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Application of SWOT Analysis for the Selection of Technology for Processing and Disposal of MSW

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Abstract

Municipal solid waste management system cannot be made sustainable only with the technical end-of-pipe solutions but an integrated approach is necessary. The use of SWOT (strength & weakness and opportunity & threats) analysis technique for the selection of technology for processing and disposal of municipal solid waste will help to mitigate the uncertainties and minimise the business/project risk and will also help to identify the raw material feed mix, establish a raw material supply chain, identify the product mix and product market, business model & business risk. In this paper a systematic approach has been developed for the selection of right technology for the sustainable processing and disposal of municipal solid waste.

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*Keywords:Municipal Solid Waste * Anaerobic Digestion * Pyrolysis * Plasma Gasification * SWOT * Composting;*

1.0 Introduction

Municipal solid waste (MSW) consists of mainly renewable resources such as food, paper, and wood products; it also includes non-renewable materials derived from fossil fuels, such as tires and plastics etc. There are number of technologies by which major portion of MSW can be processed in an environment friendly manner for extraction of value from it. In fact, technologies are available which can convert virtually any type of waste into energy. Recycling, composting (Vermi and Windrow), waste to energy and landfill gas extraction are the basic technological form through which value can be extracted from the MSW. Technologies for waste to energy can be classified in to two types of chemical conversions ; i) Thermo chemical conversion-[Incineration or mass burn , Pyrolysis,

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Refused Derived Fuel (RDF), Plasma Gasification or other form] and ii)Bio-chemical conversion (Anaerobic digestion/ Bio-methanation or fermentation etc). But not all the technologies are suitable for everywhere. In many occasions, successful technologies in developed countries have failed in developing countries. Large-scale composting projects in Africa and Asia were too expensive and inappropriate to the local conditions. As a result, some facilities had been closed, others had been scaled down, and many operate below their planned capacities (Medina M, et al, WB Report 2009). Similar experiences with incinerators have been reported India too. In Delhi, incinerator built in 1999 has been failed due to very low calorific value of waste. Selection of right technology is crucial for the sustainability of the waste processing and disposal projects.

A technology sustainable at a place may not be sustainable at other place due to one or more reasons.Technical suitability depends on various factors like waste characteristics and quantity, climatic conditions, environmental rules and regulations of the place, availability of human resources etc. For the selection of right technology for processing and disposal of MSW, the strength & weakness and opportunity & threats (SWOT)of the external and internal factors of the waste processing and disposal project is required to be done. In this paper a systematic approach has been developed for the selection of right technology for processing and disposal of MSW.

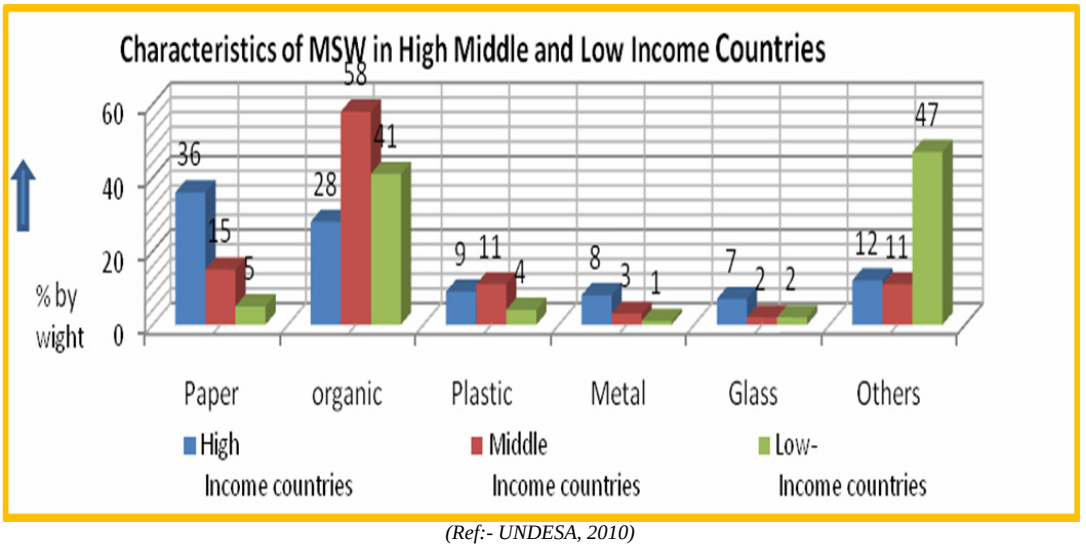
2.0 Objective

The objective of this work is to identify the method of selection of right technology for processing and disposal of municipal solid waste; which may eventually promote a sustainable waste management system.

3.0 Literature Survey

3.1 Socio Economic Factors for MSW Generation

There are major differences between the industrialized and developing countries in the field of solid waste management (SWM) system and solutions. The waste generation tends to go up as income increases. Cities of developed countries have higher waste generation rates than cities of developing countries. The average per capita waste generation rate in developed countries varies from 1.12 to 2.08 kg. per day where as in developing countries it is 0.40 to 0.66 kg. per capita per day(Dhokhikah Y 2012**)**. In the U.S waste generation rates is 2.10 kg per person per day (Municipal Solid Waste Generation, Recycling, and Disposal in the US: Facts and Figures for 2012, EPA, USA.) while the residents of Indian cities on an average generate 0.495 kg. per person per day (NEERI 2012) .



(Ref:- UNDESA, 2010)

Fig. 1.Characteristics of MSW in High and Low Income Countries