

Solid Waste Management: Adopting Green Indigenous Approaches

Astha Naval¹, Pratishta Rao²

^{1,2}Research Scholars, Dept. of Political Science, Banasthali Vidyapith, Tonk (Rajasthan) India.

ABSTRACT

The paper focuses on describing the importance and efficient ways of Solid Waste management. According to the Ministry of Urban Development. Solid waste comprises the garbage that is simply discarded by the public ranging from biodegradable waste, recycled waste, domestic waste, Construction and Demolition Waste, Inert waste, Toxic waste, etc. The accumulation of Solid waste results in piles of garbage making mountains and landfills. This is creating a hazardous health situation not only for humans but for other organisms as well. Diseases like Tuberculosis (TB), pneumonia, diarrhea, tetanus, cough, viral fever is more prominent than ever due to lack of waste management. Solid waste management is the need of the hour for living a sustainable life. Solid waste management is an initiative to use the waste that can be Recycled, Reused, Refused(3R). With the increasing industrialization, urbanization, the heaps of garbage or waste are touching the sky, for example, Deonar's Rubbish Mountain (Mumbai), Gazipur Landfills (U.P), etc. This paper also throws light on the solutions that can be opted at the national level like – Elimination waste in Gorai Dumping ground experiment by Birju Mandra and S.R Maley or at the Institutional level like Mumbai TATA institute, Mumbai opting for a biogas plant in their campus canteen. And at the local level -Vengurla in Sindhudurg district, Maharashtra, and Chotta Narena in Ajmer district, Rajasthan are setting examples for managing waste efficiently. Lastly, A humanistic approach has been adopted where the life of a sanitation worker is used as a case study. The aim is to promote the idea that "cleanliness starts from home". The story of Ashwin Malwade and Nupur Aggarwal, an eco-conscious couple has been included to justify that not only the proper implementation of institutional policies is required but active participation by citizens is the prime need. It highlights that responsibility is not one-sided. At the primary level, waste is generated from home first which makes us think about what we are doing as a human to manage the waste.

Keywords: - Waste management, Solid waste management (SWM), Biodegradable waste, landfills, Biogas plants, Compost pits, Revenue, Eco-Conscious.

“We are living on this planet as if we have another one to go to!”

-Terry Swearingen.



Fig. 1 Separating waste atop a mound of garbage at a landfill in Delhi last month. Credit-Soumya Khandelwal for The New York Times

I INTRODUCTION

India's way of life has always included self-care and cleanliness as its culture. We have hygiene practices that have been here for centuries now like removing shoes/slippers at the entrance of a house. Even our Vedic philosophy says that cleanliness is godliness. But it is the irony of ironies that a country whose gods are worshiped only by the cleanest means; can be its own worst enemy when it comes to cleaning up. Despite the progress made in open defecation-free cities and villages, solid waste management is at times a far cry from conscientiousness.

While we plan holidays we think of countries like Paris, Switzerland, etc. but not India. The major problem for tourists in India is its lack of sanitation. It's a common norm in the world that India is a country in which people defecate on roads. Our country is so dirty that it's becoming a no-go zone for tourists. To solve this problem, we just need to integrate various government initiatives like Swachh Bharat Mission, Aatmanirbhar Bharat, Green India Mission, Waste to Energy, etc.

According to the Ministry of Urban, Development India produces 1.7 lakh tons of waste daily i.e., 62 million tons of waste annually, and to manage this much amount of waste a lot of money is required. So as an easy way out only 20 percent of the collected waste is processed while the remaining 80 percent is dumped in the landfill sites. These landfill sites are often near villages. Thousands of acres of land are being used as dumping grounds still they need more. In some, villages these dumps are even 80 to 100 feet tall. Now the condition is such that we have to take permission from airport authorities regarding this. Many health problems are arising due to these huge mountains of garbage. The poisonous water i.e., leachate coming out of it is very dangerous.

To understand the danger of this situation we first need to elaborate on the real problem.

II SOLID WASTE MANAGEMENT

"Solid waste is the discarded leftovers of our advanced consumed Society."

-By Jimmy Carter

"Solid waste" is the garbage or the useless and unwanted products in the solid-state derived from the activities of and discarded by society. It is generated either by-product of production processes or produced from the domestic or commercial sector where any objects or materials are discarded once used.

"Solid waste management" is the handling of solid waste from its inception to its final disposal. This means that it encompasses every phase of the lifecycle of solid waste, starting from its very generation or birth and ending with the actual disposal site where it will be disposed of into the ground, underwater or in the air, in a safely and cost-effectively manner.

The Ministry of Urban Development broadly categorized solid waste into five categories as-

- (a) **Biodegradable waste:** food and kitchen waste, green waste (vegetables, flowers, leaves, fruits), paper (can also be recycled).
- (b) **Recyclable material:** paper, glass, bottles, cans, metals, certain plastics, etc.
- (c) **Inert waste:** construction and demolition waste, dirt, rocks, debris. Composite wastes: waste clothing, Tetra Packs, waste plastics such as toys.
- (d) **Domestic hazardous waste** (also called "household hazardous waste")
- (e) **Toxic waste:** medication, e-waste, paints, chemicals, light bulbs, fluorescent tubes, spray cans, fertilizer, pesticide containers, batteries, shoe polish.

The management of this waste is extremely important for the well-being of our health and economy. If handled poorly it can result in a curse and if handled properly it can even be a booster for our green economy. This waste can be converted into wealth. However, poor solid waste management leads to contamination of water, soil, and air. This can cause various health problems, ranging from skin diseases and respiratory ailments to more serious conditions such as cancer and damage to the nervous system.

Solid waste management is an essential part of sustainable development and plays a major in improving the quality of life. It is a vital public service.

III LANDFILLS, GARBAGE MOUNTAINS – THE COMMON SIGHT IN INDIA

Some cases prove that the accumulation of Waste results in landfills, a mountain of garbage, and unfortunately, at every end of the road you will witness piles of waste that contain waste that's not hard to decompose but put people living near to it, animals and especially the waste cleaning workers are at risk of incurable diseases, allergies and a lifetime of illness.

The following examples are some case studies that show that "Dumping grounds" are in requirement of immediate attention: -

(a) **Deonar's Rubbish Mountains (Mumbai):** - The fact that it is filled with 16 million tons of trash makes it disturbing. 8 of them unfold over a 300-acre sprawl - this is stated to be India's biggest and oldest. Waste is accumulated as highly as 120ft (36.5m). The decomposable waste now no longer most effective releases noxious gases which include methane, hydrogen sulfide, and carbon monoxide however additionally in 2016, it erupted in fires that burned for months and brought about smoke in a lot of Mumbai. Rubbish fires at landfills contributed 11% of particulate matter, a number one cause of air pollution with in the city, in line with a 2011 test through India's pollution regulator.

(b) **Landfill (Ghaziपुर Uttar Pradesh/Delhi):** - It is estimated that in near future it will be taller than the Taj Mahal. The Ghaziपुर landfill spans throughout a place of 70 acres, same to forty soccer pitches. East Delhi's superintendent engineer Arun Kumar advised information business enterprise AFP that the Ghaziपुर landfill is already extra than sixty-five meters or 213 toes high. He added that it rises by nearly 10 meters every year and if it continues to rise at this pace, the dump will be taller than the iconic Taj in Agra at 73 meters high by 2020. The company additionally quoted some other professional with the municipal employer who claims that almost 2,000 heaps of rubbish are dumped on the Ghaziपुर landfill every day.

(c) **Sewapur Landfill (Jaipur):** - The door-to-door collection of the garbage but the poor management results in this epidemic landfill in the capital of Rajasthan. Even though five years back the state clearly stated that segregation of waste is the need of the hour. But no prominent action has been taken locally and institutionally. Every day, 1,400 metric tons of garbage is generated in the city, and approx. 800 tones dumped in Sewapur landfill. And not to mention, the Mathurdaspura Site was approx. 700 tons of waste is thrown.

The city also witnesses Dirty water due to increasing urbanization and industrialization that leaks the liquid toxic waste in the Amani Shah ka Nala. Even from distance, you can smell the toxic water and from the near you can see how the water is turned into pitch green dark, where plastic is swimming on kits surface and the mosquitoes are giving birth, making dengue and malaria a common disease and putting people at risk.

According to (Das et al., 1998) in India, more than 90% of the MSW generated finds its way to the landfill sites, often in the most unhygienic manner possible. A 2020 study by a Delhi-based think tank, the Centre for Science and Environment (CSE), found 3,159 such mountains containing 800 million tons of rubbish across India.

IV SUCCESS STORIES OF TRANSFORMING 'WASTE INTO WEALTH'



Fig. 2 it is not just waste but Green Energy, Credited- Astha Naval

- (a) **An Effort to eliminate waste in the dirtiest dumping ground** - Gorai Dumping Ground in Mumbai's Gorai area near Borivali. The solution proposed by a senior scientist, S.R Maley, and his associate, Birju Mandra became a nationwide sensation when they first appeared in Satyamev Jayate, a popular T.V Show hosted by Aamir Khan on star plus. They leveled a huge mound of waste using bacteria and flies, thus converting soil out of the garbage by using the phenomenon of composting. The experiment was conducted on Gorai land, they experimented on a small patch of Gorai ground. They leveled 80 feet high garbage mound in just 60 days. The cost of this experiment was very feasible i.e., 6.9 lakh per hectare, costing 3 crores for the entire Gorai ground. The experiment initiated the process of sanitization with herbal products. They used enzymes and put them in the dump and then flies and maggots eat everything for composting. These flies turned garbage into the soil in 60 days as mentioned earlier. Later, 70 crore technique was used but it ended up providing a blanket covering the landfill underneath. Thus, end up with a temporary solution. It lacks innovation and hope that "Garbage can be a garden".
- (b) **Campuses going green** - While, giving Gorai Dumping Ground example, where two individuals with their scientific knowledge and dedication to the cause set up as an extraordinary example. Institutes like Mumbai Tata Institute show that as an institution they can change waste into wealth. Like: - The Mumbai Tata Institute of social science canteen has BIOGAS PLANT in their backyard. The aim is to use kitchen waste like rotten vegetables and fruits, vegetable and fruits peel, water used to rinse pulses and rice, eggshells. Even grass, gobar (animal dung), dry leaves, etc. can be used. This way Biodegradable waste is utilized and what was once the product of earth ends up being a part of it or used as an energy source. They use this technique to generate energy to cook food. It has saved the institute close to 4000 kg LPG. BARC (Bhabha Atomic Research Centre) Scientist Dr. Sharad P. Kale. Following this, it is the University of Hyderabad that convert 3-3.5 heaps of waste into assets each day. The Pune University installation compost pits inside the campus. It is controlled with help of waste pickers best who paintings who are associated with the organization SWACH.
- (c) **Villages getting cleaner**-Vengurla in Sindhurdurg district, Maharashtra: - it is one of the only towns in India that generated revenue out of waste. It turned a landfill into a Waste Management Park. the town with a population of 15,000 adopted waste

segregation in 2015 and has achieved 95% segregation till now. AN income of about R. 1.5 lakhs is generated by the local body of the town by simply processing 7 tons of waste. the man that made this impossible task possible is Ramdas Kokare, who became Vengurla's chief officer in 2015 and believes that without active public participation clean town is a dream only.

- (d) **Chotta Narena village in Ajmer district of Rajasthan:** - It made the state proud and shows that every villager where caste hierarchies were put aside and cleaning become their regular motto. 50% of 400 households in the village practices waste segregation. The wet waste is composed and dry waste is sent to recycle. The dry waste is stored in a room on the outskirts of the village and later sold. The wet waste was converted into 200 kilograms of manure every month by using 4 composite pits which were made in the village itself. In fact, Rs.40 lakhs were invested through the contribution by the community. It is the first plastic and waste-free village of Rajasthan State.

V A HUMANISTIC APPROACH

- (a) **Case study of a Sanitation Worker** - Monu, a 28-year male having a wheatish complexion and covered in dirt when asked how he is doing sanitation work when it comes to the risk of fatal illness. He looked and smiled stating that it's his regular work and only work which provides him income and supports his family. if he will think about consequences then who will feed his family. He says he has a 7-member family in which he is the only breadwinner. his wife Sushma supports him sometimes in the work but he refuses to take her help. As she will get ill, who will take care of his bedridden old parents and children? Further, he says that if he will not remove this garbage. Who will? He questions me -“ aap to nhi kroge didi? aap bade kaam krte ho.” He says “hum chote kaam krte hain, pr izzat humari bhi hai” (we might be doing bottom work but we deserve a dignified life). He narrates an incident where he didn't come to collect garbage door to door for two consecutive days. One SAHAB OR Mr. abused him saying kaam krte nhi aur paise lene aa jate hain. He hardly gets 50 Rs. Per house. He didn't argue back and didn't receive money on time. He claims that he was ill and even has a repository disease. he was not comfortable in sharing details He says that he has to put his hand in the garbage that is a mix of wet and dry waste. Sometimes, they don't eat or drink for hours as they are always covered in dirt. We collect garbage at every doorstep during the morning and get

a meager salary for it. he however complains that if every household takes responsibility for removing fatal objects like glass or rusted steels, tins which are recyclable and put wet garbage aside. his work might become less hard. It's children's diapers, blood-soaked cotton, and menstrual pads, and adding to a pandemic, the used masks and gloves make him uncomfortable. he doesn't want his children to do the same job who are learning in a gov. school. At the end Monu quotes – “Waise humein koi dikkat nhi hai is kaam se pr kachara hatana hum sab ki zimmedari hai. Haina Didi?” (I don't have any objection to this work but to remove waste is every individual responsibility. Isn't it sister?) Monu's story leaves us with a question we can blame institutional government but by doing so are we covering up our responsibility as a human. We can change the whole scenario and can be a game-changer even in our locality by simply segregating WET and DRY waste, making it easy to be Reused, Recycle and Reduce the waste by using Kitchen Kachara or garbage either in the garden or decomposing it in a pit can provide fuel. A woman named Durgesh Nandini is a homemaker and believes in Zero waste. Her whole Family is a Zero waste family since 2015. She started her journey by segregating the waste and her dustbin was her research subject. She adds that urbanization has made her zero-waste motto a goal that is hard to gain but not impossible. In the packaging industry, products rolled in plastic containers, plastic bags are hard to replace but she is trying to replace them with unbleached cotton drawstring bags, she replaced personal hygiene and cleaning products with homemade solutions created with kitchen staples. Here, a small Hindi poem by ASTHA NAVAL narrates the story of every sanitation worker and question us why we are neglecting our individual duty not only as a part of civil society by as a human first: -

वो समाज का अभिशाप नहीं वरदान है,
वो बीमारियों का घर नहीं, जीवनदान है।
जहां गीला-सूखा कचरा अलग करना था ज़िम्मेदारी हमारी,
वहाँ वो गंदगी समेटता फिरता था तुम्हारी।
हमारी ज़िम्मेदारी ढोने वाला,
वो दीदी नहीं, वो भैया नहीं बुलाया जाता है,
वो कचरे वाला कहलाया जाता है।

- (b) **A story that inspired to go ecofriendly** - Most of us would love to live a life shunning waste and reducing our footprint on the planet. But, for many of us, this becomes more like a pipe dream than an achievable

goal. Whether it's a lack of self-motivation or simply not knowing where to start, achieving an eco-friendly lifestyle is far easier said than done. However, for Ashwin Malwade and Nupur Aggarwal, an eco-conscious couple from Mumbai, India these goals became not only their reality but also the inspiration behind their business venture. Green MyNa, the latest addition to the country's emergent 'go green' group, is a startup that hopes to address the problems of environmental issues associated with the extravagant Indian wedding; most especially, over-use of plastic. Normally a wedding can lead to 200-300kg of plastic waste and almost 150-200kg of food waste. The couple asked their caterers for no wastage of food i.e., the leftover food was sent for composting while the extra fresh food was distributed among the poor. The major plastic wastage is seen in wedding decor but they decided to decorate everything from recyclable materials. Marriages are the most beautiful part of one's life and GREENMYNA is making them beautiful for our earth's life too.

VI WAY FORWARD

Solid waste management is a way of sustainable living. We should realize that waste is a resource in disguise. Various government policies and initiatives to curb the dangers of unattended solid waste look good on paper but in reality, the major drawback is in their implementation. Often foreign practices like incineration are imposed on us who is completely alien to Indian waste management needs. Unlike foreign countries, we create more than 70 percent of wet waste instead of dry waste which can easily be converted into green energy but burning them proves to be a huge burden on our environment. The waste which could be used as a resource is now increasing our carbon footprint. These problems can be solved by using local methods invented by Indians. However, it's well known that such green methods require a sustainable structure as well but changing a few habits like segregation of waste and formation of community Bio plants in societies can help in improving most of the problems. Local NGOs and other organizations together can work for it. Government can give incentives for segregation; various tips can be given by officials through newspapers and other mediums to use resources sustainably. For example, attaching an extra tank with water purifiers to use the wastewater for cleaning, etc. can be made compulsory. Practical activities can be added to the school syllabus to save resources, an extra tax deduction for green companies is a very good step ahead.

Our aim is not just to clean our country superficially. We need practices that can make ourselves sustainable. Every waste generated should go back to nature without harming it. By merging Swachha Bharat with Green India Mission we can adopt practices that are helpful for our green economy and then not just the roads but our environment will be clean too. And, for this to happen we need that this wave should start from our homes themselves. When more than 130 crore people will take one step ahead it will cover a very long distance. So, the most important thing right now is to start everything from ourselves.

"Earth provides enough to satisfy every man's need, but not every man's greed."
-Mahatma Gandhi

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