Bacteriological Quality Of Eldoret Water Supply And The Efficiency Of Sewage

Treatment Plants: Implications For Down-Stream Communities
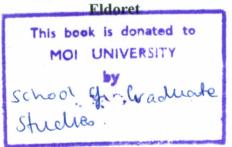
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Abstract

Although waterborne diseases occur world wide, they are commonly reported in the developing countries where sanitation is poor and safe drinking water is limited to a small proportion of the population. In Kenya, sanitation facilities are not only poor but inadequate and drinking water is largely drawn from rivers, swamps, wells and other sources that are basically unprotected and unsafe. Moreover, bacteriological quality control, monitoring services for drinking water supplies and sewage treatment is unestablished and irregularly done. Thus, the bacteriological quality of water supplies and the safety of sewage effluents is fairly unkown. Further, rivers that pass through urban areas and towns and receive effluents from sewage treatment plants as Sosiani River does, are likely to harbour dangerous bacteria particularly when such sewage plants are inefficiently managed. This study was therefore, designed to examine the bacteriological quality of drinking water supplies and the efficiency of sewage treatment plants in the Eldoret area.

A total of 204 water samples were examined by standard bacteriological methods. Of these, sixty, fifty four, seventy two and eighteen were collected from Sosiani River, Water Taps, wells and sewage plants within the Municipality of Eldoret respectively. Sosiani river water samples had mean counts of 1.8×10^5 CFU/ml, 2.8×10^3 CFU/ml and 1.7×10^3 CFU/100 ml at incubation temperatures of 22°C, 37°C and 44^{0}C respectively. The high bacterial counts at 44°C is above permissible standard count of 3 CFU/100 ml. Organic matter content of river samples was 24.0 mg/L and was consistent with found biochemical oxygen demand of 30 mg/L. Plate counts at 22°C, 37°C and 44°C for the wells were means of 3.0×10^4, 3.2×10^3 CFU/ml and 1.7×10^3 CFU/100ml respectively and suggests faecal

contamination. Tap water samples at similar temperatures did not have faecal bacteria. There were no statistically significant diffferences between raw and processed sewage from Huruma and Kipkaren treatment plants suggesting inefficient sewage processing. High *Salmonella typhi* counts of 4.0×10^2 CFU/100 ml found in treated sewage is unacceptable by international standards.

While the tap water supply in the Eldoret area meets the required standard, it is only available to a few of its residents. The majority of Eldoret area residents use well or river water that contains high levels of potential pathogens and therefore at risk of waterborne illnesses. The sewage treatment plants in this area are grossly inefficient and show high levels of faecal bacteria including known pathogens. This poses a potential risk to the communities immediate down-stream the sewage plants. The effect of dilution in river Sosiani is not known, and does not seem to check human faecal bacteria and known pathogens since their levels remained unacceptable a kilometre away from effluent outfall. This may be worse in the dry season when the water level is low.