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Investigation of Compost Generation Potential for Municipal Waste: A Case Study in the Kurunegala Municipal Council Area, Sri Lanka

Bandara, W.B.S.U.[1]*, Arjunan, K.[1], Bandara, N.J.G.J.[2]

[1]Department of Bio- Science, University of Vavuniya, Vavuniya, Sri Lanka
[2]Department of Forestry and Environmental Sciences, University of Sri Jayewardenepura, Nugegoda, Sri Lanka
*udayanganishanika40@gmail.com

Abstract

Waste management is an ever-increasing global concern, with particular emphasis in municipal areas. The effective management of waste, especially organic waste, has become a pressing issue. Developing an effective waste management strategy for a specific region requires the estimate on the amount of waste generated per unit period of time and the composition of the waste. Especially, in the context of wastes with high organic proportion composting has emerged as a promising solution to manage such wastes. Therefore, this study was conducted in the Kurunegala municipal area of Sri Lanka, focusing on the compost generation potential using municipal waste. The primary data collection method for this study was a semi-structured questionnaire survey conducted over a three-week period. 120 sample households were selected using a stratified random sampling from 12 municipal wards of Kurunegala municipal area. The assessment of waste generation and the composition of the waste stream in the Kurunegala Municipal Council area was conducted by analyzing data from four months' worth of truckloads, including their weights. Estimations and descriptive analyses were performed to find the municipal waste generation rates. Descriptive analyses were used to explore the relationships between the quantities of organic waste and several socio-economic factors, including population and monthly average income values. This study found that, in the Kurunegala municipal area, the average daily waste generated per person was approximately 0.6055 kilograms, with organic waste accounting for about 0.4055 kilograms, making up the majority at 67%. The average per capita daily organic waste generation was 0.2851 kg for the high-income group, 0.2186 kg for the middle-income group, and 0.2092 kg for the low-income group. Furthermore, the average household daily organic waste generation was 1.1012 kg for the high-income group, 1.0145 kg for the middle-income group, and 0.8197 kg for the low-income group. Specifically, when the average family income has got increased, the organic waste generation rate also increased. Contrastingly, it has been observed that higher-income households tended to produce more polythene and paper waste than middle and lower-income families. Based on the SWOT analysis, composting was identified as the most appropriate option for managing organic waste in the Kurunegala municipal area.

Keywords: Compost, Municipal waste management, Organic waste, Socio-economic factors, Waste generation and composition