

PLANNING FOR DECENTRALISED SOLID WASTE MANAGEMENT IN VARANASI

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Abstract - Varanasi, the most religious city of India and a tourist destination of International reputation needs to develop an appropriate strategy to manage its waste effectively. It should have a self-contained and decentralized SWM system, so as to make Varanasi healthy & beautiful. This approach leads to subsequent reduction in land requirements for dumping of untreated waste. It is imperative to note that up to 95% reduction can be achieved for land required for sanitary landfill sites alone by 2038, if decentralized waste management practice is followed efficiently.

Decentralized approach is not only sustainable & financially feasible but it also helps in improving the value of life and living conditions of the waste pickers. It can be achieved through citizen's participation which consequently contributes to environmental sustainability and economic efficiency. Zero waste approach should be introduced to minimize the waste and change in the consumption habits of the people. Government should prepare the plan for recycling products which encompasses the quality of products and guidelines to the recycling industries. The thought of Reduce, Reuse and Recycle need to be reconsidered and 6Rs need to come in place. So that, energy & physical recovery will be occupied very seriously.

Key Words: Decentralized, Zero Waste Management, SWM, Sustainable cities, Municipal Corporation.

1. INTRODUCTION

SWM is the basic & significant service provided through municipal authorities in the country to make urban areas clean. The framework used is unscientific, obsolete and wasteful; population coverage is low; and the poor are often as disregarded. Kashi, a city of high religious significance has similar problems of solid waste like our other Indian cities.

The municipal waste of the city is mainly comprised of waste made from family unit, markets, business foundations, lodgings, medical clinics, and little scope ventures in the city. Apart from these, several types of religious ceremonies performed at the Ghats generate a variety of wastes, ranging from flower and puja wastes to human ashes. In Varanasi the arrangement of door to door assembly of wastes is not observed in all parts of the town. Public pitch their wastes into the roads which are then collected by the safai karamacharis. The whole waste produced in the city is to the tune of 600MT produced at the amount of 0.46 Kg per capita per day.

2. SOLID WASTE GENERATION & COMPOSITION

Overall waste generated comprises 51% biodegradable waste, 31% recyclable materials, 4% domestic hazardous waste. This is due to the high quantum of religious and vegetable waste along with the high amount of plastic waste. It has been estimated that the flower wastes in the town per day is to the tune of 4.3 MT per day.

The Ganga river acts as city level dustbin for maximum of the flower and puja wastes generated in the city. This is a potential hazard for the town and the river alike. Highest proportion of organic waste is further increased by high number of pilgrimage tourist. This can be efficiently planned by providing Compost pit through which the problem can be solved.

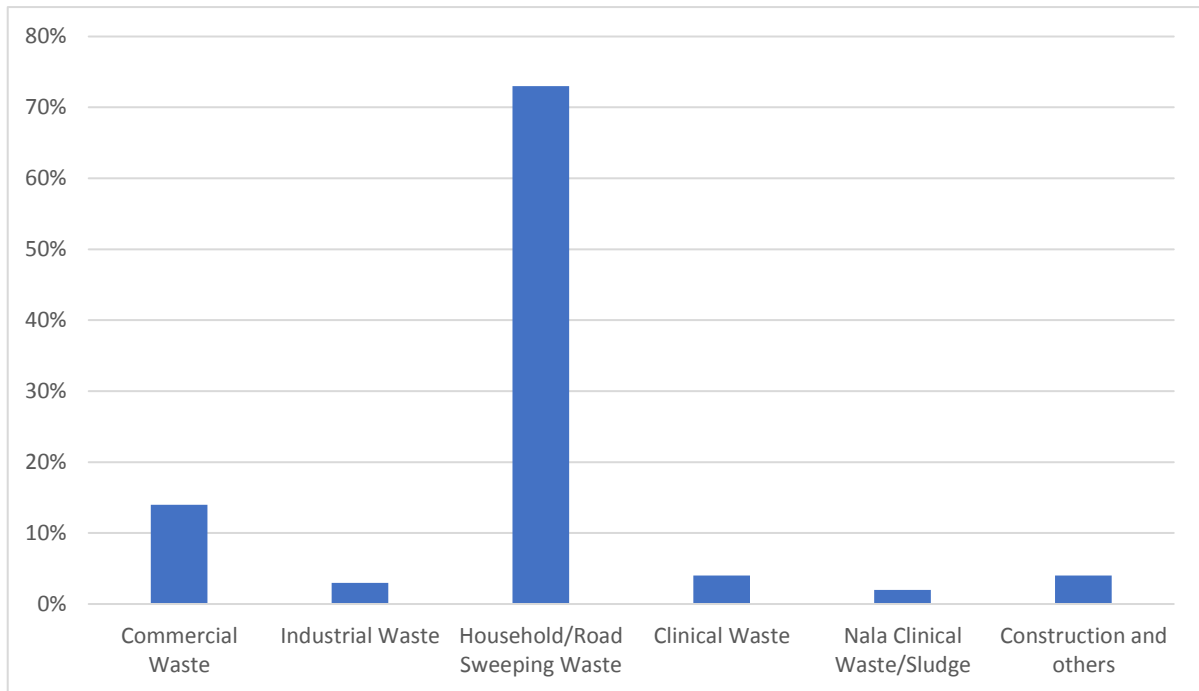
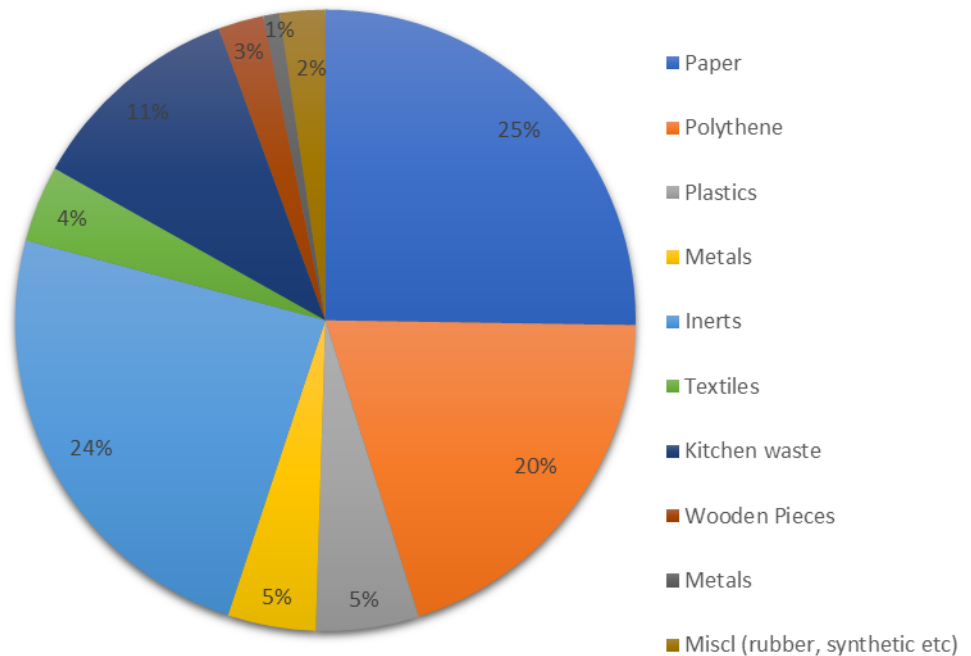


Chart-1: Percentage composition of solid waste generation from different activities

Solid Waste Composition



Composition of Recyclable waste

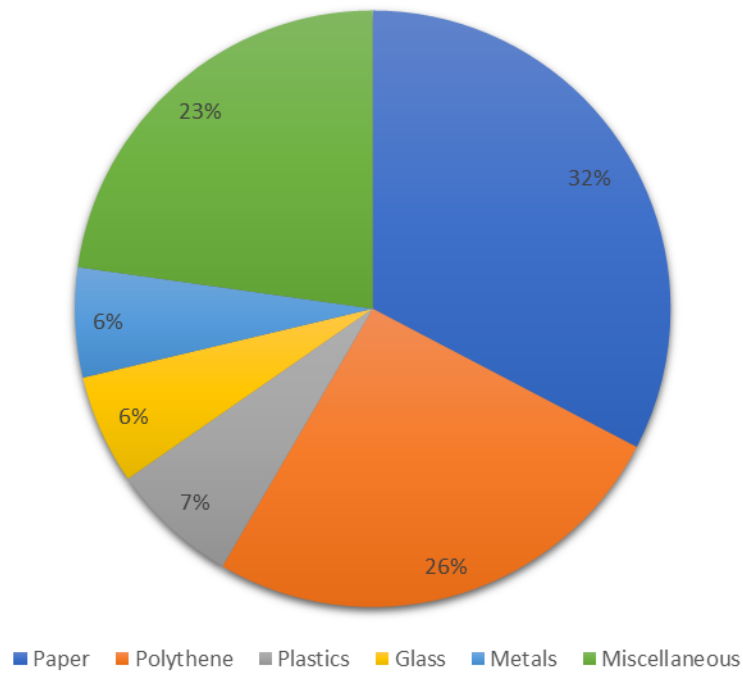
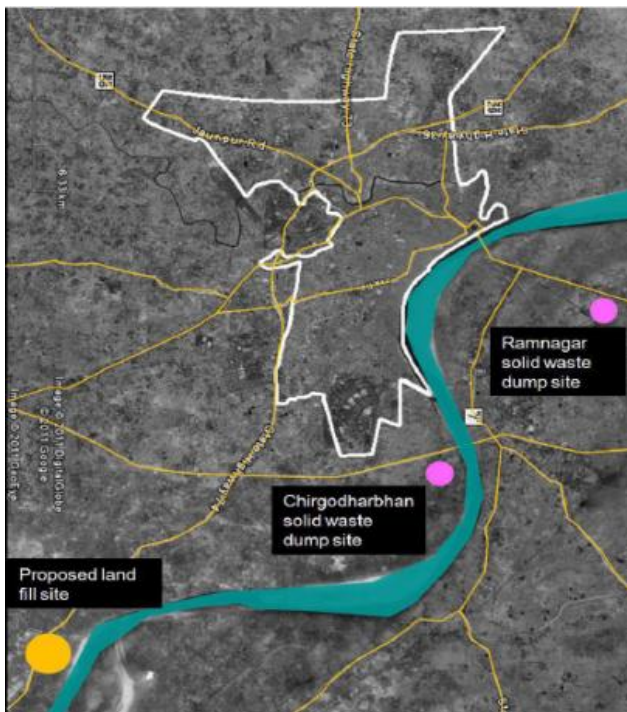


Chart-2: Composition of waste

3. EXISTING SOLID WASTE MANAGEMENT SYSTEM



- SOLID WASTE DUMPING SITE IN KARSADA
- DESTROYED DUMPING SITE IN RAMNAGAR & CHIRGODHARBHAN

Fig-1: Location of Solid waste dumps

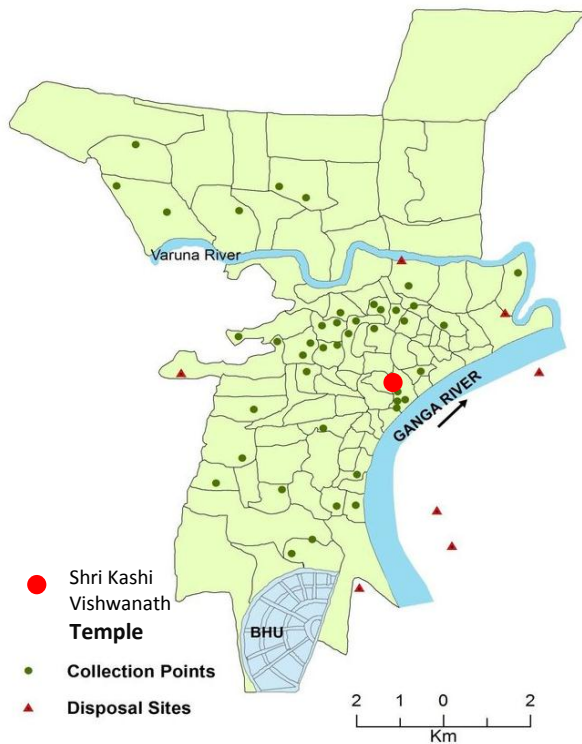


Fig-2: Solid waste collection points and Disposal sites

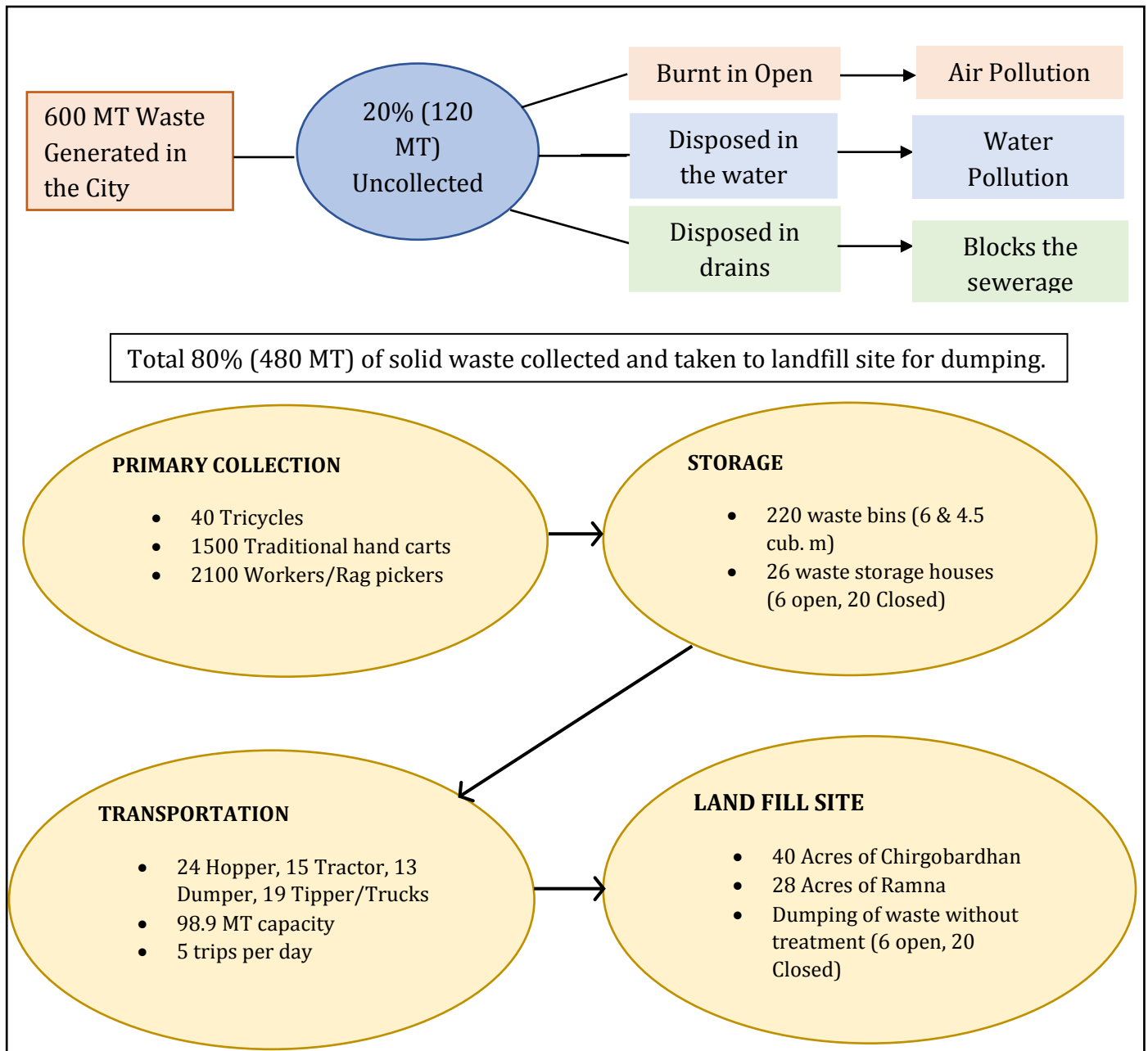


Chart-3: Solid waste management system of Varanasi city, 2019

Collection: VMC employs 21,00 permanent & prescribed employees for road sweeping. In the nonappearance of door-to-door group facility in all the wards of the town and absence of preparation of waste loading at source, mainstream of the waste is collected by road sweeping.

Storage: Waste from garbage bins and secondary collection stations are loaded into dump trucks by various shovel loaders or manually transported to the final disposal site.

Transportation: The overloaded waste is elated to concluding disposal sites by open tipper trucks. Meanwhile various trucks have no sheets or plates covering the back of the vehicle, most of the garbage keeps spilling on route.

Processing and Disposal: The 600 TPD solid waste processing plant at Kharsada was installed in June 2016 by IL&FS and is being operated by NTPC on contractual basis. The technology of treatment is RDF and windrow composting. Presently, none of these is working and it is just openly discarded at the site.

At present there are two dumping sites near Ramnagar and Chirgobardhan and three disposal sites.

4. INSTITUTIONAL STRUCTURE

SWM is a personal hygiene service of a city which is owned, operated and maintained only by municipal companies. Health inspectors, health supervisors and Safai Karamacharis are in charge of the company's health and sanitation department. Although not all sanctioned positions are currently unavailable, only 2,100 of the 3,200 sanctioned health workers are employed. There are 140 approved positions in the health inspector group. Varanasi Municipal Corporation does not have a department specifically responsible for environmental management; and various departments usually perform this function on a temporary basis. Environmental protection organizations play the same important role in the city's SWM.

5. ISSUES, STRATEGIES AND RECOMMENDATION

City level Issues and Strategies can be categorized on the basis of various parameters such as City morphology, Waste composition, Waste management process, Institutional mechanism, Land use, Temples, Slums.

5.1 Issues:

- Collection of waste from narrow and organic pattern streets in core city areas and Ghats.
- In case of no segregation, Domestic Hazardous waste spoils 80% quality of biodegradable waste.
- Lack of manpower, technology and infrastructure. unscientific disposal of waste.
- Lack of awareness among officers, supervisors & other employees about rules and guidelines of SWM.
- Unavailability of trenching ground/suitable land area. Municipal Solid wastes are dumped on roadside.
- Wastes coming from temples area unaccounted by VMC (Varanasi Municipal corporation) and these are being immersed into the rivers.
- Most slums are untouched by VMC services resulting in burning of waste, disposed in drains and water bodies.

5.2 Strategies:

- Segregation at household level or at source with dual bin systems a D2D collection.
- Social awareness among people about importance of source segregation.
- Introducing decentralized waste management system might be the solution.
- Need of community participation and expert for leadership.
- Source segregation, D2D Collection, Introducing Home composter can be helpful.
- Recycling of flower waste within campus & impose ban on plastic bags.
- Integration of rag pickers in SWM & Need of community participation with expert advice.

5.3 Recommendations:

The decentralized SWM system is also called a community-level waste management system. It reduces the burden of handling large amounts of municipal solid waste in a centralized location, and correspondingly reduces the cost of transportation, intermediate storage and waste disposal of urban local agencies. From household level to every community level, it is the consumer/producer responsibility to treat and dispose each product that is used at the source only. The overall mechanism is monitored by RWAs (Residents Welfare Association)/NGOs (Non-Government Organization)/CBOs (Community Based Organization).

Waste segregation at source has to be made compulsory and dual bin system for waste segregation at source level. Organize door to door collection in entire city, and waste to be collected daily from all the located dustbins. Increasing the area covered under SWM System, Provision of waste bins and social awareness through IEC campaign's, seminars, street plays and etc and also Elimination of manual handling of waste and provision of Personal Protective Equipment (PPE) to employees for protection against health and safety hazards. Increase in numbers depending upon area of wards and maintenance by VMC,

Dedicated space for processing non-biodegradable waste collected through street sweeping to recover into commercially valuable materials. Compactors to be used for reducing waste and high capacity vehicles for carrying waste from Storage to landfill site, Mechanized transport systems for hydraulic loading/unloading of waste. Conversion of existing Dumping yards in Scientific Disposal Sites to dispose inert waste and hazardous waste, adopt proven technologies for waste processing such as, waste to compost plant, waste to energy plant, bio-gas plant, wind-row composting and other technologies for reducing waste that is coming to landfill sites.

6. ZERO WASTE CONCEPT

Zero waste is an idea that inspires redesign of resources life cycles so any trash sent to landfills and incinerators is minimal, thus Zero waste process is similar to reuse of resources in nature. Implementing zero waste will eliminate all emissions to land, water or air, which poses a hazard to the welfare of the world, humans, animals or the world. Regrettably, zero government regulations do not support the implementation of waste sorting, reduction, recycling and recycling laws.

6.1 Zero Waste Management Approach

The first step to zero waste management is minimizing waste disposal at landfills, followed by minimizing waste generation (i.e. reduce) and meanwhile maximizing reuse, recycle and recover of waste to maximize resource recovery from waste. The zero-waste is a reduction of 10% of waste would contribute towards sustainability. The cycle of use, reuse, repair and recycling ends when it is wasted.

6.2 Zero Waste Management Analysis

Waste stream assessment is used to determine the quantity, source and composition of waste streams. This information is needed to make planning, design, contract, financial and regulatory decisions. Managing resources is managing discards. The quantity is in units of weight and volume. Knowing the estimated annual and seasonal generation rate of human discards will help make many important decisions. Discarded materials can be divided into twelve categories: reusable items, paper, plant residues, decaying wood, wood, ceramics, soil, metal, glass, polymers, textiles and chemicals.

7. CONCLUSIONS

Whether the decentralized waste management model is effective is still inconclusive. Although, there is still a gap in fully handling it. All of the aforementioned cases announced in this study did not have any different processes anywhere. Therefore, if we compare and concentrate and disperse, both types will end up in landfills. In both cases, only the number and type are different. Through classification/classification, the concept of segregation will become clear, which will lead to a zero-waste category. This means that there is actually only a small amount of work done to include and even inspire such colonies that successfully dispose of their waste.

According to the 74th Constitutional Amendment, the role of sanitation has been allocated to municipal companies among 17 other useful areas. In order to be able to accomplish this task, a suggestion was made that the rubbish mafia opposed the decentralized SWM, but it did nothing to the community and the environment.

The idea of 3R needs to be reconsidered, and the idea of 6R needs to be implemented-rejection, reduction, reuse, supplement, replenishment and recycling. Therefore, the recycling of energy and materials will be very important.

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