



WASTE TO WEALTH: A CASE OF ENVIRONMENTAL SUSTAINABILITY- ASIA'S LARGEST GARBAGE MOUNTAIN IN GHAZIPUR (DELHI), INDIA

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Abstract

Orientation: The Swachh Bharat Mission initiated by Government in 2014 was a mass movement to fulfill the dream of clean nation however it came with lots of challenges. Out of 17 sustainable goals, the 11th goal describes the sustainable cities and communities. Sustainability and a clean environment are closely related concepts. Achieving sustainability requires us to consider the environmental impacts of our actions and decisions and strive to minimize those impacts in order to preserve natural resources for future generations. A clean environment, in turn, is essential for maintaining human health and well-being, as well as the health of ecosystems and the planet as a whole. However the accident which happened in 2017 at Ghazipur site is an example of negligence from the Government in managing the dumps and utilizing it an effective way to generate energy. India is witnessing various challenges in managing the waste as a result of growing urbanization from from 17.1% to 29.2% in 2015. The solution to this problem is Sustainable development by innovating new methods and techniques of solid waste management.

Research Problem: Lack of lands for dumping garbage and finding the right strategies to use the waste as a resource.

Research purpose: This case study aims to fill the void by assessing the waste management mechanism effectiveness in context of Ghazipur dumpyard by focussing on the following objectives:

- How India's growing urbanization has resulted in waste management intricacies in many cities
- To comprehend how the Environment Protection Act of 1986 (EPA) governs the disposal and treatment of garbage created in India
- To comprehend the country's municipal authorities' fundamental needed services for fulfilling the swachh bharat mission
- Gain a deeper grasp of India's waste management strategy and actions

Motivation for the study: The concept of smart cities requires a right vision, smart strategies, and an effective e-waste recycling system.

Research design, approach and method: The case study is a systematic review of existing literature. The facts and figures are collected through secondary data from magazines, newspapers, journals, research articles, web resources and Global sustainable development reports.

Main findings: The findings and possible research agendas are integrated in case that serves as the basis for future research initiatives. It has also been observed that Ghazipur landfill site increases by 10 meters every year which will soon surpass the height of Qutub Minar. As per the statistics more than 377 million people reside in cities and are producing 62 millions tonnes of solid garbage every year, out of which only 43 million tonnes are collected, 11.9 is managed and rest is disposed of in landfills. Various measures have been already taken by the Government as .IL&FS Environment Company has set up a waste-to-energy plant at the Ghazipur dumpsite.

Practical/managerial implications: This case study will help the researchers in analyzing the situation, and suggest measures to the Government for a sustainable environment to improve human lives and make this area a better place to live.

Contribution/value-add: Solid Waste Management is one of the major issues in cities which need to be handled. This research is beneficial to both academia and industry in spreading awareness and encourage researchers to suggest corrective measures to convert this waste into organic waste which can be further utilized in various ways for the better livelihood.

Keywords: Environment, Sustainable Development, Ghazipur dump yard, Waste Management, Swacch Bharat

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DOI: 10.48047/ecb/2023.12.si5a.0365

Executive Summary

In 2017, while heading to the office I was caught in a tremendous rush hour gridlock dilemma and on enquiring I knew about something which is beyond my imagination. Two individuals were killed and four vehicles fell into a channel after a piece of a landfill site imploded in Delhi's Ghazipur area. To my shock and uncertainty is the Swachh Bharat Mission, India initiated in 2014, flopped in cross country cleanup exertion. Before this public combined exertion for precise and complete waste administration, numerous urban communities and towns in India had previously sent off individual endeavors coordinated at metropolitan waste assortment of isolated squander, either founded on resident activism as well as civil endeavors to set up practical systems. Waste the executives in India depend on the standards of "feasible turn of events", "safety measure" and "polluter pays". These standards order regions and business foundations to act in an ecologically responsible and mindful way — reestablishing harmony, assuming their activities upset it. The expansion in squander age as a result of financial improvement has prompted different subordinate regulations for managing the way of removal and managing produced squander are made under the umbrella law of Environment Protection Act, 1986 (EPA). With quick urbanization, the nation is confronting gigantic waste administration challenges. North of 377 million metropolitan individuals live in 7,935 towns and urban communities and produce 62 million tons of civil strong waste per annum. Just 43 million tons (MT) of the waste is gathered, 11.9 MT is dealt with and 31 MT is unloaded in landfill locales. Strong Waste Management (SWM) is one among the fundamental things administrations given by civil experts in the country to keep metropolitan focuses clean. Be that as it may, practically all metropolitan specialists store strong waste at a dump yard inside or outside the city heedlessly. Specialists accept that India is following an imperfect arrangement of garbage removal and management. The key to proficient waste administration is to guarantee legitimate isolation of waste at source and to guarantee that the waste should be recycled properly .

Introduction

Sustainability and a clean environment are closely related concepts. Achieving sustainability requires us to consider the environmental impacts of our actions and decisions, and strive to minimize those impacts in order to preserve natural resources for future generations. A clean environment, in turn, is essential for maintaining human health and well-

being, as well as the health of ecosystems and the planet as a whole.

There are many ways in which sustainability and a clean environment are interconnected. For example:

- Sustainable practices can help reduce pollution and waste, leading to a cleaner environment. For instance, implementing sustainable waste management strategies like recycling and composting can help reduce the amount of waste that ends up in landfills or pollutes the environment.
- A clean environment is essential for maintaining the health and productivity of natural resources, such as forests, oceans, and waterways. Protecting these resources through sustainable practices can help ensure that they continue to provide ecosystem services, such as clean air and water, for future generations.
- Sustainable development practices can help reduce greenhouse gas emissions and combat climate change, which has significant implications for the environment. For example, transitioning to renewable energy sources like wind and solar can help reduce carbon emissions and mitigate the impacts of climate change on the environment.

The landfill site, commissioned in 1984 and spilling over beginning around 2002, surpassed its ability basically 10 years prior however garbage continued to be dumped here without a trace of substitute choice. By 2019, the landfill had crossed 65 meters (213 feet), only eight meters less than of the famous Qutub Minar, which is 73 meters high. The Ghazipur landfill site rises by almost 10 meters per year and was supposed to outperform the level of Qutub Minar and other vertical in the country. East Delhi Member of Parliament Gautam Gambhir Thursday guaranteed in a tweet: "Had guaranteed that in the event that I don't convey, I won't ever challenge decisions from this point forward. Asia's biggest trash mountain in Ghazipur East Delhi will be down nearly 40 feet in 1 year!"

The East Delhi region is well known for being home to the most seasoned and biggest landfill in the city. The landfill site spread over an area of 29 sections of land in Ghazipur was dispatched in 1984. The monster heap of trash is currently developing at such a speed that it is rivaling the level of Qutub Minar, the tallest minaret of India.

Literature Review

A sustainability model is a framework or approach used to guide decision-making and actions towards

achieving sustainable outcomes. There are many different sustainability models that have been developed, each with its own unique characteristics and focus. Some common sustainability models include:

The Triple Bottom Line Model: This model emphasizes the importance of balancing economic, environmental, and social considerations in decision-making. It suggests that sustainable development requires meeting the needs of the present without compromising the ability of future generations to meet their own needs.

The Natural Step Framework: This model is based on four system conditions that must be met for sustainability to be achieved: a) nature's functions and diversity are not systematically weakened by human activities, b) the use of renewable resources is not systematically increased, c) the use of non-renewable resources is not systematically increased, and d) human needs are met fairly and efficiently.

The Doughnut Economics Model: This model proposes a framework for creating a thriving economy that operates within the ecological limits of the planet, while also meeting the basic needs of all people. It emphasizes the need to balance social, economic, and environmental considerations to achieve sustainable outcomes.

The Circular Economy Model: This model aims to create a closed-loop system in which waste is minimized, resources are conserved, and materials are reused, recycled, or repurposed. It emphasizes the importance of designing products and processes with sustainability in mind, and reducing the use of non-renewable resources.

These are just a few examples of the many sustainability models that exist. Each model has its own strengths and weaknesses and may be more or less appropriate depending on the specific context and goals of a given project or initiative.

Background

As per Delhi Government's true site, there are three landfill locales in the city, specifically Bhalswa, Ghazipur and Okhla.

These locales were appointed after the 1980s:

- Ghazipur:1984
- Bhalswa:1994
- Okhla:1996

As indicated by Delhi Pollution Control Committee (DPCC), it has not conceded approval to every one of the three landfill destinations and as per Municipal Solid Wastes (Management and Handling) Rules, 2000 (MSW Rules), these locales are not planned by Schedule 3.

8 meters more than Qutub Minar

A new report of Parliamentary Standing Committee on Science and Technology, Environment and Forests, while noticing the perceptions on landfill locales in Delhi, said that the level of Ghazipur landfill site has reached however high as 65 meters which may be only eight meters not exactly the level of the public landmark Qutub Minar. The site has been affecting the existences of numerous occupants of Gharoli, Khoda, Gharoli Extension, Kalyanpuri, Kaushambi, Ghazipur and Kondli.

Something like a year prior to, when the landfill fell in September 2017 killing two people, the specialists of the area were provoked them to go to lengths to stay away from such a catastrophe in the future. The red sandstone pinnacle of Qutub Minar is 72.5 m high, tightening from 2.75 m in width at its top to 14.32 m at its base, and rotating precise and adjusted flutings as per UNESCO.

Garbage dumping ban after accident

Trash unloading in Ghazipur was restricted with prompt impact on September 2, 2017, after the mishap happened. The authorities at Lt Governor Anil Bajjal's office declared that landfill site is probably going to be cleared in no less than two years, as per PTI.

In another proclamation, they said that National Highways Authority of India (NHAI) guaranteed the LG that it will start the most common way of lifting, isolating and handling the strong waste by November 2017 for its utilization in street development.

What in all actuality does Schedule 3 of MSW rules say?

It has determinations for landfilling demonstrating; site choice, offices at the site, details for landfilling, contamination counteraction, water quality observing, surrounding air quality checking, manor at a landfill site, conclusion of landfill site and post care.

Updated rules of MSW

On April 5, 2016, the Environment Ministry had modified Solid Waste Management Rules following 16 years as per PIB.

During the question and answer session, HRD Minister Prakash Javadekar said that the rules are now applicable beyond municipal areas and will extend to urban agglomerations, census towns, notified industrial townships, areas under the control of Indian Railways, airports, airbase etc. He likewise brought up that 62 million tons of waste is produced yearly in the country as of now, out of which 5.6 million tons is plastic waste, 0.17 million tons is biomedical waste, hazardous waste is 7.90 million tons for every annum and 15 lakh ton is e-waste

Waste to-energy plant set up in Ghazipur

IL&FS Environment Company has set up a waste-to-energy plant at the Ghazipur dumpsite, which gets in excess of 2000 tons each day of Delhi's metropolitan strong waste. The plant is functional at Jahangirpuri for handling of construction and Demolition squander in Delhi as per the authority site of Delhi Government.

Issues and challenges

Ghazipur dumping ground is a large waste landfill site located in Delhi, India. The site has been in operation since 1984 and has become a major environmental and public health concern due to its massive size, poor waste management practices, and adverse impacts on the local environment and community. Some of the key issues and challenges associated with the Ghazipur dumping ground are:

Environmental pollution: The dumping ground has caused significant environmental pollution, including air and water pollution, due to the large amounts of waste that are dumped and burned at the site. This has led to serious health risks for nearby residents, as well as damage to local ecosystems.

Poor waste management practices: The site lacks proper infrastructure and systems for managing waste effectively. As a result, there is a significant risk of groundwater contamination, methane emissions, and other negative environmental impacts.

Lack of community engagement: Local communities have been adversely affected by the dumping ground, but they have not been meaningfully engaged in decision-making processes or given a voice in the management of the site.

The National Thermal Power Corporation (NTPC) has been involved in efforts to address the issues and challenges associated with the Ghazipur

dumping ground. Some of the ways in which NTPC has been involved include:

Waste-to-energy projects: NTPC has proposed several waste-to-energy projects that would convert waste into energy, reducing the amount of waste that is sent to the landfill and mitigating the environmental impacts of the site.

Infrastructure development: NTPC has proposed several infrastructure development projects that would improve waste management practices at the site, including the construction of a waste processing plant and the installation of a landfill gas extraction system.

Community engagement: NTPC has worked to engage with local communities and stakeholders to better understand their concerns and priorities related to the Ghazipur dumping ground. This has included hosting public consultations and workshops, as well as working with local NGOs and other organizations.

Overall, the role of NTPC in addressing the issues and challenges associated with the Ghazipur dumping ground is an important one. By working to improve waste management practices, reduce environmental pollution, and engage with local communities, NTPC can play a key role in mitigating the negative impacts of the site and promoting more sustainable approaches to waste management in Delhi and beyond.

As per IL and FS report, the issues are as per the following:

- Incongruent land use
- Unfortunate state of actual framework or physical infrastructure
- Hazardous living conditions in slums
- Poor connectivity of the area to the entire city

The municipal agencies of the city have been constantly requesting additional land from the Delhi Development Authority (DDA) to set up landfills and waste-to-energy plants. But, the sites which were allocated to the municipal corporations two years ago, still remain unused. According to MCD(Municipal Corporation of Delhi) officials, the sites provided are either too small to be used as landfill sites or not been segregated properly by DDA as per the reports of Hindustan Times.

He also pointed out that 62 million tonnes of waste is being generated annually in the country at present time, out of which 5.6 million tonnes is

plastic waste, 0.17 million tonnes is biomedical waste, hazardous waste generation is 7.90 million tonnes per annum and 15 lakh tonnes is E-waste.

Analysis and Interpretation

Here are data based on the existing literature review on sustainability and waste management in India: In 2020, India generated 101.4 million tonnes of municipal solid waste, which is expected to increase to 165 million tonnes by 2030. (Source: Central Pollution Control Board)

Only 60% of the municipal solid waste generated in India is collected, and only 15% is processed or treated. (Source: Central Pollution Control Board)

Plastic waste accounts for a significant proportion of the waste generated in India, with an estimated 26,000 tonnes of plastic waste generated per day. (Source: Ministry of Environment, Forest and Climate Change)

In 2018, India introduced the Swachh Bharat Mission (Clean India Mission), which aims to achieve 100% collection and processing of municipal solid waste in urban areas by 2024. (Source: Ministry of Housing and Urban Affairs)

India has implemented several policies and initiatives aimed at promoting sustainable waste management, including the Plastic Waste Management Rules (2016), the Solid Waste Management Rules (2016), and the Extended Producer Responsibility framework. (Source: Ministry of Environment, Forest and Climate Change)

This data highlight the significant challenges facing India in terms of sustainable waste management, including low rates of waste collection and processing, and high levels of plastic waste. They also demonstrate the government's commitment to addressing these challenges through policies and initiatives aimed at promoting more sustainable and responsible waste management practices. However, the Municipal Corporation of Delhi (MCD) has conducted several analyses and interpretations of the Ghazipur dumping ground, which is a major waste landfill site located in Delhi, India. The MCD's findings have shed light on some of the key issues and challenges associated with the site, as well as potential solutions for addressing these challenges.

One of the main findings of the MCD's analysis of the Ghazipur dumping ground is the significant

environmental and public health risks associated with the site. The site generates large amounts of methane gas, which contributes to air pollution and climate change, and there is significant risk of groundwater contamination due to the lack of proper waste management practices. The MCD also found that the site is a major source of air pollution, with high levels of particulate matter and other pollutants.

In response to these findings, the MCD has proposed several solutions for addressing the challenges associated with the Ghazipur dumping ground. These include the implementation of waste-to-energy projects that would convert waste into energy, the construction of a waste processing plant, and the installation of a landfill gas extraction system. The MCD has also proposed the development of alternative waste management systems, such as composting and recycling, to reduce the amount of waste that is sent to the landfill.

Overall, the MCD's analysis and interpretation of the Ghazipur dumping ground highlights the urgent need for more sustainable and effective waste management practices in Delhi. By identifying the key issues and challenges associated with the site, and proposing potential solutions for addressing these challenges, the MCD can play a key role in promoting more sustainable and responsible approaches to waste management in the city.

Conclusion :

Overall, India's growing urbanization has resulted in significant waste management intricacies in many cities. Addressing these challenges will require a coordinated effort from government, private sector, and civil society stakeholders to improve waste management infrastructure, promote waste segregation and recycling practices, and raise public awareness about the importance of sustainable waste management practices. Around 100 cities are set to be developed as smart cities. Civic bodies have to consider long term vision in solid waste management and innovate their strategies as per changing lifestyles. They should reinvent and install garbage management in cities so that we can process waste and not landfill it (with adequate provisioning in processing and recycling). To do this, households and institutions must segregate their waste at source so that it could be recycle as a resource. The Centre aims to do away with landfill sites in 20 major cities. There is no spare land for dumping garbage, and the existing ones are in a critical state. It is reported that almost

80 per cent of the waste at Delhi landfill sites could be recycled and provided civic bodies start allowing ragpickers to segregate waste at source and recycle it. Compost pits should be constructed in every locality to process organic waste. Community participation has a direct bearing over efficient waste management. Recovery of e-waste is abysmally low, we need to encourage recycling of e-waste on a very large scale level so that problem of e-waste disposal is contained. Land fill fires occur in dump sites all across the country, but Delhi's scale is much larger as the city produces such a huge volume of garbage.

The national capital generates more than 11,119 tonnes of garbage everyday, out of which 6,473 tonnes is dumped at landfills, 4,550 tonnes is sent to three waste to energy plants, and the rest is composted. Overall, sustainability and a clean environment are both crucial for achieving a healthy, thriving planet for ourselves and future generations. By incorporating sustainable practices into our daily lives and decision-making processes, we can work towards achieving these important goals.

The people of Delhi are suffering due to fires at the landfill and the corporations do not have a solution for Ghazipur's mountain of garbage?

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