

## Sustainable Menstruation in India: Challenges, Innovations, and the Way Forward

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### Abstract

Menstrual hygiene management (MHM) is a complex issue linked to public health, environmental sustainability, and gender justice. Despite various government initiatives and increasing awareness, period poverty, menstrual stigma, and unsustainable waste practices persist. Data from the National Family Health Survey, round 5 (NFHS-5) (2019–21), shows that about 50% of adolescent girls now use hygienic menstrual products, an increase from 37% in NFHS-4. However, significant disparities still exist across different states, castes, wealth groups, and media exposure levels. In many urban informal settlements and rural areas, women often use cloth, ash, or even cow dung because of limited availability, stigma, or cost barriers. This paper explores the current need for sustainable MHM in India, and proposes policy actions to promote inclusive, environmentally responsible menstrual hygiene solutions. Eco-friendly options like reusable cloth pads and menstrual cups provide health benefits, environmental advantages, and long-term economic savings. Kerala's "Thinkal" initiative, increased menstrual cup use from around 20% to over 90% among participants, demonstrating the impact of awareness efforts. Sustainable menstrual hygiene practices offer a holistic solution, yet adoption remains limited due to socio-economic barriers and cultural taboos.

**Keywords:** *Sustainable Menstruation, Menstrual Hygiene Management, Reusable Menstrual Products, Disposable Menstrual Products, Menstrual Waste Disposal, Menstrual Cups,*

### Introduction

Menstruation, although a natural biological function, remains highly stigmatized and poorly managed in many parts of India. The lack of access to safe, hygienic, and sustainable menstrual products not only affects the health and dignity of women and girls but also creates significant environmental hazards due to improper disposal methods. The lack of awareness, affordability, and availability of eco-friendly menstrual hygiene options, especially among marginalized communities, worsens this crisis. While conventional disposable sanitary pads have become increasingly accessible, their long-term health risks, ecological burden, and socioeconomic implications demand urgent attention. As per the Down to Earth 2021 report, in India, over 12 billion disposable pads are discarded annually, creating approximately 113,000 tonnes of menstrual waste, most of which is non-biodegradable and poorly managed. Menstrual hygiene management today intersects three critical domains: public health, environmental sustainability, and gender equity. And in line with this, the idea of sustainable menstruation is becoming quintessential to be taken up in the menstrual health policy discourse.

The concept of sustainable menstruation encompasses practices that are safe for both the user and the environment while being socially inclusive and economically viable. Sustainable menstruation refers to the use of eco-friendly and non-toxic menstrual products and practices that reduce the environmental impact of menstruation. This can include using reusable menstrual products such as menstrual cups, cloth pads, and

period underwear, as well as using organic and biodegradable disposable menstrual products. In addition to reducing waste and environmental harm, sustainable menstruation can also have financial benefits for individuals who switch to reusable products, as they are typically more cost-effective in the long run. Furthermore, sustainable menstruation can also address issues of menstrual equity by making menstrual products more accessible and affordable for individuals who may otherwise not have access to them. Overall, it promotes a healthier and more environmentally conscious approach to managing menstruation, and can have positive impacts on both individuals and the planet. It syncs with the Sustainable Development Goals (SDGs) and targets many goals as shown in the figure below:

Fig 1: Sustainable Menstruation Addresses Agenda-2030



Source: The Authors

The diagram illustrates the multi-dimensional relationship between sustainable menstruation and the United Nations Sustainable Development Goals (SDGs). At the center lies the concept of "Sustainable Menstruation Targets," emphasizing the need for menstrual practices that are environmentally responsible, socially inclusive, and economically accessible. Radiating from this central theme are key SDGs that align with the vision of sustainable menstruation. SDG 1 (No Poverty) is addressed through the affordability of menstrual products, especially for marginalized populations. SDG 3 (Good Health and Well-being) underscores the importance of safe and hygienic menstrual management. SDG 4 (Quality Education) links to reduced school absenteeism due to improved access to menstrual hygiene products and education. SDG 5 (Gender Equality) highlights the role of menstrual equity in dismantling gender-based stigma. SDG 6 (Clean Water and Sanitation) supports access to sanitation infrastructure critical for managing menstruation with dignity. Environmental goals are also represented: SDG 12 (Responsible Consumption and Production), SDG 13 (Climate Action), SDG 14 (Life Below Water), and SDG 15 (Life on Land) all stress the ecological impact of menstrual waste. Lastly, SDG 10 (Reduced Inequalities) and SDG 11 (Sustainable Cities and Communities) focus on inclusivity and systemic integration of menstrual needs in urban planning and public policy. This article critically examines the need and potential for sustainable alternatives to reshape menstrual health management.

## The State of Menstrual Hygiene in India

Access to safe menstrual periods has been a long battle for Indian women, particularly in rural areas and among poorer groups. Menstrual hygiene is critical for women, who make up about half of India's population, but it has been a tough development issue due to taboos associated with it. Mindsets, religious customs, and biases prevent women from discussing menstruation freely, and this hinders access to hygiene. Improving menstrual hygiene requires investment in girls' education, alongside extensive social and behaviour change communication campaigns to change social norms and behaviours.

As per the National Family Health Survey-5 India report (2019-21), 77.6% of women in India use the hygiene methods during menstruation. It is to be noted that the survey has been conducted on 241,112 women, aged 15-24 who have ever menstruated. Women use a number of ways to tackle their period blood, for example sanitary napkins, rags, clothes, etc. The NFHS-5 India report considers the use of locally prepared napkins, sanitary napkins, tampons, and menstrual cups to be the hygienic methods of protection. Clothes and other ways are not considered to be the hygienic methods of protection during periods. As per the report, in India, out of 241,112 women surveyed, 64.4 percent of them use sanitary pads, 49.6 per cent use cloth, 15 percent use locally prepared napkins, 1.7 percent use tampons, 0.3 percent use menstrual cups and 0.2 percent use other means. Women who were surveyed could pick multiple products that they had used, thus the sum may exceed 100 percent. The use of hygienic protection by women (aged 15-24, who have ever menstruated) in India differ by states. Bihar has the lowest percentage of women using a hygienic method of menstrual protection (59.7%), followed by Madhya Pradesh (61%) and Meghalaya (65.6%). These states are among the five worst performers on the Niti Aayog's multidimensional poverty index. Surprisingly, Gujarat, whose multidimensional poverty rank falls midway among states, has just 66.9% women using hygienic methods of menstrual protection. No state or union territory from the South zone shows a lower level of use as compared to the national average. More than 95% of women are using hygienic methods of protection in Puducherry, Andaman & Nicobar Islands, Tamil Nadu, Lakshadweep, Delhi and Goa. The state-wise trends indicate that more states have now moved to the range of 70% or above use in 2019-21 than the previous round in 2015-16.

## Public Health Concerns

Lack of access to menstrual hygiene products forces many women to rely on unsafe alternatives like old rags, ash, or newspaper. As per NFHS-5, about 50 per cent of women aged 15-24 years still use cloth during their periods. Cloth is not a hygienic menstrual protection, as studies show that it can cause urinary tract infections. These infections can travel up to the pelvis, they can cause difficulties in getting pregnant or pregnancy complications like preterm labour (resulting in premature birth). Besides, poor hygiene can increase cervical cancer risks in the long-run, as one of the risk factors for this cancer is poor local hygiene. Alongside this, the increasingly widespread use of chemically-laden sanitary pads has also been associated with rashes, infections, and in rare cases, toxic shock syndrome.

## Environmental Impact of Disposable Menstrual Products

Disposable sanitary pads dominate the market, accounting for more than 90% of product use in urban areas. Disposable sanitary pads are made up of over 90 percent plastic components, including superabsorbent polymers that retain moisture and degrade very slowly. It takes hundreds of years for a pad to decompose in a landfill, during which it disintegrates into microplastics that contaminate soil and water systems. When incinerated improperly, which is common in small-scale settings, they release harmful chemicals such as dioxins and furans, contributing to air pollution and posing serious health risks to surrounding communities

and waste workers. These pads also contain toxic additives such as chlorinated bleaches, adhesive plastics, and synthetic fragrances, which may cause skin irritation, allergies, reproductive health disorders, and hormonal disruption. Additionally, menstrual waste segregation is often overlooked, and waste pickers who manage this waste face direct exposure to pathogens and toxic substances without protective equipment or awareness. With over 12 billion disposable pads discarded annually in India, the environmental footprint of menstruation is growing alarmingly.

### **Why Sustainable Menstrual Alternatives Matter**

Ecofriendly menstrual products like reusable cups, cloth pads, and biodegradable single-use pads offer measurable benefits in terms of health, economy, and the environment. These alternatives significantly reduce the volume of menstrual waste and the cost of hygiene over a woman's reproductive lifespan. Reusable menstrual cups, for instance, generate only a tiny fraction of the waste compared to disposable sanitary napkins. Reusable cloth pads also replace dozens of disposables annually, minimizing both the ecological footprint and recurring financial burdens. They are especially significant for women from lower-income households or rural backgrounds, where affordability and accessibility remain major challenges. As sustainable products become more widely accepted and adopted, they offer a pathway toward a more inclusive and healthier society.

### **Significance of sustainable menstrual practices in current times**

The need for sustainable menstrual practices is crucial today for several reasons, as briefly discussed below:

- i. **Public Health:** Sustainable products reduce the risk of infections, allergies, and long-term reproductive health issues. They promote better hygiene practices and encourage users to take greater ownership of their health.
- ii. **Environmental Sustainability:** The switch from disposables to reusable or biodegradable options can significantly reduce the burden of plastic waste, carbon emissions, and landfill contamination. It aligns with climate action goals and sustainable development targets.
- iii. **Menstrual Equity:** Access to affordable, safe, and dignified menstrual products empowers women and girls, enabling them to participate in education, work, and community life without interruption or stigma.
- iv. **Economic Efficiency:** While the upfront cost of sustainable products is higher, they are more economical over time. A menstrual cup or a set of cloth pads can last for years, replacing hundreds of disposables and saving thousands of rupees.

### **Sustainable Menstrual Hygiene products: Merits and Limitations**

The available options of the sustainable menstrual hygiene products at the time of this study include menstrual cup/ menstrual disc, reusable cloth pads, bio degradable pads and period panties. Merits and demerits of these products are discussed below.

#### **1. Menstrual Cup**

A menstrual cup is a reusable, bell-shaped feminine hygiene product made of medical-grade silicone, rubber, or elastomer that is inserted into the vagina during menstruation to collect menstrual fluid. Unlike disposable pads or tampons, it holds the fluid rather than absorbing it, offering an eco-friendly and cost-effective alternative for menstrual management.

**Merits:** These are reusable for up to 8 to 10 years and generate minimal waste. They are cost-effective over time, reduce the risk of leakage, and allow users greater mobility and freedom. Their environmental impact is

a fraction of that of disposable pads. They are safe to use and have been clinically proven to be effective for menstrual hygiene.

**Limitations:** Using a menstrual cup requires vaginal insertion, which may be uncomfortable or culturally challenging for some individuals. Initial use can be intimidating, and mastering proper insertion and removal may take time. Access to clean water and private sanitation facilities is essential for safe usage. Moreover, familiarity and education are necessary for better adoption, particularly in conservative communities.

## 2. Reusable Cloth Pads

Reusable Cloth Pads are washable menstrual pads made from layers of absorbent fabric such as cotton or bamboo. They are worn like disposable pads but can be washed, dried, and reused for several years, making them an eco-friendly and cost-effective option for menstrual hygiene management.

**Merits:** Made from organic or antimicrobial cotton, cloth pads are durable for three to five years. They can replace dozens of disposable pads per year, thus reducing both environmental impact and expenditure. These pads are free of harmful chemicals, breathable, and safer for those with sensitive skin. They can be composted at the end of their life cycle, making them highly sustainable.

**Limitations:** Proper maintenance is crucial. They require access to clean water and sunlight for washing and drying. Without adequate hygiene, there is a risk of bacterial or fungal infections. They may not be suitable for people with very heavy menstrual flow or for those who spend long hours outside the home, as changing and storing used pads can be inconvenient.

## 3. Biodegradable Single Use Pads

Biodegradable Single-Use Pads are disposable menstrual pads made from natural, plant-based materials like banana fibre, corn starch, or bamboo pulp. Unlike conventional plastic-based pads, they decompose quickly after disposal, reducing environmental harm.

**Merits:** These pads are made from plant-based materials like banana fibre, bamboo, or cornstarch. They are compostable within a few months and free from plastic and bleach. They provide the convenience of disposables while minimizing the environmental impact. These products are ideal for individuals who prefer disposable products but want to reduce their ecological footprint.

**Limitations:** The cost per unit is generally higher than regular sanitary pads, which may discourage low-income users. Composting facilities or waste collection systems are often unavailable, especially in rural areas. As a result, even biodegradable pads may end up in landfills, where decomposition is slower due to the lack of proper conditions.

## 4. Period Panties

Period panties are specially designed undergarments with built-in absorbent layers that can retain menstrual fluid without the need for additional products like pads or tampons. These panties are typically made from a combination of breathable cotton, moisture-wicking fabric, and waterproof layers to prevent leaks. Depending on the brand and design, period panties can absorb the equivalent of one to four tampons' worth of blood and are available in various absorbency levels for light to heavy flow days.

**Merits:** Period panties are reusable and washable, making them a sustainable alternative to disposable menstrual products. Since they resemble regular underwear, they provide a more natural and less intrusive experience, especially for younger users or those uncomfortable with internal products. Though initial



purchase cost may be higher, they reduce recurring monthly expenses as they can last for 2–3 years with proper care.

**Limitations:** Quality period panties are relatively expensive, which can be a barrier for low-income individuals. They must be washed properly after every use, requiring access to clean water and drying space, which can be challenging in low-resource settings. Due to their layered structure, they often take longer to dry compared to other reusable menstrual products. Some users with heavy menstruation may find period panties insufficient without supplementary protection.

### Community Initiatives Demonstrating Impact

Some grassroots initiatives in India have successfully demonstrated how sustainable menstrual practices can be integrated into communities. For example, in Thiruvananthapuram, Kerala, the ‘Thinkal Project’ has distributed free menstrual cups to thousands of women. The initiative, launched by the local municipal corporation and NGOs, has been hailed for reducing menstrual waste and empowering women to take control of their menstrual health (Deshabhimani, 2023). In parts of Karnataka, local governments partnered with health activists to distribute menstrual cups and provide hygiene education. As a result, there was a significant reduction in sanitary waste and improvement in menstrual hygiene practices. Systematic waste collection was established, and the segregated menstrual waste was treated separately. Similarly, in Nashik, local authorities promoted menstrual cups in rural areas by involving frontline health workers and self-help groups. These efforts were supported through awareness campaigns, subsidies, and workshops. Non-Governmental Organizations such as EcoFemme and Boondh have been working to distribute menstrual cups and provide menstrual health education in rural areas of India. In addition, several online resources, such as menstrual cup user guides and forums, are available to help women learn more about menstrual cups and address any concerns or questions they may have. Overall, the usage of menstrual cups in India is still relatively low, but there is growing interest and awareness about the benefits of menstrual cups, particularly as a more sustainable and cost-effective alternative to disposable menstrual products. With increased education and access, menstrual cups have the potential to become a more widely adopted menstrual hygiene solution in India.

### Challenges for Wider Adoption

Despite their benefits, several barriers hinder the widespread adoption of sustainable menstrual products in India. Menstruation is still surrounded by stigma and secrecy, especially in rural and semi-urban areas. This makes it difficult to introduce alternatives that require learning or behavioural change. Many people remain unaware of the existence and benefits of menstrual cups, cloth pads, or biodegradable products. Myths and misinformation also prevent open discussion and acceptance. Inadequate infrastructure that is essential for safe use of reusable products like availability of clean water, privacy, waste disposal, and maintenance facilities are lacking in many schools, workplaces, and public areas. Thus, users feel discouraged to try out the alternatives.

Sustainable menstrual products are not yet a part of large-scale public distribution programs or national sanitation missions. India’s policy focus remains skewed toward product distribution without integrating sustainability or long-term behavioural change. The Menstrual Hygiene Scheme (2011) and Suvidha initiative by the Ministry of Health and Family Welfare have made affordable pads available, but sustainable options like menstrual cups remain underpromoted. Additionally, sanitary waste is not uniformly categorized as biomedical waste across all states, creating confusion and unsafe disposal practices. There is a pressing need to revise the Solid Waste Management Rules, 2016, to enforce guidelines on menstrual waste segregation, treatment, and disposal.

## The Path Forward: Integrating Sustainability with Equity

To promote sustainable menstrual hygiene practices at scale, a multi-dimensional approach is necessary. Menstrual literacy should be part of school curricula and community health programs. Trained health workers can help create awareness and dispel myths. Sustainable menstrual products should be made available at subsidized prices through public health systems, self-help groups, and non-governmental initiatives. Sanitation facilities must include clean water, waste segregation systems, and safe disposal options to support the use of sustainable products. Establishing national standards for menstrual cups, cloth pads, and biodegradable products will improve consumer trust and safety. Partnerships among governments, NGOs, private companies, and local communities are essential to fund, distribute, and promote sustainable options effectively. Corporate Social Responsibility (CSR) investments in local production and distribution of sustainable menstrual products must be encouraged. Behaviour Changes Communication (BCC) campaigns involving male family members, teachers, and health workers to reduce stigma must be promoted. Investments in research and developments for indigenous, biodegradable products tailored to Indian climatic and cultural contexts must be facilitated.

## Conclusion

The transition to sustainable menstrual hygiene practices is not just an environmental necessity but a public health and social justice imperative. By shifting from plastic-based disposables to eco-friendly, reusable alternatives, we can significantly reduce waste, improve health outcomes, and promote gender equity. With greater awareness, better policies, and inclusive education, sustainable menstruation can become the norm rather than the exception. This will not only empower menstruators with dignity and choice but also help build a cleaner, more equitable, and environmentally conscious future for all. India needs to move beyond short-term fixes and adopt inclusive, eco-conscious, and rights-based approaches. Promoting access to sustainable products, transforming social attitudes, and strengthening policy frameworks will be crucial to ensuring that menstruation is no longer a barrier to dignity, health, or opportunity.

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