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Development of a Sustainable Municipal Solid Waste Management for an Urban Area: Case Study from a Developing Country

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Abstract : Increase in urbanization and industrialization have led to improve in the standard of living. However, at the same time, the challenges due to improper solid waste management are also increasing. Municipal Solid Waste management is considered as a vital step in the development of urban infrastructure. The present study focuses on developing a solid waste management plan for an urban area in a developing country. The current scenario of solid waste management practices at various urban bodies in India is summarized. Guwahati city in the northeastern part of the country and is also one of the targeted smart cities (under the governments Smart Cities program) was chosen as case study to develop and implement the solid waste management plan. The whole city was divided into various divisions and waste samples were collected according to American Society for Testing and Materials (ASTM) - D5231-92 - 2016 for each division in the city and a composite sample prepared to represent the waste from the entire city. The solid waste characterization in terms of physical and chemical which includes mainly proximate and ultimate analysis were carried out. Existing primary and secondary collection systems were studied and possibilities of enhancing the collection systems were discussed. The composition of solid waste for the overall city was found to be as: organic matters 38%, plastic 27%, paper + cardboard 15%, Textile 9%, inert 7% and others 4%. During the conference presentation, further characterization results in terms of Thermal gravimetric analysis (TGA), pH and water holding capacity will be discussed. The waste management options optimizing activities such as recycling, recovery, reuse and reduce will be presented and discussed.

Keywords : proximate, recycling, thermal gravimetric analysis (TGA), solid waste management
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