

**STRENGTHENING CAPACITY OF WATER UTILITIES TO  
PROVIDE WATER SUPPLY AND SANITATION SERVICES,  
ENVIRONMENTAL AND HYGIENE EDUCATION IN A  
SUSTAINABLE WAY TO LOW INCOME URBAN AREAS.**

**CASE STUDY OF LUSAKA WATER AND SEWERAGE COMPANY**

**National Context: Water and Sanitation Delivery to Low Income  
Urban Communities in Zambia**

Authors:

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## CONTEXT

### I. NATIONAL LEVEL

Zambia is a landlocked sub-saharan country sharing borders with 8 countries. It has a land area of 753,000 km<sup>2</sup> and a population density in 1996 of about 12.5 persons per km<sup>2</sup>. The urban poor are housed in formal or informal settlements, usually called compounds, and in Zambia these are collectively referred to as peri-urban communities.

#### Key Data on Zambia (Evolution of Poverty in Zambia, CSO, 1997)

|  |  |
|--|--|
| Population, 1996                                 | 9.5m, 37% urban, growth rate 2.8%  |
| Population in urban low cost areas               | 2,701,000 (28.4%)  |
| Lusaka population                                | 1,225,000  |
| Lusaka urban poor                                | 30.7%  |
| Types of informal settlement                     | Called "compounds" there are 33 of which 16 are termed illegal or unplanned, lacking basic services.                                       |
| Community structure                              | Often fragmented, Usually Residents Development Committee with variety of sub structures and used in managing services at community level. |
| Responsibility for water and sanitation services | Lusaka Water and Sewerage Company, delegated by Lusaka City Council. LCC owned private company.  |
| Urban poor access to water                       | Communal standposts or shallow wells.  |
| Urban poor access to sanitation                  | Mainly traditional pit latrines, often shared.   |
| Access to health centres                         | 100% within 5km  |
| Access to schools                                | 100% within 5km  |

#### Legal and regulatory framework

Zambia has been undergoing a major reform of the water related legislation for the last 4 years. Drawing on international experience 7 principles were adopted as a basis for the reforms in relation to the water supply and sanitation sector. These are:

- separation of water resource management from water supply and sanitation;
- separation of regulatory and executive functions,
- devolution of authority to local authorities and private enterprise,
- full cost recovery in the long run,
- human resource development leading to more effective institutions,
- technology appropriate to local conditions,
- increased GRZ priority and budget spending to the sector.

The reforms resulted in the enactment of the Water Supply and Sanitation Act, No 28 of 1997 which allows that:

- Provision of water and sanitation services is the responsibility of local Authorities (LAs).
- the Local Authority is obligated to provide water and sanitation services to the area falling under its jurisdiction,
- LAs will provide services directly through an LA department, or through a LA owned water utility, the private sector or other arrangements,
- A National Water Supply and Sanitation Council (NWASCO) is established to regulate the provision of water and sanitation services

Other relevant legislation includes:

- the Health Services Act, 1995 which states that new houses must be provided with a private or communal latrine and a variety of supporting conditions to protect human health;
- The Local Government Act determining the responsibilities and powers of local authorities;
- The new Water Act which provides for the greater control over water resources especially groundwater, and water pollution control.
- Environmental Protection and Pollution Control Act which gives the Environment Council of Zambia powers to licence and otherwise control polluters of water resources.
- Bye laws and regulations of Local Authorities are used to control housing standards, solid waste removal, water and wastewater disposal.

### Policy Framework

These sector principles are supported by a National Water Policy (1994) which has specific statements on the provision of water and sanitation services to the urban poor (peri-urban).

*"Additionally, urban areas are facing serious problems related to proliferation of illegal settlements, especially on rich water aquifers, and uncontrolled discharge of effluent into water resources. However, Peri-urban areas considered to be legal settlements by Government shall be treated in the same manner as urban areas with regard to provision of water supply and sanitation facilities."*

The policy emphasises a holistic approach to water resources management and stresses the importance of universal access to safe, adequate and reliable water supply and sanitation services. Rural water supply and sanitation should be community based while both urban and, to a lesser extent, rural services should be based on cost recovery.

A draft Sanitation Strategy for rural and peri urban areas has been developed. The peri urban areas and rural areas are considered together principally because of the assumption that the technical solutions for both are similar. However there is no clear policy on how the service needs are to be addressed for peri urban communities.

While Zambia has been implementing decentralisation for over 4 years there is still no concise Decentralisation Policy. The MLGH is now implementing the third component of the public sector reform programme on decentralisation and local government strengthening. The implementation strategy includes improving the effectiveness of district councils so that they can improve service delivery.

The National Housing Policy (1996) reaffirms government policy and commitment to address issues of poverty which are manifested in poor housing and a degraded environment. 69% of the nation's housing stock is considered to be informal with:

- ◆ housing owner built and not conforming to any standards in design,
- ◆ inadequate security of land tenure, and
- ◆ low levels of infrastructure and service provision.

### Technology choice.

Under the water policy, peri urban areas are to be *"provide with adequate, safe and cost effective water supply and sanitation services with due regard to environmental protection."* Neither technology nor service level are addressed in the water policy however the sanitation strategy permits the use of on site sanitation technology such as pit latrines. Guidance for the selection of technology is as in the table below.

**Guidance of technology selection for peri urban communities.** (Strategy and Institutional framework for the Water Supply and Sanitation Sector, 1994)

|              |              |   |
|--------------|--------------|---|
| Water Supply | Point source | Drilled deep well with hand pump. Chlorination if needed. Dug wells or shallow wells to be avoided for reasons of water quality |
|--------------|--------------|---|

|            |              |  |
|------------|--------------|--|
|            | Piped        | Simple piped supply with standposts, from separate, drilled deep wells, or connected to the main grid. Always chlorinated. Design for 24hours supply if water resources available. If not then minimum 8 hours, assuming corresponding design. |
| Sanitation | Pit latrine  | Improved pit latrine, suitable for high density areas. System for inspection and disposal.   |
|            | Septic tank  | Approved septic tank. System for regular inspection and emptying.  |
|            | Piped system | Not applicable.  |

In practice, most low income urban communities are served by communal standposts and pit latrines and this is unlikely to change until the full establishment of effective commercial utilities effectively covering all costs from cost recovery.

Sewerage service is not expanding at same rate as water supply as it is a low rate of priority for the utility. The City Council are responsible for development of new sewerage services but due to season constraints new planned settlement areas are no longer seweraged.

Under the Water Supply and Sanitation Act, 1997, NWASCO's functions include "the development of guidelines on the provision of water and sanitation services and the establishment and enforcement of standards for water supply or sanitation services, and the design, construction, operation and maintenance of water supply and sanitation facilities. The use of Guidelines and standards is not mandatory, but will derive authority when incorporated in licences for WSS provisions issued and regulated by NWASCO

### **Environmental conditions**

Poverty, underdevelopment and population growth represents a growing threat to Zambia's environment and to its people. In urban areas the most serious environmental threats are due to the inadequacy or absence, of facilities for the disposal of solid and human waste, especially in peri urban areas where latrines are sometimes located next to wells and can pollute drinking water, and drainage is poor. This threat to public health has contributed to the recent epidemics of cholera and other diseases. Other major environmental concerns in urban areas include industrial emissions and disposal of hazardous waste, especially in the Copperbelt Province where mines and other industries are situated. Although there is a legal framework for environmental protection, there is as yet no policy and no strategies in place for promoting community based conservation and environmental protection.

### **Institutional arrangements**

The reforms in the water sector are led by the Water Sector Reform Support Unit (RSU) who are tasked with facilitating the formation of (NWASCO). NWASCO will be responsible for regulating the water supply and sanitation sector, licensing water utilities/ service providers, and providing guidelines in areas such as technology choice, service level, subsidies etc.

It is not yet clear whether the ministry of local government or the ministry of water will be the parent ministry for NWASCO. NWASCO membership is made up as follows thus providing for inter-ministerial and inter-disciplinary representation in regulation of the WSS sector.

- Min Local Gvt and Housing
- Min Energy and Water Development
- Min Health
- Min of Environment and Natural Resources
- Min of Finance and Economic development
- Min of Community Development

Each of the above members is also responsible for supporting service delivery to preurban areas.

Regulators are

- NWASCO
- Environmental Council of Zambia
- Water Development Board (for development of water resources)

Financing arrangements

- MLGH with MFED are responsible for mobilising finances for the sector from local and international sources. Utilities and/or Las can in theory mobilise resources on their own but in practice are unable to repay loans and therefore development assistance is channelled through the above two ministries.

The sector investment strategy was dealt with in the 1994 Proposed Strategy and Institutional Framework for the Water Supply and Sanitation Sector but has not been directly addressed since. The intention was to provide a reasonable service to people without service now, before making investments to improve the quality of service to those already having a reasonable quality of service. In practice GOZ has had little funds for investment in the sector for the last 6 years. The principles of commercialisation of the sector with full cost recovery is actually seen as the most likely way of ensuring more funds for investment although this may be a medium to long term expectation given the rate of formation of commercial utilities and the lead time for them to be operating on a viable commercial basis. It is therefore expected that the reliance on donor funding for new investments will continue. Efforts are required to identify donor funding for periurban areas which are often underfunded and for which donors are not always readily available.

**II. LEVEL OF SERVICE PROVIDERS IN LUSAKA****Providers of Service**

Lusaka Water and Sewerage Company Ltd (LWSC) which is wholly owned by Lusaka City Council provides water supply and sanitation services to the city of Lusaka. The company was formed from the former Water and Sewerage Department of the council. It was incorporated in 1988 and became operational in 1990.

The Company inherited a rundown water and sewerage system which was ill maintained, unreliable, and without a supporting functioning revenue collecting system. There are no records of revenue recovery in 1989 however over the last three years it has increased from 35% to 40 %. Presently LWSC provides water supply services to 80% of the city of Lusaka. The other 20% is covered by non-governmental organisations working with periurban communities, private borehole owners (e.g. farms) and untreated hand dug shallow wells. It is not clear from the statistics whether the illegal settlements are included in these percentages. LWSC provides technical assistance (planning and operation) to NGOs and donors interested in working in periurban areas.

Up to 38% of the city, mainly metropolitan areas, have water borne sewerage reticulation. The 62% which is not serviced by sewerage is serviced by: septic tanks 20%, pit latrines 7% and bucket system 5% (Source: LWSC Policy on Peri-urban Areas.). The emptying and cleaning of septic tanks is done by commercial private companies.

**Utility Performance**

L.W.S.C. has established detailed performance indicators for each of its sections. Some of the key indicators are summarised in the following table. Performance is steadily improving with the introduction of corporate plans and performance management systems from 1995. Unaccounted for water in 1997 reduced to 33%

In 1996 LWSC prepared and defined a set of service standards for progressive implementation. Two issued in 1996:

- % water pipe bursts attended within 8 daylight hrs of notification; and
- % sewer blockages cleared within 48hrs notification.

**Table 1. Characteristics of the LWSC - 1996 and 1995**

| <b>Customers</b>   | <b>1996</b> | <b>1995</b> |
|--|-------------|-------------|
| No registered domestic customers                         | 25,242      | 30,537      |
| No registered commercial/ industrial customers           | 2,194       | 2,239       |
| No metered customers                                     | 12,548      | 10,842      |
| <b>Water Supply</b>                                      |             |             |
| Total average daily supply (million litres)              | 184         | 167         |
| % population served by water supply network              | 93.8        | 85          |
| <b>Cost of operations</b>                                |             |             |
| Production cost of water delivered (US\$ per kilo litre) | 0.06        | 0.06        |
| Unit cost of sewage treated (US\$ per kilo litre)        | 0.02        | 0.03        |
| Operational cost per water connection (US\$)             | 126.2       | 103         |
| Operational cost per sewage connection (US\$)            | 22.7        | 30          |
| <b>Infrastructure</b>                                    |             |             |
| Total length of mains (50 - 100mm)                       | 2089km      | 1,289km     |
| <b>Sewerage</b>  |             |             |
| Average volume treated per day (million litres)          | 45,000      | 45,000      |
| % population served by sewerage network                  | 28.6        | 26          |
| <b>Manpower</b>  |             |             |
| No employees   | 508         | 511         |
| Connections per member of staff                          | 94          | 98          |
| <b>Collections</b>                                       |             |             |
| Average monthly collection ratio (%)                     | 42          | 32          |
| Value of customer accounts overdue by > 4 months (US\$)  | 9,868,853   | 7,473,462   |

Table 2. Performance Indicators of the LWSC - 1996 and 1997

| <b>Performance Indicators</b>   | <b>1997</b> | <b>1996</b> |
|---|-------------|-------------|
| <b>Water supply</b>   |             |             |
| Number of occasions that category 1 and 2 zones do not receive defined service standard | 8           | 24          |
| No. customer complaints   | 3400        | 3312        |
| Ave daily volume of groundwater produced (000 megalitres)                               | 91          | 81          |
| Ave daily volume surface water produced (000 megalitres)                                | 101         | 102         |
| <b>Water quality</b>  |             |             |
| % bacteriological tests passing WHO standards for samples taken at point of treatment   | 89          | 90          |
| % chemical tests passing WHO standards for samples taken at point of treatment          | 100         | 100         |
| <b>Maintenance</b>  |             |             |
| number of meters repaired   | 349         | 830         |
| No. leaks reported  | 1055        | 1285        |
| No. leaks repaired  | 936         | 1114        |
| % bursts attended within 8 daylight hrs of notification                                 | 100         | 55          |
| <b>Customers</b>  |             |             |
| No. meters installed to previously assessed customers                                   | 33          | 182         |
| No. of unregistered (illegal) customers identified                                      | 2182        | 1817        |
| Value of cash collected as % of total bills   | 40          | 36          |
| No customers disconnected   | 25096       | 22028       |
| No registered customers   | 28520       | 25242       |
| <b>Sewerage and sanitation</b>  |             |             |
| % bacteriological tests passing Environmental standards                                 | 0           | 0           |
| % chemical tests passing environmental standards  | 72          | 49          |
| % blocked sewers cleared within 48h of notification                                     | 95          | 94          |
| Number of complaints on sewerage issues   | 1140        | 1116        |

**Consumption**

General assumptions:

|                   |                 |
|-------------------|-----------------|
| Low cost areas    | = 60 l/cap/day  |
| Medium cost areas | = 80 l/cap/day  |
| High cost areas   | = 160 l/cap/day |

### Price of water

The price of water is based on a full cost recovery. In low income areas the cost of water varies from K500 to K4,500/household/month although the LWSC estimate that K3,000 is the cost recovery level. Subsidies are provided by some NGOs.

### Standards and Service Levels

- i) Service level in peri-urban areas
  - stand pipe; No. of people per stand pipe varies between compounds.
  - minimum distance to water points varies between compounds.
- ii) Service level for individual house connections
  - varies according to the amount of water available in specified areas

### Regulation

There is no formal agreement between the LWSC and the City of Lusaka. The Environmental Council of Zambia regulate the quality of effluents discharged into natural streams by the LWSC

The LWSC has agreements with other service providers within the city. There are contract documents between L.W.S.C. and vendors specifying roles and responsibilities of each party. The contract states the kind of reports the vendor has to give L.W.S.C. and also the period in between reports, methods LWSC uses to charge the vendor on the water consumed, duration of the contract period and penalties. This is described in more detail in practise report No.2

### Services to the Urban Poor

There is no clear peri-urban policy defining investment, cost recovery etc. The Government has recently established a peri-urban working group to prepare a strategy for this purpose.

The utility has a peri urban section specifically to deal with services to the urban poor. Whilst there is some concern at Board level as to the cost and cost recovery from these areas there is an active work programme and plan for the peri urban communities.(See practice No.2)

Some low income areas of the city which have received support from donors or NGOs have special arrangements with the LWSC. A partnership agreement has been signed between L.W.S.C. and the George Complex Community defining roles and responsibilities of each party pertaining to water supply infrastructure. The focus of the work plan for peri urban areas is on cost recovery for services rendered. LWSC has a total of 21 vending/ community concession schemes in operation. In 1997 only 26% of the billed amount was collected from the vendors. The utility is not recovering costs from peri urban areas and therefore is unlikely to consider any investment until in a more secure financial position.

The lack of capacity of LCC to enforce by laws and inspect development has exacerbated environmental and health problems in Lusaka. LCC is currently implementing a "sustainable Lusaka Project" and one result is targeted at the urban poor who will benefit through *"an improved access to land, security of tenure and planning of infrastructural services with improved capacity for communities to manage their own facilities."*

## III. PERI URGAN CONSUMERS

### Consumer Description

Approximately 13% of the Zambian population live in Lusaka. The number of households which moved to Lusaka in twelve months prior to the survey by the Central Statistics Office on The Evolution of Poverty in Zambia was or 10% of the total household in the city 24 000. It is estimated

The growth of Lusaka has overtaken all physical and other city planning actions meaning that growth has largely taken place in unplanned areas. Nationally about 77 % of the population in urban areas live in low cost settlements and this is increasing annually. The population density in these areas is very high. For example George Compound has a population of 120 000 in an area of 4.772 km<sup>2</sup> (25 147 persons /km<sup>2</sup>)

| Poverty incidence for Lusaka. |                 |                 |
|-------------------------------|-----------------|-----------------|
| Extremely poor                | Moderately poor | Non poor        |
| 165 000 (14.4 %)              | 187 000(16.3%)  | 795 000 (69.3%) |

The figures above are based on expenditure as a measurement of poverty.

### Number served, poor and non poor

It is difficult to assess the access of the poor to water and sanitation services and no data are readily available. A survey of nine unplanned settlements carried out in 1997 indicated that several had received support from various NGOs over the last 5 years some including support for water supplies and sanitation.

#### Water supply.

Piped water is supplied by LWSC to standposts. The supply is erratic and inadequate in all 9 settlements. In some settlements water installations have been vandalised and are non functional while in others only small sections of the settlement are served. Piped water is paid for by only 48% of the residents using it.

Boreholes and wells are other sources of supply. Wells are often unprotected, situated close to pit latrines, and water is untreated.

#### Sanitation.

90% of the population rely on traditional pit latrines while only 2% have an improved latrine (VIP) or a flush system. Sharing of sanitation facilities is common (61%). There is no solid waste management system.

NGO activities in some compounds of Lusaka have focussed on developing water and sanitation services for the communities to manage themselves. The LWSC has been involved only as a service agent to carry out maintenance on a payment basis.

### **Tenure/Tenancy**

The peri urban settlements are a mixture of legal- illegal, planned and unplanned. The LCC is addressing this and places them into four categories:

|            |  |
|------------|--|
| Legal      | = Declared as a statutory improvement area or statutory housing area     |
| In process | = Process of legalisation has commenced                                  |
| Recognised | = Council has passed a resolution so that legalisation can be commenced. |
| Illegal    | = Not recognised by council  |

A study of nine unplanned settlements in 1997 showed that a large proportion (62.2%) own their dwelling or plots although the home owners tend to rent out every available room or space. Only 11.5% however claimed to have title deeds for their plots.

### **Cost of Water**

LWSC has estimated the price of water at K 3 000 /household/month in areas of standpost supply to achieve full cost recovery. However this may differ according to the management system adopted.

The actual cost of water to the consumer varies considerably. In some areas there is an annual registration fee (K1,500) with a monthly fee of K3,000. Other areas have a monthly fee of K1,500 or some other arrangement, but in all cases a very high proportion of the population do not pay at all as there is no reliable system of payment collection. Areas without a standpost supply, and even those with a standpost supply, have access to alternative sources such as wells where they may pay from K30 to K50 per bucket (20l) of water. (In May 1998 1,700Kwacha = 1US\$)

### Consumer Role in Decision Making and Management

In the compounds of Chipata, Jack, George and Kamanga all decisions and management are made by the community structure, the RDC, except for George compound where technical decisions and management of the investment is done by LWSC.

Other compounds have NGO assistance, vendor systems contracted by the LWSC or may be totally unserved by any organised system.

### Health Status

#### Zambia National morbidity and mortality figures 1995

| All Zambia admissions and deaths |                     |       |       |       |
|----------------------------------|---------------------|-------|-------|-------|
| SUMMARY                          | First registration, |       | Death |       |
|                                  | Total               | %age  | Total | %age  |
| <b>Malaria</b>                   | 126728              | 24.3  | 7123  | 17.9% |
| <b>URTI/pneumonia</b>            | 54912               | 10.53 | 6395  | 16.1% |
| <b>Diarrhoea/malnutrition</b>    | 50184               | 9.62  | 7842  | 19.7% |
| <b>TB</b>                        | 19358               | 3.72  | 3762  | 9.5%  |
| <b>Eye</b>                       | 2752                | 0.53  | 9     | 0.0%  |
| <b>Skin</b>                      | 14235               | 2.73  | 204   | 0.5%  |
| <b>Worms</b>                     | 4817                | 0.92  | 108   | 0.3%  |
| <b>Bilharzia</b>                 | 361                 | 0.07  | 6     | 0.0%  |

Source. Morbidity, % admission and fatality. Statistical summary 1995. Health Information Unit MOH Dec 1996

### SUPPORT FUNCTIONS - INFORMATION COMMUNICATION AND EDUCATION

Water utilities are not normally closely associated with health and hygiene promotion activities although the LWSC is effective in information dissemination in respect of improved water conservation, payment for services and other basic aspects related to better service provision.

Activities in respect of health and hygiene education, community organisation, sanitation promotion are carried out by a variety of other agencies but not in a coordinated manner.

Most people are aware of the threat of diarrhoeal disease and know that unhygienic environmental conditions can cause diarrhoea (Sanitation and communication situation analysis for peri urban and rural areas in Zambia, WASHE, 1997). This awareness has been achieved through health centres, environmental health technicians or community development workers. However in peri urban areas there is no clearly focused approach and very little activity by government extension workers. The LCC is responsible for health and hygiene education but has limited staff. Most activities have been crisis related such as the cholera task force or part of development programmes initiated by NGOs. NGO programmes such as Irish Aid in Kamanga and Care work in collaboration with municipal staff but there is little likelihood for continuation at the end of the project.

Health and Hygiene Education is carried out by:

- Lusaka District Health Board under Min. of Health (LDHD) with health department responsible for health and hygiene education.
- Cholera Task Force, with topics on:
  - ◆ awareness on water and sanitation related diseases
  - ◆ malaria
  - ◆ water source pollution
  - ◆ monitoring cholera and water quality
  - ◆ mobilisation of health agents in the community

*Water Utility Partnership – Lusaka Case Study- CONTEXT*

- NGOs (Care, World Vision, Push) and donors, facilitating health and hygiene education through funding and training
- LWSC, funding of drama groups and awareness through media

Sanitation Promotion by:

- Irish Aid funds community and council initiatives with regards to latrine construction.
- UNDP/UNCHS have the Sustainable Lusaka project
- Environmental Council of Zambia (ECZ) licencing sewage treatment plants and water quality surveying, advice on general pollution issues

Basically people are left on their own to find sanitation solutions.

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