



BEYOND DISPOSABLES: NAVIGATING ECO-FRIENDLY MENSTRUAL ALTERNATIVES

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Abstract

The *Red Dot Project –Best Practice of Lakshmibai College*, sought to shed light on the environmental and health repercussions of single-use sanitary napkins. Through the engagement of Apparel Design students of the college, the project aimed to educate and train underprivileged women in Wazirpur Village. The focus had been on crafting cost-effective and reusable fabric sanitary napkins, fostering both women's emancipation and environmental conservation.

This paper further gives an insight into recent developments in the area of sustainable menstrual initiatives and the progress made so far.

Keywords: Single-use sanitary napkins, Underprivileged, Reusable fabric sanitary napkins, Women emancipation, Environmental conservation, Sustainable menstrual initiatives

Introduction

Conventional menstrual napkins, predominantly made from non-biodegradable materials, contribute significantly to environmental pollution and waste accumulation. In response to this challenge, researchers and manufacturers are increasingly exploring sustainable fibre options to develop biodegradable menstrual napkins. This review investigates recent advancements in sustainable fibers utilized in menstrual napkin production, focusing on their biodegradability, absorption capacity, comfort, and environmental impact. Various sustainable fibers, including bamboo, organic cotton, hemp, and algae-based materials, have been researched upon to replace traditional synthetic fibers and lead to the reduction of menstrual waste. Additionally, challenges and opportunities concerning these new sustainable fibers in menstrual product manufacturing are presented, with recommendations for future research and industry initiatives.

• Growing Crisis

Alternatives that are sustainable in order to address menstrual waste is critical due to several pressing factors, such as environmental impact caused due to waste generated at landfill sites (Sareen, 2021), depletion of resources leading to soil pollution; health concerns due to use of plastic napkins and contamination of resources due to improper disposal etc are explained below:-

1. **Environmental Impact:** Conventional menstrual products, like sanitary napkins and tampons, are primarily composed of non-biodegradable materials like plastic and synthetic fibers. These products contribute significantly to environmental pollution, as they often land up in landfills or water bodies (Sareen, 2021), where they take hundreds of years to decompose (Panjwani, et.al. 2023). The accumulation of menstrual waste exacerbates environmental degradation, posing risks to ecosystems and wildlife.



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2. **Resource Depletion:** The production of conventional menstrual products requires extensive resources, including water, energy, and raw materials. The extraction and processing of these resources contribute to habitat destruction, deforestation, and greenhouse gas emissions (Sareen, 2018). By transitioning to sustainable alternatives, we can reduce the reliance on finite resources and minimize the environmental footprint of menstrual hygiene management.

3. **Public Health Concerns:** Menstrual wastes that have not been properly disposed off, can lead to public health risks by contaminating water sources and spreading infectious diseases. Inadequate access to sanitation facilities and menstrual hygiene products disproportionately affects marginalised communities, exacerbating health disparities and social inequalities. Sustainable menstrual alternatives offer an opportunity to promote public health and hygiene while minimising environmental harm.

4. **Climate Change Mitigation:** The production, distribution, and disposal of conventional menstrual products generate greenhouse gas emissions, contributing to climate change. By adopting sustainable alternatives made from renewable or biodegradable materials, we can mitigate carbon emissions and support climate resilience efforts. Additionally, sustainable menstrual practices align with broader sustainability goals aimed at reducing our ecological footprint and transitioning to a circular economy.

5. **Consumer Awareness and Choice:** Today's well aware consumers demand products that align with their values of environmental sustainability and social responsibility. By providing access to sustainable menstrual alternatives, manufacturers are able to meet consumer demand for eco-friendly options and foster a culture of environmental stewardship. Education and advocacy play crucial roles in raising awareness about the environmental impact of menstrual waste and empowering individuals to make informed choices.

- **Alternatives available to address the crisis**

The need for sustainable alternatives to address menstrual waste is paramount in mitigating environmental pollution, conserving resources, promoting public health, mitigating climate change, and empowering consumers to make environmentally conscious decisions. As a step in the direction some alternative sustainable materials have been discussed as a way forward. A review into the area reveals effective use of fibres like -Bamboo, Banana, Organic cotton, Hemp, Jute, Soybean, Milkweed, etc. to make sustainable pads . Features that makes these fibres effective have been discussed :

- **Absorbency:** These natural fibers possess inherent absorbent properties, allowing them suitability for menstrual hygiene products. Their ability to absorb moisture effectively helps in keeping the skin dry and comfortable during menstruation (Mahalakshmia et.al.2024).
- 2. **Breathability:** Natural fibers offer superior breathability compared to synthetic materials, allowing air circulation to prevent moisture buildup and minimise the risk of bacterial growth and odour.
- 3. **Softness:** Fibers such as Bamboo, Organic Cotton, and Milkweed are extremely soft and gentle in texture. These provide comfort and prevents skin irritation during prolonged use.
- 4. **Biodegradability:** A key advantage of using natural fibers is their biodegradability, meaning they can decompose naturally without causing harm to the environment. This property is crucial for recyclable fabric sanitary napkins, as it reduces waste accumulation and supports sustainable waste management practices.
- 5. **Sustainability:** Many of these fibers, including Bamboo, Organic Cotton, Hemp, Jute, and Soybean, are obtained from renewable sources and require less water and pesticides compared to conventional crops (Jia, et.al. 2020). Utilising these sustainable fibers in menstrual products helps reduce the ecological footprint of the textile industry and promote environmental conservation.

6. **Strength and Durability:** Fibers like Hemp and Jute have both strength and durability, allowing their suitability as reusable fabric sanitary napkins that undergo multiple wash cycles. These fibers retain their structural integrity even after repeated use, ensuring longevity and cost-effectiveness.
7. **Anti-microbial Properties:** Some natural fibers, such as Bamboo and Soybean, possess inherent anti-microbial properties that help inhibit the growth of bacteria and fungi. This feature contributes to improved hygiene and reduces the incidences of contracting infections associated with menstrual hygiene products.
8. **Versatility:** Natural fibers offer versatility by means of processing and blending with other materials to enhance specific properties such as absorbency, strength, or softness. Manufacturers can customise the composition of fabric sanitary napkins to meet diverse user preferences and performance requirements. By leveraging these features, natural fibers like Bamboo, Banana (Siddiqe, 2019), Organic Cotton, Corn Husk (Rastogi, et.al 2022), Hemp, Jute, Soybean (Reddy, et.al.2009), and Milkweed (Sharma, et.al., 2022) lead to the development of effective and environmentally sustainable recyclable fabric sanitary napkins, addressing the growing demand for eco-friendly menstrual hygiene solutions. Further, Terry towel as an alternative has been researched as effective on the above parameters of absorbency, strength, durability, softness and breathability. Hence, Red Dot Project at Lakshimbai College utilised Terry fabric layers to manufacture reusable sanitary napkins. These napkins have been made by training and empowering village women of Wazirpur and are available on **Amazon** under the brand name of *Stree- Fabric Sanitary Napkins* https://www.amazon.in/dp/B091SRM5D5/ref=cm_sw_r_wa_api_glc_fabc_60WD257XPN855TYZPDW6

- **Cost Benefit Analysis**

According to a survey, only 12% of India's 355 million menstruating women utilise sanitary napkins, with affordability cited as the primary deterrent (refers Fig. No 1). Over 70% of respondents mentioned financial constraints being an important reason for not purchasing sanitary napkins, as it significantly impacts their family's income (Nielson, 2018). A comparative cost analysis was conducted to highlight the advantages of reusable sanitary napkins over their disposable counterparts. The analysis spanned three scenarios: one year, three years, and the complete menstruating duration of 37 years (Refer Fig. No.2). It aimed to demonstrate how reusable sanitary napkins offer greater affordability and increased commercial viability over time. Assumptions for the analysis included:

- Average cost of a single plastic layered sanitary pad:Rs 9 (based on four prominent brands available)
- Average number of disposable pads used per cycle for adequate menstrual hygiene: 8 sanitary pads
- Average cost of a single reusable cloth pad: Rs. 90
- Six reusable cloth pads needed for three years
- Average menstruating duration for a healthy female considered as 37 years
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Reusable sanitary pads market	\$2.8 Bn
Projected market size (2032)	\$8.3 Bn
Value based CAGR	11.6 %
Top player's share	10%
Organic pads dominated market share	77.88 %

Fig No. 1 : Market Analysis of Reusable Sanitary Napkins

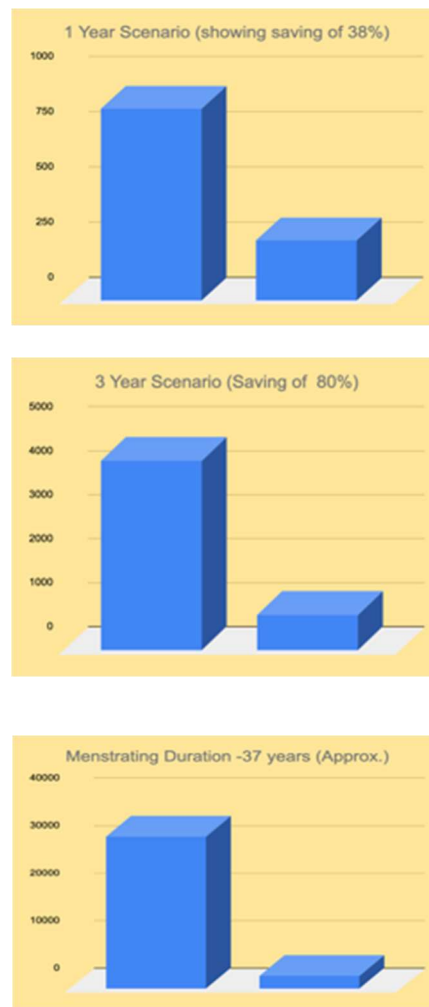


Fig. No. 2: Cost-Benefit Analysis

• Conclusion

The advancements made in the past decade underscore the path forward toward sustainability, highlighting its dual benefits of environmental friendliness and cost-effectiveness. Embracing a shift in mindset and implementing sustainable practices will be pivotal in advancing this initiative for a better future.

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