Abstract

Carbon dioxide and certain other trace gases, including methane (CH_4), nitrous oxide (N_2O) chlorofluorocarbons (CFCs), and tropospheric ozone (O_3), are accumulating in the atmosphere as a result of human activities. Global warming occurs because these gases retain infrared radiation, which normally would dissipate into space from Earth in the atmosphere, thus the atmosphere warms up. Some of the heat from the atmosphere is transferred to the oceans and raises their temperature as well. As the atmosphere and oceans warm, the overall temperature of the Earth rises. Because carbon dioxide and other gases trap the sun's radiation in much the same way as the glass does in a greenhouse. Global warming produced in this manner is known as the greenhouse effect.

This study will be used to develop plans for rehabilitating and mining of dumpsites in the Colombo District. Most of the disposal sites were small scale and suffered by operation problems such as the lack of man power and heavy machines and from the environmental impacts such as ground water contamination and odor problem.

The methane emissions have been determined by the Intergovernmental Panel on Climate Change (IPCC) using a method on the basis of mass balance approach incorporates no time factor and can be applied to the total waste emanating from the area. The calculation based on the amount of waste generation and open dumpsites, the fraction of Degradable Organic Carbon (DOC) that actually degraded into biogas and the fraction of biogas that actually released as methane.

Therefore, secondary data and information were gathered on disposal of wastes in the Colombo District and three dumpsites, namely at Buthgamuwa, Karadiyana and Maharagama were monitored for a period of seven days and a closed flux chamber method was used to determine the rate of gas emissions and the composition of the gas was analyzed.

As expected the new dumpsite generated higher rate of Landfill Gases (LFG) than the old ones. Thus, an average gas generation was obtained for the three sites and when compared with the reported value was much higher than IPCC method for Sri Lanka. The experimental value may be an over estimation and verification is needed and further studies are recommended. Interestingly considerable oxidation of methane takes place, perhaps in the cover soil. However, this oxidation is limited when methane generation levels exceed threshold levels. Also depending on the partial pressures, only moisture is given out while curtailing gas emissions. All of these aspects needs in depth studies.