



Menstrual Waste Management



Menstruation is a normal physiological phenomenon, yet is surrounded by taboos, myths and stereotypes that make it challenging for girls and women to manage their monthly periods in a safe and hygienic way. Poor hygiene makes girls and women susceptible to adverse health conditions including reproductive tract infections (RTIs), stress and anxiety, gender-based violence, and contributes to absenteeism from school and the workplace.

As a consequence of government, private sector, and NGO efforts to make sanitary napkins more available, an increasing number of girls and women are now using disposable non-biodegradable sanitary napkins. The National Family and Health Survey 4 reported that 57.6% of young women, in the age group of 15-24 years, used a hygienic method of menstrual protection i.e. sanitary napkins. While sanitary napkins may offer a safe option for girls and women when changed regularly and used hygienically, their disposal and treatment is of increasing concern.

Menstrual waste load in India

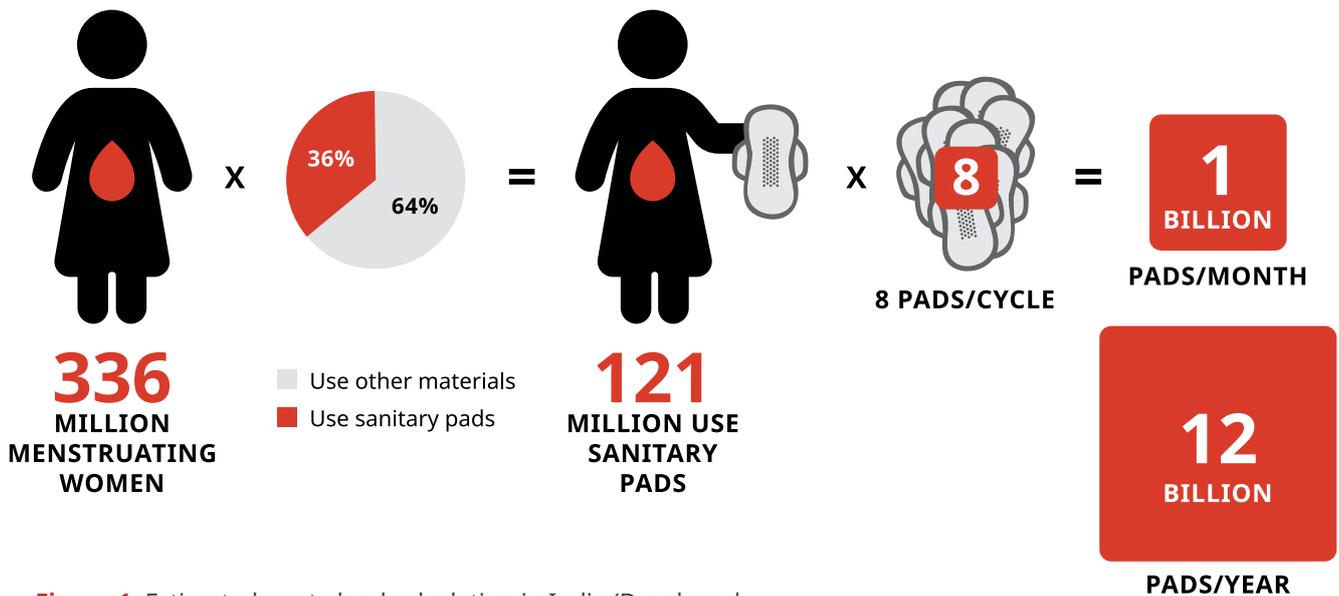


Figure 1: Estimated waste load calculation in India (Developed by Menstrual Health Alliance India)

Menstrual waste refers to blood, bodily tissues, and used menstrual absorbents, including cloth, disposable sanitary napkins and other materials used to capture or absorb blood during menstruation. An estimated 36% of the female population of reproductive age in India are using sanitary napkins, producing one billion used pads per month.

Menstrual waste management is a concern and must be addressed

- Rural India and many urban areas (e.g., slums, small and medium towns) lacks routine waste collection mechanisms. Used menstrual products (cloth and sanitary napkins) are often discarded in open fields and water bodies (ponds, lakes, rivers, streams), buried, or burned in the open.
- Anecdotal evidence suggest that when girls lack disposal facilities, they may use pads for a longer duration than recommended resulting in unhygienic use. This in turn, places them at risk for infections.
- Most sanitary pad varieties used are made of cellulose, super absorbent polymers (SAP), plastic covering, and adhesives/ glue; many of these components do not decompose easily and remain in the environment (polluting soil and water sources).
- When sanitary pads, particularly those with SAP, are burned (in the open, in burning chambers, or low quality incinerators), they release toxic chemicals (dioxins and furans that are known carcinogens) that are harmful for health.
- Most incinerators lack certification that they meet emission standards set by the Central Pollution Control Board. Low-cost incinerators typically burn at low temperatures and lack mechanisms to control release of the toxic emissions (that are carcinogenic). These incinerators are potential health hazards for girls, students, school staff, and community members who use the incinerator or live in close proximity to these machines.

Potential solutions for menstrual waste management

The figure below presents a snapshot of what menstrual waste is and its classification.

Figure 2: Definition and classification of menstrual waste in India

Menstrual waste	Classification of menstrual waste	Safe management of menstrual waste
Blood and used menstrual absorbents, including cloth, disposable sanitary napkins, tampons, and other substances or materials	The Solid Waste Rules (2016) consider menstrual waste as solid waste and define it as Sanitary Waste Rules specify responsibilities of the waste generator, local authorities and gram panchayats and producers of sanitary products	Series of steps, treatment and disposal of used absorbents in a manner that does not cause harm to girls and women (the user) and to the environment (in terms of land, air and water sources)

A universally agreed way to effectively and safely deal with menstrual waste does not exist in India. However, menstrual waste management solutions should aim to tackle waste through the following approaches:

Table 1: Menstrual waste management approaches and solutions

Approaches for menstrual waste management	Purpose	Potential solutions
Reduce waste volume	Lessen the amount of waste that is generated and that has to be managed	Alternative menstrual hygiene products: reusable menstrual hygiene products such as reusable pads and menstrual cups
Sterilise waste	Make menstrual waste less hazardous through treatments that make them inert and pathogen free	<ul style="list-style-type: none"> • Chemical treatments • Autoclaving technologies
Change the physical nature of waste	Make waste easier and safer to handle, reduce waste volume by changing the very structure of waste	<ul style="list-style-type: none"> • Incineration • Deep burial and Composting • Recycling

In order to identify the menstrual waste management solutions, it is imperative to understand the type of menstrual hygiene products used and the implications for waste management (the Informed Product Choice Brief provides more detailed information).

Here we briefly provide key considerations for incinerators and deep burial, composting solutions.



a. Incinerators

Incineration uses combustion to make waste less harmful (sterilises waste), reduce the volume of waste, and change the nature of waste from solids to ash that can more easily be disposed of.ⁱ When incineration is carried out properly, waste is converted into relatively harmless gases and incombustible solid waste (e.g., ash), and permissible gases from incineration are released into the atmosphere (after gas cleaning or emission control measures). Residue ash from proper incineration can be collected and disposed of in designated ash pits or controlled landfills without any major risk. However, when incineration occurs in unsafe conditions (e.g., waste is not appropriately segregated, combustion occurs in a poorly constructed incinerator with low burning temperature, no emission control features), toxic compounds can be present in the unburned waste, and hazardous gases can be released into the air.

Despite the range of incinerator facilities available and used in the country, specific standards and guidelines for incinerator use for menstrual waste do not exist. However, recommendations for the use of large and small scale incinerators for bio-medical waste do offer important and relevant guidance for incinerator use in institutional and community settings. The World Health Organization has issued guidelines for safe incineration of bio-medical or health care wasteⁱⁱ, and suggests that small-scale incinerators should have certain features to ensure safe incinerationⁱⁱⁱ. Good planning, adherence to standards for both incinerator design and emissions, technical oversight, and continual supportive supervision of incinerator systems are essential to ensuring safe incineration^{iv}. Table 2 highlights considerations for small scale incinerators used in institutional settings (schools, residential schools and hostels for girls, and anganwadis) and community and public toilets.

Table 2: Core considerations for State Departments for incinerator use

<p>Type and composition of product disposed</p>	<ul style="list-style-type: none"> Identify the types of products typically used and discarded in the setting as they may have to be segregated before incineration: <ul style="list-style-type: none"> Sanitary pads made of cellulose without any SAP, and those with SAP Cloth pads of various textiles (cotton, synthetics) and other materials
<p>Volume of product disposed on a daily and weekly basis</p>	<p>Estimate:</p> <ul style="list-style-type: none"> The number of menstruating girls who will likely use and dispose sanitary pads The average number of sanitary pads that will be disposed in the incinerator per day. This will enable choice of the right incinerator that can deal with these waste volumes on a daily or weekly basis
<p>Settings for use</p>	<ul style="list-style-type: none"> Education settings (schools, Ashramshalas, KGBV, girls hostel) Community settings (community toilet complexes) Public settings (public toilets) Health care facilities Anganwadis Child care institutions
<p>Placement of incinerator</p>	<ul style="list-style-type: none"> Incinerators to not be placed in closed rooms or toilet blocks where the risk of emissions being released into the room is high If placed inside a room, the vent stack/outlet pipe of appropriate length to lead outside the room (to an appropriate height), and away from where people collect or pass by
<p>Minimum and maximum burning temperatures</p>	<ul style="list-style-type: none"> The maximum burning to be considered to ensure complete combustion. The maximum burning temperature has implications for placement of incinerator and its handling by a trained caretaker to ensure safety of users and caretakers Minimum temperatures to be reviewed carefully to ensure that complete combustion takes places with measures in place to control for toxic emissions
<p>Adherence to the Central Pollution Control Board Standards for emissions and ambient air quality</p>	<ul style="list-style-type: none"> Before procuring and installing incinerators, Government agencies to ensure that the State Pollution Control Board has reviewed the incinerator and has certified it as safe for use Ideally emissions from the incinerator should be tested in a government accredited laboratory and confirmed to be within limits. Certification to be provided.
<p>Operation and Maintenance</p>	<ul style="list-style-type: none"> Incinerators to be maintained well to ensure efficient functioning Designated caretaker to be identified and well trained to operate the incinerator, with necessary safety equipment Segregation of menstrual waste from other waste to be ensured for efficient functioning Monitoring use of incinerators to be done on regular basis
<p>IEC</p>	<ul style="list-style-type: none"> IEC materials to clearly display instruction for safe and appropriate disposal of used menstrual products and on incinerator use. For instance, clear instructions on disposing used materials in a separate dustbin Clear instructions for maintenance must be displayed

b. Deep burial and composting solutions

Biomedical Waste Management Rules (2016) provides guidelines for deep burial of biomedical waste that can be adapted for menstrual waste. An adapted protocol for deep burial has been developed in by NEERI and Menstrual Health Alliance India. This protocol is currently being piloted before finalisation.

1. Deep burial suitable for compostable sanitary pads and regular disposable sanitary pads without SAP. Evidence lacking on the suitability of this solution for sanitary pads with SAP.
2. The deep burial pit should be of a depth of 1.5-2m, and with a width and breadth of 50-100cms each. The pit should only be half filled with waste, then covered with lime (10 cms), before filling the rest of the pit with soil.
3. The pit can be an above ground pit, constructed of brick or cement.
4. Inside the pit, each layer of used pads should be 10 cms. Over this, a 10 cm layer of soil is to be added.
5. When constructing the pit (below or above ground), care should be taken that the water table is at least 10 meters below the lower level of the pit. The pit should also be constructed away from water sources.
6. Deep burial pits should be protected from animals and rodents using covers of galvanised iron or wire meshes.
7. Soil and leachate testing to be done when deep burial pits are piloted in any site to test for the toxicity of soil and any leachate post degradation of waste in the pit.

Figure 3 shows the deep burial pit prototype currently being tested.

Composting is a form of waste disposal whereby organic waste decomposes naturally under oxygen rich conditions. While little is known about the composting of used menstrual absorbents, experts suggest that reusable cotton pads and disposable sanitary napkins made of napkins without SAP and those made of natural fibres or materials can be composted, following composting procedures outlined in the Solid Waste Rules (2016). Regular compost pits, bio-digesters, vermi-composting been suggested as possible composting solutions by experts.

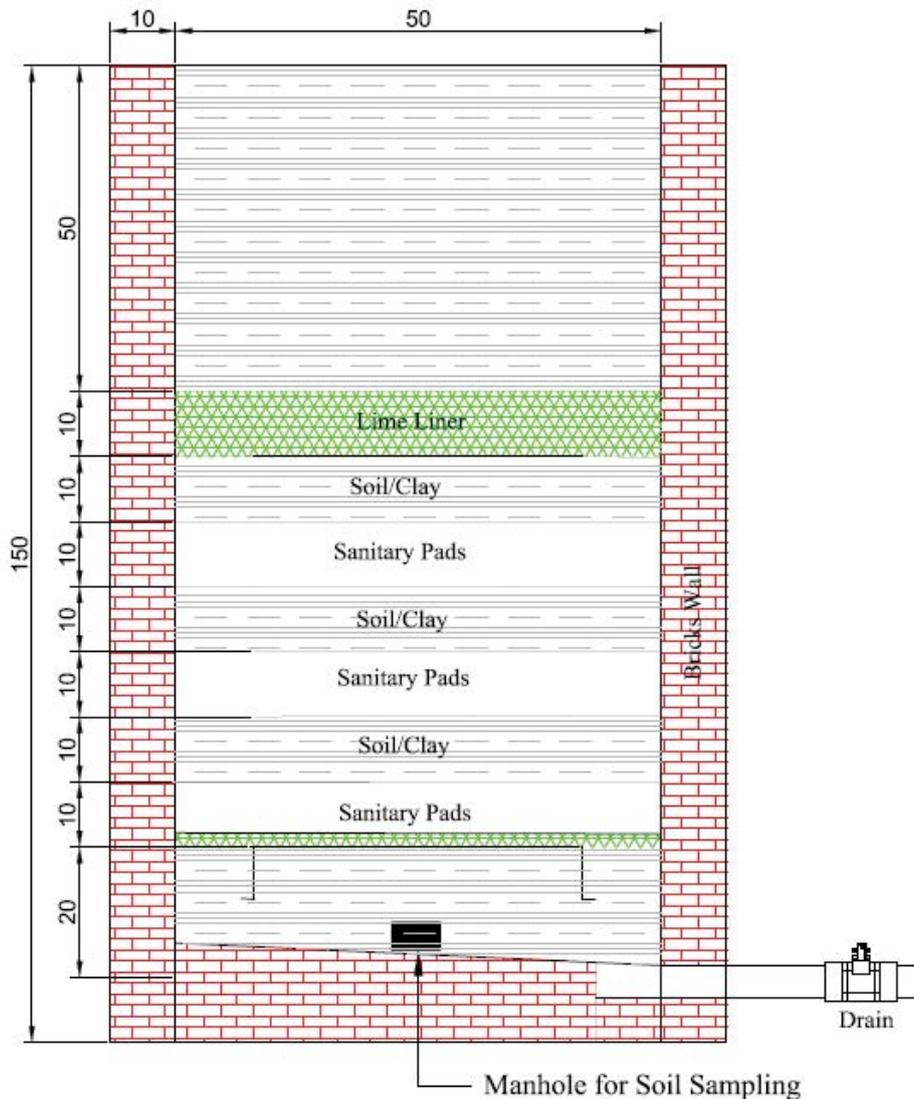
Considerations for deep burial and composting:

- Deep burial and composting pits must be designed according to established guidance on this matter (e.g., Solid Waste Rules, Biomedical Waste Rules).
- Sanitary pads and other menstrual waste products must be segregated from other waste before disposal in deep burial or composting pit.
- Organic materials (e.g., kitchen waste, soil) may have to be added to facilitate decomposition in the case of composting.
- Used sanitary pads may have to be processed further (e.g., shedding, separation of cellulosic content from plastic) before disposal in deep burial or composting pit.
- Selection of an appropriate site for composting, keeping in mind soil quality and permeability, and distance from water source and water table.
- The deep burial and composting site must be protected from animals and rodents.

- Construction and maintenance of deep burial and composting pits must be done under supervision, with careful thought to design and implementation. A monitoring system must be in place.

- The location of the deep burial site shall be authorised by the prescribed authority i.e. CPCB/ SPCB or District Pollution Control Board Office.

Figure 3: Illustrative Deep burial pit for menstrual waste products developed by NEERI, based on the deep burial protocol in the Biomedical Waste Management Rules 2016



Contact Arundati Muralidharan (ArundatiMuralidharan@wateraid.org) for further information on deep burial design

ⁱ PATH and JSI. The Incinerator Guidebook: A practical guide for selecting, purchasing, installing, operating and maintaining small-scale incinerators in low-resource settings

ⁱⁱ World Health Organization (WHO). Policy Paper: Safe Health Care Waste Management. Geneva: WHO; 2004. Available at: http://www.who.int/immunization_safety/publications/waste_management/en/HCWM_policy_paper_E.pdf. Accessed December 2016.

ⁱⁱⁱ Batterman S. Assessment of Small-Scale Incinerators for Health Care Waste. Ann Arbor: University of Michigan, Environmental Health Sciences; 2004. On consultancy for WHO

^{iv} PATH and JSI. The Incinerator Guidebook: A practical guide for selecting, purchasing, installing, operating and maintaining small-scale incinerators in low-resource settings



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