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A Comparative Benefit-cost Analysis for the Potential Waste Management Options for the Western Province, Sri Lanka

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Abstract

Sri Lanka generates 7,000 metric tons of solid waste per day while only 3,242 tons are being collected. Within the Western province 1783 metric tons are collected daily. Management of municipal solid waste is mainly a responsibility of local governmental entities. Only a few waste management options are often practiced while economic aspects of this problem are rarely taken into consideration. The present study was designed therefore with the objective of analysing current and potential waste management options for the western province and identifying the best option that maximises the net benefit to the country. Seven different options for municipal solid waste management were identified for the analysis (option 1–open dumping; 2-sanitary landfilling; 3-recycling paper, polythene, glass and other recyclable waste (15%) and open dumping the rest; 4-composting the biodegradable (62%) and open dumping the rest (38%); 5-composting the biodegradable (62%), recycling paper, polythene, glass and other recyclable waste (15%) and open dumping the remaining; 6–waste to energy handled by the government; 7–waste to energy collaborated with private organizations). Then costs and benefits, including environmental costs related to each option were identified and quantified using literature and information obtained from interviews held with coordinators of waste management projects under both government and private sectors. Economic cost-benefit analyses were conducted for the seven options for a period of 30 years assuming that a constant amount of municipal solid waste (100 MT) per day is treated by each method. All seven models were developed on the basis of current municipal solid waste composition. According to the net present value analysis, five options resulted in negative net present values, while options four and five showed positive net present values. In the next step, the value of compost was re-estimated considering the replacement benefit of imported nitrogen, phosphorus and potassium fertilizer which has yielded a much higher net present value than earlier. Furthermore, option five was identified as the economically most profitable option. The results of the study will provide guidance toward designing the most economically and environmentally viable waste management options for urban areas of Sri Lanka.

Keywords: Municipal solid waste, Composting, Recycling, Cost-benefit analysis