

Impact of Human Activities on The Sources of Drinking Water in some Selected Communities in the Akuapem South District of the Eastern Region

SAVIOUR VICTOR KWABLA ADJIBOLOSOO

2000

ABSTRACT

The study was undertaken in three communities namely Adamrobe, Aburi and Pokrom Nasaba, all located in the Akuapim South District of the Eastern Region. These communities depend on streams, wells, and springs for their drinking water requirements. Water samples from these sources were analyzed over a period of twelve months for various water quality parameters (pH, colour (C), -including pH, electrical conductivity (EC), nitrate (N~), phosphates (P₀₄), biological oxygen demand (BOD), turbidity, suspended solid (S₈), total dissolved solids (TDS), dissolved oxygen (DO), trace metals (Pb, Cd, Zn & As), faecal coliform (FC), total coliform (TC), and enterococci (EC), following standard methods designed in APHA, AWWA, and economic data were also collected using questionnaire. The main objective of the study was to identify the key human activities that contributed to poor drinking water quality in the three communities. The results of the study revealed that, most of the mean levels of the chemical parameters registered from the water samples were below the World Health Organization (WHO) and Ghana Water Company Limited (GWCL) recommended critical limits for drinking water standards with the exception of the mean pH values of 4.3 and 4.4 recorded from the well and spring water respectively, fell below the WHO and GWCL set by WHO and GWCL and 5.0-8.5 below the drinking water quality guideline values of 6.5-8.5. The mean DO levels registered for the Aburi well respectively, indicating acidic pollution. The mean DO levels registered for the Aburi well (4.27mg/l) and Aburi and Pokrom springs (4.7mg/l & 2.22mg/l) respectively, also fell below the WHO acceptable limits of 5.0mg/l for drinking water quality standards. This also indicated evidence of microbial pollution. With the exception of the mean BOD level registered for Pokrom spring (4.2 mg/l) in the dry season, mean levels recorded from other stations for both wet and dry seasons were within the WHO drinking water quality guideline limits of 3.0mg/l. The low level of trace metals recorded in the water samples was due to the absence of industrial and mining activities in these communities and their environs. The mean nitrate levels registered at AUST (56.3mg/l) in wet season, ABW (28.5mg/l) and ABSP (21.2mg/l) both in the dry seasons were above the WHO drinking water quality standard level of 10mg/l. The mean levels of bacteriological indicators recorded were far above the WHO and GWCL permissible levels of zero cfu/100ml for drinking water quality. The low levels of pH and DO and high level of microbial population of the water were the direct results of the agricultural activities being undertaken within the catchment areas of the water sources coupled with poor sanitation at the water sites and improper disposal of human and solid wastes. In terms of pH, DO, and bacteriological qualities of the water, these water sources were unsuitable for human consumption as they have serious negative health implications. Based on these findings, it is

recommended that the minimum lateral separation between potential pollution sources and drinking water sources be increased and education on the need to ensure proper sanitation at the water sites be intensified in the three studied communities in order to forestall any further .pollution of the water sources