

An assessment of groundwater quality in Zimbabwe's urban areas: case of Mkoba 19 suburb, Gweru

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Abstract

Groundwater quality assessment in urban areas is one of significant endeavours to ensure safety of urban residents who use groundwater especially in areas with erratic tap water supply. The study assessed groundwater quality and vulnerability of residents to water contamination-related diseases in Mkoba 19 suburb in Gweru, Zimbabwe. The research employed a mixed methods research design using both quantitative and qualitative research methods. Laboratory tests, questionnaires, interviews, focus group discussions and observations were used to solicit data. Statistical package for social scientist (SPSS) version 20.0 and Microsoft excel package were adopted for data analysis in this study. The study revealed that Mkoba 19 suburb has more wells than boreholes. Boreholes were evenly distributed over the residential area than wells which were clustered to the southern and northern edges of the suburb. All boreholes in Mkoba 19 were drilled to the depth of 40 m, but wells were dug to varying depths. The study confirmed that borehole water in Mkoba 19 was acidic and thus unsafe for human consumption. Water from wells in Mkoba 19 was confirmed positive of *Escherichia coli* which shows contamination from sewage and waste dump leachates. The findings of this research indicated that both borehole and well water sources in Mkoba suburb had permissible levels of dissolved oxygen and turbidity. Chi-square tests conducted confirmed that there was an association between water source depth and level of *E. coli* contamination in water whereas there is no association between water source depth and water pH level. The research confirmed that residents of Mkoba 19 were highly vulnerable to water borne illnesses as they were using contaminated water for domestic purposes without treating it. Basing on similar studies conducted in the past 3 years, it was shown that groundwater quality in Mkoba 19 mimics that of other countries of the developing world, especially in sub-Saharan Africa, which shows that vulnerability to ground water contamination in urban areas is an issue that requires critical attention and almost similar solution. The research recommends that Gweru City Council should upgrade its water supply system especially the pumping system to improve water supply in Mkoba suburb. To minimize water-borne disease outbreaks in the future, urban residents who rely on secondary or tertiary sources of water for domestic purposes should treat water using chlorine, water guards and other water cleansing measures on a regular basis.