td>
<td>2.2</td>
</tr>
<tr>
<td>ZINWA - Manyame</td>
<td>1.8</td>
<td>4.6</td>
</tr>
<tr>
<td>Upper Manyame</td>
<td>0.3</td>
<td>0.4</td>
</tr>
<tr>
<td>Others</td>
<td>6.6</td>
<td>10.5</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>47.7</strong></td>
<td><strong>80.6</strong></td>
</tr>
</tbody>
</table>

Source: City of Harare data.

Harare’s creditors

Due to poor cash collections, Harare Water is unable to pay its creditors. Harare Water owed over $80 million to creditors as of May 2013, representing more than 20 months of cash revenues at the current level of cash collections of less than $4 million per month (Table 2). This is close to double the amount owed 12 months ago ($47 million).\(^1^2\)

Harare Water is owed close to $200 million (debtors), representing about 20 months of revenue at a monthly billing of $10 million. However, a moratorium on customer debt was announced by the Minister of local government in the run up to the collections. This means that this much of this debt will now never be collected.

Harare Water is in serious financial distress, and an effective revenue enhancement strategy is urgently required.
Harare’s expenses

Harare’s unit costs (operating costs per unit of water sold) have been increasing and are high (more than $1 per kilolitre (kl) of water sold) due to the utility’s inefficiencies (Figure 19). Unit staff, chemicals and electricity costs all increased substantially over the period 2009 to 2012.

Ensuring efficient use of chemicals and energy, reducing non-revenue water, increasing staff productivity and improving collection efficiency are all critically important to ensuring sustainable provision of services.

Accounting and reporting

Recent audited financial statements for Harare Water are not available. Reported revenues are not reliable due to problems with meters and meter reading and large dependence on estimates. There are large variances between budgeted amounts and actual reported expenses. Accounting practices are deficient. Management reports of expenditure include VAT and there is no accounting for depreciation. Financial data is inconsistent and financial controls need improvement.

Short-term investments

The City of Harare (CoH) entered into a contract with China National Machinery and Equipment Import and Export Corporation (CMEC) for the rehabilitation of water and sewage treatment plants in Harare, being Morton Jaffray and Prince Edward water treatment plants and Firle and Crowborough sewage treatment plants. The value of the contract was US$144 million. The World Bank undertook, on request by the City of Harare, a review of the CMEC contract. Risks identified in this review were conveyed to the City of Harare.

3.4 Reflections and agreed actions

A serious and deteriorating situation

The initial work undertaken in the TA showed that the water and sanitation situation in Greater Harare was even more serious than previously thought and that the situation was deteriorating rather than improving. Although some improvements had been achieved after the social and economic crisis in 2008–09, and there was reasonable stability in the system over the period 2010 and 2011, there had been a deteriorating trend in billed revenues and from about September 2011 and cash collections had dropped significantly from September 2012 through May 2013 from about $6 million per month (60 percent collection efficiency) to below $4 million per month (40 percent collection efficiency). This placed severe pressure on cash flows and the ability to fund essential inputs, maintain and repair assets, and pay creditors. Water production dropped had also dropped significantly from December 2012 to levels last seen during the cholera epidemic in late 2008 and early 2009. A detailed analysis showed that the reduced cash flows contributed to the subsequent reduction in water production due to shortages of water treatment chemicals.

There was a very significant danger of a continued negative spiral where lack of cash results in reduced production that in turn leads to even lower reliability of supply and a further reduction in payments by customers. At that point, more than half of customers were not paying for water and no effective sanctions for non-payment had been implemented. The debt forgiveness instituted by national government in June 2013 was reported to have
exacerbated the situation. The risk of another public health crisis could not be discounted.

The underlying causes of this situation was discussed with the management teams at both the City level (Directors) and in Harare Water (Managers). A consensus was reached on six contributing factors: (1) The lack of cash means that Harare Water finds it difficult to pay its chemical suppliers and other creditors and does not have the money to undertake essential repairs and maintenance; (2) The Harare Water managers alleged that a network of informal money flows within and related to the Harare Water system bled resources from the system; (3) The political environment up to the elections in July 2013 made enforcement of credit control difficult; (4) Poor systems related to metering, billing, and cash collection contributed to inefficiencies and reduce the ability to monitor, manage, and control cash flows effectively; (5) poor services reduced willingness to pay; and (6) the overall weak economy reduced the ability to pay.

**Agreed actions**

There is a significant amount of money at stake for the City (cash flow losses amount to between $2 million and $4 million per month) and thus the importance to the City of getting this right is hard to overstate. It is possible to reform a public utility. However, this requires strong leadership together with an appropriately supportive political environment. Internal reforms thus far have not yielded good results and a different strategy is needed.

In this context, a set of urgent actions were agreed in discussions with the City of Harare Directors and Harare Water management over the period June 2013 to May 2014. These included:

- Develop, approve and implement an effective credit control policy;
- Appoint a supervising consultant to oversee the implementation of capital spending by contractors;
- To decide on the creation of a Harare Water utility, a corporatized entity, owned by the City, to provide water and sanitation services effectively and efficiently; (See Section 5); and,
- To issue a letter of request for technical assistance from the World Bank to explore partnerships and contracting options to assist with the creation of a corporatized water utility and to improve revenue and debt management.

At the time of writing this report (June 2013), these actions had not been undertaken.

## 4 Investing for the long term

A water and sanitation services investment plan for Greater Harare was developed. This work was jointly funded by the African Development Bank who had provided funding for the development of investment plans in six cities – Harare, Chitungwiza, Mutare, Masvingo, Kwekwe, and Chegutu, and the World Bank who funded the extension of this work to include Norton, Epworth and Ruwa and to prepare an investment plan for the Greater Harare area. The Investment Plan is fully described in a separate report. Key features of the plan are described here.
The objective of the study was to develop detailed water supply and sanitation investment plans that meet medium term (until 2020) and long term (until 2030) infrastructure requirements for Greater Harare that were cost-effective, taking into account affordability constraints, with an outcome of “bankable investment plans” for the Greater Harare area that the municipalities can use as guide for future infrastructure and institutional development. The work was undertaken over the period October 2013 to June 2014 and involved nine tasks (Table 3).

The project area included the current municipal boundaries as well as anticipated future developments both inside and outside of existing municipal boundaries (Figure 20).

Investments were prioritised in light of scarce resources and affordability concerns. The following priorities were identified: (1) Stabilise water production through rehabilitation of existing water treatment plants; (2) reduce the high physical losses in the transmission mains and network through prioritised attention to bursts and leaks, strategic placement of pressure reduction valves, zone metering and improved reservoir management to enable existing production to service more people more reliably; (3) reduce the high apparent losses (non-physical losses), increase revenues & cash collection through improved management and systems (including a customer database clean-up, improved metering meter reading, billing and collection procedures, replacement of meters and service connections etc.) and implement an effective credit control policy to ensure sufficient resources to operate and maintain the system; (4) reduce the highest priority health risks by paying attention to sewer spills, initiating a prioritised project to provide on-site water to residents in Epworth, and ensuring more piped water is supplied from the main bulk piped water system to Epworth, Norton, Ruwa and Chitungwiza; (5) reduce the environmental impact from wastewater on Harare’s drinking water sources in the Manyame catchment by rehabilitating existing treatment works and finding a least cost solution to the expansion of wastewater treatment facilities in Greater Harare; and (6) ensure security of supply by meeting the 4% risk standard for urban systems and (7) expand water and wastewater systems to meet increasing demands arising from population and economic growth.

Major investments are required to rehabilitate the water and sewer networks. Required activities include

![Figure 20: Project area showing anticipated settlement growth](image)

<table>
<thead>
<tr>
<th>Table 3: Investment Plan tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: Data collection and establishment of planning framework</td>
</tr>
<tr>
<td>B: Develop Planning and Design Criteria</td>
</tr>
<tr>
<td>C: Water demand forecasts until the year 2030</td>
</tr>
<tr>
<td>D: Assessment of existing water and sewerage infrastructure</td>
</tr>
<tr>
<td>E: Development of medium and long term investment plans</td>
</tr>
<tr>
<td>F: Preparation of cost estimates</td>
</tr>
<tr>
<td>G: Financial analysis</td>
</tr>
<tr>
<td>H: Institutional assessment</td>
</tr>
<tr>
<td>I: Environmental and social</td>
</tr>
</tbody>
</table>
network mapping, network investigations and prioritised repair and replacement programmes, customer database clean up and water demand management awareness campaigns in all cities and towns (Figure 7).

The detailed work on the Investment Plan showed that it was necessary to construct Kunzvi Dam in order to increase the security of water supply to Greater Harare. The investment plan provides for a new water treatment works (150,000 m³/day) and transmission infrastructure in two phases. This will also require primary distribution network re-structuring and construction of new storage reservoirs.

It was proposed to construct a Harare South trunk sewer, sewage pump station and force main, and the Harare South Wastewater Treatment Works to provide a least cost long-term solution for the effective treatment of wastewater from the expansion of the sewer networks in southern Harare and in Ruwa, Epworth and Chitungwiza. The solution protects greater Harare’s drinking water sources and also reduces dependence on pumping and electricity use.

Table 4: Investment costs (US$ million, 2014 dollars)

<table>
<thead>
<tr>
<th>Investment to 2020</th>
<th>Investment 2021 – 2030</th>
<th>Total investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water demand Management and NRW reduction</td>
<td>121</td>
<td>107</td>
</tr>
<tr>
<td>Water supply service improvements</td>
<td>29</td>
<td>48</td>
</tr>
<tr>
<td>Sewerage service improvements</td>
<td>57</td>
<td>38</td>
</tr>
<tr>
<td>Extension of water supply services</td>
<td>181</td>
<td>393</td>
</tr>
<tr>
<td>Extension of sewerage services</td>
<td>157</td>
<td>354</td>
</tr>
<tr>
<td>Accompanying measures</td>
<td>127</td>
<td>94</td>
</tr>
<tr>
<td>Preliminary &amp; General, Contingencies</td>
<td>191</td>
<td>329</td>
</tr>
<tr>
<td>Total (excluding water resource development)</td>
<td>863</td>
<td>1,363</td>
</tr>
<tr>
<td>Of which reticulation extension (water and sewer)</td>
<td>205</td>
<td>623</td>
</tr>
</tbody>
</table>

The major investments requiring financing were grouped into two programs (Figure 21). The first program (including Kunzvi Dam Phase 1) is to commence as soon as the necessary preparatory studies and technical investigations have been undertaken and the financing secured. This is likely to take at least two years and so the first major investments are scheduled for 2017. The second program (including the Harare South treatment works) commences a few years later and will be dependent on the ability to raise further finance. The total grant/loan financing requirements for these two programs totals about $660 million and $740 million respectively.

The financial impact of these investments on the utility were analysed using a utility-based financial model. This model sought to understand the conditions under which the planned investments would be financially sustainable.

For these investments to be sustainable, the utility would need to substantially improve operational efficiencies. Key efficient improvements required are non-revenue water (from 60% down to 25%) and collection rates (from 40% up to 80%
initially and then to 90% and beyond). These would yield substantial additional revenues and cash over time. Without this, the investments would not be sustainable.

The previous section (Harare 24/7 Strategy) showed that these improvements are unlikely to be achieved without significant institutional reforms.

5 Institutional options for sustained improvements

A study was undertaken to better understand the possible institutional options for the effective provision the water and sanitation services in Greater Harare taking into account current circumstances and lessons from international experience, to present a set of preferred options to senior officials and decision makers so that these decision makers can make informed decisions on future institutional arrangements; and to develop a roadmap for institutional alignment and reform. This study is reported on in Working Paper 2.

5.1 Factors for and against integrated provision

Factors favoring integrated provision across Greater Harare

There are strong arguments for providing water and sanitation services for the entire region through a single service provider.

Lower costs through economies of scale and avoided costs: Water provision in the smaller satellite towns have low economies of scale (Figure 22). Provision by a single entity could lower overall costs by reducing overhead costs, reducing procurement costs, reducing transaction costs, reducing planning costs, avoiding the duplication of services and lower unit treatment costs as a result of greater scale.

Enhanced professional capacity in larger scale of operation: A larger more financially viable entity has a greater ability to attract and retain professionals—managers, engineers, planners and other technical personnel. It is hard for small operations to attract and retain professional staff.

Integrated water resources management: The urban areas of Greater Harare fall largely within a single catchment (Figure 2), and the water system in the Greater Harare area is highly interconnected. All areas rely on the same resource for most of their supply and most of the wastewater flows back into the same resource. It is imperative that this cycle be better managed. Having a single entity play a significant role in this cycle will make it much easier to manage compared to the situation where multiple entities are involved.

Access to finance: A single, larger, and financially viable entity has a much greater chance of accessing investment finance compared to a few small entities. The financing transaction costs are also reduced for a single entity compared to multiple entities.

Private sector participation: Private sector participation—through a management contract, for example—is much more feasible for a single entity than for multiple entities.

Ability to average costs across the region: A regional entity can apply average costs across the region, thereby eliminating high tariffs to cover costs in

![Figure 22: Relative settlement scale Greater Harare](image)
specific circumstances within the region. For example, in the case of Norton, it is must more cost effective for the town to purchase bulk water from Harare Water than it is to supply its own water through a separate scheme.

Factors favoring disaggregation
Although the arguments for integration are strong, there are a number of factors that pull in the opposite direction.

The National Water Policy supports decentralization and gives responsibility for water and sanitation provision to local government. This policy implies that local governments have the right to decide on how water supply and sanitation services are provided for their area.

Poor performance on the part of Harare Water (as regional bulk provider) and the inequitable distribution of water between settlements provide strong incentives for the satellite towns to develop and manage their own independent supplies.

Town councils will lose revenue through aggregation under the current fiscal dispensation in which local municipalities have few local revenue sources and where water is a major source of local revenue. Unless there is fiscal reform of inter-government finances and the ability of local government to raise local revenues, it is unlikely that local governments will want to give up control of water services distribution and the revenue stream attached to it.

5.2 Reform options

There are five main institutional options to provide water supply and sanitation services in Greater Harare (Figure 23).

Option 5: Formalization of the status quo
The current situation can be improved through the formalization of service and supply agreements between Harare Water and the towns it supplies. These agreements need to clearly specify rights and responsibilities and provide for corrective measures in cases of breach of contract. This will improve the incentives for better performance and increase transparency in terms of the levels and standards of service provided across the metropolitan area.

However, this option does not solve the service integration issue.

Option 2: Creation of a water utility by City of Harare
The City of Harare can create its own water utility. This utility can then enter into service agreements with the other towns. The advantage of this is that there is more transparency in relation to the allocation and reporting on revenues and costs associated with the service. This may give the other towns greater confidence and result in more willingness to enter into service agreements. This would be attractive to the other towns if the utility performs well. This option does not solve the service integration issue but could be considered as a step toward integration.

Option 3: Consolidation through a metropolitan-wide entity
In this option, the five municipalities agree to form a jointly-owned municipal entity to
provide water and sanitation services to the metropolitan area. Each municipality will have both an ownership agreement (shareholder agreement) and a separate services agreement with the utility. This is a complex and potentially unstable arrangement, being subject to changes in the politics in the different municipalities. Current trends of service fragmentation also suggest that this option is unlikely to materialize voluntarily and that strong incentives would need to be provided in order to realize this outcome.

**Option 4: National government establishes a metropolitan water utility**

In this option the decision to establish a metropolitan water utility is made by national government. The utility would be owned by national government and local governments would be required to enter into service agreements with the metropolitan water entity. This option is similar to the previous ZINWA dispensation except that the public utility is set up specifically to serve the metropolitan area (whereas ZINWA had a country-wide mandate). This option may be strongly contested by local government, especially where their experience of management of their water and sanitation by ZINWA was not favorable.

**Option 5: Local government is reformed to create a single metropolitan area**

In this option, the local governments within Greater Harare are amalgamated into a single metropolitan government through local government boundary reforms. This reform would, at the same time, solve the service integration issue. The single metropolitan-wide government could then provide water services through its own metropolitan government department, or it could establish a corporatized water utility wholly owned by the metropolitan government to provide the service on its behalf.

5.3 Assessment of options

The above options were presented and discussed at a workshop with officials from the five cities/towns (town clerks and town engineers or their equivalents) and officials from the ministries of local government and water in April 2013. The outcome of the assessment framework is given below (Table 5).

**Table 5: Assessment of institutional options**

<table>
<thead>
<tr>
<th>Option name</th>
<th>1: Enhanced status quo</th>
<th>2: City of Harare water utility</th>
<th>3: Municipal-owned metropolitan utility</th>
<th>4: National-owned metropolitan utility</th>
<th>5: Single metropolitan municipality-owned utility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process description</td>
<td>Formal service agreements are put in place between City of Harare and other municipalities</td>
<td>City of Harare creates a wholly-owned water utility which enters into service agreements with municipalities</td>
<td>Municipalities cooperate to form a municipal owned and controlled metropolitan water utility</td>
<td>National government creates a metropolitan water utility</td>
<td>Local government is reformed to create a single metropolitan municipality for Greater Harare. The metro municipality creates a water utility</td>
</tr>
<tr>
<td>Service integration</td>
<td>Mild (voluntary opt-in, easy exit)</td>
<td>Mild (voluntary opt-in, easy exit)</td>
<td>Moderate (voluntary opt-in, difficult exit)</td>
<td>Strong (Mandatory integration)</td>
<td>Strong (Legislated integration)</td>
</tr>
</tbody>
</table>
Although Option 3 (voluntary aggregation into a joint municipal-owned metro-wide utility) was initially attractive to many of the workshop participants, it was realized through discussion that this option was unlikely to be achieved in practice; it was therefore rejected. There was a strong rejection of Option 4 (national government owned metropolitan utility) due to the poor experience with ZINWA. Option 1 (enhance status quo) was also rejected due to the modest benefits that would be achieved. This left Option 2 (City of Harare owned utility providing metro-wide services) and Option 5 (local government reform into a single metropolitan local government entity). Option 5 was preferred as the best long-term solution, but it was recognized that this process was outside the control of local government, and it would take a number of years to achieve. The workshop agreed that the pragmatic way forward, therefore, was for the City of Harare to create a

<table>
<thead>
<tr>
<th>Option</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option name</td>
<td>Enhanced status quo</td>
<td>City of Harare water utility</td>
<td>Municipal-owned metropolitan utility</td>
<td>National-owned metropolitan utility</td>
<td>Single metropolitan municipality-owned utility</td>
</tr>
<tr>
<td>Transparency &amp; accountability</td>
<td>Mild (improvement on status quo)</td>
<td>Moderate (ring-fenced finances &amp; expenses)</td>
<td>Strong (built into shareholder &amp; service agreements)</td>
<td>Moderate (less accountability due to lack of local ownership)</td>
<td>Strong (direct local accountability)</td>
</tr>
<tr>
<td>Institutional stability</td>
<td>Moderate (municipalities can opt out of service agreements)</td>
<td>Moderate (municipalities can opt out of service agreements)</td>
<td>Complex multi-municipality governance is unstable</td>
<td>Strong</td>
<td>Strong</td>
</tr>
<tr>
<td>Efficient use of resources</td>
<td>Mild (improvement on status quo)</td>
<td>Moderate</td>
<td>High transaction costs make this option costly</td>
<td>Mild</td>
<td>Strong</td>
</tr>
<tr>
<td>Practically achievable &amp; politically acceptable</td>
<td>Strong (modest effort required)</td>
<td>Moderate (City may not want to create separate utility)</td>
<td>Unlikely to achieve the necessary cooperation</td>
<td>Lack of local say may make this a contested option</td>
<td>Unknown</td>
</tr>
<tr>
<td>Ranking of options</td>
<td>Not supported by workshop participants</td>
<td>2</td>
<td>Unlikely to be achieved unless imposed</td>
<td>Not supported by workshop participants</td>
<td>1</td>
</tr>
</tbody>
</table>

Box 1: Corporatisation and regional water provision in Lusaka

Institution reforms in Lusaka, Zambia, followed a very similar path to the recommendations for Harare. The Lusaka Water and Sewerage Company (LWSC) was formed in 1988 from a department in the Lusaka City Council and become operational in 1990. It was set up in terms of the (Private) Company’s Act with Lusaka City Council as the sole shareholder. In 2008 the Government requested the company to expand its services to the whole of the Lusaka Province, comprising Kafue, Chongwe and Luangwa District Councils who were allocated shareholdings of 20%, 10% and 10% respectively. LWSC has managed to turnaround its financial performance and had increased its cash collections from 74% in 2003 to 96% in 2012. Non-revenue water has decreased from 58% down to 47% over the same period. Recent use of performance contracts has yield positive results although further performance improvements are needed.

Source: Lusaka Water and Sewerage Company, 2013
water utility with substantially improved performance to provide metro-wide services. This reform was considered necessary, in any event, to achieve improved performance for the City of Harare. In addition, this option could be an important stepping-stone toward improved integration and service provision for Greater Harare. The four other towns would have a greater incentive to request services from this utility if it performed well. Interestingly, the preferred reform path is very similar to the actual reform path undertaken in Lusaka (Box 1).

5.4 Taking reforms forward

These recommendations from the officials need to be taken forward at a political level with firm commitment to a chosen reform pathway, and led by a reform champion. Substantial technical and management support will be needed.

6 Recommendations

1. Undertake the necessary studies to prepare for the planned investments

Very large investments (up to $2 billion) are needed to both restore and expand water and sanitation infrastructure in the Greater Harare area over the next 16 years. Achieving this will require a substantial amount of work (Figure 24).

However, it is doubtful that the necessary financing will be raised without implementing serious institutional reforms. Thus the sequencing of the investment plan places the institutional reforms as the critical next step.

While these reforms are being initiated, the municipalities can commence undertaking the more detailed planning, feasibility and design studies necessary to put investment packages to tender for construction.

2. Create a conducive external environment for better utility performance

Harare Water needs to be given a clearer mandate by creating a company structure with a company charter and board of directors. Directors need to be independent and appointed based on competence. Management and staff appointment need to be merit-based with operational responsibility delegated to the management team. Tariffs need to be set at an appropriate level to ensure sufficient resources to operate and maintain the system.

Revenues from the sale of water need to be ring-fenced and used for improvements to the service. Credit control needs to be effectively enforced. Financial accounts need to be regularly audited and up to date. The utility needs to report in a transparent way on its performance to the board, its shareholder and to its customers. Strong political leadership will be necessary to create these conditions.

3. Reform local government finances so that water revenues can be ring-fenced

Local governments are heavily reliant of water and wastewater revenues. Local government finances will need to be reformed at the same time as the utility is financially ring-fenced and its finances and operations separated from the rest of the city. This exercise could benefit from further technical assistance.
4. Improve the technical capability and management of Harare Water

Existing technical capability needs within Harare Water needs to be enhanced, particularly at the engineering and technical supervision levels. Much more attention needs to be given to improving the overall management of the utility in general, and the management of finances and customers in particular. It is the World Bank's view that this will require external management expertise to achieve substantial improvements in performance. Getting cash collections up from 40% to over 90%, and reducing non-revenue water from 60% down to 25% are very challenging tasks. The utility will benefit from managers who have achieved these results in other contexts and can bring their skills and experience to bear.

5. Obtain external management support

It is the World Bank's recommendation that the City of Harare seek external professional expertise to turn the utility around in the context of establishing an autonomous legal entity. This can be achieved through a management contract although other modalities (such as a lease or aftermage contract) are also possible. Implementing performance contracts in the absence of bringing in additional management expertise is unlikely to succeed.

6. Raise the necessary investment finance on appropriate terms

The quantum of investment finance required is unlikely to be to be made available through grant finance alone. While some grant finance may be available, a significant share will have to be raised through loans. Financiers will want assurance that the loans can and will be repaid. Significantly improved performance of Harare Water is necessary in order to make the repayment of loans possible.

7. Implement the investments

Implement the investments as per the steps set out in Figure 24.

Afterword

In late May 2014, the ministers responsible for water and local government respectively had indicated their support for the recommended reforms, in response to a presentation of the core content of this Summary Note. Some clear milestones to indicate commitment to the process had been set – implementation of an effective credit control policy, appointment of a professional supervising consultant to oversee the short-term investments, and a written request for further technical assistance to take forward the institutional reform recommendations. These matters were outstanding since June 2013. At the time of finalising this Summary Note (January 2015), progress on these action items had not been reported.
End Notes

1 Figure 1 source data: World Development Indicators. data.worldbank.org
2 All dollar amounts are in US$ unless otherwise stated.
4 In addition, Zimbabwe was in arrears to bilateral Paris Club creditors to the amount of $2.9 billion. Arrears data provided by J. Herderschee (World Bank, pers comm., 2014).
5 Zimbabwe, April 2014. STRMG. World Bank.
8 The policy states: “Investments in primary water for basic needs of urban areas may be subsidized during the recovery period but recurrent costs will be borne by the users to ensure sustainability.” Zimbabwe National Water Policy, 2013.
10 Water production held up for three months following the decline in cash collection but then declined in December 2012, initially as a result of a shortage of chemicals. The long-term chemical contracts came to an end in December 2012 and Harare Water had to make cash payments for chemicals with money they did not have.
11 Billing data is not reliable. The drop in production in December 2012 did not have the expected reduction in sales indicating a problem with the sales data that appears to rely largely on estimates rather than on actual water used. Many meters are not working and intermittent supply also contributes to the problem.
12 More up to date financial data was not available.
13 Statements made by the Mayor of the City of Harare at the Investment Plan stakeholder workshop on 28 May 2014.
14 Creditors for chemical supplies stood at $7.8 million in May 2013, having increased from $3.5 million over 12 months. Long-term contracts for chemical supplies ended in December 2012 and supplies thereafter have been based on cash payments.
15 A stakeholder net-mapping exercise was undertaken with the Harare Water management team in April 2013. During this exercise the managers alleged that there was an extensive network of informal money flows that detract from the objective of achieving 24/7.
16 Note that Kunzvi Dam was originally motivated as a priority investment in order to meet a current nominal demand of 1200 Ml/day. The analysis in the TA showed that this demand was overstated and the restoring existing production capacity to 700 Ml/day would be more than sufficient to meet existing demand. The investment plan analysis showed that Kunzvi was still necessary, for the purposes of increasing security of supply (not meeting a high nominal demand). The original assumption that short-term investments should prioritise restoration of production capacity is still correct.
17 Cost are based on quotations from reputable manufacturer’s agents in the region were developed into rates with the addition of transport, handling charges, profit and overhead charges and installation costs. For the major overall works component of pipe installations and civil works involving earthworks, the rates have generally been worked up from first principals using basic earthworks rates from the higher end of the market spread. For investment items where works are similar to recent tenders under the UWSSRP Phase 1 works currently under execution, the rates tendered by the contractors have been used. The rates do not include VAT and other taxes. It is further assumed that import duty will be waived on all materials and equipment that will be imported for the purpose of these investments.
18 This issue is also longstanding. See, for example, “Integrated water quality management in Harare Zimbabwe” (Gumbo Bekithemba, 23rd WEDC Conference, 1997).