

# **Municipality Solid Waste Management and Performance of the Tricycles: A Case Study of the Tamale Metropolis**

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## **ABSTRACT**

Tamale, one of the fastest growing cities in Ghana, is faced with daunting challenges in the management of Municipal Solid Waste (MSW). A corresponding increase of population and rising quality of life with high rates of resource consumption patterns have led to serious problems of high volumes of waste being generated and high costs involved. In addition, the disposal technologies and methodologies are far beyond the handling capacities of municipal authorities and agencies. This research was therefore designed to focus on the Municipal Solid Waste Management (MSWM) system in Tamale, seeking to identify the main sources, quantities and composition of solid waste generated and to assess the performance of newly introduced tricycles for waste collection. The study employed three methodologies; administration of questionnaire and interviews, waste characterization and laboratory analysis. The questionnaire and interviews revealed that there is a relationship in the level of education and how households stored their waste before disposal. There is also a close relationship in the household income level (residential class) and the use of covered plastic waste bins. Most households rated waste collection after the introduction of the tricycle as good followed by very good and satisfactory whilst none were of the view that waste collection was not good. During the waste characterization, the city was zoned into three residential classes according to economic status and the waste characterized into components for the wet and dry seasons. The aggregate disposed waste composition were 45% organic, 17% plastic, 11 % other waste, 9% paper and cardboard, 6% glass, 6% metal and 6% textile. There was significant difference ( $P < 0.003$ ,  $P < 0.003$ ) in the mean aggregate disposed textile and paper waste, respectively, by season in Tamale. There was however, no significant difference in the mean aggregate disposed waste by residential class. The laboratory analysis investigated some physicochemical drinking water parameters for the dug outs and boreholes in the two communities close to the landfill site to check whether there was any impact of the landfill on the water sources. The results revealed the mean level of pH for Gbalahi borehole (5.40) to be below the minimum limit (6.5) for World Health Organization (WHO) guideline.

In addition, the mean level of T. iron (0.48mg/l) recorded in the Gbalahi dug- out exceeds the WHO guideline (0.3mg/l). Also, the mean level of T. manganese (0.50 mg/l) in the Wovoguma dug-out exceeds the WHO guide line (0.10 mg/l). High total coliform and faecal coliform levels exceeding the WHO guideline were recorded for all the dug-outs and boreholes in the two communities. There is therefore the need for regular monitoring of the quality of water bodies close to landfill site since waste disposed at the landfill site have effects on water bodies close by. Though there has been an improvement in waste collection after the introduction of the tricycles, there is the need for an integrated approach to waste management where all aspects of waste management (technical and non-technical) are analyzed together considering managerial, financial, legislative and public participation aspect.

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