Solid Waste Management Review in India: State of the Art

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Abstract:

This paper addresses the study of the procedure on solid waste management in India. Since solid waste management comprises of several wastes such as manufacturing, farming, urban, transport etc. the traditional complicated manual system for SWM consumes large amount of money is spent annually. Hence requirement of high demand for a robust SWM system. An effort was made to supply complete analysis of MSW features, generation, selection and movement, disposal and treatment technologies.

Key words: Municipal waste, waste management, environment conservation

1.0 Introduction:

India is the second fastest growing economy and the world's second most populous region. India's population is projected. a rise of 42 percent in recent years from 1029 million to 1400 million over the period 2001-2028, at a pace of 5.2 percent annually. Roughly 852 million residents remain in rural areas, and 325 million in metropolitan areas [1]. The country's urbanization has accelerated in the last 50-60 years, from 26.5% to 38% which is projected to grow to 44% by 2026. A main attribute of India Urbanization reflects a remarkable population concentration in Class I cities, urban regions areas has a population of more than 1 million, as shown by the rise in metropolitan numbers from 23 to 35 in last year [2].

Rapid industrialization and population explosion have led to citizens commuting from villages to cities that produce regular thousands of tonnes of MSW. The MSW would rise in the immediate future [1] Bad selection and insufficient transport are liable in both corners for MSW accumulation. The MSW management is facing a crucial process due to shortage of appropriate care and disposal facilities in metropolitan towns daily. The disposal of MSW with out proper care leads to environmental and health problems. The big environmental issues in Indian mega cities are the handling the MSW without any safeguards. it requires the toxic waste storage, recycling and disposal. The MSWM framework consists of just four operations in most towns, i.e. The generation, storage, transport and recycling of waste. MSW management needs appropriate facilities, repairs and upgrade all operations. This is becoming more costly and complicated as population expansion progresses and also it is not expected. The environmental issues with the required standard of public service in urban centers are mostly due to the weak financial condition

2.0. Literature Survey

In 2007, Sharholy and Ahmad et al a research paper on the treatment of urban solid waste in Indian cities. The study emphasized that Qualitative and Quantitative research, features and composition, storage and selection, transmission and transport, Municipal Hazardous Waste disposals and treatment. The report ends with a few fruitful ideas that may support encourage the qualified authorities / researchers to further develop the new framework [3].

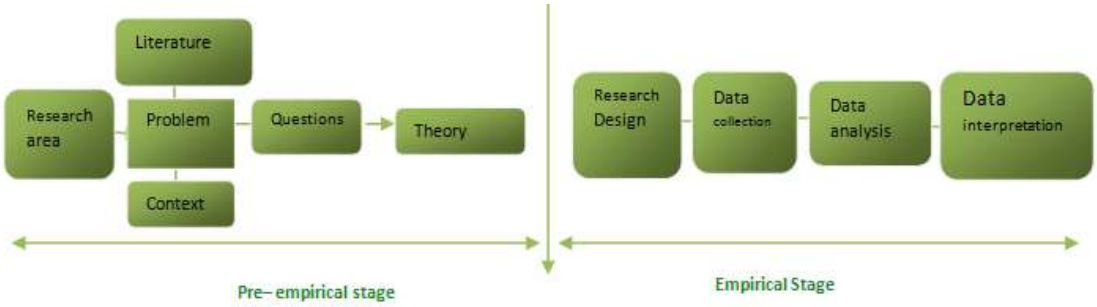

Figure 1 Qualitative and Quantitative research

In 2008, Vikash and Shreekrishnan assess the actual condition of urban solid waste management in Delhi. Since Delhi is the about 3.85% in India, inhabited and urbanized, 3.85%, almost doubles the national average. Delhi is also an industrial hub, provide work and drive urbanization, contributing to a subsequent rise in municipal production of MSW. The population of Delhi currently produces approximately 7 000 tonnes / day of MSW, which is expected to increase by 2021 to 17,000–25,000 tonnes every day. MSW administration remained one of the municipal areas most overlooked. Delhi method. Around 70–80% of generated MSWs are collected and the remain unattended on the roads or in small open dumps. Just 9% of the collected MSW is handled by composting [4].

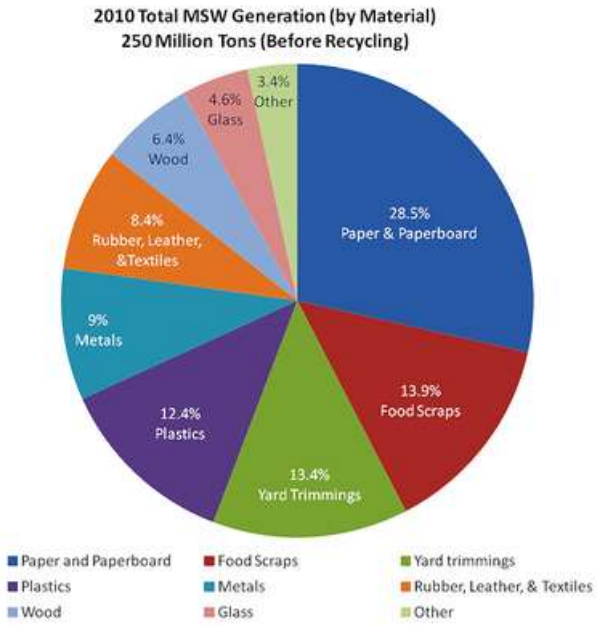

Figure 2 Total MSW generation

Hazra and goel et al., 2009 offers an outline of existing activities in solid waste management in Kolkata, India and offers solutions of the greatest issues towards SWM. In Kolkata Municipal Corporation, around 3000 tonnes / day of solid waste is produced. With the absence of adequate equipment (equipment and infrastructure) and waste generation rates under estimated, bad management and non-technological expertise, inappropriate to storage, urban solid waste is liable for inadequate collection and transport [5].

Figure 3 MSW generation in cities **Figure 4 MSW collection methods**

Municipal waste management activities in Kharagpur, a small town in West Bengal, were examined and suggested. Integrated strategy for solid waste disposal. Municipal Company generates 45mt / day of solid waste out of 95mt / day much of this waste is dumped on open land, in natural and constructed drains and thereby preventing storm water flow and pollution of groundwater. Further significant concerns include inadequate bin sites and badly built containers, badly conditioned recycling equipment, insufficient work force to move waste to the disposal facilities. There are 30 samples to collect, measure and use different parameters including humidity content, solids, organic carbon, reactive solids. The calorific value is evaluated. The vermi composting the safest strategy for treatment. Composting will help to divert more than 80% of overall waste and contribute to large volumes of waste. Savings in waste generation, storage and recycling rates. The residual waste could be disposed of in a manufactured site itself. The increased labour, transport inventory and enhanced treatment and recycling facilities have been suggested to manufacture the vermicompost in production site itself [6].

Narayan provides a comparison paper on Urban Solid Waste, Incineration and Composting Activities in India Control — From waste disposal to resource recovery. Take into consideration the expenses occurred the respective Governments can find the cheapest and safest feasible approach to the waste disposal problem [7]. Seema 2010 focuses on clean development mechanism (CDM) initiatives linked to urban solid waste recovery energy (MSW). In this work she also contrasted municipal questions, legislative system and CDM opportunities in India explain ways of recovery of resource description framework (RDF), composting and landfill gas. Comparative case analysis between brazil is also taken into account and India revealed that Indian sanitary landfills where methane can be collected and aim to establish more science places, extract methane and earn carbon credits [8].

Dimple 2012 provides a paper on the urbanization and management of solid waste in India., explained how urbanization is achieved in the article Fast population development, diminishing rural prospects and changes from a stagnant and low-paid agriculture to a More paid urban occupations lead primarily to urbanization. Unforeseen immigration has also contributed to an increase of slums and squatters and illegal

housing development in quickly expanding developed world cities. Urban growth It directly leads to waste production, and unscientific waste disposal creates health risks and deterioration of the urban ecosystem [9]. The rise in urbanization would make solid waste management, which has already become a major challenge in India more complicated. Lifestyle transition and consumerism rise. Financial limitations, structural failures, technological abuse and This condition has exacerbated civic apathy against Urban Solid Waste (MSW). In this study assesses existing procedures prevailing in India to cope with this solid waste and its relevant issues. It also points out plans for coping with this waste Safe, more sustainable approaches to prove a capital instead of pollution.

3.0. Conclusion

Since India is a developing country and has vast capital, but lacks knowledge of SWM techniques and facilities, Lack of commitment to the activities related to handling of SWM. The job opportunities are there in waste collection, proper handling of SWM. The strict regulations on the appropriate management and handling of waste should be implemented. The public involment is important for handling the SWM. The private and public sector roles play major to solve the SWM challenges The Indian context following waste to energy technologies of MSW, they are as follows: Bio methanation, vermi composting, Preparation of briquette/ pellets/ fluff as Refuse Derived Fuel (RDF), Incineration / Gasification for generation of power.

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