

Swachh Bhubaneswar Abhiyaan: A Revenue Generation Model of Bhubaneswar Municipal Corporation (BMC) from Solid Waste Management

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ABSTRACT

The waste generation rates are rising across the globe. Poorly managed waste serves as a breeding ground for disease vectors, contributes to global climate change through methane generation, and can even promote green house effect. Operating an efficient waste management is an essential municipal service which requires integrated systems that are efficient, sustainable, and socially supported. Bhubaneswar as a capital city of Odisha is surrounded by the challenges like increased population, rapid urbanization and expansion of industries. These factors contribute in creation of waste which is harmful both to the environment and human health, if they are not treated in a proper manner. The Bhubaneswar Municipal Corporation has come up with some smart and sustainable solutions to tackle the challenges of solid waste and to create revenue out of that. The study emphasizes on analyzing the steps involved in the solid waste management process which can be replicated in other cities dealing with similar issues.

Keywords: Solid Waste, Material Recovery Facility, Micro- Composting Centre.

Introduction

In developed countries, the rapid increase in the volume of solid waste has been emerging as a major cause of environmental pollution. In most developed countries, the existing method of solid waste management is unsustainable and unsuccessful (Pierce and Turner, 1994). The problems of air pollution in the form of green house effects, ozone depletion, water and soil pollution and acid rain are caused by this inefficient solid waste management (Visvanathan & Glawe, 2006). According to the World Population Prospects: The 2017 Revision, India is the second most populated nation in the globe, having a population of 134 crores, which accounts for almost 18

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percent of world's human population. However it doesn't have sufficient resources and adequate systems in proper place to treat the solid wastes.

Around the world, waste generation rates are rising. In 2016, the worlds' cities generated 2.01 billion tonnes of solid waste, amounting to a footprint of 0.74 kilograms per person per day. With rapid population growth and urbanization, annual waste generation is expected to increase by 70% to 3.40 billion tones in 2050. Compared to those in developed nations, residents in developing countries, especially the urban poor, are more severely impacted by unsustainably managed waste. In low-income countries, over 90% of waste is often disposed in unregulated dumps or openly burned. These practices create serious health, safety, and environmental consequences. Poorly managed waste serves as a breeding ground for disease vectors, contributes to global climate change through methane generation, and can even promote urban violence. Managing waste properly is essential for building sustainable and livable cities, but it remains a challenge for many developing countries and cities. Effective waste management is expensive, often comprising 20%–50% of municipal budgets. Operating this essential municipal service requires integrated systems that are efficient, sustainable, and socially supported.

The capital city of Bhubaneswar, Odisha, has been one of the most beautiful cities the country which is famous as the temple city of India. With increased population the city has been challenged by growing industrial trends and urbanization that increase migrated population from nearby districts. As a negative side effect of these changes, the generation of household solid wastes has also increased which is harmful both to the environment and human health, if they are not treated in a proper manner. The management of solid waste is the duty of the local government. It makes all necessary requirements in order to make collection of the wastes up to the disposal site (Rahji et al., 2009). It is the responsibility of municipality or local administration to provide good health and environment. The government authority must be the master planner for the management of solid waste and related issues through decentralization and/or privatization of solid waste management. Yet, the role of community participation in solid waste management cannot be totally ignored. Thus, an aspect of encouraging the participation of public and private sector as well as the community to the management of the issue is highly essential. Indeed, the municipality and related authorities were unable to render sufficient services as observed in different cities of some developing and developed countries due to certain unavoidable limitations.

Some of the problems are insufficient finance, unavailability of human resources, and lack of awareness among people to the management of solid waste. In Bhubaneswar City, some people dispose their waste illegally; they dispose it under bridge, in river, open places, sewer, etc.

Objective of the study

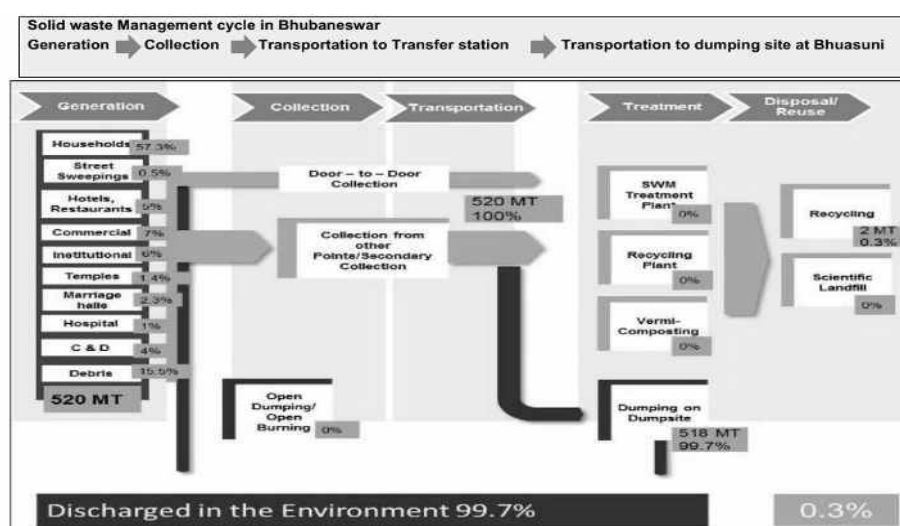
- To emphasize on the steps involved in the solid waste management process.
- To understand the revenue generation model of solid waste management implemented by BMC in the name of “Swachh Bhubaneswar Abhiyaan”.

Solid Waste Management Model of BMC

For the purpose of solid waste management to be carried out most efficiently, 67 wards of the Bhubaneswar Municipal Corporation (BMC) are divided into four packages and the

activities like solid waste collection &

transportation, conservancy cleaning, drain cleaning & de-silting are be put into practice. The solid waste management basically includes door-to-door garbage collection, street sweeping, transportation, drain cleaning, drain de-silting, conservancy cleaning, and bush cutting.



Source: City Sanitation Plan 2017 For Bhubaneswar | CDD Society

Collection of Solid Waste

Solid Waste collection is exercised by using Micro-pocket planning approach. On a daily basis, three private agencies operating under the Public Private Partnership (PPP) model perform all SWM (Solid Waste Management) activities in the 57 wards (out of 67 wards). M/s. Jagruti

Welfare Organization, M/s. Ramky Enviro and M/s. PMR Consortium Engineers are the three private parties engaged in Collection and Transportation of Municipal Solid Waste in Bhubaneswar City. Whereas, BMC is carrying out SWM initiatives on a daily basis in the remaining ten wards. The Households' mixed garbage is collected and sent to the dumpsite. BMC has engaged sufficient number of tricycles, trolleys and auto-tippers for door-to-door waste collection. The personnel engaged in door-to-door rubbish collection are provided with safety gears like safety vests, gloves, and masks for protecting themselves from contamination. Bhubaneswar generates about 520 tons of solid waste each day which are generated from different sources. In commercial areas, sweeping is done twice a day, including on Sundays and holidays. In the BMC's jurisdiction, night sweeping of main roads is also done by a private cleaning business partners using mechanical sweeping.

Transportation of Solid Waste

Tipper, trucks, dumper placers/compactors transport the MSW collected from various part of the city to Temporary Transfer Station (TTS). Implementation of online monitoring and tracking of MSW Management activities at BMC area under a PPP mode was taken up under Bhubaneswar Smart City Plan. Currently the BMC is tracking 65 vehicles as part of the project. Temporary transfer station (TTS) is located in an area of 25.806 Ac near Sainik School is being used as the TTS where the collected wastes are weighed and recorded. The payment to the private agencies is done on monthly basis based on quantity of waste collected & transported. All MSW collected at the TTS is transported by the private agency through tippers and heavy vehicles to the dump site (61.485 Ac) located at Daruthenga, Bhuasuni. The wastes so collected at land fill site are dumped and leveled in layers by BMC on a daily basis.

Solid Waste Treatment Plant

There were no operational solid waste treatment plants in Bhubaneswar till 2020 that could facilitate solid waste disposal by the utilization of modern and efficient devices and combining with different sorting methods to separate useful resources out from the municipal solid waste. The primary importance of these solid waste treatment plants is to convert the waste in to a useful form that have an economic value. These treatment plants play an important role in converting waste into wealth. As the waste treatment is concerned, there are two sets of treatment plants being made

operationalised by the Bhubaneswar municipal corporation in order to handle dry and wet waste separately. The BMC had planned to install 43 Micro Composting Centers (MCCs) convert wet or bio-degradable waste into compost and greatly help in addressing waste management issues in the capital city in the beginning of 2020 and subsequently, at the end of September 2021, 11 MCCs are in operation and successfully treating the wet or bio-degradable wastes in bio-compost in more sensible manner and cost-effective manner. Each MCC has the processing capacity of up to five tonnes per day. The equipments which are used to convert the waste into compost are shredder machine, conveyor belts, shivering machines, fly catchers' machines, insulators, compost pits, BOB Charging points, washing stations etc. The 11 MCCs are located at NICCO Park for Ward No. 55, Laxmi Sagar (Ward 32 and 33), Unit VIII (Ward 51), Sainik School (Ward 12 and 17), Unit – VIII (Ward 47), Prashanti Vihar (Ward 1 and 2), Pandra (Ward 18 and 19), Laxmi Sagar (Ward No 31 and 42), Nicco Park (Ward No 36), NICCO Park (Ward No 28 and 29) (see Figure 3.12) and at Bargarh (Ward No – 45). A Material Recovery Facility (MRF) is running in Sundarpada to handle dry waste that the corporation has collected. This project had been operationalised on a pilot basis and appropriate step will be taken to introduce and replicate success in other wards of Bhubaneswar in the future days to come.

Revenue Generation

The MCCs are converting the bio-degradable waste like kitchen waste, vegetable & fruits, leaves, etc. into bio-compost which are sold in the name of “Mo Khata” in the packet size of 5 Kg and 20 Kg and at a reasonable price of Rs.125 and Rs. 445 respectively. In MRF waste collected from the doorstep in a segregated manner is further segregated and various components of recyclable waste recovered from it for recycle or resale. The equipments or machineries were installed to convert the dry or non-degradable waste into usable materials. These usable materials are reprocessed into products, materials or substances. Recycling is one of the best and popular methods employed for non-biodegradable waste management. The waste such as plastic, paper, glass, iron materials and cloth can be recycled and has economic value as well. It also helps in reducing the waste being sent to landfills, supports deforestation and saves energy.

Future Implications

Awareness on environmental issues is crucial tool to tackle all the problems related to the environment in general. Therefore, environmental education at the lower level such as in schools and colleges is needed to develop public awareness on environmental problems; this will lead to public participation in the activities to avoid environmental damage in general. Awareness Campaigns and training sessions should be carried out on locality level that will focus on reduction in food wastage, saying no to plastic packaging, reduce electronic waste segregation of wastes, recycle bio-waste, reuse waste materials etc.

Cooperation among government authorities and companies/cooperatives in charge of sanitation and community participation are important aspects to the management of household wastes. More number of Material Recovery Facility (MRFs) and Micro Composting Centers (MCCs) units are to be established at the ward level. Waste workers can be involved in this process to collect waste from the households and can bring to these units.

Further, to stream line the process of solid waste management system, the priority should be given on strengthening the monitoring mechanism. Monitoring sheets should be prepared covering each process of solid waste management such as timings of waste collection, frequency of waste collection, route followed for waste transportation, trips per day of each collection vehicle, provision of covered vehicles, waste collection from community bins, labeling and compaction at dumping site etc.

Appropriate strategies must be adopted to promote the use of bio-fertilizer ‘Mo-Khata’ among the local citizens for in-ground and terrace gardening at their home. The Corporation should also increase the retail counters for ‘Mo Khata’ to make it available at convenient locations in the city. Awareness campaigns through door-to-door garbage collection trucks can be done for creating awareness about the benefits of use of bio-fertilizer “Mo khata”. The mass acceptance of this ‘Mo-Khata’ will make this solid management process an environmentally sustainable model.

Conclusion

The initiatives taken by BMC are in proper direction to manage solid waste in a sustainable manner. The corporation should also identify more efficient methods to manage the rapidly growing waste generated in the city. There are many innovative methods and solutions in the

pipeline to achieve solid waste management goals. To manage organic waste, composting is touted as one of the best methods, which if implemented in households, can greatly reduce the waste burden. There are biological solutions such as Organica Biotech's Soilmate, which helps in faster composting process and output. In the case of non-biodegradable waste management, plastic roads, for instance, is a great way to solve the problem of potholes in India. The recycled plastic in combination with bitumen can be used for constructing roads. Also, the non-biodegradable waste contains energy. Various scientific research, studies and innovations are happening in this field to use this energy and replace fossil fuels with it. As mentioned before, using effective solutions such as recycling and incineration can help in efficient non-biodegradable waste management in India. In addition, better awareness and mindset towards controlling non-biodegradable waste at an individual level will support the cause. It will further help in protecting human health as well as the environment.

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