**Time Series Analysis and Forecasting of Municipal Solid Waste Generation in the Douala Municipality, Cameroon: An Autoregressive Integrated Moving Average Modeling**

 **ABSTRACT**

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Municipal solid waste generation in the Douala municipality has been steadily increasing from less than 2,000 tons per day in 2000 to more than 4,000 tons per day in 2013. Despite the modern techniques employed by the municipality to ensure optimal management of municipal solid wastes, solid waste management is constrained by a number of setbacks ranging from the absence of environmentally reliable disposal sites to inadequate solid waste transportation vehicles to the current disposal site causing high operational costs and reduced collection capacity. Consequently, the urban landscapes is characterized by such environmental problems such as open spaces and roadsides littered with refuse, drainage channels and gutters choked with waste, and beaches strewn with plastic solid wastes, leading to inundations and floods, climate hazards, and loss of soil and biodiversity. Accurate prediction of municipal solid waste’s quantity is crucial for designing and programming municipal solid waste management system. This research, which is a predictive study, uses the Autoregressive Integrated Moving Average (ARIMA) time series model to explore the dynamics of solid waste generation and also forecast monthly solid waste generation in the Douala municipality of Cameroon. This study used monthly solid waste generation data from 1999 to 2013 that was obtained from HYSACAM (“Hygiène et Salubrité du Cameroun”) database. The results showed that in general, the trend of solid waste generation peaked in December 2008. The forecast, using ARIMA (1, 1, 1), revealed that, everything remaining same, for the next couple of years, the generation of solid waste will continue to increase as a result of the high rate of urbanization in the metropolis. The research is therefore of the view that sustainable solid management programs should be put in place to rescue the current situation and also plan for the anticipated solid waste predicted by the research. The methods and findings of this study may assist experts, decision-makers and scientists performing forecasts of MSW generation, especially in developing countries.

**Keywords:** ARIMA, Municipal Solid Waste, HYSACAM, Douala municipality