

ABSTRACT

Municipal Solid Waste (MSW) is a growing problem in Sri Lanka and this problem is aggravated due to absence of a proper Solid Waste Management (SWM) system in the country. Although there are several SWM programs that have been implemented in some of the Local Government Authorities (LGAs) in Sri Lanka, there had been no standard procedure to manage the amount of waste that is being generated. Composting, bio gas generation, semi-engineered landfill and recycling are the key waste treatment technologies available in Sri Lanka.

The objectives of this study were to (i) evaluate the effectiveness of household, community and local government authority level initiatives in SWM, using the USAID/OTI funded SWM program for Galle and Weligama UC SWM programs as case studies; (ii) to identify and optimize key operational parameters of MSW composting processes at the household, community and local government authority level in order to increase the rate of decomposition.

Galle Municipal Council and the Weligama Urban Council were selected as two study locations. To study the effectiveness USAID/OTI funded SWM project in Galle, primary data were collected through interviews and by direct observations. Total of eighty households and five community mobilizers were selected randomly from all five MC wards. Data were analyzed using frequencies, percentages, chi-squares using SPSS and Minitab.

Effect of aeration on the rate of degradation of household bins was studied by turning the materials in five bins at weekly intervals and not turning the materials in the other five bins. The effect of aeration and the moisture content on the rate of degradation on the commercial level composting piles were also studied. Volatile solids, temperature, moisture, volume reduction and the particle size were measured and recorded. The data were analyzed and presented as time series plots, tables, etc.

The findings of the Galle SWM project revealed that, the majority of the respondents (70%) do not practice household waste sorting and 62.5% said the separate collection by GMC is not functioning. Only 16.25% are using the community composting units. None of them is functioning as expected. Overall the techniques and technologies introduced to GMC have not been successful. Although, the rate of degradation of materials in the household composting bins did not show any difference with or without turning, the commercial scale composting showed a difference in VS reduction in the turned and not turned piles. Also, there was no difference in the rate of degradation in the piles with controlled or without controlled moisture.

It can be concluded that a higher level of political commitment is compulsory for implementing a better managed SWM program. Community composting is not a good solution to manage the waste. Turning the materials does not have any effect in household composting, but the rate of degradation is higher in commercial level composting, when the piles are turned. The excess moisture received from rain does not affect heavily if the materials in the piles are turned frequently. A combination of household and LGA level SWM practices can be proposed to develop a SWM system suitable for small and medium scale LGAs in Sri Lanka.