

Examining the Need for Sustainable Menstruation in India

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Abstract

The commonly used disposable plastic sanitary napkin takes roughly 500-800 years to decompose, according to the Menstrual Health Alliance India, not to mention the health and human risks involved in the procedure and usage. Keeping the environmental impact of even a single sanitary napkin in mind in a country as populated as India, the need for sustainable alternatives is a pressing priority. Thus, this paper aims to explore the full or known extent of the ecological consequences borne by the use of sanitary napkins. The paper also seeks to identify the menstrual waste management systems available and the ones towards which we need to work. While highlighting the negative impact of the widely used sanitary napkins, the paper will also explore the health issues faced by women due to the usage of the same. It also aims to find sustainable and inexpensive solutions to the customary plastic sanitary pads used in India by categorically differentiating between all the options available today. The categories for the basis of differentiation are – sustainability, accessibility, and longevity. Menstrual cups and washable cloth pads along with 100% compostable sanitary pads have been discovered to be the best suited sustainable alternatives to disposable sanitary napkins. Disposable sanitary napkins have been found to be harmful for women's health as their usage puts them at risk for various infections, interference with bodily systems and cervical cancer. The commercial plastic sanitary napkins also contribute to climate change as the manufacturing process and improper handling of menstrual waste leads to choking of the environment.

Keywords: Sanitary Napkins, Sustainable alternatives, Environmental impact, health issues

Introduction

According to the Ministry of Drinking Water and Sanitation (MDWS) 2016 report, there are 336 million menstruating women in India, out of which 64 percent use Sanitary Pads, that is, 121 million menstruating women. Assuming that they make use of 8 pads per cycle, the menstrual waste load in India amounts to a whopping 12 billion sanitary pads in a year (*Menstrual Waste Management*, n.d.). The discourse on Menstrual Hygiene Management (MHM) has gained ground in the last decade due to its collision with the UN laid Sustainable Development Goals (SDGs). A single disposable plastic sanitary napkin takes roughly 500-800 years to decompose. Disposed sanitary products are dumped in landfills and rivers, or incinerated. Incineration brings its own set of problems as incineration technology infrastructure in India is lacking in many respects. Moreover, burning sanitary napkins releases environmental toxins like dioxins and furans which may lead to the impairment of immune, nervous, endocrine, and reproductive systems ("Climate change and health", 2018). Sustainable steps to contain the environmental toll these products are taking on our ecology involve bio-medical decentralized incineration, recycling, and composting. But these waste management solutions are not without its inevitable concerns either.

With 121 million women using these sanitary pads, it becomes imperative to look into the conditions with which these products are developed so as to reassure ourselves that the environmental cost we bear down on this Earth with our actions is worth the risk. Unfortunately, it is not. Extensive research has been conducted into the raw materials that go into the making of a sanitary napkin and other adjacent products by countries across the world. The results of various studies lead us to the conclusion that these female hygiene products may use residual pesticides, toxic chemicals, and carcinogens. These contaminants and irritants are easily

absorbed into the circulatory system of women due to the high permeability of vulvar skin and vaginal mucosa and are thus harmful to women's endocrine and reproductive systems (Gao & Kannan, 2020). In light of this information, it becomes essential to review those menstrual products in the Indian market that claim to be safe, hygienic, and biodegradable as opposed to the disposable sanitary napkins.

Impact on Women's Health

While sanitary napkins have existed in the Indian markets since the 1930s, disposable plastic sanitary napkins with adhesives which we use today took hold among the masses in the late 1980s and early 1990s. Some research has been conducted in India in recent years by scientists and NGOs working in the menstrual products and their sustainable alternatives sector to understand the ingredients that go into the making of the disposable sanitary napkin yet the research is quite limited and lacking in many aspects while the scope is quite expansive. Since the standards to certify the quality have not been updated since 1980 by the Bureau of Indian Standards (these standards are now under revision), we cannot rely on the validity of these products based on faith alone. So we look towards research conducted in other countries as the conglomerates and multinational corporations with monopoly over these menstrual products are the same across nations. It is common knowledge in the healthcare world that the vulvar tissue is more permeable than exposed skin and therefore the safety assessment of menstrual hygiene products should keep in mind the heightened level of permeability of the vulvar skin and vaginal mucosa (Farage & Maibach, 2004). Women and adolescent girls belonging to low-income groups often wear disposable sanitary napkins for more than the recommended 4-6 hours due to socio-economic constraints which puts them at risk for medical complications such as reproductive tract infections (RTIs), cervical cancer, and interference with embryonic

development. Thus, the risk assessment for sanitary napkins is necessary as women wear these pads for 3-8 days on average every month for the entire period of their reproductive years.

Sanitary Napkins have undergone immense technological advancement moving from cloth rags to papyrus to sanitary aprons to menstrual belts to the sanitary napkins with adhesive we know today. The disposable sanitary napkins attributes that we have come to value such as fragrances, high absorbent core, “cotton-y soft” feel, and enhanced longevity result from super absorbent polymers (SAPs), phthalates, polycyclic aromatic hydrocarbon (PAHs). Phthalates (also used to add fragrances to sanitary napkins) are a group of chemicals used as a plasticizer found in high concentrations in sanitary napkins which have been known to cause precocious puberty, endometriosis, female genital tumors, and ovulation disorders (Gao & Kannan, 2020). SAPs are added in the core absorbent layer to increase the absorption capacity of the napkin and have been linked to toxic shock syndrome (TSS), a rare but life-threatening condition.

Testing conducted by Women’s Voices for the Earth in August 2014 of Always menstrual pads, manufactured by Procter and Gamble, sold under the name of Whisper in the Indian subcontinent indicates that both scented and unscented Always pads emit toxic chemicals (“Always Pads Testing Results - Women's Voices for the Earth”, 2020). Our concern increases with the knowledge that several of these chemicals which have been identified as carcinogens, and reproductive and developmental toxins are not disclosed on the product by the manufacturer. These include – Styrene (carcinogen), Chloromethane (reproductive toxicant), Chloroethane (carcinogen), Chloroform (carcinogen, reproductive toxicant, neurotoxin), and Acetone (irritant). Furan is “reasonably anticipated to be a human carcinogen” by the National Institutes of Health (NIH) and various other institutions (National Toxicology Program, Department of Health and Human Services, 2016).

To give our sanitary pads the pristine white look, they have to undergo chlorine bleaching of paper, cotton, and wood pulp, an unwanted by-product of which is dioxins and furans that are generally released into the environment because of incomplete burning in waste incinerators. Dioxin is a carcinogen and its exposure has a range of toxic effects – chloracne; reproductive, developmental and neurodevelopmental effects; immunotoxicity; and effects on thyroid hormones, liver and tooth development ("Dioxins and dioxin-like substances", n.d.). Furans are present in pesticides that are sprayed on inorganically-grown cotton plantations. Other plasticizing chemicals like BPA and BPS disrupt embryonic development and are linked to heart disease and cancer (Mercola, 2013).

Till today in rural India, the social myths and taboos around menstruation lead to unawareness regarding menstrual management and unhygienic menstrual and sanitation practices (Chanana, 2016). The outcome of using waste synthetic cloth that does not have the absorbency, retention and airflow of cotton cloth is microbial growth and risk of RTIs. Usage and maintenance also plays a big role in the conduction of WASH practices even if the cloth is cotton. Social taboos prevent women and young girls from access to water for sterilization in open spaces and drying and washing the blood-soaked cloth under sunlight (Mahajan, 2019). Thus, the need for state intervention in rural areas to create awareness and implement Menstrual Hygiene Management (MHM) programmes is high.

Impact on the Environment

The Earth is a unique planet and it has sustained human life for about 200,000 years but for the Earth to sustain human life for another 200,000 years, we need to start taking care of this planet. With respect to the matter at hand here, sanitary napkins are a necessary public health right for every woman as part of the international clause put down in Sustainable Goal 6 –

WASH (Water, sanitation, and hygiene) – with the aim being to “Ensure availability and sustainable management of water and sanitation for all.” However, improper and inadequate practices of MHM have led to choking the environment. A national estimate puts the amount of menstrual waste created per annum at 113,000 tonnes (Rathi, 2019). The Solid Waste Management (SWM) Rules 2016 clearly dictate that the responsibility of sanitary waste lies with the manufacturers but conglomerates and MNCs like P&G, Johnson and Johnson et al rarely heed to these rules or take any responsibility that goes beyond the perfunctory disclaimer on packages (“Solid Waste Management Rules”, 2016).

The lifecycle of the production of any consumer good negatively impacts the environment at one point or the other in the whole process be it with the pumping out of carbon dioxide by the vehicle transporting the goods to the market or the improper and harmful disposal practices performed by us. Nonetheless, there are ways to minimize our carbon footprint and reducing the global warming potential at almost every stage by making conscious sustainable choices. Waste management for menstrual hygiene products is the most crucial and game-changing stage for reducing land use and waste as improper waste management is the source of clogged drains, toilets, rivers, sewage backflow, soil pollution and, the creation of mountains of non-biodegradable landfills.

Proper handling of sanitary napkin after disposal is imperative. The plastic layers, adhesive wings, SAPs used to make commercial sanitary napkins are non-biodegradable and take up to 800 years to decompose. If menstrual waste is not segregated, handled separately, and properly wrapped at the household level, the waste collectors have to manually separate these at a later stage making them susceptible to infections and diseases like HIV and Hepatitis. The hazardous and toxic chemicals from the sanitary pads seeps into the soil which leads to emission

noxious odours, groundwater pollution and loss of fertility. The waste created is a biomedical hazard for human health, especially for manual scavengers picking out the waste in landfills and cleaning the sewers. The blood in the pads may accumulate pathogens which can infect the soil as well as the water supplies through improperly insulated pipelines in cities and villages.

“According to the Central Pollution Control Board’s guideline on Management of Sanitary Waste, 2018, deep burial, composting, pit burning and incineration (low-cost, small-scale, electric and high temperature biomedical incinerators) are some of the methods that should be adopted to dispose such waste.” (“Is green menstruation possible?”, 2019) According to the data collected by the department of Drinking Water and Sanitation, out of the 12 billion pads being disposed annually, 28% are disposed along with routine waste, 28% are disposed in the open, 33% are buried, and 28% are burnt in the open (*Menstrual Waste Management*, n.d.).

The Indian government has been promoting the use of mini incinerators in schools, women’s sanitary complexes, primary health centres and any other suitable place in the village to burn sanitary pads (“Breaking the silence on the incineration of menstrual waste - EcoFemme”, n.d.). WHO recommends combustion of health-related waste at high temperatures (above 800°C) to convert waste into relatively harmless gases and incombustible solid waste like ash which are then disposed in designated ash pits or controlled landfills. The major concern around incineration lies in the fact that when incineration occurs in unsafe conditions – such as poorly constructed structures, low burning temperatures, insufficient waste volume, poor emission control, and inappropriate waste or improperly segregated waste – carcinogenic gases like dioxins, furans, and biphenyls are released into the atmosphere (*Menstrual Waste Management*, n.d.). Thus, there are too many factors to consider when incinerating and the odds of release of toxic chemicals into the atmosphere too high. Constructing incinerators away from inhabited

areas would not be a possible solution to minimize the negative impact created as these toxins can travel far from the initial point of emission. Hence, incineration is only appropriate for sanitary napkins without SAPs and bleaching agents.

Composting is the process of complete degradation due to biological processes which yields carbon dioxide, water and other inorganic compounds in a defined period of time, without visible, distinguishable or toxic residue (*Menstrual Waste Management*, n.d.). It is really only appropriate for sanitary napkins without SAP, adhesive wings and other perforated plastic layers as the disposable plastic sanitary napkin is non-biodegradable and thus not compostable. When considering the discourse on compostable sanitary napkins, we need to keep in mind that composting at home is not feasible for most Indian women due to various reasons – discomfort surrounding the idea of manual composting, space constraints in urban areas, social myths and taboos in rural areas, the number of blood soaked sanitary napkins produced in households of more than one menstruating women and the harsh odours it might release. On a parallel note, deep burials pits following the guidelines for deep burials of biomedical waste are also recommended.

India needs to focus on developing a circular economy since reusable cloth pads and menstrual cups are not a permanent solution. A circular economy is an economic system aimed at eliminating waste and the continual use of resources. Large scale recycling of all kinds of menstrual products is the best way to handle menstrual waste management. Fater Group in Italy has evolved a technological process of recycling, developed from Fater patents, in which diapers and hygienic pads are separated into their basic components – including plastic, cellulose and SAP – and generated into plastic granules and high quality and completely sterilized organic-cellulose material, using steam for eliminating all potential pathogens and odors (Fater Group,

n.d.). Thermal Pressure Hydrolysis is another similar recycling method developed by Elsinga Beleidsplanning en Innovatie in the Netherlands to recycle diapers and other incontinence products that may be applicable to menstrual products as well with technological evolution (Odegard, Lindgreen & Broeren, 2018). Similar research and recycling initiatives are being developed around the world. For any initiative like this to work, segregation and collection of waste is the primary and most crucial stage that needs to be implemented across the nation.

The other optimal option is to declare menstrual waste as biomedical waste. This also requires separation as waste collection stage leading to incineration in biomedical incinerators. Biomedical incineration devices are complex and designed to safely dispose of menstrual waste. The waste is first put into primary chamber that reaches temperatures of +850°C and then the gases are processed through a secondary chamber that retains the gases for over 2 seconds. It is then passed through a number of pollution control systems. This process ensures that no harmful gases are being ejected at the end of the process into the environment (Billingsley, 2019).

Sustainable alternatives

The answer to many of these health and environmental concerns that surround disposable plastic sanitary napkins is finding better, sustainable alternatives. These include biodegradable or organic sanitary pads which claim to compostable and decompose over time, washable or reusable cloth pads, and menstrual cups. A comparative analysis on the basis of sustainability, accessibility and longevity has been showcased in Table 1.

Biodegradable Sanitary Pads

These are pads that claim to be biodegradable, eco-friendly and compostable. There are a few companies in India that manufacture these using water hyacinth, bamboo fibre, banana fibre,

and organic cotton. It is undeniable that they can be a gateway to reducing plastic waste and learning more about the various menstrual product alternatives available. Ultimately, any disposable menstrual product that is used only for 3 to 6 hours will negatively impact the environment due to the waste generation and treatment. Although, since it decomposes in 3 to 6 months, it has an exponentially smaller carbon footprint than the non-biodegradable disposable sanitary napkins.

Testing conducted by volunteers at Green the Red of these pads from three popular companies – Heyday, Saathi, and Carmesi – gave them inconclusive results about their claims of being compostable since none of these pads were 100% compostable under the three-month period. With Carmesi pads, there seemed to be a layer of bio-plastic or plastic which would not shred ("Biodegradable Sanitary Pads - Testing the tall claims", 2019). Composting conditions for menstrual waste needs to be monitored for the right temperature and pressure and designed according to established guidelines such as Solid Waste Rules and Biomedical Waste Rules.

Washable Cloth Pads

In the last two decades, we have witnessed a harkening back to the past with the resurgence of the use of cloth during menstruation, except these are sanitary cloth pads made safe and hygienic with technological enhancement. These are sustainable, eco-friendly sanitary pads but they need to be hygienically washed and dried in the sunlight as the sun's heat naturally sterilizes them. They need to be stored in clean and dry places to avoid contamination. They are reusable and do not create disposable waste after each use. With increasing awareness, these cloth pads are being incorporated into the lives of urban women very slowly but surely. Lakshmi Murthy who works with Vikalp Design (NGO) conducted workshops in the rural areas of Rajasthan to explain the usage and procedure of washable cloth pads to women in the area and

emerged successful. Yet, civic activism and mobilization campaigns carried out by NGOs are not enough if we are to turn the tide on the wave of sustainability in a country the size of India.

Widespread planning and implementation directed at community mobilization in the cause of menstrual hygiene and management by the administration is the need of the hour.

Reusable Menstrual Cups

Menstrual cups are small, flexible funnel-shaped cups made of US Food and Drug Administration (FDA) approved medical grade silicone or latex rubber that one inserts into their vagina to catch and collect period fluid. They can hold more blood than the other options on the market and depending on the flow, can be worn up to 12 hours. They are durable and reusable up to 6 months to 10 years without any health hazards (that we know of) depending on the product and aftercare the user provides. Aftercare involves washing with water and wiping it clean. One may even sterilize them after use to be on the safe side. Finding the right menstrual cup and fit is a trial and error process and requires some gynecological assistance or can be learnt through internet tutorials but one has to be careful in their choice of product as the wrong size can lead to leaks or spillage.

It is important to consider the fate of menstrual cups once abandoned as finding the right menstrual cup is a trial and error process and sharing or lending menstrual cups is not advised by any means. This means that in the process of using menstrual cups for the first time, one may accumulate a number of menstrual cups that will be of no use down the line. Since medical grade silicone is not compostable, recycling is the best option although infrastructure solely dedicated to silicon recycling may not be developed or easily accessible. However, since many medical devices are made from medical grade silicone, recycling plants have devised ways to recycle them and menstrual cups may be recycled along with them. This would require collection points

of some kind to be set up in hospital and Primary Health Centres around the country. Thermal decomposition or burning silicone is an option as silicon dioxide is not harmful and the carbon dioxide produced is miniscule. Keeping all of this in mind, the idea of menstrual cups to be in widespread use in rural India might be a bit of a stretch in the immediate future. However, Primary Health Centers in more developed rural areas joining hands with NGOs that work to provide and educate the masses about menstrual cups and other alternatives can change the planet.

Table 1

Product/Category	Biodegradable Sanitary Pads	Washable Cloth Pads	Menstrual Cups
Sustainability	<p><i>Raw Materials:</i> Manufactured using water hyacinth, bamboo fibre, banana fibre, and organic cotton with a bioplastic layer in some cases.</p> <p><i>Waste Management system:</i> Composting by burying in a pit.</p> <p><i>Quality Standards:</i> Performance and Hygiene Parameters – BIS IS 5405 (currently under revision) Compostability – IS 5404 (currently under revision) or ISO 170888 from a Government authorized testing facility (<i>Menstrual Waste Management</i>, n.d.).</p>	<p><i>Raw Materials:</i> Made using organic cotton cloth or bamboo fibre, while the back of the pad is usually made with a PUL (polyurethane laminate) leak-proof layer.</p> <p><i>Waste Management System:</i> They are made using biodegradable ingredients and will hence decompose through natural processes.</p> <p><i>Quality Standards:</i> BIS standards under development (<i>Menstrual Waste Management</i>, n.d.).</p>	<p><i>Raw Materials:</i> Medical Grade Silicone.</p> <p><i>Waste Management System:</i> Medical grade silicone is not compostable. Recycling and thermal decomposition are the best possible ways to manage menstrual cups once they are not of use.</p> <p><i>Quality Standards:</i> BIS standards under development (<i>Menstrual Waste Management</i>, n.d.).</p>
Accessibility	<p><i>Cost:</i> A single pad usually costs Rs. 20-250. Annually this adds up to Rs.1920-24000 for an average</p>	<p><i>Cost:</i> A single pad usually costs Rs. 100-300. If one buys four pads for a monthly</p>	<p><i>Cost:</i> It generally costs around Rs. 1000-4000.</p>

	<p>consumer and therefore while the cheapest products are on par with the cost of the commercial disposable plastic sanitary napkins, the average priced and more expensive products are not economically feasible for most women in the country. However, it is to be noted that most of the acclaimed products fall in the Rs. 20-40 range.</p> <p><i>Availability in rural areas:</i> Being made available through NGOs. Most manufacturing units employ rural women and are set up in villages and urban slums.</p>	<p>reusable cycle, it amounts to Rs.400-1200. The consumer may bear a high one-time cost but considered inexpensive in the long run.</p> <p><i>Availability in rural areas:</i> Being made available through NGOs. Most manufacturing units employ rural women and are set up in villages and urban slums.</p>	<p>Budget-friendly as you only pay once and can reuse them up to 10 years. The amount spent gets compensated in the first year of use.</p> <p><i>Availability in rural areas:</i> Not highly available but some rural areas have been reached with the help of Green The Red campaign and the NGOs associated with it.</p>
Longevity	<i>Life Span:</i> One-time use (3-6 hours)	<i>Life Span:</i> Reusable up to 3 years (3-6 hours at a time)	<i>Life Span:</i> 6 months to 10 years

Conclusion

The world we live in today provides no easy sustainable and organic options if we are to reside among civilization. We cannot go from breakfast to lunch without hurting the environment in some way or the other. Yet, life is about choices – the choices we make every day make up the rest of our lives. Consequently, what we can do is make conscious choices in favour of preserving our health and preserving our environment if we have access to and the privilege to make sustainable choices. For those who do not have access, it falls on the State to encourage and make available those sustainable choices for them.

The movement to make conscious sustainable choices has picked up speed in urban and educated sections of the nation but does not limit itself to these regions and categories. Social media activism, word-of-mouth experience communication, community mobilization by NGOs, and subject matter experts have heavily contributed to the cause of menstrual hygiene and waste management across the nation. According to the National Family Health Survey (2015-16), women using hygienic means of managing menstruation in India stand at 78% in urban areas, 48% in rural areas, and 58% overall. In this survey, locally prepared napkins, and MNC manufactured sanitary napkins are both considered as hygienic methods of protection (Ministry of Health and Family Welfare, 2016). These are promising numbers and can provide a good base to initiate women into the folds of sustainable menstruation.

Our main concern today should be social activism, awareness drives and State directed missions in rural and suburban communities of tried and tested methods of menstrual hygiene and waste management. Conversion of rural women to the cause of reusable sanitary products is more crucial than converting urban women. The reason behind this is as follows: Firstly, the best possible waste management solution for disposable, non-compostable, sanitary products that are developed with SAPs can only be done through bio-medical incinerators or large scale recycling. Either of those methods require large volumes of menstrual waste to be collected and transported which is not viable in the immediate future in the case of rural communities and remote areas. These methods can be comparatively easily implemented in the urban context. Secondly, as discussed, rural women face higher incidence of RTIs and disruption in accessing an equitable lifestyle as poor hygiene contributes to stress, anxiety and absenteeism from school and workplace. Therefore, it is absolutely pertinent in the cause of sustainable menstruation to

empower rural women to utilize biodegradable sanitary pads, cloth based sanitary pads or menstrual cups.

With receding stigma around menstruation, it becomes easier and much more pertinent for us to address the issues around sustainable menstruation. Even though menstrual cups and washable cloth pads may not be a permanent solution in our campaign to save the planet, they are the most suitable sustainable alternatives to disposable sanitary napkins available today along with State directed centralized incineration, composting, deep burial and recycling centres to handle menstrual waste properly.

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