

Case study briefing

The crisis of poor water supply, inadequate sanitation and chronic groundwater pollution facing Lusaka

Evidence from Kanyama



At a glance

The groundwater resource underlying Lusaka is of critical importance to the city and its residents, providing more than half of the city's current water needs. This all important resource is also highly vulnerable to contamination from inadequate sewerage provision and solid waste collection, industrial pollution and poorly planned development. Together with unregulated exploitation, this threatens the sustainability of the resource and the well-being of Lusaka's residents and its economy.

Nowhere is this more apparent than in Kanyama, where a lack of planning, inadequate water supply and sanitation services and poor solid waste management degrade groundwater resources, with a severe toll on the health and livelihoods of 439,406 residents.

Extensive legislation exists to enable responsible institutions to provide water supply and sanitation services and protect the resource, including the Water Resources Management Act 2011, the Water Supply and Sanitation Act 1997, the Environmental Management Act 2011, the Public Health Act and the Local Government Act. However, it is clear that those responsible for ensuring the protection and management of water resources in the interest of public health and safety are failing to deliver on their mandates.

The current situation in Kanyama shows how important it is for our water governance institutions to be active and accountable. Reversing the water crisis in Kanyama requires a well-coordinated and immediate response from the Water Resources Management Authority (WARMA), the Zambia Environmental Management Agency (ZEMA), the National Water Supply and Sanitation Council (NWASCO), Kanyama Water Trust (KWT), Lusaka Water and Sewerage Company (LWSC), the Lusaka City Council (LCC), the Ministry of Health (MoH) and ZESCO.

Planning, new-investment and action to improve the provision of water supply and sanitation services, as well as the protection and management of groundwater resources is desperately needed across Lusaka's peri-urban areas to

safeguard the health and economic well-being of citizens and the sustainability of precious groundwater resources.

The vulnerability of Lusaka's groundwater resources

Lusaka lies on a plateau of mainly dolomitic marbles and fractured karstic rocks. These rocks support a highly productive and extensively used aquifer system which is of great strategic importance to the region. While highly productive, the karst aquifer in Lusaka is also highly vulnerable to contamination because the water moves quickly through large fractures in the rock and is not subjected to a filtering process (BGR, 2011).

Kanyama is a legalised, but largely unplanned settlement in Lusaka, which is located in an area of extremely vulnerable groundwater (BGR 2013).

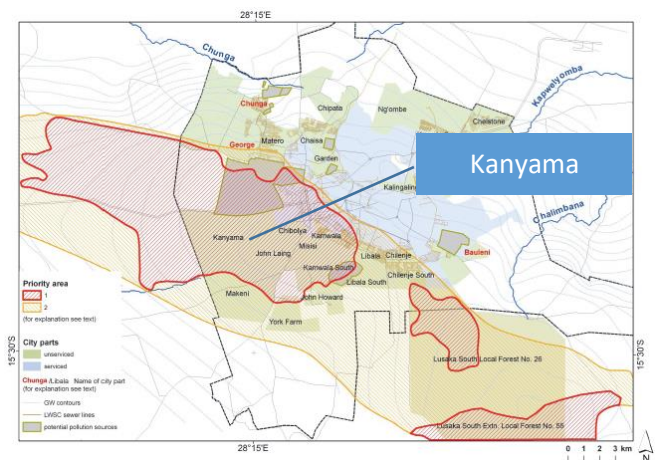


Figure 1: Priority intervention areas for groundwater protection (BGR, 2013)

Across most of Lusaka's peri-urban areas, sanitation takes the form of simple pit-latrines. Combined with leaking sewerage these discharge untreated human sewage directly into the aquifer upon which people rely for drinking water. Together with pollution from industrial and commercial activity this severely degrades groundwater quality, particularly where development is allowed to encroach into the protection zones normally in place to protect public supply boreholes.

This report was produced by the Fair Water Futures Programme, a joint initiative between Action for Water and Water Witness International. Fair Water Futures undertakes high quality action research to generate evidence and advocacy materials to improve water resource management and water security for all Zambians.

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Under the Local Government Act Cap 281, the Lusaka City Council has the duty to control developments and the use of land in the interest of public health and safety, and to take measures to prevent the pollution of water supplies in places like Kanyama. However, the Council has yet to fulfil this duty to protect groundwater and the health of communities.

The Water Resources Management Authority (WARMA) has been handed a powerful legal mandate and duty to protect the nation's groundwater resources under Section 93(1) of the Water Resources Management Act 2011. However, despite the Act being in existence for 5 years, WARMA has yet to take any measures to protect and regulate the use of groundwater resources in Lusaka, or anywhere else in Zambia.

It is critical that these responsible institutions fulfil their key roles. For example, they need to step up monitoring of the resource and its use, and establish and enforce clear guidelines and by-laws to protect groundwater in Kanyama, and Lusaka more widely to ensure that residents and the water utilities can use the resource safely and sustainably.

The impact of inadequate water supply services

The vast majority of Kanyama residents do not have piped water in their homes. Instead, they rely on water provided by the Kanyama Water Trust and Lusaka Water and Sewerage Company through water kiosks and communal taps. However, the number of kiosks and taps is woefully inadequate. Based on design specifications and population figures, the current water supply infrastructure in Kanyama is only sufficient to serve 65% of the population (Kambole, 2012; GTZ, 2009).

The amount of water supplied is also inadequate. It is estimated that KWT only provides 10.6 litres per person per day. In contrast to this figure, the World Health Organisation recommends 20 litres per person per day as the minimum water requirement in order to meet basic health and hygiene needs (WHO, 2000).

I would like to see government come to our aid by either drilling a borehole for us or enable Kanyama Water Trust to construct more tap stands within this area so that we lessen on the distance and time spent on fetching for water - Kanyama resident

The shortage of water supply means that residents are forced to travel long distances, and wait in long queues to collect water. According to a survey conducted in Kanyama, 82% of respondents reported having to wait in long queues before drawing water from kiosks (Kapulu and Tembo, 2014). It is women and children who bear the brunt of this burden of queuing and waiting for water. The time wasted collecting water eats into income generating activities, and school attendance (Gauff Ingeniure, 2011).

The shortage of water supply in Kanyama is further exacerbated by the load shedding crisis, as the reduced supply of power from ZESCO affects KWT's ability to pump water.

Even when water is available, some residents are unable to afford the tariff. Due to the shortage of water supply and issues of affordability, residents are forced to seek out water of inferior quality from private boreholes, and unprotected sources such as shallow wells. In some areas of Kanyama there are up to five times as many shallow wells as there are water kiosks, and 40% of the population uses shallow wells for drinking water (WSUP, 2009; Heath, 2010).

We try to fetch water from households with individual connections but they do not allow us... we have no other option but to go to shallow wells- Kanyama resident



Unprotected shallow well in Kanyama

The impact of inadequate sanitation services

There is no sustainable sanitation system in Kanyama. 95% of inhabitants rely on pit latrines, which are the most significant source of groundwater contamination (WSUP, 2015; Chandipo, 2015). Studies of groundwater quality in Kanyama show widespread contamination of boreholes, public taps and shallow wells (Chandipo, 2015; Mutesu, 2014; BGR, 2010).

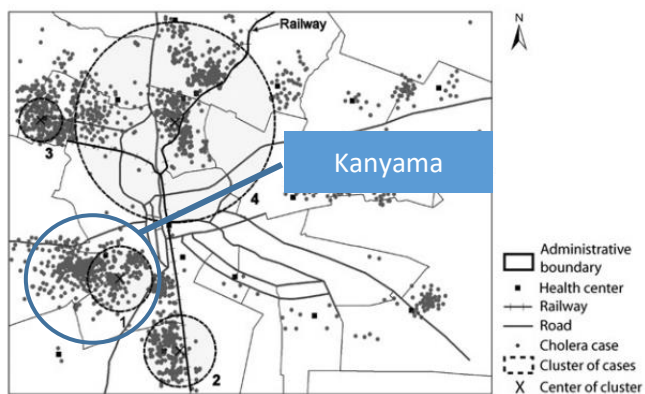
Sampling of water from KWT and LWSC boreholes in Kanyama found that nitrate concentrations frequently exceed ZABS and WHO drinking water standards. High nitrate levels are an indicator of faecal contamination of the water supply, and can cause 'blue baby' syndrome in infants, a disease which can be fatal (BGR, 2010).

Shallow wells in peri-urban areas surrounded by pit latrines face very severe and dangerous levels of water contamination by pathogenic – disease causing – material. Studies of shallow well water quality in Kanyama show levels of microbial contamination which vastly exceed ZABS drinking water standards. The acceptable concentration of E. coli in drinking water is 0. The average concentration of E. coli in Kanyama shallow wells is 1117.08 (Chandipo, 2015).

In their assessment of LWSC supply systems, Gauff Ingeniure (2011: 61) concluded that:

...shallow wells in Lusaka are not an option for water supply, especially in informal and peri-urban areas using pit latrines. – Gauff Ingeniure, 2011: 61

The use of untreated water from shallow wells is a major contributory factor to high rates of waterborne disease in Kanyama. Most recently is the outbreak of cholera in February 2016. Kanyama suffers from recurring outbreaks of cholera, and studies have demonstrated that the prevalence of cholera in Kanyama is directly linked to the contamination of shallow well water from pit latrines (Zulu and Nyambe, 2004).



Lusaka cholera incidence – map 2005-06 (Sasaki et al, 2009)

Tikudya nakumwa matuvi olo muti ona ku ina (we eat and drink faecal matter even though we look this fat) - Kanyama resident

The impact of inadequate solid waste management

According to Section 56 of the Environmental Management Act 2011, local authorities are responsible for the collection and disposal of solid waste. However, solid waste management on behalf of the Lusaka City Council is severely limited and sporadic (LCC, 2008). It is estimated that Lusaka produces 765 tonnes of solid waste daily, only 10% of which is collected and properly disposed of (BGR, 2011).



Dumped solid waste in Kanyama

Indiscriminately dumped solid waste contributes to the incidence of flooding in Kanyama during the rainy season, and pollutants associated with solid waste leach out into the groundwater, leading to deterioration of groundwater quality and contributing to the burden of environmentally related diseases such as cholera, and malaria (Gauff Ingeniure, 2011).

What needs to change?

The situation in Kanyama highlights the importance of accountable institutions for the effective implementation of water management law and policy.

Addressing the interrelated issues of water supply and sanitation provision, and groundwater management and protection in Kanyama and other vulnerable peri-urban areas in Lusaka requires a well-coordinated, immediate and time-bound response by the responsible institutions. In order to improve the situation, it is recommended that:

Locally:

- The Lusaka City Council and NWASCO need to mobilize funding through the Ministry of Local Government and Housing and the Devolution Trust Fund to invest in the improvement of water supply services in Kanyama. Additionally, the LCC, LWSC and KWT need to take responsibility for the provision of sanitation services, and procure and allocate the necessary resources to do so.
- The Lusaka City Council must take responsibility for solid waste management in Lusaka, especially in vulnerable, high density peri-urban areas.
- ZESCO must provide consistent, uninterrupted power to KWT and LWSC treatment and pumping facilities in Kanyama.
- The Ministry of Health (MoH) through the Lusaka District Health Management Team should increase water quality monitoring and step up community sensitization activities, and undertake comprehensive water safety planning in order to assess and manage risks to water supply. Additionally, the MoH should advocate, and collaborate with other institutions for the adequate provision of water supply and sanitation services.

Nationally:

- WARMA needs to fulfil its mandate under the Water Resources Management Act 2011 Section 93(1) to sustainably manage and protect groundwater resources in coordination with the appropriate authorities. In order to fulfil this mandate, WARMA should establish a groundwater management unit and develop by-laws on groundwater usage and protection.
- ZEMA need to fulfil their duties under Section 48(1) of the Environmental Management Act 2011 to monitor effluents and groundwater quality and take measures to prevent pollution.