



# THE IMPACT OF INTRODUCING SUSTAINABLE SANITARY PRODUCTS ON SOCIETY AND THE ENVIRONMENT- A CASE STUDY

By

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## ABSTRACT:

The rise of sustainable menstrual products stems from growing environmental awareness. Sustainable sanitary pads, made from organic materials like cotton, bamboo, and hemp, offer a reusable and eco-friendly alternative to traditional disposable pads. This shift reflects historical practices of reusable cloth pads before the dominance of disposables.

Aside from environmental benefits, sustainable pads also prioritize women's health by reducing exposure to harmful chemicals. Accessibility to affordable and eco-conscious menstrual products is essential for social equity, particularly in marginalized communities.

This study contributes to global efforts in sustainable development and women's health empowerment by evaluating the effectiveness and feasibility of sustainable sanitary pads as a viable alternative in menstrual hygiene management.

## KEYWORDS:

1. Sustainable menstrual products
2. Organic materials
3. Reusable pads
4. Eco-friendly alternative
5. Environmental awareness

## CHAPTER 1- INTRODUCTION

### 1.1 INTRODUCTION

Sanitary pads that are sustainable refer to menstrual products made to minimize their environmental effects while still offering a safe, comfortable alternative to traditional disposable sanitary pads. Cloth pads are made from soft, absorbent materials such as organic cotton, bamboo, or hemp, and can be washed and reused multiple times. They come in a variety of sizes and designs to suit different needs and preferences. (no date) *Free Periods Canada*.

In our modern society, sanitary pads and diapers have become essential products for personal hygiene and convenience. While these items provide comfort and convenience to countless individuals, their widespread use comes with a heavy environmental price tag. The production, consumption, and disposal of sanitary pads and diapers contribute to various ecological issues, including deforestation, pollution, and landfill overflow. V., M. (2023) *The hidden costs: Harm to the environment caused by sanitary pads and diapers*, LinkedIn.

Over the past few years, there has been an increased demand for sustainable sanitary pads as people have become more conscious of the impact of regular disposable pads on the Environment. The average sanitary pad contains the equivalent of four plastic bags, and it takes around 500–800 years for a sanitary pad to decompose. *Toxic Link India* (2019) *Deccan Herald*.

Sanitary napkins are a major source of plastic pollution, which is greatly overlooked compared to other sources (i.e. plastic bottles, packaging). Disposable napkins are used by about one-tenth of adolescents (rural: 10%, urban: 21%) and one quarter of adult women (rural: 10%, urban: 33%) in Bangladesh. Together they roughly consume 37000 tons of disposable sanitary products annually. Majority of this vast sanitary waste is either dumped in landfills and river banks, or is incinerated. In India the situation is equally grim. A study conducted by UNICEF in West Bengal concluded that 78% of the women interviewed disposed sanitary waste either by burial or by discarding near a water body.

2. In North America annual disposal of sanitary napkins in landfills reaches an estimate of 55000 tons. Although incineration is deemed the safest form of disposal, it requires extensive resources rendering the method counterproductive. WHO recommends incinerating all health-related waste at temperatures over 800° C. Moreover plastic polymer products incinerated at lower temperatures release asphyxiants and irritant gases such as Dioxins and Furans. An assessment by Royal Institute of Technology, Stockholm concluded that, Low Density Polyethylene (LDPE) synthesis has the largest impact on global warming.

3. Sanitary napkins employ varying forms of LDPE in myriad forms. Through thermal or photochemical degradation, constituents of these products release Micro/Nano plastic particles in the oceans.

4. Consequently via algal and microbial uptake, these synthetic particles have a high probability becoming incorporated into the food chain. 5, 6. The general design of sanitary napkins employs non-degradable materials in each component. Transitioning to degradable raw materials is the preferred path to reduce the overall impact of sanitary napkins. In this study current constituents of sanitary napkins along with their sustainable alternatives have been reviewed. Alternatives were selected on the basis of functional characteristics and efficacy. Siddiqe, R. (2019). Sustainable alternatives for producing biodegradable Sanitary Napkins. *Bioresearch Communications - (BRC)*, 5(2), 737–743.

### 1.2 DESCRIPTION OF THE PRODUCT:

Eco-friendly and sustainable menstrual pads are developed to be environmentally friendly and sustainable as compared to the conventional disposable ones. They are reusable in most cases, made from eco materials like organic cotton, bamboo or hemp. In making sustainable pads, materials are often cut and sewn into different shapes and sizes as desired. Some manufacturers may use special processes or treatments to improve the

absorbency of the pads or make them leak proof. Therefore after manufacturing, they are usually packed up and sent off.

Regarding use, sustainable sanitary towels should be as straightforwardly simple and convenient for you as possible. Many reusable cloth pads plus period underwear can snap on wings just like a disposable pad would clip over it for security purpose. Unlike this one Menstrual cups however serve the same purpose by being inserted into vagina like tampons with a view of collecting blood during menstruation.

One can wash out these multiple times after having used them but before washing pads can be cleaned in normal laundry with machine while soap and water may cleanse menstrual cups. Proper care through maintenance including cleaning could extend their life spans thereby reduce such waste.

## 1.2 CHARACTERISTICS OF THE PRODUCT:

**Environment-friendly:** Made from biodegradable, renewable, organic material sources; these products are Eco-designed to minimize waste, pollution, and environmental impacts.

**Reusable:** This means that sustainable sanitary pads can be washed after use again multiple times thus reducing waste in the long run as well as saving money.

**Comfortable:** The makers ensure the sustainability of this product is a user friendly through developments such as soft fabrics, leak protection systems, secure fasteners among others.

**Chemical free:** It also reduces irritation due to chemical fragrances or dyes because there is no need for those substances in many environmental friendly sanitary pads.

**Variety of Options:** Sustainable sanitary pads include reusable cloth pads, period underwear and menstrual cups which provides more options for people with different preferences or requirements.

**Accessible:** Today there is increasing availability and affordability of sustainable sanitary pads.

## 1.4 HISTORY AND BACKGROUND

Attempts have been made to create disposable sanitary pads out of alternative materials for schoolgirls in Africa. Emily Sharpf, with funding from Echoing Green and a social-entrepreneurship fellowship from Harvard Business School, founded the Sustainable Health Enterprise (SHE) Initiative to create sanitary pads in Rwanda (Kristof, 2010; Lidman et al., 2009). Several materials were tested including “cassava leaves, banana leaves, banana-tree trunk fibers, foam mattresses, [and] textile scraps (Kristof, 2010).” Banana fiber was chosen as the most absorbent material (Kristof, 2010). In addition to SHE, a research group called JANI from Norway/Netherlands has designed and prototyped sanitary pads. Neither research teams have produced a working sellable product nor established a market even though considerable R&D and donor funding was used. An alternative has been developed in Uganda to address the need for affordable, comfortable, and sustainable sanitary pads. The product known as MakaPads was developed by Dr. Moses Kizza Musaaazi under a grant from the Rockefeller Foundation. Currently four million MakaPads are being produced per year by Technology : Musaaazi, M.K., et al., Quantification of social equity in life cycle assessment for increased sustainable production of sanitary products in Uganda, Journal of Cleaner Production (2013)

The use of reusable cloth pads significantly declined as disposable menstrual products were introduced in the mid-20th century. They were marketed as more convenient and hygienic alternative to reusable pads; but they posed significant environmental problem due to non-biodegradable materials and high production, disposal costs. Recently there has been a growing interest in eco-friendly menstruation products such as washable cloth pads, cups and even period panties. This new enthusiasm about sustainable menstruation care is partly explained by concerns over the environmental impact of disposable towels and a need for reducing waste and pollution. “Ramsay C, Hennegan J, Douglass CH, Eddy S, Head A, Lim MSC. Reusable period products: use and perceptions among young people in Victoria, Australia. BMC Womens Health. 2023 Mar 11;23(1):102.”

Overall, the history and background of sustainable sanitary pads reflect a growing concern for the environment and a desire to promote more sustainable and healthy menstrual care practices. As people become more aware of the impact of disposable pads on the environment, the demand for sustainable menstrual products is likely to continue to grow in the years to come.

### 1.5 RESEARCH QUESTIONS

1. Which are the best and environmentally friendly substances for biodegradable sanitary pads that absorb more, feel comfortable and decompose easily?
2. How do user preferences and perceptions differ in regard to sustainable sanitary pads as opposed to conventional ones, while there are some factors which make people resort to eco-friendly alternatives?
3. What contribution can be made by the educational awareness campaign towards sustainable menstrual products for explaining advantages of going green instead of adhering to preconceived notions or fallacies about eco friendly options?
4. How do cultural and social norms influence the adoption and usage patterns of sustainable sanitary pads; what is effective in promoting behavior change, fostering a culture of environmental responsibility in menstrual hygiene management?

### 1.6 NEED FOR THE STUDY

There are a number of reasons why it is important to study sustainable sanitary pads and menstrual hygiene, these may be social, environmental, health or economic among others. Here are some major points that underline the importance of this research:

**Health Awareness:** Encouraging women’s health requires an understanding of menstrual hygiene. These poor practices could result in such things as menstruation discomforts, infections and reproductive health problems. When women know about sustainable sanitary pads they will always have access to their safe period products.

**Environmental Impact:** Pollution in the environment is caused by non-biodegradable elements like plastics which are often found in regular sanitary napkins. Such examination builds responsible consumption and waste management through discussion on their environmental impact and biodegradability.

**Cost-Effectiveness:** Sustainable sanitary pads may turn out to be cheaper over time compared to the disposable pads. Examining financial factors helps us understand how accessible these items are and how much they cost especially for women living in less developed or low-income areas.

**Social Equity:** Menstrual hygiene product access touches on dignity and social equity.

It is one of the sustainable choices that is used for addressing challenges of menstrual stigma, promoting inclusivity in management of menstrual health and improving accessibility for marginalized communities.

**Innovation and Development:** Investigating research papers on environmentally friendly sanitary pads will initiate development and innovation of menstrual hygiene technology. Such an initiative promotes materials, production techniques as well as distribution strategies that are predicated upon sustainability and efficacy.

**Policy and Advocacy:** Policymakers, advocacy groups, public health initiatives can benefit greatly from informed publications on menstrual hygiene and sustainable pads. They can guide the development of campaigns, programmes and policies aimed at promoting women's rights, sustainability, and menstrual health.

**Educational Initiatives:** Workshop leaders in educational institutions should be capable of creating workshops around this data set to help individual students. This will enable them to instil in individuals the knowledge needed to live sustainably with a healthy lifestyle. Menstrual hygiene is becoming more widely acknowledged as a critical element of the global health agenda. The pursuit of sustainable sanitary pad research and promotion is consistent with larger endeavors aimed at accomplishing the Sustainable Development Goals (SDGs), which encompass objectives concerning environmental sustainability, gender equality, and health.

## **PROBLEM STATEMENT:**

While sanitary pads and diapers provide undeniable benefits in terms of personal hygiene and convenience, their environmental costs cannot be ignored. The harmful effects on forests, greenhouse gas emissions, plastic waste, water pollution, and landfill overflow call for urgent action. It is essential for manufacturers, consumers, and policymakers to explore and promote alternative solutions. In response to these pressing environmental concerns, there is a growing imperative to transition towards sustainable alternatives in menstrual hygiene management. “V., M. (2023) *The hidden costs: Harm to the environment caused by sanitary pads and diapers*, LinkedIn.”

Moreover, Women in low- and middle-income countries struggle to maintain good menstrual hygiene. Most research to date details the challenges of menstrual hygiene management in sub-Saharan Africa and South Asia . However, studies conducted in East Asia, Latin America, Caribbean and the Middle East also highlight consistent challenges in women’s menstrual experience . These struggles are in part due to a lack of affordable sanitary products . Poor menstrual hygiene can cause increased vulnerability to urinary and reproductive tract infections, which can lead to infertility and other reproductive organ issues “Foster, J. and Montgomery, P. (2021) *A study of environmentally friendly menstrual absorbents in the context of social change for adolescent girls in low- and middle-income countries*, *International journal of environmental research and public health*.”



## **CHAPTER 2 - LITERATURE REVIEW**

Elledge, M.F. *et al.* (2018a) *Menstrual hygiene management and waste disposal in low and middle income countries-a review of the literature*, MDPI. Available at: <https://www.mdpi.com/1660-4601/15/11/2562> .

This review addresses the gap in research on menstrual waste management, focusing on safe disposal in low- and middle-income countries (LMIC). It examines literature since 2002, identifying 152 articles and reports, with 75 meeting inclusion criteria. The neglect of menstrual waste management in MHM and sanitation chains leads to improper disposal and negative impacts. Further research is needed to understand MHM waste streams, disposal behaviors, and technologies for health, safety, and dignity of women and girls in LMICs.

Pednekar, Sulochana, et al. "Enabling Factors for Sustainable Menstrual Hygiene Management Practices: A Rapid Review." *Discover Sustainability*, vol. 3, no. 1, 31 Aug. 2022,

This paper highlights crucial factors affecting menstrual hygiene management, including access to water, privacy, and socio-economic factors. Gender equality is vital for Sustainable Development Goals (SDGs). Limited research exists on menstrual product usage and its impacts. Understanding women's preferences and improving disposal systems are emphasized. Addressing these issues can enhance menstrual hygiene management and promote gender equity.

Velasco Perez, Maribel, et al. "Waste Management and Environmental Impact of Absorbent Hygiene Products: A Review." *Waste Management & Research: The Journal for a Sustainable Circular Economy*, vol. 39, no. 6, 10 Sept. 2020, p. 0734242X2095427,

This research examines the environmental impact of absorbent hygiene products (AHP), stressing their growing use and significant end-of-life (EoL) effects. It estimates AHP in municipal waste and discusses waste management options, including landfilling and incineration. Life cycle assessments (LCAs) reveal environmental impacts, advocating for alternative product substitution. Policy tools like extended producer responsibility systems and bans are proposed to alleviate the environmental burden of AHP waste.

Panjwani, M H, et al. "Biodegradable Sanitary Napkins — a Sustainable Approach towards Menstrual and Environmental Hygiene." *Biomass Conversion and Biorefinery*, 1 Aug. 2023, This research shows that Conventional sanitary napkins, made mostly of non-biodegradable plastic, endanger the environment and women's health with harmful chemicals like phthalates. Researchers and governments are exploring eco-friendly alternatives, including plant-based materials and utilizing industrial waste. Initiatives in Africa and India show promise in utilizing natural resources like sansevieria and water hyacinth. These efforts aim to address environmental concerns and promote sustainable menstruation practices worldwide.

Moses Kizza MUSAAZI, Abigail R. Mechtenberg, Juliet Nakibuule, Rachel Sensenig, Emmanuel Miyingo, John Vianney Makanda, Ali Hakimian, Matthew J. Eckelman, Quantification of social equity in life cycle assessment for increased sustainable production of sanitary products in Uganda, *Journal of Cleaner Production*, Volume 96, 2015, Pages 569-579,

The life cycle assessment of MakaPads in Uganda highlights its social equity impact, especially for female workers, using a combined SLCA and ELCA approach. MakaPads, a locally designed product, contrasts with imported brands like Libresse, showing lower environmental impacts and higher social benefits. The study recommends policies to promote local design and manufacturing of sustainable products in Sub-Saharan Africa for improved social equity and environmental sustainability.

C, Kobia, et al. "Redesigning Reusable Sanitary Pads Using the Human-Centered Design Model and Triple Bottom Line Strategy." *Pathways to African Feminism and Development: Journal of the African Women Studies Centre*, vol. 7, no. 1, 2022, pp. 122–155,

In Sub-Saharan Africa, limited access to menstrual hygiene products hinders women's education and employment, leading to stigma. The study aimed to produce a cost-effective reusable pad (HERS pad) and evaluate its quality and adoption among target users in Eastern Uganda. Results showed the HERS pad, made from sustainable materials, was cheaper and performed better than comparable pads on the market, enhancing

menstrual hygiene management. Despite cultural barriers, the project empowered women to produce environmentally friendly products, yielding social benefits.

Tudu, Preshita Neha. "Saathi Sanitary Pads: Eco-Friendly Pads Which Will Make You Go Bananas!" *International Journal of Nonprofit and Voluntary Sector Marketing*, Dec. 2019,

Saathi, an Ahmedabad-based social enterprise, offers an eco-friendly, biodegradable sanitary pad as an alternative to non-biodegradable commercial pads, reducing environmental impact. Founded by MIT graduates, Saathi's pad addresses health concerns associated with commercial pads made of plastic and chemicals. The case explores Saathi's sustainability marketing strategy and challenges in a country where menstruation remains taboo, including pricing and environmental awareness. It considers the possibility of expanding into the Indian B2C market.

Ahuja, P., & Singh, N. (2022). Sustainable menstrual products: The challenges ahead. *Asian Journal of Women's Studies*, 28(3), 397–411. 96

Taboos around menstruation impact women's lives, compounded by corporate-driven commercialization of menstrual products. An exploratory study identifies challenges women face, noting a preference for traditional products due to gaps in awareness about sustainable menstrual products (SMPs). Addressing these gaps could increase adoption of SMPs, highlighting the need for further research on novel sustainable menstrual products.

Foster J, Montgomery P. A Study of Environmentally Friendly Menstrual Absorbents in the Context of Social Change for Adolescent Girls in Low- and Middle-Income Countries. *International Journal of Environmental Research and Public Health*. 2021; 18(18):9766.

In low- and middle-income countries, girls face challenges in menstrual hygiene due to unaffordable sanitary products, leading to school absenteeism and environmental pollution. Investigating low-cost biodegradable options like bamboo wadding, which shows promising absorption rates, presents an opportunity to address these challenges. However, overcoming extraction process complexities is necessary. Further research integrating social science and policy perspectives could enhance school attendance, education levels, and gender equality in these contexts.

Parthasarathy, S. (2022).

How sanitary pads came to save the world: Knowing inclusive innovation through science and the marketplace. *Social Studies of Science*, 52(5), 637-663.

Inclusive innovation, focusing on developing technologies for and by low- and middle-income countries, has gained momentum among international development institutions and social entrepreneurs. Unlike previous approaches, it prioritizes devices over infrastructure, claiming scientific evidence and market logics for humanitarian goals. While proponents highlight its potential for catalyzing economic and social change, this article questions how market and technological imperatives shape the international development agenda. Using menstrual hygiene management in India as a case study, it reveals how inclusive innovation shapes both problems and solutions, often reinforcing narrow understandings of inclusion and innovation in development efforts.

Jamie Hand, Christina Hwang, Wren Vogel, Christina Lopez, Sangchul Hwang; An exploration of market organic sanitary products for improving menstrual health and environmental impact. *Journal of Water, Sanitation and Hygiene for Development* 1 February 2023; 13 (2): 63–77.

Limited access to menstrual education and sanitary products affects menstruators globally, influenced by economic, educational, and cultural factors. Improper use or lack of sanitary products can lead to health issues and environmental harm, especially with plastic-based pads. Addressing this, organic pads made from local materials offer a sustainable solution, potentially improving health, economics, and reducing environmental impact.

Saravanan Parthasarathy, Vaishnavi Jayaraman, Selvaprabu Jeganathan, Arun Raj Lakshminarayanan, Menstrual hygiene and waste management: The survey results, *Materials Today: Proceedings*, Volume 65, Part 8, 2022, Pages 3409-3416,

Menstrual hygiene issues, rooted in cultural beliefs and economic constraints, impact the achievement of Sustainable Development Goals. A survey highlights limited sanitary pad usage and lack of proper disposal

mechanisms, contributing to environmental hazards. Despite awareness of incineration as a disposal method, its utilization remains low. Proposals for effective, low-cost smart incinerators offer potential solutions to reduce biowaste in landfills.

Babbar K, Garikipati S (2023) What socio-demographic factors support disposable vs. sustainable menstrual choices? Evidence from India's National Family Health Survey-5. *PLoS ONE* 18(8): e0290350.

Efforts to improve menstrual hygiene in low- and middle-income countries have focused on promoting disposable pads, but period poverty persists due to financial and environmental burdens. Sustainable alternatives like menstrual cups offer a solution, but factors influencing their uptake remain poorly understood. Research suggests that awareness and cultural factors drive the adoption of sustainable products, with exposure through education or mass media increasing usage. Urban residence and disadvantaged social status also influence adoption, suggesting the need for innovative approaches to promote sustainable period choices.

Peberdy, E.; Jones, A.; Green, D. A Study into Public Awareness of the Environmental Impact of Menstrual Products and Product Choice. *Sustainability* 2019, 11, 473.

This study investigates awareness regarding the environmental impact of menstrual products, revealing that most people are unaware of the hidden plastic in disposable items and other related environmental issues. Using a mixed-method approach, the research indicates that individuals with higher awareness are more inclined to opt for environmentally friendly options. The findings underscore the need for increased awareness and suggest potential avenues for future research and action to address environmental concerns associated with menstrual products.

Sumangala, M., Sahadevan, P. (2022). Model of Ethical Consumerism: A Segment Study on Handloom Reusable Menstrual Pads Adoption. In: Muthu, S.S. (eds) *Sustainable Approaches in Textiles and Fashion. Sustainable Textiles: Production, Processing, Manufacturing & Chemistry*. Springer, Singapore.

This study aims to understand the factors influencing female consumers' adoption of reusable handloom menstrual pads and provides managerial implications. Conducted through quantitative research, data was collected via an online survey from respondents aged 20–40 years. Results from regression analysis indicate the impact of various factors such as product awareness, attributes, consumer innovativeness, and past sustainable behavior on adoption intention. The study contributes to existing literature by highlighting the role of ethical consumerism in promoting eco-friendly menstrual products and offers managerial suggestions for fostering ethical consumer behavior among female consumers.

## 2.2 RESEARCH GAP:

The issue of menstrual waste is a growing concern, as disposable menstrual products have a significant environmental impact due to their non-biodegradable nature. As a result, there has been a growing interest in sustainable menstrual products, including sustainable sanitary pads. While there is a growing body of literature on sustainable sanitary pads, there are still research gaps and opportunities for innovation in this area. In this section, we will discuss the research gaps and opportunities for innovation in sustainable sanitary pads.

Research gaps:



### **1. Effectiveness and safety:**

While several studies have examined the effectiveness and safety of sustainable sanitary pads, there is still a need for more research in this area. Studies have shown that reusable cloth pads and menstrual cups are effective and safe, but more studies are needed to examine the effectiveness and safety of disposable biodegradable pads.

### **2. Acceptability:**

Acceptability is an essential aspect of menstrual hygiene management. While studies have shown that sustainable sanitary pads are acceptable to women, more research is needed to explore the factors that influence acceptability, such as cultural beliefs and attitudes towards menstrual hygiene.

### **3. Environmental impact:**

While sustainable sanitary pads are designed to minimize environmental impact, there is still a need for more research to quantify the environmental impact of these products. Studies have shown that sustainable sanitary pads can reduce waste and greenhouse gas emissions, but more research is needed to explore the full extent of their environmental impact.

### **4. Economic feasibility:**

The economic feasibility of sustainable sanitary pads is another research gap. While reusable cloth pads and menstrual cups can save women money over time, the initial cost may be a barrier for some women. More research is needed to explore the economic feasibility of sustainable sanitary pads in different contexts.

While there is a growing body of literature on sustainable sanitary pads, there are still research gaps and opportunities for innovation in this area. Research is needed to examine the effectiveness and safety of sustainable sanitary pads, explore the factors that influence acceptability, quantify the environmental impact, and explore the economic feasibility in different contexts. Opportunities for innovation include material innovation, design innovation, improving accessibility and distribution, and education and awareness. Sustainable sanitary pads offer a promising solution to the environmental impact of menstrual products, and continued research and innovation in this area are needed to improve menstrual hygiene management and reduce environmental pollution.

## **CHAPTER 3: RESEARCH METHODOLOGY**

### **3.1: RESEARCH OBJECTIVES:**

The objectives of a study on sustainable sanitary pads can vary depending on the specific research questions being addressed. However, some common objectives for such a study might include:

1. To examine the effectiveness and safety of sustainable sanitary pads: This objective would involve assessing the performance of sustainable sanitary pads, including their ability to absorb menstrual flow and prevent leakage, as well as any potential health risks associated with their use.

2. To explore the acceptability of sustainable sanitary pads: This objective would involve investigating the attitudes, beliefs, and behaviors of women towards sustainable menstrual products, including their perceptions of the environmental impact of traditional disposable pads and their willingness to try alternative options.
3. To quantify the environmental impact of sustainable sanitary pads: This objective would involve measuring the environmental footprint of sustainable menstrual products, including their carbon emissions, water usage, and waste generation, and comparing them to traditional disposable pads.
4. To evaluate the economic feasibility of sustainable sanitary pads: This objective would involve assessing the costs associated with producing and distributing sustainable menstrual products, as well as the potential savings for consumers who switch to these options.
5. To identify opportunities for innovation in sustainable sanitary pads: This objective would involve exploring new materials, designs, or distribution strategies that could improve the performance, acceptability, and sustainability of menstrual products.
6. To understand the cultural and social factors that influence the adoption of sustainable sanitary pads: This objective would involve investigating the role of cultural beliefs, social norms, and gender dynamics in shaping women's choices around menstrual products, as well as the potential for targeted interventions to promote the adoption of sustainable options.

Overall, the objectives of a study on sustainable sanitary pads would aim to contribute to our understanding of the benefits and limitations of these products, as well as the potential for innovation and wider adoption.

### **3.2: HYPOTHESIS:**

**H1: Sustainable sanitary pads offer significant health benefits compared to traditional disposable pads.**

**H2: The adoption of sustainable menstrual products is influenced by factors such as affordability, accessibility, and cultural acceptance.**

**H3: Sustainable pads contribute to reducing environmental pollution and waste generation.**

Each hypothesis addresses a specific aspect related to sustainable sanitary pads and their impact on health, adoption rates, and environmental sustainability. These hypotheses serve as guiding principles for the research study, providing a framework for data collection, analysis, and interpretation to test the validity of these statements. The findings from the research will either support or refute these hypotheses, contributing valuable insights to the field of menstrual hygiene management and sustainable practices.

### **3.3: RESEARCH APPROACH:**

This study will use a mixed-methods approach, blending quantitative and qualitative research methods to gain a comprehensive understanding of sustainable sanitary pads' use and impact. This approach aims to gather detailed and diverse data about the effectiveness, acceptance, and perceptions of sustainable menstrual products among women in India.

### **3.4 POPULATION:**

The population for this research aimed at women from the age group of 13-50 years old.

The reason behind selecting this is quite obvious as a female gets her first menstrual cycle at the age of 13 at an average and ends at the age of 50 at an average.

### **3.5 SAMPLING METHOD:**

According to this research, probability sampling method was taken into consideration with simple random sampling so that every member of the target population has a known chance of being included in the sample.

### **3.6 SAMPLE SIZE:**

The sample size for this research is 40 women from different localities, educational background, socioeconomic status to gain in depth insights about their current sanitary products usage and their perceptions about sustainable sanitary pads and adapting them.

### **3.8 DATA COLLECTION METHOD:**

Using a simple survey having a list of question with the help of Google Forms for convenient data collection method as it can be accessible by anyone and we can gain accurate data analysis using Google forms its own data analytic tools.

## **CHAPTER 4: DATA ANALYSIS**

Women's health and hygiene have become major global concerns over the recent decade, and some rural communities still lack awareness of menstrual hygiene and the use of sanitary napkins. Inadequate menstrual hygiene can lead to cervical cancer, fungal infections, recurrent infections leading to urinary tract infections, and an increased risk of infertility.

Ages 13 to 50 have an average menstrual cycle that lasts 3 to 7 days. Over the course of her 38 years of life, the average woman experiences 1,368 to 3,192 periods. Because of this, there is a constant high need for sanitary pads.

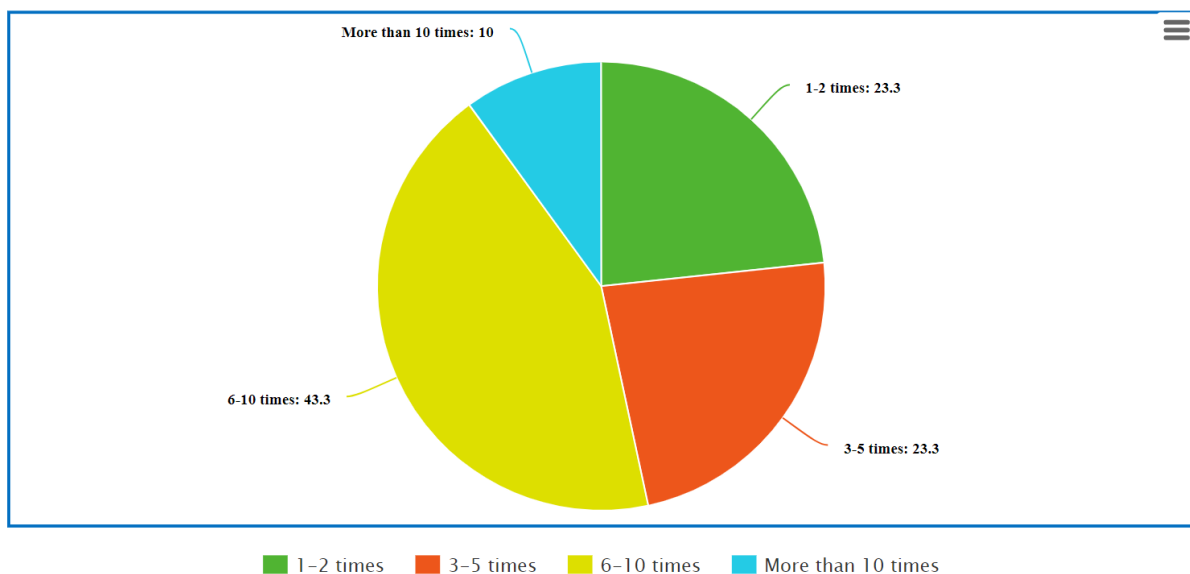
An average person discards 200 kg of menstruation products throughout their lifetime (Committee, 2018). A pack of monthly pads is equivalent to four plastic bags due to the estimated 90% plastic content of a pad. Plastic

is also present in tampons, string, and plastic applicators consisting of polyethylene (PE) and polypropylene (PP).

Feminine hygiene product leaves behind a significant carbon footprint. According to Menstrual Health Alliance India, one sanitary pad can survive between 500 and 800 years due to the non-biodegradable nature of the plastic that is disposed of in a landfill, which releases toxic fumes into the air (Barman, 2017). The majority of businesses concentrate on producing sanitary pads without considering the environmental impact of their disposal. As a result, using jute fiber to make sanitary pads also means making organic and biodegradable sanitary pads.

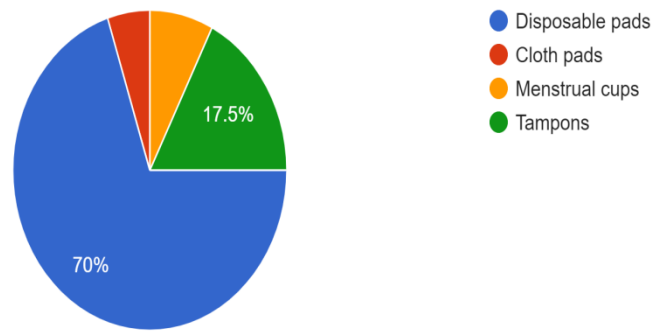
A quick survey was conducted to learn more about how often women use sanitary products, other aspects of female hygiene, and the environmental impact of sanitary napkin disposal. This study, which focused on gathering information on the types of sanitary napkins women used and whether they would choose one that was healthy, environmentally friendly, and economically advantageous over a more traditional option, This was mostly done to get a broad overview of some of the problems women run into during their periods and some of the methods they employ to deal with those problems. The result of the survey is as follows:

#### Q1. How often do you use feminine sanitary products in a month?



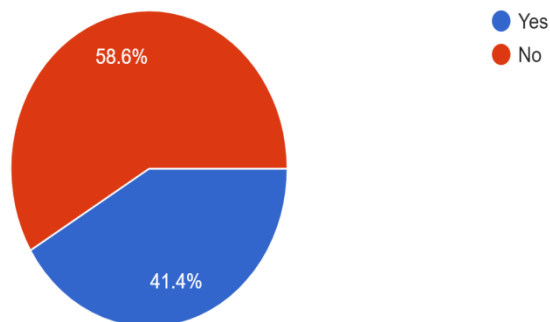
Given 4 options to the sample, we get to infer that 43.3% of women of our sample use sanitary products 6-10 times a month, whereas on the other hand only 10% of them use sanitary products more than 10 times a month. Furthermore, 23.3% of the women use sanitary products 3-5 times a month which is the exact same value for the women to use sanitary products 1-2 times a month, which is 23.3%



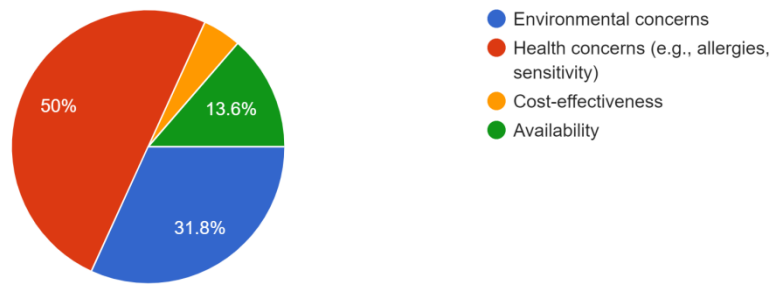
**Q2. What types of feminine sanitary products do you use?**

About 70% of our sample use disposable sanitary pads usually which is the largest segment, where as the lowest segment is of the women using Cloth pad which consists of only 5% of the entire sample.

On the other hand 17.5% of the women use Tampons, and lastly 7.5% of the women use Menstrual cups.

**Q3. Have you ever used sustainable sanitary pads? (e.g., organic cotton, bamboo, reusable cloth pads)**

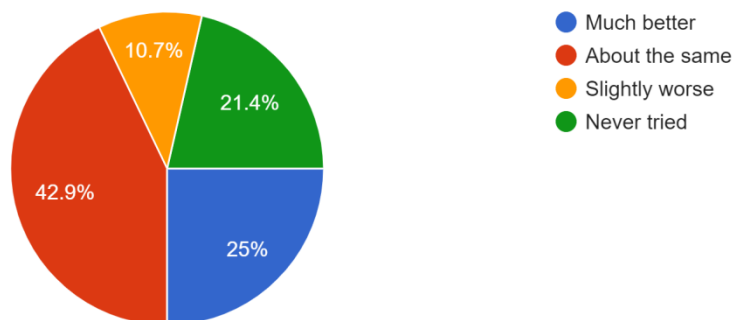
About 58.6% of the women in our sample have not tried sustainable sanitary pads, where as the only 41.4% of them have actually tried sustainable sanitary pads.

**Q4. If you have used sustainable sanitary pads, what influenced your decision to try them?**

From the above pie chart, we understand that about 50% of the women in our sample have used sustainable sanitary pads due to health concerns, which could be Allergies, Sensitivity etc.

Whereas, 31.8% of them used sustainable sanitary pads due to genuine environmental concerns.

Furthermore, 13.6% of them used sustainable sanitary pads due to its availability, and only 4.5% for its cost effectiveness.

**Q5. How would you rate the performance of sustainable sanitary pads compared to conventional pads in terms of comfort?**

About 42.9% of the women in our sample opted for the performance of the sustainable sanitary pads in terms of comfort to be about the same with comparison to conventional pads.

Furthermore 25% of them feel that sustainable sanitary pads are much better, whereas 10.7% of them feel they are slightly worse

The rest 21.4% of them have never tried sustainable sanitary pads.

## CHAPTER 5 :FINDINGS OF THE TOPIC

The other questions in the survey were descriptive based questions which gave us in depth and accurate insights about the adaptability and usage of sustainable sanitary pads.

### **Q1. What are your views on shifting from conventional sanitary pads to sustainable sanitary pads? (Against it/ Considerable/ \*your honest response according to you\*)**

About 52.1% of them strongly consider the idea of shifting from conventional sanitary pads to sustainable sanitary pads.

The rest 25.8% of them moderately agree to consider shifting from conventional sanitary pads to sustainable ones, but with their own conditions and reasons.

Some of them are:

1. it is considerable as long as it healthy for a women's body and environment.
2. Considerable but uncomfortable and not cost effective

The remaining opted for not considering this shift as they have their own personal reasons.

### **Q2. What improvements would you like to see in sustainable sanitary pads?**

Based on our survey, 30.4% of women expect sustainable sanitary pads to provide more comfort, 17.6% would prefer these pads to be more affordable, 26% want such pads to have a longer durability while 13% of women find no faults in these pads, 13% wish it was more environmental friendly.

### **Q3. Would you recommend sustainable sanitary pads to others? Why or why not?**

About 72.72% of the women in our sample strongly opted for recommending sustainable sanitary pads to other due to comfort and environmental factors.

The remaining denied recommending it to others as it is quite subjective and that different people would have their own preference and outlook towards things.

### **THEREFORE:**

1. Sustainable sanitary pads have the potential to reduce waste and greenhouse gas emissions when compared to traditional disposable pads.
2. Women are increasingly interested in sustainable menstrual products, but cultural and social factors can influence their adoption.
3. Reusable cloth pads and menstrual cups have been found to be effective and safe alternatives to disposable pads.

4. Sustainable menstrual products can be more expensive upfront, but they can save money in the long run since they are reusable.
5. The materials used to make sustainable menstrual products, such as organic cotton or bamboo, can have environmental benefits but may also have higher production costs.

## CHAPTER 6: IMPLICATIONS OF RESEARCH:

The findings of this research study on sustainable sanitary pads in India are expected to have several significant implications for various stakeholders, including policymakers, healthcare professionals, manufacturers, advocacy groups, and women themselves. These implications are outlined below:

### 1. Policy Development and Implementation:

- The research findings can inform the development of policies and initiatives aimed at promoting sustainable menstrual products and improving menstrual hygiene management in India. Policymakers can use the evidence-based insights to create regulations, standards, and subsidies that encourage the adoption of eco-friendly options and ensure their accessibility to all women, especially those in marginalized communities.

### 2. Healthcare Practices and Education:

- Healthcare professionals can incorporate the research findings into their practices by educating women about the benefits of sustainable sanitary pads for their health and well-being. This includes raising awareness about reducing the risk of infections, allergic reactions, and other health issues associated with traditional pads. Health education programs can also emphasize proper menstrual hygiene practices and the environmental impact of different menstrual products.

### 3. Environmental Sustainability Initiatives:

- The research outcomes highlight the role of sustainable menstrual products in reducing environmental pollution and waste generation. Environmental organizations and sustainability advocates can use these findings to promote eco-friendly alternatives and advocate for sustainable manufacturing practices within the menstrual products industry. This can contribute to broader efforts towards environmental conservation and waste reduction.

### 4. Manufacturing and Innovation:

- Manufacturers of sanitary pads and menstrual products can use the insights from this research to develop and improve sustainable product lines. This includes innovations in materials, production processes, and packaging that prioritize environmental sustainability without compromising on quality or user experience. Consumer preferences and feedback gathered from the study can guide product development strategies.

### 5. Consumer Awareness and Choice:

- Women consumers gain valuable information about the health benefits, environmental impact, and affordability of sustainable sanitary pads through this research. Increased awareness empowers women to make informed choices about their menstrual hygiene products, encouraging them to consider eco-friendly options that align with their values and preferences. Consumer demand for sustainable products can drive market trends and encourage industry responsiveness.



#### 6. Social and Cultural Change:

- The study's findings can contribute to shifting social norms and cultural attitudes towards menstrual hygiene and sustainability. By addressing taboos, stigma, and misconceptions surrounding menstruation, the research promotes open dialogue and acceptance of sustainable menstrual practices. This cultural shift fosters inclusivity, dignity, and gender equality in menstrual health management.

#### 7. Educational Initiatives and Community Engagement:

- Educational institutions, NGOs, and community organizations can utilize the research findings to develop educational programs, workshops, and awareness campaigns on sustainable menstrual hygiene practices. These initiatives empower women with knowledge, skills, and resources to make positive choices for their health and the environment. Community engagement activities can also foster peer support networks and collaborative efforts towards sustainable development goals.

Overall, the implications of this research extend beyond academic inquiry to actionable outcomes that benefit individuals, communities, and the planet. By bridging the gap between research and practice, the study contributes to meaningful change in menstrual hygiene management, environmental stewardship, and social progress.

## CHAPTER 7 : SUGGESTIONS

### Suggestions:

1. Raise awareness and educate women on the environmental and health benefits of sustainable menstrual products.
2. Increase accessibility and affordability of sustainable menstrual products, particularly in low-income areas.
3. Promote innovation in the design and materials of sustainable menstrual products to improve performance, comfort, and sustainability.
4. Collaborate with local governments and waste management systems to facilitate proper disposal and recycling of sustainable menstrual products.
5. Address cultural and social barriers to the adoption of sustainable menstrual products through targeted education and awareness campaigns.

## CHAPTER 8: LIMITATIONS OF RESEARCH:

While this research study on sustainable sanitary pads in India aims to provide valuable insights and contributions to the field of menstrual hygiene management and environmental sustainability, it is essential to acknowledge and address certain limitations that may impact the interpretation and generalization of the findings. The limitations of this research include:

### 1. Sampling Bias:

- The study's sample population may not fully represent the diversity of women. Sampling bias could result from factors such as limited access to certain demographic groups, self-selection of participants, that may exclude certain segments of the population. As a result, the findings may not be entirely generalizable to the entire female population in India.

## 2. Self-Reporting Bias:

- The data collected through surveys and interviews rely on self-reported information from participants. This introduces the potential for response bias, where participants may provide socially desirable or inaccurate responses, leading to biases in the data analysis. Efforts will be made to minimize bias through anonymous surveys and interview techniques that encourage open and honest responses

## 3. Limited Scope of Variables:

- The research focuses primarily on the use, perceptions, and impact of sustainable sanitary pads. While efforts are made to cover various aspects such as health benefits, affordability, environmental impact, and cultural acceptance, certain variables or factors influencing menstrual hygiene practices and product choices may not be fully explored. This limited scope may overlook other important determinants of behavior and decision-making related to menstrual products.

## 4. Resource Constraints:

- The research may face resource constraints in terms of funding, time, and personnel. These constraints could limit the scope of data collection, sample size, geographic coverage, and depth of analysis. Despite efforts to maximize resources efficiently, these limitations may impact the study's comprehensiveness and generalization.

## 5. External Factors and Contextual Influences:

- The study may be influenced by external factors and contextual variables that are beyond control. Socio-economic, cultural, political, and environmental factors can influence participants' responses, behaviors, and perceptions related to menstrual hygiene and sustainability. While efforts are made to account for these factors, their influence on the research outcomes cannot be entirely eliminated.

Despite these limitations, the research endeavors to address these challenges transparently and mitigate their impact through rigorous methodology, data validation techniques, and thoughtful interpretation of findings. Awareness of these limitations is crucial for interpreting the research findings accurately and identifying areas for future research and improvement in menstrual hygiene practices and sustainable development initiatives.

## **CHAPTER 9: FURTHER SCOPE OF RESEARCH**

The scope of the study for sustainable sanitary pads can encompass a wide range of topics related to the production, distribution, and use of menstrual products that are environmentally friendly, socially responsible, and economically viable. Some areas of focus could include:

1. **Materials:** Investigating the different materials that can be used to make sustainable sanitary pads, such as organic cotton, bamboo, and biodegradable polymers.
2. **Manufacturing:** Assessing the environmental impact of the manufacturing process of sustainable sanitary pads and identifying ways to reduce waste and energy consumption.
3. **Distribution:** Analyzing the supply chain of sustainable sanitary pads, including transportation, warehousing, and retail, and identifying ways to minimize carbon emissions and reduce packaging waste.
4. **User acceptance:** Examining user preferences and behavior related to sustainable sanitary pads, including factors such as comfort, absorbency, and affordability.

5. **Health implications:** Investigating the health implications of using sustainable sanitary pads, including the risk of infection, skin irritation, and allergic reactions.
6. **Policy implications:** Analyzing the policy implications of promoting sustainable sanitary pads, including government regulations and incentives for sustainable manufacturing and distribution.
7. **Social impact:** Assessing the social impact of sustainable sanitary pads, including their potential to improve access to menstrual products for marginalized communities and reduce the stigma surrounding menstruation.

The scope of sustainable sanitary pads is expanding as more people become aware of the environmental impact of disposable pads and seek out more sustainable options. In addition to providing a more eco-friendly and cost-effective option for menstrual care, sustainable sanitary pads also promote health and well-being by reducing exposure to harmful chemicals and reducing waste

**1.Consumer market:** Sustainable sanitary pads can be marketed to consumers who are concerned about the environment and want to reduce their carbon footprint. This includes women who are environmentally conscious and want to switch from traditional pads to a more sustainable option.

**2.NGOs and government organizations:** Non-governmental organizations (NGOs) and government organizations can include sustainable sanitary pads in their hygiene kits distributed to women in rural and underprivileged areas. This would help to provide access to safe and sustainable menstrual products to women who may not have access to them otherwise.

**3.Corporate sector:** The corporate sector can promote the use of sustainable sanitary pads by providing them as part of their employee wellness programs. This would help to encourage employees to adopt sustainable practices and reduce their carbon footprint.

4. **International aid agencies:** International aid agencies can include sustainable sanitary pads in their aid packages to disaster-affected areas. This would provide access to safe and eco-friendly menstrual products to women in crisis situations.

Overall, the scope of study for sustainable sanitary pads should aim to provide a comprehensive understanding of the environmental, social, and economic aspects of producing and using sustainable menstrual products.

## CHAPTER 10 - CONCLUSION

Sustainable sanitary pads have emerged as an eco-friendly and cost-effective alternative to traditional disposable pads. As this study has shown, sustainable menstrual products have the potential to reduce waste, greenhouse gas emissions, and environmental impact, while also promoting women's health and well-being. However, despite the growing popularity and demand for sustainable menstrual products, there are still barriers to their wider adoption, including cultural and social factors, lack of accessibility and affordability, and resistance to change.

To promote the adoption of sustainable menstrual products, it is important to raise awareness and educate women on their benefits, increase accessibility and affordability, promote innovation and collaboration, and address cultural and social barriers. With these efforts, sustainable sanitary pads and other menstrual products can become the norm, helping to create a healthier and more sustainable future.

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