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GOVERNMENT POLICIES BEYOND DISPOSAL: RETHINKING WASTE MANAGEMENT FOR SUSTAINABILITY

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Abstract:

This study delves into waste management in the Mira Bhayander region, with a specific focus on examination of public's understanding of waste management as well as emphasizing the importance of waste management literacy. It also studies the issue of food waste, as globally, about one third of all food produced for human consumption is wasted each year along the supply chain. This paper focuses on the food waste generated by hospitals, as hospitals are estimated to be responsible for more than two times the food waste of other food service sectors. The research is based on Mix-method research approach. The primary objective is to scrutinize the effectiveness of various waste management strategies and impact of various governmental policies, and suggest improvements in policies. This research also analyses various governmental programs that are initiated to raise awareness about waste segregation, recycling, and the environmental consequences of improper waste disposal within the broader community. This study highlights the importance of efficient waste management for sustainable development.

Keywords- *Sustainable Development, Waste Management, Government Policies.*

Introduction:

Waste management is crucial for preserving the environment, minimizing resource depletion, and promoting public health. This research explores various aspects of waste management, including its challenges, benefits, and sustainable practices, emphasizing reduction, reuse, and recycling. It highlights the importance of waste management as a legal obligation, social responsibility, and moral duty for present and future generations. Wilson (2007) examines waste management perspectives in emerging and developing countries, focusing on public health implications and drivers shaping waste management practices. The study identifies challenges and emphasizes the need for sustainable practices. Population and Waste Production in Oman study investigates waste dynamics in Oman concerning population growth and urban expansion, emphasizing effective waste management strategies. Adewole (2009) analyzes waste management practices in Lagos, Nigeria, identifying causes of inefficiency and proposing solutions. Lemaire and Limbourg (2019) present a literature review on food loss and waste management, categorizing causes and solutions**,** providing insights for local application. Integrated Sustainable Waste Management in Indore evaluates the effectiveness of waste management models, particularly the ISWM model, in Indore, highlighting successful initiatives and suggesting areas for further research. The research underscores the importance of

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sustainable waste management practices in addressing environmental, economic, and social challenges. By examining diverse contexts and strategies, it contributes to the development of effective waste management policies and practices, promoting a cleaner and healthier environment for all.

Objectives:

1. To find the amount of food waste generated by hospital of Mira Bhayander region.
2. To understand the importance of waste management literacy.
3. To analyse the effectiveness of various waste management practices and policies and how it leads to sustainable development.

Methodology:

This study employed a mixed-method research approach, combining qualitative and quantitative methods to comprehensively investigate effective waste management practices. Qualitative insights were obtained through structured and semi-structured interview with a doctor at Bhakti Vedanta Hospital. Sampling techniques included purposive sampling for qualitative data to ensure representation and diversity. Thematic analysis was conducted on interview data to identify recurring patterns. Additionally, an experimental study involving 61 participants assessed the impact of waste management literacy on sustainable practices, with educational interventions leading to observed behavior changes, proved by chi-square test.

Results and Discussion:

Interview with the hospital staff:

The interview was conducted of Dr. Vaidehi Nawathe, a chief dietician at Bhaktivedanta Hospital. She has been attached to this hospital for almost 26 years. The results of the semi structured interview are discussed according to the major themes – Meal System, Reasons for food wastage, Suggestions and practical difficulties.

Theme	Sub Theme	Paraphrased Statements
Meal system	**1) Rules**	The meals are vegetarian and Jain, without onion and garlic, served three times a day alongside soups, fruits, etc. Patients receive their meals directly from the pantry without table service.
	2) Wastage and disposal	-Only 60% patients finish entire food on their plate -On average, 20% of food which is served goes to the dustbin daily.
Reasons for wastage	**1) Physical**	Patients may order food but later develop vomiting or undergo procedures, leading to refusal to eat. Additionally, patients might miss meals due to procedures like X-rays or sonography, and sometimes, staff are unaware of patient discharge, resulting in wasted food.
	2) Psychological	-Psychological factors plays an important role when it comes to food wastage. Many patients are alone, they don't have their relatives around, especially the senior citizens, and so they lose appetite.

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Reduction of food waste	**1) Current practices**	-If, after speaking with the patients, the doctors feel that their appetite is not good, the full plate diet is changed to half plate diet. -Before serving, the patients are asked if they want to eat a particular dish or not. -The untouched cooked food which is left at the end of the day is consumed by the ward boys.
	2) Suggestions	Understanding and addressing psychological factors behind patient refusal to eat is crucial. Implementing Tender Love and Care (TLC) by doctors can reduce food wastage, as can providing counseling training to dieticians. Utilizing a Bedside Serving System, where patients can select their food like a buffet, reduces waste. Feeding leftover food to animals prevents it from being discarded.
Practical Difficulties	**1) Bedside Table System**	Some patients are infectious, risking contamination of the entire meal if they come in direct contact with it. Additionally, some patients may protest if ward boys refuse to serve certain dishes, such as sweet dishes to diabetic patients as per doctor's instructions.
	2) Animal feeding	-The hospitals are a busy place these days. There is not enough staff which can collect, and take the food to the appropriate place for feeding animals.
	3) TLC	-As there are many patients and few doctors, TLC becomes difficult to implement.

Impact of Waste Management Literacy on Environmental-Friendly Choices: A Controlled Experiment

The study explores the impact of waste management literacy on environmentally-friendly choices among students through a controlled experiment. Sixty-one students were divided into experimental and control groups, with the former receiving a presentation on waste management while the latter received an unrelated presentation. Subsequently, both groups were offered a choice between plastic and biodegradable glasses. Results showed a significant preference for biodegradable glasses in the experimental group, highlighting the influence of waste management education. In the experimental group, none of the students chose plastic glasses, opting instead for biodegradable paper glasses. In contrast, in the control group, the majority chose plastic glasses. The chi-squared test revealed a significant difference in glass selection between the two groups ($\chi^2 = 144.69$, $p < 0.05$), indicating that waste management education influenced environmentally-friendly choices. The findings support the hypothesis that waste management literacy influences individuals to make sustainable choices. Providing education on waste management can empower individuals to contribute to environmental conservation efforts by opting for eco-friendly alternatives. Incorporating waste management education into school curriculums is essential for promoting sustainable consumption patterns and fostering environmental stewardship from an early age.

Evaluation of Current Government Policies:

Evaluation of Government Waste Management Policies:

The Ministry of Environment, Forest and Climate Change has implemented several waste management

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rules to ensure environmentally sound practices:

1. **Solid Waste Management Rule, 2016:** Mandates door-to-door waste collection in municipal areas to streamline waste management for recovery, reuse, and recycling.
2. **E-Waste (Management) Rule, 2022:** Promotes a circular economy through Extended Producer Responsibility (EPR) for e-waste recycling, covering over 106 Electrical and Electronic Equipment (EEE) items.
3. **Hazardous and Other Waste (Management and Transboundary Movement) Rules, 2016:** Prioritizes waste management hierarchy, applying to all facilities engaged in hazardous waste processing, recycling, and safe disposal.
4. **Bio-Medical Waste Management Rules, 2016:** Enhances segregation, collection, and treatment of infectious biomedical waste from hospitals to school first aid rooms.
5. **Plastic Waste Management Rule, 2016:** Extends regulations to cover rural areas, introducing responsibility for waste generators to segregate plastic waste at its source and comply with user fee payments.
6. **Battery Waste Management Rules, 2022:** Ensures environmentally sound management of waste batteries through EPR, with producers responsible for collection and recycling.
7. **Other Initiatives:** Various national missions and schemes, like JNNURM and NUSP, aim to improve sanitation and waste management. Public-private partnerships, such as Delhi Waste Management (DWM), are exploring innovative solutions.

Into the Abyss of Waste:

India is grappling with a monumental waste management crisis. Annually producing a staggering 640 million metric tons of municipal solid waste, the nation faces a dire situation compounded by a paltry 18% recycling rate. Informal recycling practices, particularly prevalent in the e-waste sector, pose significant environmental and health risks, with 95% of e-waste being handled illegally. Furthermore, despite government assertions of a 60% recycling rate for plastic waste, the reality is far bleaker, with only 12% actually being recycled. The remaining plastic waste often ends up incinerated or in landfills, contributing to pollution and environmental degradation. The informal recycling sector, comprising waste pickers and kabadiwalas, plays a crucial role in waste management but lacks proper training and support, leading to hazardous practices such as burning waste and exposure to toxins. Additionally, India's capacity to handle e-waste falls short of its massive production, with only 468 authorized recyclers and 2,808 collection points across 22 states. This crisis necessitates urgent action and comprehensive solutions from the government, extending beyond mere disposal strategies to embrace sustainable waste management approaches. Such measures are imperative not only for India's environmental well-being but also to mitigate the global impact of its waste management challenges. This underscores the imperative for government policies to transcend mere disposal strategies and adopt comprehensive and sustainable waste management approaches, what we call it as ‘beyond disposal’

Policy suggestions based on the experiment:

1. **Incorporating Environmental Education into School Curriculum:** Research shows that education in sustainable development increases students' concern about climate change and promotes pro-environmental behaviors like waste reduction and recycling. Environmental education should be integrated into school curriculums to influence sustainable decision-making.
2. **Making the Course More Interactive:** Interactive lessons engage students and motivate them to improve their learning experiences. To enhance students' interest in environmental education,

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courses should be made more participatory.

3. **Involving Relatable Case Studies:** Including local waste-related case studies in environmental education courses increases students' motivation to address environmental issues by making the content more relatable to their surroundings.
4. **The Power of Revision:** Behavior change interventions are effective, but sustaining these changes over time requires periodic reinforcement. Regular revision of environmental education materials can help ensure that sustainable practices persist beyond the initial learning phase.
5. **Activity-Based Learning:** Incorporating activities like gardening and trash clean-up into environmental education enhances understanding, fosters a sense of responsibility, and creates an engaging learning environment for students.
6. **Early Integration of Sustainable Practices:** Environmental education should start from a young age to instill sustainable habits early in life. Making environmental education compulsory from primary school through activity-based learning can lay a strong foundation for lifelong sustainability practices. Policies based on Interviews

Hospital Policies:

1) **Psychological Factors:** Refusal to eat in hospitals often stems from psychological factors such as loneliness or social isolation. Empathetic communication and understanding the patient's concerns can significantly improve their willingness to eat. Implementation of programs like Tender Love and Care (TLC) and providing counseling training to dietitians can help address this issue and reduce food wastage.
2) **Bedside Table Serving System:** Research suggests that implementing a bedside serving system, where patients can freely choose their food from a trolley, can reduce plate food waste compared to a plated meal system. Further research is needed to overcome challenges associated with this system and ensure its effective implementation.
3) **Animal Feeding:** Food waste from hospitals can be converted into sustainable animal feed, reducing waste disposal and providing an alternative protein source for animals. Investing in staff recruitment and research in this area can help overcome challenges associated with the animal feeding system and promote sustainability.

Waste Management Towards Sustainable Development:

Waste Management and Sustainable Development:

Efficient waste management is pivotal for advancing the Sustainable Development Goals (SDGs), a comprehensive framework established by the United Nations in 2015. Waste management practices are intricately linked with various SDGs, contributing to holistic progress towards sustainable development. SDG 3, which aims to ensure healthy lives and well-being for all, highlights the importance of waste management in preventing diseases and injuries caused by waste exposure, thereby promoting public health and safety. Similarly, SDG 6 emphasizes the role of waste management in safeguarding water resources from contamination, ensuring access to clean water for everyone. Waste management also contributes to SDG 7 by generating renewable energy from waste, diversifying energy sources, and promoting sustainable energy access. In urban contexts, waste management plays a transformative role in advancing SDG 11 by improving waste collection, treatment, and recycling services, enhancing the quality of urban life and promoting sustainable urban development. Adhering to waste hierarchy principles and circular economy practices, waste management aligns with SDG 12, promoting sustainable consumption and production patterns. Efforts in waste management also contribute to combating climate change (SDG 13) by reducing greenhouse gas emissions from waste and adapting

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waste management systems to climate-related challenges. Addressing marine pollution, particularly from plastic waste, supports SDG 14 by protecting marine ecosystems and coastal communities. Additionally, waste management indirectly supports several other SDGs, including poverty eradication (SDG 1), quality education (SDG 4), gender equality (SDG 5), and economic growth (SDG 8), by creating income opportunities, providing clean learning environments, promoting gender equality, and stimulating economic growth.

Conclusion:

This research offers a comprehensive examination of significant waste management challenges and the critical imperative for sustainable practices across various contexts. Drawing on a rich array of research methodologies, including, experiment, and interview. This study presents a robust set of policy recommendations. Emphasizing the importance of environmental education in schools, the paper contends that integrating sustainable practices into the curriculum can instill a sense of responsibility towards waste reduction and resource conservation from an early age, nurturing a generation mindful of their environmental impact. Overall, this paper underscores the urgent demand for comprehensive and sustainable waste management strategies that transcend mere disposal. It calls for a multifaceted approach encompassing education, TLC programme and bedside table system. By embracing this holistic strategy, the paper contends that we can address the waste management crisis more effectively and pave the way towards a more sustainable future. So that the waste of today becomes the raw material of tomorrow.

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