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Review Article

Evaluation of Sanitary Waste Disposal Frameworks in India

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Abstract *- Sanitary waste disposal has long been neglected and not given the importance it deserves. According to a government study, Around 12.3 billion sanitary napkins, amounting to 113,000 tonnes of waste, reach India's landfills annually. Several parts of India still use outdated disposal methods that not only have harmful impacts on the environment but also young women and girls. This makes it an issue of utmost importance. The nuances of the disposal practices were researched. The study aims to look into the root causes of poor sanitary waste management in India, analyze existing solutions in the form of policies for the same, and make observations about the various legal frameworks and guidelines in place across India. Furthermore, recommendations for stronger sanitary waste disposal frameworks have been provided in the paper, providing policies for Menstrual Hygiene Management [MHM] awareness programs, research, coordination, and government efforts. The lack of existing material and research on this issue makes it of utmost importance to research. Provisions were made to ensure that the information was largely unbiased and provided a multitude of perspectives. While several measures by the Indian government formalize sanitary waste disposal, the lack of awareness, source segregation, and enforcement of these guidelines make it an immense issue in India. This paper solidifies the strengths and weaknesses of pre-existing frameworks while also providing further solutions for the same, which will ultimately lead to stronger frameworks that have greater success in the field of sanitary waste management.*

Keywords *- Menstrual hygiene, Period poverty, Public policy, Sanitary waste disposal, Sustainability.*

1. Introduction

Menstrual hygiene is essential to maintain for women across the globe. Sanitation systems and hygiene products are of utmost importance. Governments and non-state actors alike have been working on making sanitary products accessible, attempting to alleviate period poverty as well. Sanitary Waste Management includes disposing and managing sanitary napkins daily. India generates approximately 137,483 tonnes of used sanitary napkins annually, or 377 tonnes daily. (Menstrual Hygiene Alliance India, 2019) This is increasing, with more individuals embracing and using disposable sanitary napkins with heightened awareness in urban and rural regions. Hence, sanitary napkin waste management's inclusion in MHM (Menstrual Health Management) policies and frameworks is of utmost importance.

Few definite definitions or meanings of menstrual waste have been consensually and clearly reached, making its global classification unclear. Hence, globally, there is an apparent lack of menstrual waste infrastructures that target safe and effective disposal (WaterAid, 2019). Most frameworks and guidelines highlight the importance of such infrastructures but fail to mention how (NIH, 2018.) This reduces the scope of implementation and the practicability of introducing MHM policies. Furthermore, their specific regional practices are subjective from country to country. A factor that is widely disregarded is waste generation through the usage of sanitary napkins. Sanitary Waste Management has received little consideration due to societal stigma and lack of awareness in local communities for organized action. It is a problem globally with weak guidelines, frameworks, and policies in place to dispose of sanitary waste even though it fits in the scope of waste management. There is a lack of effective and efficient research on sanitary waste management this research gap The research gap in sanitary waste management has been evident in various studies, including the seminal work by Smith et al. (2020), which highlights the need for a more nuanced understanding of the challenges in waste disposal [Smith et al., 2020]. Furthermore, the 2019 National Sanitation Survey has brought attention to regional disparities in waste management infrastructure, emphasizing the urgency of targeted interventions [National Sanitation Survey, 2019].

Building on this foundation, a study conducted by Johnson and Patel (2018) delves into the socio-economic factors influencing waste disposal practices, shedding light on the intricate interplay between cultural norms and economic disparities [Johnson & Patel, 2018]. However, a critical analysis of existing policies reveals a lack of specificity in addressing these socio-economic determinants. The United Nations Environment Programme (UNEP) report on global waste management policies (2017) underlines the need for more tailored approaches to bridge

this gap and create effective, context-specific strategies [UNEP, 2017].

This paper will aim to examine and analyze frameworks on menstrual waste disposal and key challenges for implementation while also recommending plausible policies for better waste management practices that support the needs of women and girls and the environment. This brings novelty to previous ideas by effectively addressing the research gap in previous studies specific to India. While several global papers or studies exist on sanitary waste management, they do not address specific issues or circumstances in India, which this paper aims to research and analyze. The next section introduces the causes of poor sanitary waste disposal practices and explores the root causes that lead to poor sanitary waste management in the first place.

2. Literature Review

The evaluation of sanitary waste disposal frameworks in India is a critical area of research that requires examination of existing literature. One prominent study by Gupta et al. (2018) provides a comprehensive overview of the policy landscape, analyzing key frameworks implemented by the government to address sanitary waste disposal challenges [Gupta et al., 2018]. The study evaluates the effectiveness of these frameworks in promoting sustainable waste management practices, considering factors such as accessibility, community engagement, and environmental impact. This research employs a mixed-methods approach, combining quantitative data on waste management indicators with qualitative insights from community stakeholders and policymakers.

Further insights into the evaluation of sanitary waste disposal in India are seen in the research of Sharma and Desai (2017), who focus on the cultural dimensions influencing the acceptance and adherence to waste disposal policies [Sharma & Desai, 2017]. Their analysis underscores the importance of aligning policies with local customs to ensure higher compliance rates. This study provides a nuanced understanding of community behaviors and attitudes towards sanitary waste disposal.

In addition to academic studies, governmental reports contribute significantly to the literature evaluating sanitary waste disposal frameworks in India. The Ministry of Environment, Forest and Climate Change's (MoEFCC) annual reports on sanitation policies (2019) offer valuable insights into the implementation and outcomes of various frameworks [MoEFCC, 2019]. These reports provide a quantitative analysis of waste management indicators, highlighting the areas of success and areas that require improvement.

However, the literature also reveals gaps in the evaluation process. A study by Reddy and Kumar (2020) critiques the lack of longitudinal data in assessing the sustained impact of sanitary waste disposal frameworks [Reddy & Kumar, 2020]. Their research emphasizes the need for continuous monitoring and evaluation to ensure the long-term effectiveness of policies.

In summary, the literature on evaluating sanitary waste disposal frameworks in India is robust, drawing from various research methods, including mixed-methods approaches, ethnographic studies, and governmental reports. This literature review provides a foundation for future research to build upon, emphasizing the need for comprehensive and context-specific evaluations to enhance sanitary waste management in India.

Fig. 1 Sanitary waste in India

Source:https://www.newindianexpress.com/nation/2021/jun/03/menstrual-waste-disposal-adding-to-indias-environmental-crisis-study-2311185.html

3. Causes of Poor Sanitary Disposal Waste Practices

To understand the issue of sanitary napkin waste disposal, first need to look at the key issues that cause poor disposal practices across India. One key cause is a lack of awareness about proper waste management practices. According to a study conducted by the Central Pollution Control Board (CPCB) in 2019, only about 60% of urban and 20% of rural households had access to proper waste collection services (CPCB, 2019). This lack of awareness and access contributes to improper disposal of sanitary waste, with an estimated 432 million pads being disposed of daily in India, creating a massive waste management challenge (CPCB, 2019). Poor sanitary waste disposal can be seen in urban slums, where waste collection services are often scarce. In such areas, used sanitary pads and diapers are frequently discarded in open spaces, alleys, and water bodies, leading to environmental pollution and health risks for the residents (CSE, 2019).

Moreover, taboos and prejudices surrounding menstruation are prevalent in many parts of India. According to a survey conducted by WaterAid India in 2018, approximately 71% of adolescent girls in the country did not know about menstrual hygiene before their first period. This lack of education and the stigma surrounding menstruation contribute to improper disposal of sanitary waste (WaterAid India, 2018). As a result, women may resort to disposing of used sanitary products poorly, further increasing waste management challenges and environmental pollution(SWM, 2016). These statistics and examples highlight the urgent need for targeted

interventions to improve waste management practices in India, particularly concerning sanitary waste disposal.

Furthermore, economic constraints significantly impact waste management efforts and contribute to poor sanitary waste disposal in India. Limited financial resources pose challenges for local governing bodies and municipalities to invest in waste management infrastructure and programs. This results in insufficient waste collection services, inadequate waste treatment facilities, and a lack of awareness campaigns on proper waste disposal. As a result, residents resort to dumping their sanitary waste in nearby water bodies and open spaces, causing environmental contamination and health hazards. The lack of financial support also hinders educational programs on waste segregation and proper disposal practices, perpetuating the problem of improper sanitary waste disposal in the community.

Limited access to affordable and hygienic sanitary products also poses a significant challenge to proper sanitary waste disposal in India. In many rural and economically disadvantaged areas, women struggle to access quality menstrual hygiene products. Hence, they often use non-biodegradable alternatives, which contributes to accumulating sanitary waste in landfills and natural environments. In a study conducted in a remote village in Odisha, researchers found that women primarily used old cloth pieces during menstruation due to limited access to affordable sanitary pads.

Source segregation refers to separating different types of waste at the point of generation, such as segregating organic waste, recyclables, and sanitary waste separately. The lack of proper source segregation practices in India also significantly contributes to poor sanitary waste disposal. When sanitary waste is not segregated correctly, it gets mixed with other types of waste, making it challenging to manage and dispose of safely. Bangalore in Karnataka faces severe challenges in managing sanitary waste due to ineffective source segregation(Intech Open, 2021).

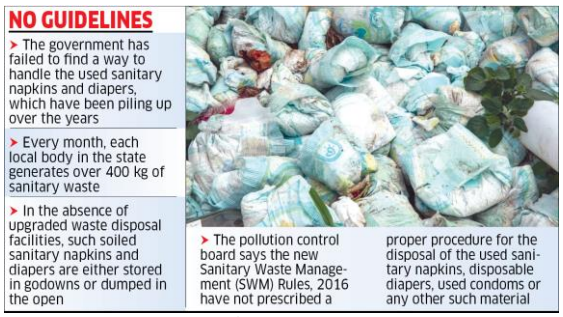

Fig. 2 A newspaper article referring to the growing sanitary waste in India

Source: https://timesofindia.indiatimes.com/city/kochi/corp-to-install-incinerator-to-treat-sanitary-waste/articleshow/81518258.cms

Waste collectors are exposed to health hazards during the manual sorting of mixed waste. Without proper source segregation, waste management facilities struggle to treat safely and process sanitary waste. Improperly disposed of sanitary waste can end up in open dumps, landfills, or water bodies, posing environmental and health risks. In addition, mixing different waste types negatively impacts recycling efforts, reducing the overall efficiency of waste management systems. The following section will explore common sanitary waste disposal practices in India.

4. Common Sanitary Waste Disposal Practices in India

India generates around 141,000 tonnes of solid waste per day (Ministry of Housing and Urban Affairs, 2017). The Centre for Science and Environment estimates that India's consolidated daily generation of sanitary napkins and baby diaper waste (excluding adult diapers, tampons, condoms, incontinence sheets, and similar waste) is approximately 925 tonnes, which accounts for 0.65 percent of total solid waste (CSE, 2019). Hence, various methods are followed across the country with both positives and negatives. The establishment of a unilateral method of disposal across geographical and cultural diversity is a significant challenge to sanitary waste disposal practices.

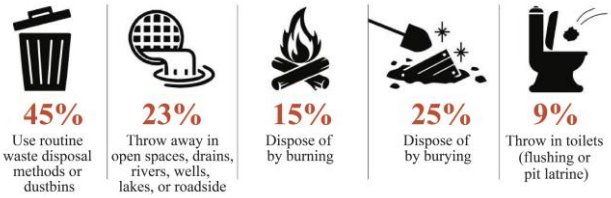

Fig. 3 Popular disposal methods across the country

Source https://www.cseindia.org/content/downloadreports/11282

4.1. Incineration

As a means of waste disposal in India, incineration has been a topic of growing importance due to the country's rapid urbanization and increasing waste generation. Incineration involves the controlled burning of solid waste, converting it into ash, gas, and heat. This process can reduce the volume of waste and produce energy, making it an attractive option for waste management in densely populated areas.

While incineration offers benefits, it raises environmental concerns, including releasing greenhouse gases and pollutants such as dioxins and furans(National Institute of Health, 2013). Proper emission control systems, such as scrubbers and filters, are necessary to mitigate these impacts. Several incinerators commonly used for their benefits of on-site treatment and easy disposal are not certified to meet national guidelines set by the Central Pollution Control Board. They burn at low temperatures and produce harmful pollutants that can also be carcinogenic. This leads to poor health for young girls, employees or workers who use the incinerator frequently or live nearby.

4.1.1. Regulatory Framework

The Indian government has developed a comprehensive regulatory framework for waste management, including incineration facilities.

The CPCB sets emission standards and guidelines for Waste to Energy projects to ensure compliance with environmental norms. However, the guidelines set by the CPCB were generic and very broad without commenting on the technical aspects of the equipment needed, making it tougher to follow. Similarly, other guidelines also elaborate on using incinerators and attempt to provide assistance in their implementation and application.

The Menstrual Hygiene Management Guidelines by the Ministry of Drinking Water and Sanitation in India also elaborate on technical assistance. International protocols by UNICEF also exist. However, all these models lack important technical details about the process of setting up incinerators and only mention the models of incinerators that should be used.

4.1.2. Centralized Incinerators

Centralized incinerators are large-scale facilities designed to efficiently manage substantial volumes of sanitary waste from urban areas. These facilities offer economies of scale, efficient waste disposal, and the potential for energy recovery through incineration. In India, the "Guidelines for Common Bio-Medical Waste Treatment Facilities" issued by the Central Pollution Control Board (CPCB) govern emission standards for centralized incinerators. These guidelines establish stringent limits for pollutants such as particulate matter (PM), sulphur dioxide (SO_2), nitrogen oxides (NOx), and dioxins/furans.

The Okhla Waste to Energy Plant in Delhi is a prime example of a centralized incineration facility. The plant incinerates approximately 1,950 tons of solid waste daily, generating 16 MW of electricity. In the past, the facility faced compliance issues due to high levels of particulate matter emissions. Consequently, the plant invested significantly in advanced pollution control equipment, including electrostatic precipitators and scrubbers, to meet CPCB guidelines, resulting in a marked reduction in emissions.

Failure to Meet Emission Standards

When centralized incinerators fail to meet emission standards, several dire consequences emerge. Firstly, substantial environmental and health risks exist, as pollutants released into the atmosphere adversely affect air quality and public health. Elevated levels of PM, NOx, and SO_2 can lead to respiratory problems and worsen existing health conditions. Moreover, the release of dioxins and furans poses a grave concern due to their long-term presence in the environment and potential long-term health effects.

Secondly, non-compliance with emission standards can lead to severe legal penalties for facility operators. The CPCB guidelines stipulate stringent penalties for violations, including substantial fines and potential facility shutdown orders. These penalties can impose a significant financial burden on operators and dissuade further investment in centralized incineration facilities.

Fig. 4 School girls with a new incinerator installed in their school

Source: https://www.telegraphindia.com/jharkhand/sanitary-napkins-incinerator-at-jharkhand-government-school/cid/1693594

4.1.3. Decentralized Incinerators

Decentralized incinerators are smaller-scale units primarily used in healthcare facilities, clinics, and smaller municipalities. They offer localized waste disposal solutions, reducing the need for long-distance waste transportation. Emission standards for decentralized incinerators are also outlined in the CPCB guidelines, tailored to the smaller capacity and lower emissions associated with decentralized units.

In 2008, the Pune Municipal Corporation (PMC) embarked on a mission to install decentralized incineration units in various municipal hospitals and healthcare centres to manage medical waste effectively(Pune Municipal Corporation, 2008). However, these smaller facilities encountered challenges maintaining emissions within CPCB limits due to limited resources and expertise. As a result, PMC implemented stricter monitoring and capacity-building initiatives to enhance compliance. Furthermore, they collaborated with environmental agencies to secure advanced pollution control equipment funding.

Fig. 5 A truck is used to collect sanitary waste for easy disposal

Source: https://www.downtoearth.org.in/blog/waste/plastic-recycling-is-failing-here-s-how-the-world-must-respond-89720

4.1.4. Challenges of Centralized Incineration

Capital Intensive: Establishing and maintaining centralized incineration facilities requires substantial capital investment, posing a significant barrier for smaller municipalities. This can lead to inadequate waste management infrastructure in rural areas.

Transportation Costs: Centralized facilities often necessitate the long-distance transportation of waste, increasing costs and carbon emissions associated with waste transportation.

Public Opposition: Centralized incinerators can face strong opposition from local communities due to concerns about emissions, health risks, and the visual impact of large-scale facilities. Overcoming these objections requires careful community engagement and transparency.

Operational Challenges: Managing a large centralized facility is complex, necessitating skilled personnel and strict adherence to operational guidelines to ensure compliance with emission standards.

4.1.5. Challenges of Decentralized Incineration

Limited Scale: Decentralized incinerators are typically smaller and may not be suitable for handling large volumes of waste, especially in densely populated urban areas. This limitation necessitates careful waste stream segregation.

Expertise and Resource Constraints

Smaller facilities may lack the resources needed to invest in proper maintenance, skilled operators, and state-of-the-art pollution control equipment, potentially leading to non-compliance with emission standards. Collaboration with experts, capacity-building and access to funding and grants can mitigate this challenge.

Inadequate Monitoring

The decentralized nature of these units can make it challenging to ensure consistent monitoring and enforcement of emission standards. Robust monitoring systems and periodic inspections are essential.

To address these challenges, a holistic approach is required, which includes investing in modern incineration technologies, enhancing waste segregation at the source, and promoting public awareness about waste management practices. Proper waste management policies, coupled with the development of sustainable waste-to-energy projects, can help India address its waste management crisis and move towards a more environmentally sustainable and energy-efficient future. The following section will explore other forms of waste disposal. There are several other forms of waste disposal ranging from more advanced to more localized, and this paper will focus on deep burial, an extremely common form of disposal found across India.

4.2. Deep Burial

In many rural communities across India, access to formal waste collection services is a luxury that often remains out of reach. The lack of comprehensive waste management infrastructure means that residents must seek alternative means of waste disposal.

Deep burial is a practical solution in these areas, where waste collection trucks rarely make their rounds. This is a prevalent waste disposal method, particularly in rural and peri-urban areas of India, where modern waste management infrastructure is often lacking. It is commonly practised by individuals, primarily women, to manage sanitary waste, including used sanitary napkins. Chittoor is a rural district in Andhra Pradesh that has adopted deep burial as the primary method for managing menstrual hygiene waste due to limited access to formal waste collection services and a cultural emphasis on privacy and modesty (BMC Public Health, 2019).

According to the CPCB guidelines, once the sanitary material has been placed inside the burial pit, it is covered with soil to avoid foul smell and exposure to the open air. The pit should be built at least 5–7 metres away from any drinking water sources. At the village and panchayat levels, homemade cotton or cloth-based sanitary waste can be disposed of in burial pits of at least 50 cm depth(CPCB, 2016). Deep burial is not the best disposal option in areas with a low groundwater table or frequent rains.

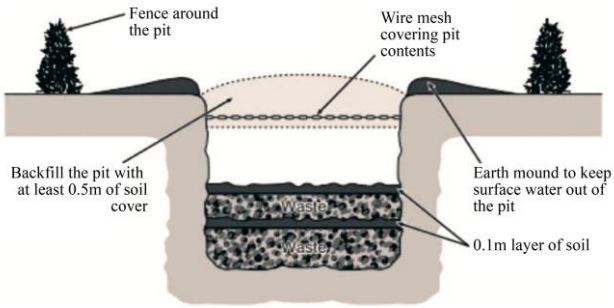

Fig. 6 "The process of deep burial"

Source: https://www.cseindia.org/content/downloadreports/11282

4.2.1. Challenges of Deep Burial for Sanitary Waste

Environmental Impact and Inefficient Decomposition

One of the primary challenges of deep burial is the potential for environmental harm. Sanitary waste, particularly non-biodegradable components like plastic, may not decompose efficiently in shallow pits. Contaminants can leach into the soil and groundwater over time, posing environmental risks. This slow decomposition rate can lead to the accumulation of waste over time.

Hygiene and Health Risks and Improper Execution

Improper execution of deep burial can lead to hygiene and health risks. Inadequate covering or incorrect disposal practices may result in exposure to pathogens and unsanitary conditions, leading to health concerns within communities.

Space Constraints and Overcrowding

Finding suitable locations for deep burial pits in densely populated areas can be challenging. This can lead to overcrowded or shallow burial sites, exacerbating environmental and health risks. The next section explores the various established guidelines and rules discussing sanitary waste disposal in India and analyses its strengths and weaknesses.

4.3. Analysis of Established Legislative Guidelines and Policies in India

4.3.1. Menstrual Hygiene Management (MHM) National Guidelines

The "Menstrual Hygiene Management (MHM) National Guidelines" issued by the Government of India provide a comprehensive framework to improve menstrual hygiene practices across the country. While the guidelines primarily focus on menstrual hygiene and related issues, they also touch upon sanitary waste management.

Positives of the MHM National Guidelines

Emphasis on Environmentally Friendly Products: The guidelines encourage the use of environmentally friendly menstrual hygiene products such as biodegradable sanitary pads and menstrual cups. By promoting sustainable products, the framework indirectly encourages responsible sanitary waste disposal, as these products are designed to be less harmful to the environment when properly discarded.

Promoting Safe Disposal Practices: The guidelines emphasize the importance of safe and hygienic disposal of used menstrual hygiene products. They encourage using dedicated disposal bins for sanitary waste in toilets and washrooms, which can help prevent the improper disposal of menstrual waste in public spaces.

Waste Segregation: The guidelines recognize the importance of proper waste source segregation, including the segregation of sanitary waste at the source. This is a positive step towards reducing the improper disposal of sanitary waste alongside regular household waste. Proper segregation allows for more effective management and disposal of sanitary waste, saving time and resources to ensure proper segregation at a later stage.

Negatives of the MHM National Guidelines

Lack of Enforcement Mechanisms: While the guidelines outline best practices for sanitary waste disposal, their implementation and enforcement may vary across different regions and settings. The lack of a robust enforcement mechanism can result in inconsistent adherence to the guidelines, leading to continued improper disposal practices.

Limited Focus on Waste Management Infrastructure: The guidelines do not extensively address waste management infrastructure to handle the increasing volume of sanitary waste. Adequate waste treatment facilities and composting units are essential to manage the growing amount of sanitary waste generated nationwide.

Need for Awareness and Education: While the guidelines acknowledge the importance of awareness and education on menstrual hygiene, there is a need for more specific emphasis on raising awareness about proper sanitary waste disposal practices. Increased awareness campaigns can help break cultural taboos and positively impact waste management knowledge.

4.3.2. Solid Waste Management Rules (SWM) 2016

The Solid Waste Management Rules (SWM), 2016, were introduced in India to address the pressing issue of increasing solid waste generation and its improper disposal. These rules aimed to promote a sustainable waste management system and reduce solid waste's environmental and health impacts. Below is an analysis of the SWM Rules, including their positives, negatives, and legislative significance (Government of India, 2016).

Positives of the SWM Rules, 2016

Holistic approach: The SWM Rules, 2016, take a comprehensive approach by focusing on all aspects of solid waste management, including waste segregation, collection, transportation, processing, and disposal. This helps in creating an efficient and environmentally friendly waste management system.

Waste segregation at source: The rules emphasize waste segregation at the source of generation, encouraging citizens to sort waste into separate categories such as biodegradable, non-biodegradable, hazardous, and domestic hazardous waste. This facilitates better waste processing and recycling. Extended producer responsibility (EPR): The rules introduced the concept of extended producer responsibility, a fairly new concept in this field. It holds producers responsible for the environmentally safe management of their products throughout their lifecycle. This encourages manufacturers to design products with recycling and disposal in mind.

Promoting decentralized waste processing: The SWM Rules encourage decentralized waste processing and composting, reducing the burden on large landfill sites and promoting a more sustainable waste management approach. Public awareness and involvement: The rules emphasize public participation in waste management through awareness campaigns, citizens' engagement, and the formation of waste management committees at the local level. This creates a sense of responsibility and ownership among the public. Ban on littering and open dumping: The rules prohibit littering and open dumping of waste, imposing penalties on those who violate these guidelines. This helps in curbing the adverse environmental effects of improper waste disposal.

Negatives of the SWM Rules, 2016

Monitoring and Implementation Challenges: One of the major drawbacks of the SWM Rules is the lack of proper monitoring mechanisms and weak enforcement at the grassroots level. Many local authorities struggle to implement the rules effectively due to a lack of guidelines, infrastructure, and involvement at various levels.

Limited participation of informal waste workers: Currently, the SWM Rules do not consider the role of informal waste workers in the waste management ecosystem. Integrating them into the formal waste management system could be more sustainable and equitable.

4.3.3. CPCB Guidelines for Management of Sanitary Waste

The Central Pollution Control Board (CPCB) Guidelines for Management of Sanitary Waste provide a framework for properly handling and disposing of sanitary waste, including used diapers, sanitary napkins, and other similar items.

These guidelines are crucial to address the growing concern of improper disposal of sanitary waste and its environmental and public health implications (CPCB 2017).

Positives of the CPCB Guidelines for Management of Sanitary Waste

Awareness and Sensitization

The guidelines emphasize the need for awareness campaigns and sensitization programs to educate people about the proper disposal of sanitary waste.

This helps in creating a responsible attitude toward waste management among individuals.

Waste Segregation

The guidelines advocate for separate collection and segregation of sanitary waste at the source, making proper treatment and disposal easier. This ensures that such waste does not end up with regular municipal solid waste.

Safe Handling Practices

The guidelines provide clear instructions for the safe handling of sanitary waste by healthcare facilities, municipal authorities, and waste workers, reducing the risk of infection and disease transmission while dealing with sanitary waste.

Encouragement for Disposal Solutions

The guidelines encourage the use of environmentally friendly and safe disposal methods, such as incineration, autoclaving, or encapsulation, depending on the nature of the sanitary waste. This helps in minimizing the environmental impact.

Incentives for Waste Management

The guidelines suggest providing incentives to the stakeholders involved in properly managing sanitary waste, promoting active participation and compliance with the guidelines.

Negatives of the CPCB Guidelines for Management of Sanitary Waste

Like many waste management guidelines, implementing CPCB guidelines may face challenges, especially in areas with inadequate infrastructure and resources, such as;

Limited Access to Proper Facilities

In certain regions, proper waste management facilities such as incinerators or autoclaves may not be readily available, making it difficult to adhere to the guidelines due to economics and accessibility issues.

Affordability and Cost Burden

Implementing advanced waste treatment methods, as recommended in the guidelines, might be financially burdensome for some healthcare facilities and waste management agencies.

Lack of Public Participation

While the guidelines stress public awareness and involvement, achieving active participation from the public may be difficult, particularly when cultural taboos and stigmas are associated with the disposal of sanitary waste.

Monitoring and Enforcement

Ensuring strict compliance with the guidelines and monitoring the proper handling and disposal of sanitary waste can be challenging due to limited resources and personnel.

5. Recommendations

This section discusses recommendations for tackling poor sanitary waste disposal.

5.1. Research for Holistic Development and Further Progress

- Comprehensive Data Collection and Analysis: Comprehensive data collection on the current state of sanitary waste management across India is essential for strengthening frameworks and establishing a background. This data should encompass, but not be restricted to, waste generation rates, disposal methods, infrastructure availability, public awareness, and environmental impacts. Gathering data at both urban and rural levels is essential to understanding regional disparities and diversity across India.

- Life Cycle Assessments (LCAs):
  Conducting LCAs to evaluate the environmental impact of different sanitary waste disposal methods would be extremely effective. Assessments should consider factors such as greenhouse gas emissions, resource consumption, and pollution. This research can inform policy decisions and promote better practices in India.

- Health Impact Assessments (HIAs):
  Undertaking HIAs to understand the health risks associated with various sanitary waste disposal practices would promote better research. This research should evaluate potential exposure to pathogens and chemicals, especially in regions where open dumping or improper disposal is prevalent. HIAs can even inform the development of health-conscious policies and guidelines.

- Behavioural Studies:
  Investigation of user behaviour and perceptions related to sanitary waste disposal is critical. Understanding the factors influencing disposal choices, including cultural, social, and economic factors, is critical. Behavioural research can guide the design of awareness campaigns and education programs promoting responsible disposal practices.

- Technological Research and Innovation: Investing in research and development of advanced technologies for sanitary waste disposal. Exploring innovations in waste-to-energy conversion, biodegradable materials, and pollution control systems would help increase progress. Collaboration with academic institutions, research organizations, and industry experts to drive technological advancements is recommended.

- Pilot Projects and Demonstrations:
  Implement pilot projects in select regions to test innovative sanitary waste disposal solutions. These projects can serve as testing to gather feasibility, efficiency, and public acceptance data. Findings from pilot projects can inform policy recommendations and scalability to other parts of India.

- Policy Analysis and Comparative Studies:
  Conducting comparative studies to analyze the effectiveness of existing policies and regulations related to sanitary waste disposal would help find areas of weakness. This, followed by assessing international practices and their applicability to the Indian context, would prove valuable.

- Stakeholder Engagement and Surveys:
  Engagement with stakeholders, including government agencies, local authorities, healthcare institutions, waste management companies, and non-governmental organizations, is extremely important for furthering research as collaborative research initiatives can pool resources, expertise, and knowledge, accelerating progress in sanitary waste management.

- Conduction of surveys and consultations to gather input and insights on policy challenges, barriers to implementation, and potential solutions will also prove beneficial. Furthermore, increasing transparency and availability of sanitary waste data for the public helps increase awareness and responsibility.

Fig. 7 "A female worker collecting waste'"

Source: https://www.hindustantimes.com/pune-news/pmc-swach-blame-one-another-as-sanitary-workers-suffer-in-pune/story-ZNmTETOkRhBnL0DKCNB4TK.html)

5.2. Comprehensive MHM Programs to Address Product Use and Menstrual Waste Disposal Practices in Public Settings

- Education and Awareness: Developing and launching nationwide MHM-focused awareness campaigns targeting schools, colleges, and communities, with a particular emphasis on rural areas. Also, engaging local leaders, teachers, and influencers to highlight MHM information, breaking taboos, and encouraging open discussions.

- Providing access to Affordable and Sustainable Menstrual Products through promoting the use of eco-friendly menstrual products and encouraging the adoption of reusable and biodegradable menstrual products like cloth pads and menstrual cups. Furthermore, subsidizing or providing free menstrual products by the introduction of schemes to provide low-cost or free menstrual products to economically disadvantaged individuals through government or NGO initiatives.

  Sanitary Disposal Infrastructure, such as installing incinerators, is essential. Setting up safe, environmentally friendly disposal options like incinerators in public spaces such as schools, colleges, and community centres would prove beneficial in furthering MHM in India.

- Promoting cultural sensitivity by addressing cultural norms and beliefs and developing MHM programs that respect and integrate local cultural beliefs and practices would ensure long-term enforcement. Engaging local leaders and influencers and working with community leaders to sensitize communities to the importance of MHM and waste management while catering to marginalized groups and focusing on rural areas improves inclusivity and accessibility.

- Achieving long-term sustainability by promoting entrepreneurship. Supporting the creation of small-scale enterprises for producing reusable menstrual products, generating local employment, and promoting sustainability is important. Moreover, the emphasis is on the environmental impact of poor menstrual waste disposal.

Fig. 8 "Women posing with sanitary napkins they received"

Source: https://www.giveindia.org/program/sponsor-sanitary-napkins-for-rural-women

5.3. Policy on Sanitary Waste Disposal

- Policy Formation and Amendment are essential. Advocating for dedicated MHM policies is possible by urging the government to formulate comprehensive Menstrual Hygiene Management policies that explicitly address menstrual waste management. Moreover, amendment of existing sanitation laws by pushing for amendments to existing sanitation and waste management laws to include specific provisions for properly handling and disposing of menstrual waste is helpful.

  The creation of monitoring and evaluation frameworks to assess the effectiveness of MHM policies and their compliance with menstrual waste management standards in India helps strengthen policy. Furthermore, periodic reviews of MHM policies to adapt them to evolving needs and technologies are extremely important.

- Regulation and compliance are essential when strengthening policy. Proposal for creating regulatory bodies responsible for monitoring and enforcing menstrual waste management standards and guidelines and advocacy for regular audits and inspections of manufacturing facilities, ensuring that menstrual product manufacturers adhere to eco-friendly disposal standards, are important for policy formation and enforcement.

- Extended Producer Responsibility (EPR) encourages implementing EPR policies that make manufacturers responsible for properly disposing and recycling their menstrual products. Furthermore, eco-labeling advocates for a certification system that rewards eco-friendly menstrual product manufacturers and ensures clear labelling indicating safe disposal methods.

- Public-private partnerships with collaborations with manufacturers and encouraging partnerships between the government and menstrual product manufacturers to develop sustainable product designs and disposal solutions jointly are important. Moreover, the involvement of the waste management industry to facilitate safe disposal infrastructure development and operation is also possible.

- International Collaboration would prove beneficial through meaningful engagement with international organizations and governments to share best practices and adopt globally recognized standards for menstrual waste management. Further representation in international forums focused on MHM and sustainable waste management to discuss best policy measures and practices fuels deliberation and serious consideration of MHM.

Fig. 9 Women's empowerment in rural areas

Source: https://idronline.org/the-problem-with-women-empowerment-schemes/

6. Conclusion

Sanitary waste management is a pressing problem in India that requires urgent consideration and policy intervention to enforce and uphold the several MHM management policies introduced by governing bodies. This requires a careful analysis of the policies and their strengths and weaknesses. Moreover, sanitary waste management needs collaboration from the government as well as non-governmental organizations in order to put social welfare at the forefront. This means recommendations ranging from research needs to create greater awareness such as health assessments, comparative studies, and surveys; stronger MHM programs across the country; and policy introduction and enforcement on all levels, from local to national. This ensures the advancement and progress of sanitary waste disposal in India towards sustainable and enhanced alternatives. This research could prove important in developing and progressing the sanitary waste disposal field in India extensively in the future. Moreover, it sheds light on the root causes of poor sanitary waste disposal and provides solutions to the same.

The paper also has limitations. It does not consider a case or region-specific approach, which may be important due to the diversity in opportunities and resources across India. Hence, developing state-wide policy would require regional analysis and statistics to identify the best measures of better sanitary waste disposal frameworks. Furthermore, the recommendations do not cover all the issues that lead to poor sanitary waste disposal. Hence, this is another limitation of the paper. Overall, the paper explores sanitary waste disposal in India through various lenses, providing a deep insight into the issue and its prevalence on a national level.

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