STRATEGIES FOR THE WASTE MANAGEMENT IN INDIA

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ABSTRACT

This paper speaks about waste management in India. How the waste is disposed of and recycled in India. India widely use the landfill method to dispose the waste. The various problem is arise by using this method. This method is harmful to the environment and it cause various diseases to the people living in the nearby area. Different method is used to dispose and recycle the waste in other countries. These methods is reduce the landfill waste and it create very useful resource for the people. By using this this methods India can reduce the landfill waste and protect the environment and people's health. Some of these methods improve the economic state of our country. Recycling the waste is the important process of the country but 90% of the waste of our country is not recycling. This Article deals with the Recycling the waste, Waste management in India, Landfill waste in India, Waste generation in India, Other recycling methods used in different countries, Sweden, Netherlands, Brazil, Waste to energy plant in India.

INTRODUCTION:

This publication provides an overview of the reasons and ways to better manage garbage or other household waste in India. Recycling is the key point to manage the waste. Reducing the waste and reusing items will increase the way to reduce your impact on the environment. The most impactful approach to waste reduction involves prevention at the source. Crafting new products releases greenhouse gases, contributing to climate change, while consuming substantial materials and energy. This process entails extracting raw materials from the Earth, manufacturing the product, and transporting it to its destination. Consequently, prioritizing reduction and reuse proves to be the most efficient means of conserving natural resources and safeguarding the environment.

RECYCLING THE WASTE:

The concept of waste has evolved over time. It's no longer viewed merely as discarded material; instead, it's seen as a valuable resource capable of generating significant revenue. Waste management goes beyond reducing landfill waste; it also addresses our dependence on fossil fuels. Globally, numerous countries are actively researching advanced technologies to harness the potential of waste. Proper waste treatment, or sustainable waste management, is crucial not just for sanitation but also for its economic and environmental benefits. This includes its potential to contribute to energy generation, particularly in developing nations like India. Many developed countries have adopted integrated waste management strategies to maximize revenue from waste, including energy, fuels, heat, recyclables, value-added products, and chemicals. These strategies also create more job opportunities and business prospects.[1]

WASTE MANAGEMENT IN INDIA:

The solid waste management industry in India has experienced substantial growth recently, propelled by the government's emphasis on cleanliness and sanitation. The combination of a growing population and rapid urbanization has led to a significant upswing in waste production, necessitating efficient and sustainable waste management methods. The government's Swachh Bharat Abhiyan (Clean India Mission) has been a catalyst for this sector, fueling the demand for

[1] Adam Augustyn - Recycling - Britannica, (October 07, 2023, 03.15 P.M) ,https://www.britannica.com/science/recycling

waste management solutions. Projections indicate that the Indian solid waste management market is poised to grow at a CAGR of 7.5% from 2021 to 2026, driven by factors such as urbanization trends, heightened awareness of waste management, and increased investments in waste management infrastructure.

India ranks among the top 10 nations globally in the generation of municipal solid waste (MSW) due to rapid urbanization, economic growth, and increased urban consumption. According to a report from The Energy and Resources Institute (TERI), India produces more than 62 million tons (MT) of waste annually. However, only 43 MT of this waste is collected, with 12 MT undergoing treatment before disposal, while the remaining 31 MT is simply discarded in landfill sites. A significant portion of the waste generated goes untreated and unaccounted for. This situation, characterized by inadequate waste collection, transport, treatment, and disposal, poses substantial environmental and public health challenges in the country.[2]

LANDFILL WASTE IN INDIA:

Municipal solid waste, a blend of household and commercial refuse, arises from a culture of heavy consumerism. The uncontrolled disposal of such waste is on the rise, closely tied to issues like poverty, inadequate governance, urbanization, population growth, low living standards, limited environmental awareness, and subpar management. In India, towns and cities grapple with the challenges of unchecked urbanization and extensive industrialization. It's not inaccurate to assert that India still lacks essential amenities such as proper sewage and drainage systems, as well as comprehensive solid waste management strategies. Urbanization has ushered in an influx of rural-to-urban migration, fostering lifestyle upgrades, consumerism, and changing fashion trends. Consequently, this has led to a significant surge in waste production, burdening government agencies, local authorities, and urban bodies with the demanding task of waste collection, processing, and disposal. Research by Das et al. (1998) reveals that in India, over 90% of municipal solid waste ends up in landfills, often in unsanitary conditions. Landfilling remains the predominant but highly disorganized method in municipal solid waste management, creating a

[2] Indian Solid Waste Management, International Trade Administration, (October 07, 2023, 03.00 P.M), https://www.trade.gov/market-intelligence/india-solid-waste-management

state of disarray throughout the entire process.

In India, the concept of landfilling has devolved into a practice of merely dumping waste in areas outside cities, devoid of any sanitary precautions. Landfills were originally designed to minimize human and environmental exposure to toxic waste, but the reality is that they pose a significant threat to human health, primarily through soil and groundwater contamination. Inadequate or absent waste segregation facilities at the source of waste generation result in the accumulation of a hazardous waste mixture within landfills. Disposing of these toxic substances exposes waste pickers to harmful chemicals. These waste pickers, reliant on waste collection for their livelihoods, often remain unaware of the health risks posed by the waste they handle, endangering their own well-being and the surrounding environment. Those living in close proximity to landfills are especially vulnerable, as these sites are prone to collapse, posing an imminent threat to lives. Chaotic landfills are akin to ticking time bombs, susceptible to catching fire when they reach a saturation point and can no longer withstand the heat generated by the accumulated waste. The health issues associated with emissions from landfills encompass high exposure to PM10 particles, respiratory problems, bacterial infections, asthma, increased cardiovascular risks, and various other illnesses.

In the Indian context, open dumps are prevalent, fostering the breeding of disease-carrying mosquitoes, flies, rats, cockroaches, and other pests. Consequently, diseases like plague, histoplasmosis, murine typhus, malaria, dengue, and West Nile fever are common among the population residing near landfill sites due to the proliferation of these disease vectors within landfills. Beyond the immediate health risks, concerns persist regarding the transfer of toxins into the food chain of wildlife, fires and explosions, damage to vegetation, foul odors, settlement of landfill sites, groundwater and air pollution, and contributions to global warming. It's crucial to note that the methane released from landfills has a substantial global warming potential, estimated to be 23 times greater than that of an equivalent amount of carbon dioxide, as highlighted by the Environmental Impact Assessment (EIA) in 2003[3].

[3] Aditee Das, Indian Landfill: The Ultimate Trash Kingdom, Readers Blog (October 07, 2023, 03.30 P.M), https://timesofindia.indiatimes.com/readersblog/environmental/indian-landfill-the-ultimate-trash-kingdom-25565/

WASTE GENERATION IN INDIA :

Annually, the world generates a staggering 2.01 billion tonnes of municipal waste, with India contributing an estimated 277 million tonnes of municipal solid waste as of 2016.

In India, the waste disposal landscape is concerning, with a substantial 77% of waste ending up in open dumps, a mere 18% undergoing composting, and just 5% being recycled. It's noteworthy that a significant 34% of global waste originates from a mere 16% of the world's population, mainly hailing from high-income countries. Encouragingly, more than one-third of this waste is recovered through recycling and composting efforts.

In low-income countries, the primary issue lies in waste mismanagement, where over 90% of waste is mishandled, resulting in increased emissions and heightened disaster risks, as documented in the World Bank's 'What A Waste 2.0' report from 2018.

The surge in waste generation not only places a heavy burden on a nation's resources but also poses a substantial threat to public health, safety, and the environment. Consequently, addressing this problem at the grassroots level becomes an utmost priority[4].

OTHER RECYCLING METHOD USED IN DIFFERENT COUNTRIES:

SWEDEN:

Sweden exemplifies a remarkable commitment to environmental conservation, boasting one of Europe's highest recycling rates. The key to their waste management success begins with citizen engagement in the initial step of waste separation. Swedish residents meticulously sort their waste into color-coded bags based on the type of material. Recycling facilities further refine this separation, distinguishing between recyclable and non-recyclable components.

Non-recyclable waste undergoes an innovative "waste to energy" process, where it is incinerated in specialized plants. This combustion is transformed into electricity, supplying power to approximately 250,000 homes across the nation. Meanwhile, recyclable materials follow the

[4] Madhur Rathi, Recycling Waste Can Generate Crores In Revenue In India, Times Of India, June 9, 2022.

standard recycling journey, ultimately being repurposed into new products. This sustainable approach has yielded such efficient results that Sweden finds itself in the unique position of not generating enough trash to fully meet the demands of its waste-to-energy plants. Consequently, the country imports waste from neighboring nations like Germany and the U.K., a practice that aligns with their commitment to environmentally responsible energy generation, surpassing the reliance on fossil fuels.

NETHERLANDS:

The Netherlands serves as a shining example of sustainability, effectively implementing sustainable models in mobility, construction, and consumption. A noteworthy illustration of their commitment to recycling can be seen in the 2018 construction of two bike path sections entirely crafted from recycled plastic in Zwolle and Giethoorn. While using plastic for road construction has been attempted elsewhere globally, this marked the pioneering instance where entire paths were built using this recycled material.

Beyond their dedication to material reuse, the Netherlands demonstrates a robust commitment to renewable energy and invests in innovative initiatives aimed at steering the country towards achieving a circular, sustainable economy.[5]

BRAZIL:

In Curitiba, Brazil, the city faced a budgetary constraint for establishing a traditional recycling plant. However, they ingeniously transformed this challenge into an opportunity through initiatives like “lixo que nao è lixo” (garbage that is not garbage) and “cambio verde” (green exchange). Curitiba introduced complementary currencies to incentivize residents to separate their organic and recyclable waste, which they could then exchange at waste stations for bus tickets, food, and schoolbooks, a concept similarly implemented in Calgary and Tokyo. During the 1990 participation among Curitiba households soared to 70%.

[5] Recycling Lessons From Different Countries In The World, BBVA Open Mind (October 8, 2023, 09.30 A.M), https://www.bbvaopenmind.com/en/science/environment/5-recycling-lessons-from-different-countries-in-the-world/amp/

This strategic approach by Curitiba effectively converted waste into a valuable resource, resulting in a multitude of positive outcomes, much like the success witnessed in Stockholm. It addressed pressing issues such as food security, reduced littering in public spaces, improved material utilization, and diminished environmental and health hazards. Additionally, it made education more accessible, particularly for the most economically disadvantaged families. Employment opportunities were created through recycling and the green exchange system, enabling even those residing in distant slums/favelas to access job opportunities in the city center. This expansion of formal employment also boosted tax revenues, supporting urban governance and public services. These interconnected benefits generated positive multiplier effects, showcasing how employment, education, environmental preservation, food security, and social inclusion can mutually reinforce one another[6].

WASTE TO ENERGY PLANT IN INDIA:

Waste-to-energy initiatives harness non-recyclable dry waste to produce electricity by incinerating the waste to generate heat, which is subsequently converted into electrical energy. These projects are also known by various names, including trash-to-energy, municipal waste incineration, energy recovery, or resource recovery plants.

1987. India has seen the installation of a total of 14 waste-to-energy plants, but unfortunately, seven of them have since been closed. Because of the low calorific value of solid waste in India due to improper segregation. The calorific value of mixed Indian waste is about 1,500 kcal/kg, which is not suitable for power generation, high cost of energy production and improper assessment[7].

CONCLUSION:

India generates 62 million tonnes of waste each year. About 43 million tonnes (70%) are collected, of which about 12 million tonnes are treated, and 31 million tonnes are dumped in landfill sites.

[6] 10 Countries Tackling Plastic Pollution, Sustainability (October 8, 2023, 10.35 A.M), https://sustainabilitymag.com/top10/10-countries-tackling-plastic-pollution

[7] Waste To Energy Projects In India, IAS Parliament (October 8, 2023, 11.00 A.M), https://www.iasparliament.com/current-affairs/waste-to-energy-projects-in-India#:~:text=Status%20of%20for%20waste%20to,which%20seven%20plants%20were%20closed.

Landfills, incinerators, and waste treatment facilities possess the potential for adverse environmental impacts, including contamination of soil and groundwater, the emission of pollutants into the air, and disruption of natural habitats. Despite employing advanced technology, these facilities can still inadvertently release harmful substances into the environment. India is thrice the Sweden by our geographical area and our population also higher than the Sweden. For that Sweden has 32 waste to energy plant. But India has only 14 waste to energy plant seven of that was closed. Bike path by plastics and Brazil's green exchange system is the best method for recycling. By following these methods India can reduce its waste and it helpful to protect our environment.

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