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Release Of Methane and Carbon dioxide Gases from
Municipal Solid Waste Landfills in the Colombo
Metropolitan Region

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Abstract

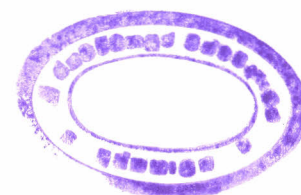
Environmental and social problems caused from improper solid waste disposal are some of the biggest environmental threats Sri Lanka faces at present. Most of the waste generated in Sri Lanka ends up directly in open disposal sites on land. These disposal sites are overloaded and uncontrolled. Often the sites selected are marshy areas on lowland. These open dumps have posed serious environmental and social threats. Air pollution from landfill emissions, ground water pollution from leachates, health problems due to breeding of disease causing pests and social problems such as decreasing land values and aesthetic appeal of an area etc. are some of these problems. Currently about 60 temporary open dumpsites are in operation within the Colombo Metropolitan Region (CMR) alone. All of them can be said to be temporary because they are small in size, unplanned and unengineered. As in most other low and middle income countries Sri Lanka has a high percentage of organic content in their waste. Due to this high percentage of organic waste (80-90) high amounts of Carbon dioxide and Methane are released in to the atmosphere from anaerobic degradation under low oxygen conditions prevalent in uncontrolled landfills. Thus in addition to many other social and environmental problems, Green house gas contribution is another major concern arising from the current waste disposal practices in Sri Lanka. It has been estimated that through out the world about 8% of methane that is released in to the atmosphere comes from landfills.

This study intends to estimate the amount of greenhouse gases that is Carbon dioxide and Methane that is released into the atmosphere annually from the landfills under study operating in the Colombo Metropolitan Region. Most of the landfills are open dumpsites. Colombo, Gampaha and Kaluthara districts are located in the CMR in which 45 local authorities are included. All the relevant data was collected from each local authority in CMR by using questionnaires, primary interviews, field observations and past data. Scholl Canyon gas generation model was used to estimate greenhouse gas emissions from the municipal solid waste degradation in the dumps in the CMR.

As model inputs the amount of waste dumped annually, the age of the waste and the gas generation potential of the waste was used. Gas generation potential was calculated on the basis of the composition of waste. It was found that methane gas emission is $1507.681 \times 10^3 \text{ m}^3$ and CO_2 gas emission is $9474.516 \times 10^3 \text{ m}^3$ in CMR in the year 2003.

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