**THE HISTORICAL DEVELOPMENT OF LUSAKA – A POSSIBLE CAUSE FOR CURRENT & FUTURE GROUNDWATER MANAGEMENT PROBLEMS**

D.C.W. Nkhuluwa

**Liquid waste disposal**

- Inaugurated new capital city of NR on Friday, 31 May 1935.
- Selected after careful consideration of a number of alternative locations (Chilanga, Broken Hill, and some Copperbelt towns).
- Chosen partly to (i) avoid domination by mining cos., & (ii) because of its central location, intersection of main road network.
- Laid out in what would commonly have been called the green field site near a rail-side settlement.

**Excreta Disposal**

- To maintain Lusaka as a garden city, Design Plan of 1950 detailed Lusaka to accommodate a total population of 125,000 within 25 years: 100,000 Africans, and 25,000 Europeans.
- Consequently, the city has had difficulties to:
  - Cope with a high rate of population increase.
  - Formulate an adequate and elaborate strategy for water supply & management of liquid and solid wastes.

**Public health problems**

- Population growth was responsible for the evolution of the city and loss of a vision, as is illustrated by the figure opposite.
- The consequences of consuming such water to support socio-economic activities of the city's residents.

**Gaps & Innovations**

- Growing demands for domestic water
- Current trends of informal high-density settlements
- Sprawls of unplanned low-density residential areas are all promoting activities that pose great threats to the potability of groundwater resources in the Lusaka aquifer. The consequences of consuming such water have been responsible for the recurrence of outbreaks of waterborne diseases.

- A re-examination of the original development plan - garden-city concept- for the city will assist in curbing these endemic outbreaks, thereby reducing on costs for health care services and the loss of productive time due to illnesses that would otherwise have been avoided.

**Lessons Learned**

**Concerning the unplanned development of Lusaka,** informal and unplanned settlements have flourished mostly over the aquifer recharge area. However since waste disposal practices have generally been on and in the karstified marbles, an environmentally very fragile terrain, these practices pose serious risks to the potability of water to support socio-economic activities of the city's residents.

Consequently, the city’s residents have now understood that they are faced with increasing difficulties in meeting overall developmental goals because they cannot ensure a protected natural environment in which people live a healthy and productive life.

**Planned Implementing Actions**

1. An important element in the assessment of groundwater quality, protection and management in these areas involved the identification of water points and potential pollution sources: This involved mapping of excreta disposal facilities and water points using a Garmin E-Trex hand-held GPS and the results of the mapping campaign were imported into an ArcView GIS programme.

2. Concerning water quality, three sampling campaigns were planned for the project and this arrangement was meant to compare the variability of pollutants with varying levels of saturation in the aquifer. The two subsequent sampling campaigns targeted those points that proved qualitatively problematic during the first sampling campaign.

**Key Conclusions & Recommendations**

The current spread of human activities, such as the uncontrolled settlement patterns & Inadequate Methods of waste Disposal point to an ignored vision for the city’s growth. These activities raise serious risks of groundwater contamination which may have far-reaching public health implications for the current and future residents.

**FUTURE GROUNDWATER MANAGEMENT PROBLEMS OF LUSAKA – A POSSIBLE CAUSE FOR CURRENT & FUTURE GROUNDWATER MANAGEMENT PROBLEMS**

- The immediate problem of housing has been solved by relegating most of this population to high-density settlements, where excreta disposal is through pit latrines, while shallow wells have provide the most common sources of water supply.

- Consequently, the cost of pumping may increase to such levels that the poor may not readily afford water charges.

- The recurrence of outbreaks of waterborne disease-causing organisms. This is particularly serious during the rainy season, when faecal contamination is flushed into the groundwater system and heights with increasing levels of saturation, thereby making the aquifer very vulnerable to pollution.