THE EFFECT OF SEWERAGE WATER TREATMENT PLANT ON THE WATER QUALITY OF MZIMNENE RIVER, IN SWAZILAND

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ABSTRACT

A study to determine the effect of the Nhlambeni wastewater treatment plant on Mzimnene River water quality was undertaken between September 2011(dry season) and January 2012 (wet season). Three sampling sites were selected along the river. Site 1 was located some 200 m upstream the wastewater treatment plant and site 2 was located at the point of discharge. Site 3 was located some 2 km downstream the treatment plant. Water samples were collected and analysed for temperature, pH, Chemical Oxygen Demand (COD), Dissolved Oxygen (DO), total hardness, chloride, ammonia, turbidity, conductivity, colour, total coliform and faecal coliform. The results were analysed using SPSS software for ANOVA and t-test. The results were further compared with the permissible levels for drinking water. The results showed that the river was highly polluted in terms of total coliform and faecal coliform, as counts of up to 84150/100 ml and 5883/100 ml were reported respectively. The differences in water parameters for the three sites were not significantly different ($p > 0.05$). The results showed a significant difference ($p < 0.05$) for temperature (30.50 and 24.83 ^{o}C), pH (8.87 and 7.30), DO (20.70 and 25.56% saturation), ammonia (0.86 and 0.180 mg/l) and total coliform (15668 and 121500 counts/100 ml) for dry season and wet season. It was recommended that households that rely on water from the Mzimnene River should be educated and informed about the quality of the water that it has bacterial counts above the permissible limit for drinking water. The water should be treated by boiling before it was used for drinking.

Keywords: Contamination, portable water quality, sewerage discharge, sustainable development goals.