

Challenges in Waste management in India

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Abstract

Due to rapidly increasing population, industrialization, urbanization worldwide, various kinds of waste materials are generating with alarming speed and leading to destruction of natural habitats and ecosystems. Now a days the management of waste materials in developing countries, particularly India has significant challenge as it affects from local level to global concern. Developed countries comparatively India has better strategy for the management of waste materials and the recycle the wastes that is better for environment and ecosystem. India in this reference faces several challenges due to high population density, huge amount of waste generation, and particularly economic reasons, the sorting and handling of waste causes waste management a difficult task. Difficulty in this waste management in country also have very bad impact on public health and environmental concern. This article focuses on current different kinds of waste materials, issues related to waste management, different waste generating sources in India, waste generation and waste characterization data, current trend of waste management particularly solid waste, data of solid waste generation per capita, waste management laws in India, waste recovery and waste recycling process etc. are discussed in detailed with relevant references.

Keywords: Waste management, Environment, solid waste, Sources of Waste.

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I. Introduction

Waste materials are unusable or unwanted substances that is discarded after primary use and is defective or worthless that includes municipal solid waste, hazardous waste, Water waste, sewage, surface runoff, radioactive waste and many more. With reference to India, waste generation and its management is among the major issues related to environmental challenges caused by huge amount of waste generation, improper and inadequate waste collection, poor transport facilities, improper treatment, and its disposal. The Current waste management systems in India is insufficient and cannot overcome with problems and difficulties associated with the huge volumes of waste generated by an increasing urban over population, and it causes the environmental and public health related issues. This Article reports on various types of waste and their management for proper disposal. The process of Waste segregation at the source of generation and use of specialized waste processing facilities required and to separate recyclable or reusable materials has a key role in proper waste management system. The proper Disposal of residual waste materials after extraction needs engineered landfill sites and required to investment in waste-to-energy facilities. The potential for generation of biofuel from landfill via methane extraction or thermal treatment is a major opportunity, but the lack of qualified engineers and environmental professionals with the experience to deliver improved waste management systems in India is major challenge. It is estimated till 2025, daily municipal solid waste material (MSW) will be more than 6 million tonnes by the global urban population [1,2]

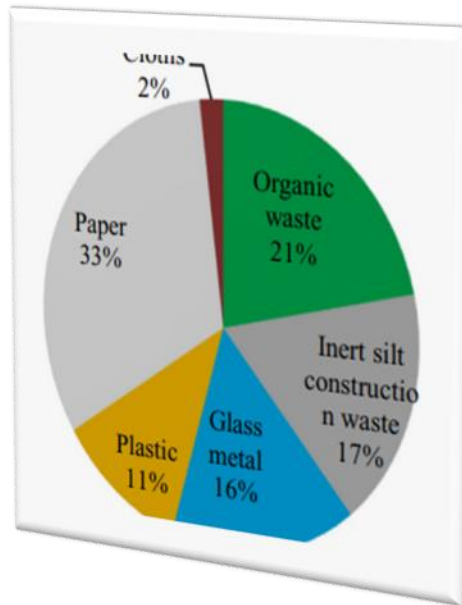


Figure 1. Waste composition in developed country [3,4]

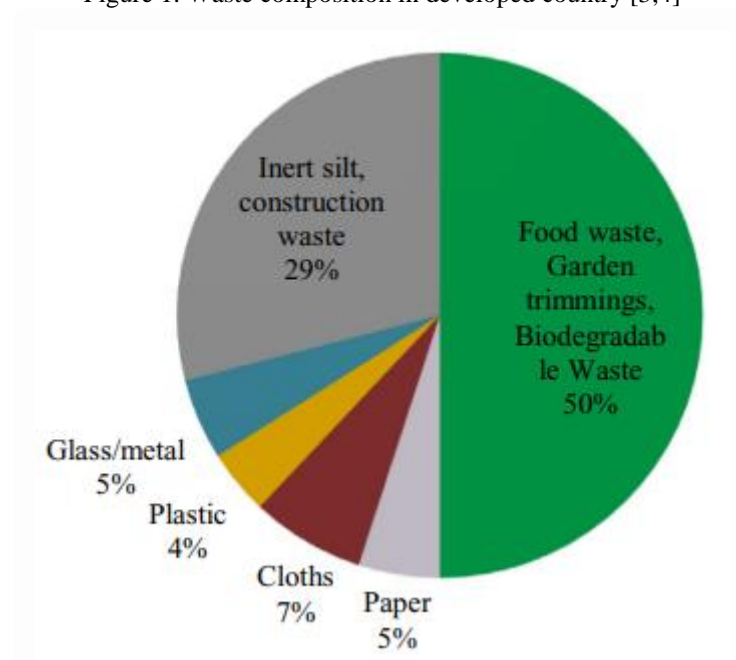


Figure 2. Waste composition in Indian cities [5]

II. Waste generating sources in India

In India waste generating sources includes wastewater released from different industries, tanneries, distilleries, thermal power plants, unused solid waste including food materials, market-associated waste, dead animals, paper wood, dried leaves, ashes released from fire burning, tires, battery acids, medical waste released from hospitals, constructional waste, metal sheets, metal scraps, different plastic waste including plastic bags, bottles, buckets, nuclear waste released from nuclear power plants and other many more.

III. Waste generation and waste characterization data

As per Annual Report on Solid Waste Management (2020-21), CPCB, Delhi, the total quantity of Solid waste generated in the country is 160038.9 TPD of which 152749.5 TPD of waste is collected at a collection efficiency of 95.4%. 79956.3 TPD (50 %) of waste is treated and 29427.2 (18.4%) TPD is landfilled. 50655.4 TPD which is 31.7 % of the total waste generated remains un-accounted [6]*

*Data adopted from CPCB website.

IV. Trends in Solid Waste management (SWM)

SWM Trend (Year-wise)

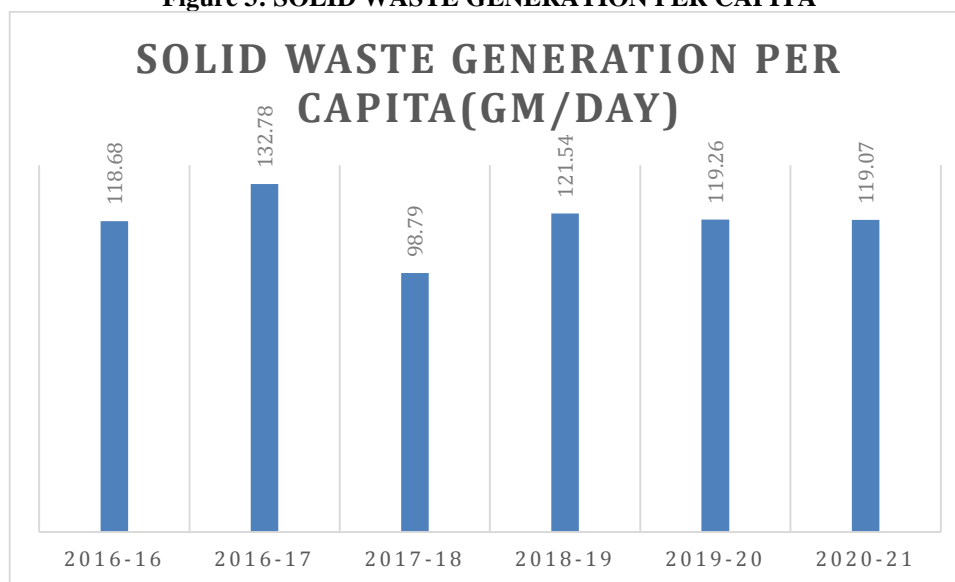
Solid waste management information for the last six years (2015-21) has been examined and following are the observations: (a) Per capita Solid waste generation: Per capita solid waste generation has been calculated for the last six years and is given in Table 1. The trend in per capita waste generation is also illustrated in Figure 3. Marginal decreasing trend is observed in per capita solid waste generation over the last six years.

Table 1: SOLID WASTE GENERATION PER CAPITA*

S.No.	Year	Solid Waste Generation Per Capita(gm/day)
1	2016-16	118.68
2	2016-17	132.78
3	2017-18	98.79
4	2018-19	121.54
5	2019-20	119.26
6	2020-21	119.07

*Data adopted from CPCB Website

Figure 3: SOLID WASTE GENERATION PER CAPITA



V. Waste management laws in India

Union Ministry of Environment, Forests and Climate Change makes observation on Waste management in India, also the ministry has rules in 2016 regarding Solid Wastage Management. The policy released in 2016, plays a important role in the acknowledgement and inclusion of the informal sector into the waste management process for the first time in the country. About 62 million tonnes of waste is released in India per year of which about 70 % are collected, of which about 12 million tones waste are treated, and about 31 million tones of waste are dumped in landfill sites.it is estimated that till 2030 about 165 million tones of municipal solid waste will be generated, due to population growth and development activities[6-12]

VI. Waste recovery, recycling, and Swachh Bharat Mission

In order to reduce the bulk volume of waste materials recovery, from waste materials is an important procedure that helps in better management of waste and reduces the burden of pollution also. With respect to plastic waste materials and many electronic waste the reduce, reuse and recycle the waste materials plays an important role in waste management. The nation-wide campaign related to waste reduction in whole country, Swachh Bharat Mission, was introduced by the Indian Prime minister Sri Narendra Modi to clean up the streets, roads and infrastructure in cities, towns and rural areas also make the people of country to aware about the participation in waste reduction and it also helped in the management of waste materials.

VII. Conclusion

Rapidly growing Population and development of megacities is making waste management in India a major problem. Now the current scenario is that India is dependent on inadequate waste infrastructure, the informal sector and waste dumping that is necessary for proper waste management. The major issues associated

with public participation in waste management and there is generally a lack of responsibility towards waste management Indian in the community. There is a need to cultivate community awareness programmes and need about the change in the attitude of people towards waste and its management, as it is fundamental requirement in India to develop the proper and sustainable waste management systems that is important for neat and clean environment and good public health. Sustainable and economical needs require the waste management that must ensure maximum resource extraction from waste, associated with safe disposal of residual hazardous waste by the development of engineered landfill and waste-to-energy facilities. India is currently facing challenges related to proper implementation of waste policy, best waste technology selection and the more availability of trained people in the waste management sector. Until these fundamental requirements are not properly managed, India will continue to suffer from poor waste management and the associated issues that impacts on public health and the environment.

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