Project Flow

Mapping barriers to the safe and sustainable disposal of menstrual health products in low- and middle-income countries

This project seeks to map the barriers to the use and disposal of menstrual health products.

In this report we identify user needs to inform future investments in improved disposal systems and technologies.



Acknowledgements

Team:

Aly Beeman, Ankita Rawat, Geetika Pandya, Joseph Kwesiga, Nicole Ippoliti, Dr. Rebecca Hope, Theo Gibbs

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All photos and primary data included in this document are used with informed consent or credit where appropriate.

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Executive Summary

Project Flow aimed to investigate and understand user behavior and social norms regarding menstrual product waste disposal in diverse contexts in low- and middle-income countries (LMICs).

Challenge

- While significant research and investment has gone into menstrual hygiene management (MHM) initiatives in LMICs, product disposal systems have been largely overlooked to date.
- Lack of adequate disposal facilities has a harmful impact on menstruators' physical and psychosocial health, on economic opportunity, and on the environment.
- Currently, menstruators bear the burden of disposal, and lack the education, facilities, and community support to dispose in safety, privacy, and dignity.
- Facilities have not been designed with menstruators' needs in mind, nor do they consider the powerful influence of stigma and taboos surrounding menstrual blood.

Approach

Between July and August 2021, YLabs conducted 1) key informant interviews in Uganda and India, 2) interviews with global and regional experts, and 3) a rapid literature review.

Findings

In this presentation we summarize:

- A menstruator's journey in disposing of menstrual products
- · Barriers and challenges experienced by menstruators in usage and disposal
- The drivers of behavior that impact disposal decisions, including socio-cultural and infrastructure context

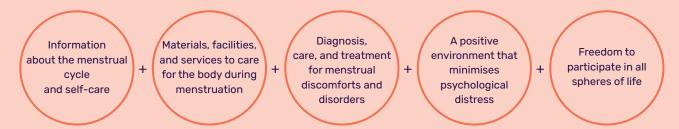
We conclude by recommending key design principles and opportunities for future work to develop effective, culturally competent disposal ecosystems. We emphasize the need for user-led design approaches to drive context-sensitive innovations in product disposal.

Introduction

Definitions

Menstrual health is defined as a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity, in relation to the menstrual cycle.¹

Achievement of menstrual health requires¹:



Management of menstruation requires²:

Clean absorbents

Adequate frequency of changing absorbents

3. Washing the body with soap and water

4. Adequate disposal

5. Privacy for managing menstruation

The Challenge

1.

An unmet need persists for safe, appropriate, and effective disposal systems to support menstruating people.³⁻⁶

2

Limited access to products and safe, private, accessible spaces for disposing of menstrual health (MH) products is a pressing problem for millions of people who menstruate.³⁻⁶

3.

Lack of suitable disposal options can affect menstruators' ability to actively participate in community activities, prevent young girls from going to school, and restrict menstruating people's mobility to access essential services.³⁻⁶



"I travel to the open fields to bury the pads. I do not throw them into the dustbins despite them being present outside my house because I do not want anyone to see my used menstrual products."

Female, 34, Uttar Pradesh, India



Photo credit

10,000-12,000

The average number of disposable menstrual products a menstruating person uses in their lifetime.⁷





250-300

The average number of pounds of product waste a menstruating person will create over a lifetime.⁸

The Urgent Need for User-Driven Design of Dignified Disposal Systems

Historically, menstrual waste disposal systems have been overlooked by MHM initiatives. 9,10

Currently, there is no uniform recommendation for quality standards for menstrual waste disposal systems. Instead, the burden of choosing the "correct" disposal method falls on the menstruators themselves.¹¹

There has been very little user-driven research conducted on menstrual product waste disposal systems, especially in LMICs.

There is an urgent need to design systems in partnership with users, taking into account their context, needs, and behaviors, as well as prevalent taboos about menstrual blood.³

This project seeks
to address that gap. We
build on existing
evidence with user
insights from Uganda
and India to inform
the future design
of user-centered
disposal systems.

Why Disposal Matters

Why Disposal Matters

While there is abundant literature on the challenges of general menstruation management in LMIC contexts, there is relatively little published evidence that specifically and exclusively focuses on the impacts of menstrual waste disposal.

Based on the literature available and our interviews with menstruating people in two countries (India and Uganda), we identified four primary negative impacts that poor disposal systems have on the well-being of people who menstruate:

- 1.
- Physical health risks
- 2.
- Loss of income and educational opportunity
- 3. Environmental toxicity and chemical pollution
- 4. Psychological stress, anxiety, and social trauma

Physical Health Risks

An absence of appropriate and accessible disposal facilities often leads menstruators to overuse products beyond their recommended time, which puts them at greater risk for bacterial vaginosis, sores, and both urinary and reproductive tract infections. 12-14

Those who use disposable pads are also at **risk of absorption of endocrine-disrupting chemicals** from prolonged use of the pads.¹⁵

"I felt scared to be in public due to any leakage or bad smell and I also had worries of having small wounds at my private part [due to long usage]."

Woman, 35, Bidi Bidi Settlement, Uganda

Loss of Income and Educational Opportunity

Menstruators may miss hours or entire days of work or school rather than attempt to manage their menstruation in ineffective or unsafe WASH (water, sanitation, and hygiene) facilities. As a result, this may lower menstruators' income and economic opportunity. 16-18

In one study, 64% of Ugandan schoolgirls reported avoiding standing in class and 51% struggled to concentrate due to menstruation, mostly due to fear of soiling.¹

While previous studies report school and work absenteeism due to menstruation, any correlation to a lack of access to disposal facilities has not yet been documented.¹⁶⁻²⁰

Evidence from nationally representative surveys in Burkina Faso, Niger, and Nigeria found that women aged 15-49 working outside the household had reportedly missed at least one day of work in the previous month due to menstruation. School-going girls (aged 15-24) had similarly reported having missed school days in the past year to manage their menstruation. ¹⁸

"The mental capacity that goes into worrying about disposal and hiding it takes away energy from other important tasks, creating a huge opportunity cost."

Afton Bloom, Interviewed expert

Environmental Toxicity and Chemical Pollution

Disposing of menstrual products has a significant impact on the environment. Used products thrown into pit latrines or flush toilets not only clog sewage lines, but also end up at landfills, where a single disposable pad can take **500-800 years to decompose.** 7.8, 22, 23

When dumped in open grounds or bodies of water, the **chemicals and plastic makeup** of menstrual products can contaminate the area or be ingested by animals or marine life. The same holds true when the products are buried; they often end up being dug up and ingested by animals.⁸

Burning of disposable pads results in dioxin emissions that take a long time to break down once they are in the environment. Inhalation can lead to cancer and both reproductive and developmental damage if menstruators are in the vicinity when the product burns.²⁶

"There is so much to be gained from widening the lens of menstrual health - by including not just women's personal health, but also the health of the environment."

Interviewed Expert, EcoFemme

Psychological Stress, Anxiety, and Social Trauma

There is substantial evidence on the psychosocial consequences of menstruation, including fear of stigma, anxiety, shame, and embarrassment.^{1, 25-28}

A lack of dedicated disposal facilities can increase individuals' anxiety and stress, exacerbated when they fear their menstruating status or menstrual products may be discovered by others.²⁷⁻²⁹

Menstruators experience difficulty concentrating or participating in daily activities, including education, due to fear of discomfort, leakage, and menstrual pain.^{1, 25-27}

"I feel scared disposing pads when many people are at home. Away from home, there is no better place to dispose of pads. I could dispose of my pads in the bush, but that also makes me feel ashamed."

Woman, 21, Bidi Bidi Settlement, Uganda

Research Approach

Research Questions

1. What are the **current behaviors**, **needs**, **and challenges** related to menstrual health product disposal?

2.

What are users' preferences and barriers to use of different types of disposal devices, including **taboo** and **stigma-related preferences** and **related fears** around disposal of menstrual blood?

3.

What are users' habits and preferences regarding menstrual health products, including duration of use and product choice?

Research Methods:

Primary research: Rapid key informant interviews in Uganda and India (n=30)

Secondary research: a rapid literature review and interviews with 15 global and regional experts



Research Methods: Key Informant Interviews

Primary research took place over one week in August 2021.

Sampling: We used purposive and snowball sampling to identify and recruit participants. Participants were first contacted with the help of community leaders or local organisation to assess interest and schedule a meeting time. A total of 30 menstruators were interviewed in-person as well as virtually.

Structure: We used semi-structured interviews of 45-60 minutes to collect data pertinent to our research questions.

Consent: All participants provided informed consent to take part in interviews. All photos were taken with written consent in line with YLabs' Ethical Image Policy, or used with credit to the photographer.

Study Population

Uganda (n=15)

Predominantly South Sudanese inhabitants of Bidi Bidi refugee camp

India (n=15)

Rural and urban participants from Delhi, Haryana, and Uttar Pradesh states

Selection Criteria

For both countries

- Have an active menstrual cycle
- · Be at least 18 years old
- Have low or no literacy
- Currently use or have used cloths or disposable menstrual products (e.g., pads) to manage their menstruation

For only India

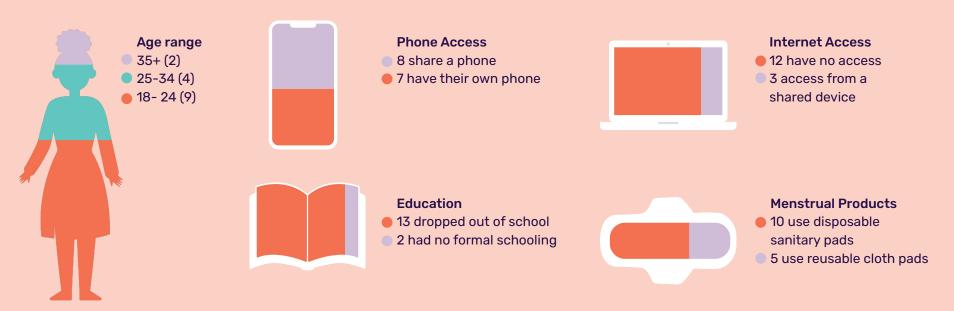
Mix of rural and urban contexts

Key Informant Interviews: Research Sites INDIA UGANDA Nehru Nagar, Nizammudin, Bidi Bidi Refugee Sunder nagar, Jahangirpuri, Delhi Settlement Zone 5, Yumbe Basdhara Village, Haryana Sitapur, Uttar Pradesh

Key Informant Interviews:

Demographics

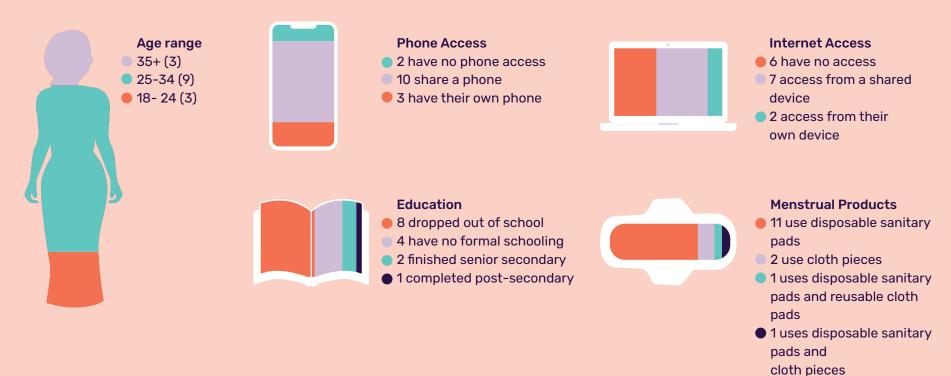
UGANDA (n=15)



Key Informant Interviews:

Demographics

INDIA (n=15)



Research Methods: Literature Review

We conducted a rapid review of the literature, including gray literature and peer-reviewed papers on challenges relating to the disposal of menstrual health products, focusing on LMICs and diverse contexts.

Four key focus areas:

Menstruators' preferences, behaviors, and needs for product waste disposal Impact of current disposal methods on the individual, community, and organizational level

- 3. Quantity of products being disposed
- 4.
 Review of previous disposal interventions

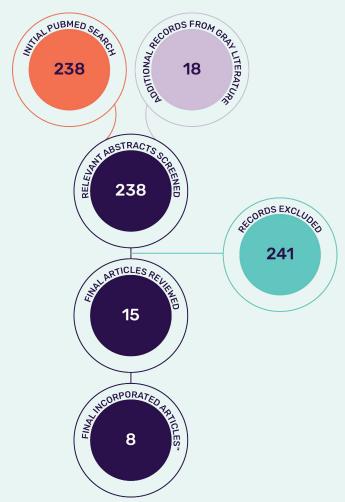
Literature Review:

Inclusion Criteria

- · Focus on menstrual disposal practices
- · Target individual behavior change
- Report on a relevant intervention that could include hardware (infrastructure) or software (education) interventions
- Conducted in LMIC context
- · Published in 2016 or later
- Written in English

Final search string for systematic literature review:

((menstrual* OR menstruation OR "menstrual hygiene products") AND (waste OR dispos* OR disposal OR "disposal technolog*" OR incinerat*)) AND ((intervention OR program OR quasi - experiment* or quasiexperiment* or quasi - random* or quasirandom* or non - random* or nonrandom* or compar* or randomized controlled trial [pt] OR controlled clinical trial [pt] OR randomized controlled trials [mh] OR random allocation [mh] OR double - blind method [mh] OR single - blind method [mh] OR clinical trial [pt] OR clinical trials [mh] OR ("clinical trial" [tw]) OR ((singl* [tw] OR doubl* [tw] OR trebl* [tw] OR tripl* [tw]) AND (mask* [tw] OR blind* [tw])) OR (placebos [mh] OR placebo* [tw] OR random* [tw] OR research design [mh:noexp] OR comparative study [pt] OR evaluation studies [mh] OR follow - up studies [mh] OR prospective studies [mh] OR control* [tw] OR prospectiv* [tw] OR volunteer* [tw]) NOT (animals [mh] NOT human [mh])))



Research Methods: Expert Interviews

We used purposive and snowball sampling to identify and recruit experts from a mix of relevant backgrounds and disciplines, with an emphasis on practitioners with direct or lived experience of MH-related challenges.

Experts were first contacted by email to assess interest and schedule a meeting time. A total of 15 experts were interviewed virtually, with interviews lasting an average of 35 minutes.

Roles of Interviewees (placed emphasis on people working on the ground):

- Program Lead
- Policy Makers
- WASH Technical Advisor and Engineer Researchers
- Associate Director
- Grassroots Advocates
- Gender Specialists
- Managing Director
- Senior Consultant
- Public Health Promotion and Community
 Engagement Lead
- CE0

Organizations Interviewed:























Pro-Girls Foundation

Findings

Menstruating people make careful deliberations in their menstrual journey.

The overall management of their menstruation is determined by the **stigmatized and taboo** nature of menstrual blood, the **knowledge** menstruators possess of the phenomenon, the **restrictions** imposed upon them, and the **cultural beliefs** of their communities. These induce a deep sense of **fear and shame** in menstruators, resulting in **physiological and psychological stress** that has limited outlets.

Menstruating people's social and physical contexts determine what type of products they choose and how they use and dispose of them. Menstruators' level of access to product options, WASH facilities, and safe, private spaces drive their decisions on product choice, usage, and disposal.

The following stories based on field research in India and Uganda bring these tensions and decision dependencies to life.



Diana Uganda



Diana* is 22 years old and lives in the Bidi Bidi refugee settlement. She starts her day early at 6am in order to bathe, attend to household chores, and prepare breakfast for the household.

Diana dropped out of school and is currently unemployed, but she is kept fairly busy with domestic chores, field work, and fetching water.

She does not have much free time or opportunity to rest somewhere private and quiet during her day. Men and boys in the community often watch her work through the day. Diana hates feeling watched, especially when she is menstruating. At the end of her day, Diana prepares food for the household and then, if there is enough water left over, she washes herself and prepares for bed.

*All names and personal details are fictionalized in order to preserve participant confidentiality

Product Choice

Diana uses disposable pads since they are the main product that she can access in the settlement.

Water supply is limited so reusable pads are not a viable choice. She fears that men would also shame her if they saw her washing or drying pads.

Sometimes the free disposable pad supply from NGOs in the settlement runs out, and she must ration food money to buy expensive pads from the market.

Usage

Diana often experiences heavy flow, so she feels anxious thinking about where she will be when she needs to change her pad.

Having heard stories about women being bullied, one of Diana's biggest fears is experiencing leakage or odor in public.

Diana also worries whether she will be able to change her pad somewhere private and safe, as she has limited access to such spaces. She plans her days carefully when she is menstruating.

Disposal

While Diana is out doing chores, she asks to use a neighbor's latrine. This is the only privacy she gets.

There is a waste bin inside, but she does not want the men who use the latrine to know she is menstruating if they see her pad in a rubbish bin. They would humiliate her.

She drops her used pad into the pit while inside, unwraps a fresh pad, and continues with her chores.

Shilpi India



Shilpi* is 18 years old and lives in an urban slum of Delhi with her parents and three sisters. Her father is an alcoholic who is unemployed and her mother earns money by working as a domestic helper. Shilpi left school in order to support her mother with house chores, take care of her sisters, and bring in some extra income when she can.

She lives in a small room with no private toilet. She and her family use a community washroom which is a few yards away from her home. She makes sure to use the washroom after sunrise and before sunset because she fears being sexually harassed or abused in its vicinity.

There are times when the community washrooms are filthy or occupied. The door does not lock. With little choice, she once tried to bathe outside her home with her clothes on, however, men in her community started staring at her and made her feel uncomfortable. She misses her childhood when she used to freely bathe outside her home without risk or fear.

*All names and personal details are fictionalized in order to preserve participant confidentiality

Product Choice

Shilpi uses pieces of cloth to manage her menstrual flow.
Occasionally, she uses disposable pads when they are distributed by the government or NGOs, but there are five women in her family, so there is usually not enough for everyone.

Using reusable pads is a challenge as she doesn't have any private space to wash and dry them out in the sun.

She's previously experienced men staring while she was trying to hang her washed reusable cloth pad to dry.

Usage

She has a cycle of only two days with heavy flow. She uses pieces of cloth or three disposable pads (if available) in a day, which she changes every eight hours.

Due to limited access to a private place to change and dispose of the products, she waits until the cloths or pads are completely filled up.

She regularly gets rashes and itching since she uses the menstrual products longer than advised, but is too embarrassed to seek medical help.

Disposal

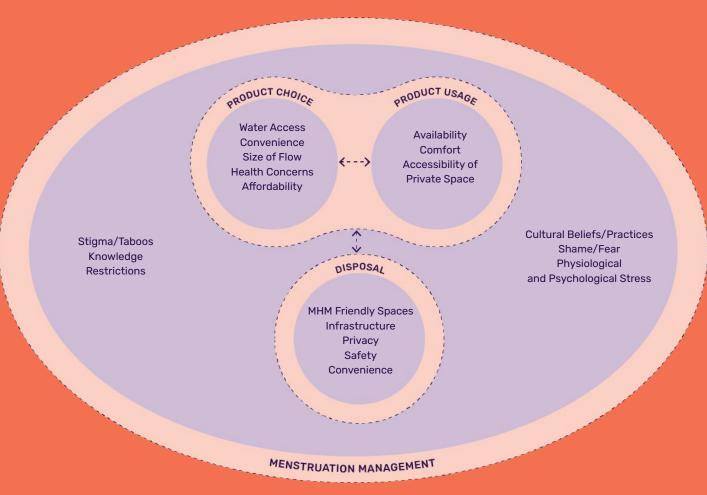
During daytime, she tries to go to the community toilets, wraps up the used cloths or pads, and throws them into dustbins there.

Sometimes when her father is away from home, she can change her pad at her own home and throw the used products into the small dustbin.

Later at night, she takes them to the larger dustbins outside her neighborhood so that her father and neighbors don't see them. For her safety, she makes sure to be accompanied by her mother on these trips.

Disposal Decision Ecosystem

Drivers of user behavior that impact disposal decisions



Menstruation Management

Key Influences:

- Stigma/Taboos
- Knowledge
- Restrictions
- Cultural Beliefs/Practices
- Shame/Fear
- Physiological & Psychological Stress



Menstruators are burdened with keeping a "secret" everyone knows. Menstruators go to great lengths to maintain the illusion that menstruation doesn't happen. Societal expectations that menstruators should contain, conceal, and eradicate traces of menstrual blood profoundly affect their behaviors related to the disposal of menstrual product waste.

Findings from the Field:

Menstruation Management

1.

Consistent with the literature, most menstruators did not receive accurate information about different types of menstrual products and their proper usage. Much of their practices were influenced by a prevalent belief that period blood is dirty. Indian participants reported being prohibited from worship or visiting religious spaces during menstruation.

2.

The expectation to keep silent on menstruation, due the taboo nature of the topic, meant that their needs are neglected in the home, community, workplace, and public spaces, leading to a lack of basic menstrual management facilities for washing and product disposal. Menstruators reported being taught to not discuss menstruation with male family members, including parents, because then they will be labeled as a "bad woman."

3.

Social shame also leads to concealment or inappropriate discarding of products, driven by a **fear of products being found and lack of education on disposal.**

4.

Many menstruators do not seek medical attention for infections and wounds caused by extended or unhygienic use of menstrual products because menstruation is not considered appropriate to discuss with others.

"[When disposing of menstrual products] I like to be in a hidden place so that no one will see me in the process, because other people will embarrass me."

Female, 23, Bidi Bidi Settlement, Uganda

"The religious book [Quran] states that it is wrong to dispose of menstrual products where anyone, including animals, could come in contact with it as it may harm the person who has accidentally touched the used product and they may start acting strangely. The ideal way is to wash and reuse cloth but I am unable to do it because I feel disgusted to see as well as touch "dirty" blood came out of my body. I feel guilt and shame to do it."

Female, 22, Delhi, India

Evidence from the Literature:

The Taboo Nature of Menstrual Blood

1.

Choices on disposal of menstrual products are inextricable from stigma and taboos regarding menstrual blood. The private, natural, biological process of menstruation has evolved into a public social practice where the responsibility is placed on menstruators to manage their own bodies, blood, and products in a "responsible" and "appropriate" way, often meaning concealing one's menstrual status and products. 25, 30

2.

Various restrictions are also placed on where menstruating bodies can go or what they can do. These include **limitations on cooking, work, and household duties, sexual intercourse, bathing, worshipping, and eating certain foods.**^{29, 31-33}

3.

Menstrual blood and **menstruators' bodies are often cast as "dirty", "impure"**, and something that needs to be hidden from public view.³¹⁻³⁴

4.

Menstrual waste is frequently linked to witchcraft, black magic, infertility, danger, and misfortune if men, children, animals, or even other menstruators see menstrual blood. 4.9.30.34.35

Product Choice

Key Influences:

- Water Access
- Convenience
- Size of Flow
- · Health Concern
- Affordabilit



The "when" and "where" is more important than the "what" in deciding which product to use.

Disposal options influence product choice.

Menstruators choose their product based on the perceived ease of disposal of the product, such as when and where they can dispose of or wash the product. Other key decision factors in product choice include availability of a given product, price, and the favored product of other family members.

Overview of Products	Cloth Rags	Disposable Pads	Compostable Pads (banana/bamboo)	Reusable Pads	Menstrual Cups
Type of Use	Reusable/Single use	Single use	Single use	Reusable	Reusable
Type of material	Biodegradable	Non- Biodegradable	Biodegradable	Biodegradable	Non- Biodegradable
Number of uses per unit	1-12	1	1	65	Approximately 650
Care	Requires care and maintenance	None	None	Requires care and maintenance	Requires care and maintenance
Decomposable rate	Up to 5 months	500-800 years	3-6 months	5 or more months	N/A
Cost	Low cost (usually made from old clothing)	Low cost (multiple competitors)	High	High	High
Availability	High/easily available	Largest market share and reach	Limited	Limited s have been excluded from the table due to low	Limited

Project Flow

Findings from the Field:

Product Choice

1.

A common fear of washing or handling blood from reusable pads heavily influences product choice.

Menstruators prefer disposable pads because they don't require hand-washing.

3.

For Indian participants, the **absence of dustbins or private washing facilities** forced menstruators to choose non-reusable pieces of cloth for prolonged periods of time.

5.

Menstrual product supply and access has been moderately disrupted due to COVID-19. Menstruators in humanitarian contexts rely on charitable organizations for menstrual products. When supply is disrupted, menstruators are more likely to switch to reusable pads, even if water access is unreliable.

2.

In the Bidi Bidi settlement in Uganda, menstruators will switch from using disposal pads to reusable ones if their price becomes costly, since they need to be bought monthly.

4.

In the Bidi Bidi settlement, **disposable pads are seen as most practical** for menstruators as they can be reliably disposed of in pit latrines.

о.

The farther menstruators are from home, the fewer options they have for adequate and dignified product disposal, as appropriate community facilities are lacking. In Uganda, menstruators reported frequently resort to burying or throwing used pads in the bush.

"Disposable pads are available to me and in the community because we freely access them from the women's centre."

Woman, 24, Bidi Bidi Settlement, Uganda

"[My preferred product is] reusable pads because they are long-lasting"

Woman, 35, Bidi Bidi Settlement, Uganda

"I find it easier to use pads once and then dispose; I don't like reusing cloth due to fear of infections and also it feels dirty."

Woman, 30, Delhi, India

Evidence from the Literature:

Preferred and Commonly Used Products

- Studies across LMIC contexts report that disposable pads, cloth, and reusable pads are the most commonly used menstrual hygiene products.9
- 3.
 There are notable differences between rural and urban regions; cloth pads are more common in rural area, whereas urban menstruators use disposable pads, partially due to availability and cost.⁴

5. Menstruators often choose a product based on its availability, comfort, affordability, absorbency capacity, and cultural acceptability. 4, 9, 25, 37

2.

Menstrual cups, biodegradable products, and tampons have been slow to infiltrate the market in LMIC contexts due to financial barriers and taboos related to women's sexuality.³⁶

4.

- Disposal considerations influence product choice.
 People may choose to use different product materials when they are at home versus at work or school.
 Menstruators tend to prefer using disposable pads at home but, for secrecy, do not want to dispose of their pads at work or school, so switch to a reusable pad. 17, 25
- 6. In low-resource settings, menstruators resort to using readily available materials like **old sacks, rags, husk, or jute** to absorb menstrual blood.³⁸

Product Usage

Key Influences:

- Availability
- Comfort
- Affordability
- Accessibility of Private Space



Daily life is planned around menstruation and disposal, in spite of inconvenience. Menstruators sacrifice significant time and energy during the days of their active cycle in order to accommodate their flow, particularly if private and secure disposal or washing options are not easily available.

Findings from the Field:

Product Usage

- Menstruators will use cloths or pads for longer periods than advised if there are no accessible places for washing, changing, and secure disposal.
- 2.
- Menstruators **who work outside the house face particular challenges** in lack of disposal or washing facilities at their place of work.
- 3.
 Participants reported painfully enduring rashes, itching, and vaginal sores from
- **overused or improvised menstrual products.** Due to stigma, these problems are not shared with others.
- 4. Unreliable access to water and soap **hinders menstruators from washing**
- Unreliable access to water and soap **hinders menstruators from washing themselves** and reusable pads (Uganda only).

"I would not waste the little soap that I had so that I could use it during menstruation, because getting it is difficult."

Woman, 22, Bidi Bidi Settlement, Uganda

"I used [a disposable pad] for longer than I wanted; I was at a market where there is no disposal point."

Woman, 22, Bidi Bidi Settlement, Uganda

"I had to use products for the whole day while working at a factory before marriage. I waited until home to change and dispose. I would feel awkward to change my products [at work] because there were always many people around and the bathroom there was common for both men and women."

Woman, 22, Delhi, India

Findings from the Field:

Product Usage (continued)

5.

- Menstruators prefer changing pads whenever **privacy of changing and disposal is possible**, and reported needing to carefully plan their days and movement around these constraints. This might be at home or in a community washroom, if there are private stalls.
- 6. Menstruators will often use black plastic bags to conceal, store, and transport used sanitary pads until they can get to a pit latrine for disposal (Uganda only).
- 7. Participants reported that changing and **disposal of products during night hours was particularly challenging** due safety concerns and the presence of male family members at home.

"It's hard to transport a pad at night especially if it gets full and you don't want to keep it in the house. I keep a kavera [plastic bag] or a piece of cloth to help me move it to the latrine if need be."

Woman, 20, Bidi Bidi Settlement, Uganda

"I am often unable to change pads at night due to public toilets shutting at 10 PM. In this case, I have to wait until the morning to change. Also, I don't have my private toilet/room in the house and I feel uncomfortable in the presence of my father."

Woman, 20, Delhi, India

Evidence from the Literature:

availability, and disposal access.²⁵

Habits around Product Usage and Duration

- People who menstruate use and change their products at varied frequencies depending on water access, user convenience, flow, odor, discomfort, product
- Users may wear a product longer than they may have wanted or intended because of a lack of access to a disposal site.^{25, 39}

5.
People who menstruate may change their usage behavior when they are at work or school compared to when they are at home due to lack of adequate disposal or wash facilities. For instance, people who menstruate regularly report delaying changing their products at school. They may even wear multiple products for better absorption if they expect a delay in being able to change their product.⁴¹

2. Cloths pads are on average changed up to three times a day and they are disposed of 29.2 times per year. On the contrary, disposable pads are on average disposed

6.

of eight times per cycle or 96 times per year. 35, 40

- Washing the genitals each time menstrual products are changed is often seen as crucial to maintain proper hygiene, which may be challenging or unsafe outside of daylight hours.²⁵
- In some cases, reusable pads present various challenges for cleaning, as they require water and a safe, private place to dry, which is not always accessible. Menstruators sometimes choose to dry products at night to avoid visibility.⁴²

Product Disposal

Key Influences:

- MHM Friendly Spaces
- Infrastructure
- Privacy
- Safety
- Convenience



With disposal, out of sight is out of mind.

Disposal needs to be discreet and final - menstruators wish to leave no discoverable trace of their menstrual blood or products. A product is not truly disposed of until it is completely out of sight and inaccessible - now or in the future- to men, children, or animals who might pull it out and socially shame the menstruator.

YLABS Project Flow

Types of Disposal Methods

We have identified six typical methods that people who menstruate use to dispose of products, depending on their culture, context, and product type:



Bury products



Flush Toilets



Discard in the environment (forest, jungle, bush, water bodies)



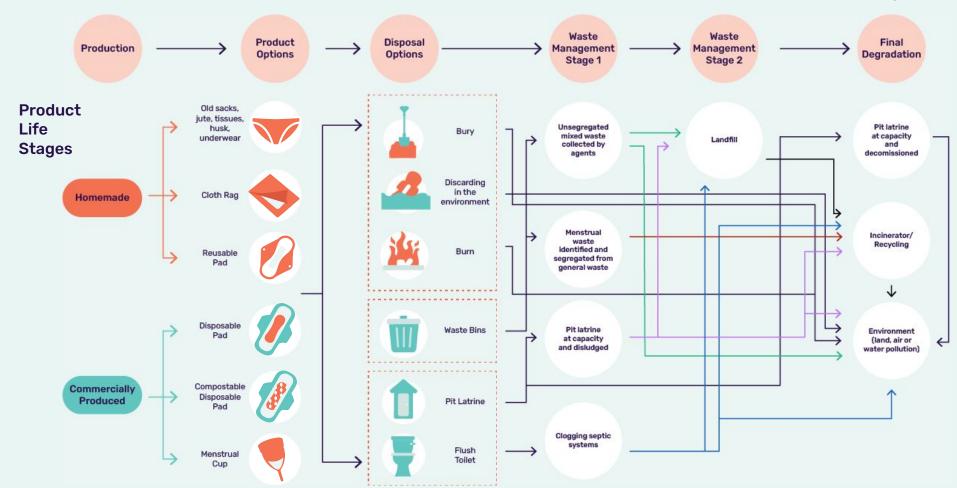
Pit Latrines



Waste bins



Burning



Findings from the Field:

Product Disposal

UGANDA

1.

Participants reported that **burning disposable pads is not straightforward**. Pads need to be dried out beforehand, adding an extra complicated step, or they will not fully combust.

4.

The drying of pads for burning is not seen as an easy or trusted process. Menstruators fear that if their used pads are left unattended, young children or men may tamper with them and display them to the community.

INDIA

1.

Many menstruators **prefer to dispose of their used product in a community dustbin**, which is then collected by waste pickers and transferred to landfill sites.

2.

For most menstruators, the **preferred product disposal method is a pit latrine**, as it offers the most discretion and anonymity.

5.

Menstruators have a **fear of used pads being found** and used for witchcraft.

2.

Menstruators also travel to locations to discreetly bury the products (clothes or pads), which they believe will then degrade in the ground.

3.

However, menstrual products disposed of in latrines risk resurfacing as the latrine fills. Menstruating people who use these latrines are blamed by community members.

3.

Some participants believed burning of disposable, non-degradable pads was best, but other participants did not prefer burning pads due to a fear that burning menstrual blood leads to infertility.

"In the pit latrine no one will have access [to used products], especially kids... It is not good to keep in the disposal bin due to the fact that some people will pick the used pads and bewitch them, which will make any women not be able to reproduce."

Woman, 21, Bidi Bidi Settlement, Uganda

"I chose to dispose in a pit latrine because I lack a special place like an incinerator within our compound and disposing somewhere else is far for me."

Woman, 26, Bidi Bidi Settlement, Uganda

"I do not prefer using community dustbins because the sanitation worker burns the waste, including used menstrual products. My mother strictly told me not to dump in that dustbin because she believes in a superstition"

Woman, 26, Delhi,India

"I live with my family and we share common room and use community toilet and dustbin. At night, it is difficult for me to change the pads as well as dispose of them, because of no privacy and the presence of my father makes me uncomfortable. We are taught not to share and discuss periods with male members"

Woman, 20, Delhi, India

Evidence from the Literature:

Drivers of Disposal Behavior

- 1.
- Discretion and privacy of the disposal method is paramount in how a user decides to dispose of their used products. Additional considerations in disposal choices include a safe and hygienic space.
- 3.

Across regions, people who menstruate are more likely to dispose of their used menstrual products in facilities or areas that are close to home due to convenience, security and availability.⁴³ In the case that a menstruator is not comfortable with their immediate disposal system in public or in an institution, they may prefer to carry, collect, and hide their used pads at home until they can dispose of them in a private space, sometimes at night to reduce risk of being observed.³⁰

2.

Commonly, menstruators report washing their used products - both disposable and reusable pads as well as cloth - before discarding to eliminate any evidence of blood. 35, 43, 44

4.

In a 2019 study in Malawi of 31 female participants, almost all feared menstrual blood being used in witchcraft. If another person got ahold of a menstrual cloth or used pad, or even stained underwear, it was believed that they could take it to a sing'anga (witch doctor) and use it to cast a curse over the owner of the object, causing them harm. This meant that women and girls were afraid of disposing used products in bins or locations where others could easily access them.⁴⁵

YLABS Project Flow

Context Specific Disposal Methods

		Rural Context		Urban Context		Humanitarian Context
		Household	Institutional (Work/School)	Household	Institutional (Work/School)	Refugee and IDP settlements
	Bury products					
	Discard in the environment*					
How do users	Burn products					
dispose of products?	Discard in a waste bin					
	Discard in a pit latrine					
	Flush in a toilet					

^{*}forest, jungle, bush, water bodies

Color Key

No evidence		
Anecdotal evidence**		
Peer- reviewed study		
Multiple peer- reviewed studies		

^{**}from key informant and expert interviews

YLABS Project Flow

Pain Points Associated with Disposal Methods

		Rural Context		Urban Context		Humanitarian Context
		Household	Institutional (Work/School)	Household	Institutional (Work/School)	Refugee and IDP settlements
Pain Points:						
Inadequate WASH Infrastructure	Lack of private and secure space (missing locks or doors, inadequate lighting, lack of sufficient ventilation)					
	Lack of clean water and soap to wash reusable products and genitals					
	Lack of gender-segregated facilities					
	Lack of waste bins for disposal					
High Costs (i.e.	Facilities cost money and have long queues					
High Costs (i.e., time, money, social	Burden of disposal is borne by individual					
capital)	Disposal is done at night to avoid being seen					
Unreliable Waste Management Systems	Lack of confidence in the existing disposal systems leading menstruators to store used products for prolonged period to ensure safe disposal					
	Fear of having menstrual waste traced back to self or household					

Color Key

No evidence		
Anecdotal evidence**		
Peer- reviewed study		
Multiple peer- reviewed studies		

^{**}from key informant and expert interviews

^{*}Rebuilding/repairing shared pit latrines can prove costly

The Pit Latrine as a Disposal Method

People who menstruate often dispose of their products in a pit latrine in contexts where a functional solid waste management system is absent.⁴⁶

Numerous studies report that the disposal of intimate items such as menstrual waste and condoms into a pit latrine gives people a sense of security and confidentiality, as they believe their item cannot be traced back to them specifically.⁴⁶

Individuals commonly throw used menstrual products, diapers, fabrics, menstrual cloths, toilet rolls, razors, underwear, and condoms into pit latrines. Several studies have sought to quantify this extraneous solid waste content in fecal sludge. A range of solid waste accumulation rates have been reported, which vary by region. Nevertheless, almost all of the studies have reported a significant amount of solid waste in pit latrines. 47-49

High amounts of solid waste in a pit latrine can lead to adverse effects for communities and organizations. In some areas, predominantly in rural areas, when a pit latrine is full, it is typically covered with soil and a new pit is dug. In areas with limited space, such as informal settlements and humanitarian settings, pits often need to be desludged, which can be costly and is usually not accounted for in budgets.^{49, 50}

While the evacuation of waste from septic tanks/pit latrines is the responsibility of local authorities or community members, menstruators feel a sense of shame when discarded used menstrual products resurface. ⁴⁵ Many menstruators have also reported being shamed by waste collectors in smaller communities.*

(*Source: Expert Interviews)

Existing Disposal Interventions



Evidence on Existing Disposal Interventions

Overall, there are a very limited number of studies that have sought to analyze the acceptability, adoption, appropriateness, cost, feasibility, fidelity, acceptability, penetration, and sustainability of menstrual waste disposal interventions. There is only one study that was found that considered user needs.⁴¹

The successful implementation of disposal infrastructure must reflect the local preferences and customs around menstruation rather than being a one-size-fits-all approach.³⁵

"The end life of menstrual products are often not thought about. What happens to that disposal pad after a woman puts it in a trash bin? Are there any systems in place for someone to come collect it? Transport it? Where is it then going? Did her putting the pad in that trash bin really fix the problem of disposal?"

Interviewed expert

Waste Bins

One of the most common interventions that have been attempted in various contexts is the implementation of waste bins with various designs such as swing tops, bins with lids, and pedal bins.⁵¹

"My school was for women only and the washrooms had dustbins, but I always used bigger dustbins near the canteen to dispose my used product because I didn't want anyone to know that I am menstruating. I felt embarrassed even though there were only women around. Menstruation was considered a "disease."

Female, 32, Delhi, India



Waste Bins

Advantages and Successes:

1.

Waste bins are relatively **easy to use** with very little instruction needed.⁵¹

2

Waste bins were found to be more successful when there was a regular cleaning service with frequently scheduled emptying of the waste bins.⁵¹

Disadvantages and Barriers to Usage⁵¹:

1.

Overall, there has been minimal success with waste bins. Many users have reported the need for a more discreet disposal method and often continue to choose to bury, burn, or throw their product into a pit latrine.⁵¹

2.

When discarding of their product in a dustbin, users worry about others seeing their used product or dogs getting in the waste bin.⁵¹

3.

Users reported disgust from touching the lid of a waste bin, unpleasant odors if not regularly maintained, and seeing other used products, and waste bins filled very quickly.⁵¹

Chutes

While not well-documented yet in literature, according to interviewed experts, chutes are becoming more popular and have been tested in humanitarian contexts and school settings.

"We installed the chutes in a section of the camp almost six months ago after women requested a way to dispose of their products privately... So far, they have worked great... I just wish we can install more of them throughout the camp."

- Interviewed Expert



Chutes

Advantages and Successes:

Chutes are able to discreetly carry menstrual waste from the source to a disposal pit, where the waste may be collected or connected directly to an on-site incinerator to be completely decomposed.^{10, 41}

2.

When compared to other disposal technologies, chutes were the preferred method among school-aged girls because it provides them **comfort to know that** waste is concealed from public eye. 10, 43,*

3.

The chute can be used for a long time, does not require regular maintenance, and reduces odor.^{10,*} 1. Can be **costly to install.**^{10,*}

Incomplete incineration leads to the release of carcinogenic gases, which

2.

can blow back into the bathroom through the chute.^{23, 52,*}

Disadvantages and Barriers to Usaged:

^{*}Source: Expert interviews

Incinerators

Incinerators allow for the onsite management of menstrual waste by burning soiled cloth, cotton waste, sanitary napkins, paper towels, etc. A range of different technologies exists to allow for variations in implementation needs such as the desired location, volume of waste, temperatures, emissions, and budgets.^{9,53}

"Governments like to invest in concrete things like infrastructure. Currently, many incinerators have been implemented in schools. But to me, buying an incinerator is low-hanging fruit. So far, there has been little thought if this technology is appropriate for this context and is it safe... There are no standards for small and medium-size incinerators [in *India*]. We need to think about how to create these standards and how to then enforce them."

Interviewed Expert, WaterAid India



YLABS

Incinerators

Advantages and Successes:

1

Onsite incineration is an option for managing the disposal of menstrual waste to achieve both pathogen and volume reduction, thus alleviating the environmental problems associated with improper disposal.^{44, 51, 54}

Disadvantages and Barriers to Usage:

1.

Cost of installation and maintenance:

A number of studies in schools reported that the cost of running incinerators can be prohibitively high and thus do not prioritize them when there are budget constraints. 4, 50, 51, 55

3.

Weak waste collection systems: Larger electric incinerators are available as part of the solid waste management efforts of local and municipal authorities, however most menstrual waste often does not reach the incineration site due to gaps in waste collection and transportation system.⁵⁷

2.

Incomplete incineration risk: The taboo and the associations of witchcraft with menstrual blood has made washing of disposable pads prior to disposal a common practice. This leads to an increase in the favorable moisture content of the pad (<25% for thermal processing), and could result in incomplete incineration. Incomplete incineration leads to the release of carcinogens, pollutants, and other toxicants that impact human health.^{44, 56}

4.

Low awareness: Our primary research in Uganda and India revealed a low level of awareness among menstruators of incinerators as a disposal method.

Software Interventions

"Software" interventions refer to interventions addressing the psychosocial effects of poor menstrual health and social stigma, whereas "hardware" interventions include targeting material challenges and providing physical infrastructure.⁵⁸

"The biggest system challenge is the mental model, the most granular level. For example, self imposed shame that women face [is] reinforced by the community culture. Deepest systemic causes permeate [upwards to] the institutional level as well leadership and organizations fail to see the importance of menstrual health and hygiene, and lack female representation."

Interviewed Expert, Dahlberg



Software Interventions

Advantages and Successes:

1. According to the literature and experts, software interventions are just as **pivotal to** invest in and implement as hardware solutions. 41, 58, 59

2.
Promising software interventions have focused on menstrual education to address beliefs and restrictions related to menstrual blood.⁵⁸

3. Successful software interventions include sensitivity training with men and boys, sanitation workers, and other key stakeholders within the community. They might also include addressing myths related to burning blood to support incinerator introduction.^{58,*}

Software interventions are gradual and long term. They **create safe spaces in which difficult conversations can take place** and traditional beliefs that limit menstrual health can be challenged.*

Summary of Key Findings

YLABS Project Flow

Summary of Key Findings

1. Disposal matters. Disposal is a largely overlooked aspect of MHM that has significant social and environmental impacts. Lack of adequate disposal options has notable repercussions for menstruators, impacting their reproductive health, psychological health, and economic opportunity.

When and where disposal can happen is a key driver of product choice.

WASH facilities are frequently not designed with menstruators' disposal needs in mind, often placing the burden of finding acceptable disposal methods onto menstruators themselves.

Limited disposable facilities constrain menstruators' product decisions and limit their freedom of movement.

3. With disposal, out of sight is out of mind. For menstruators to feel comfortable in their disposal method, it needs to be discreet and final.

Menstruators are more likely to use a disposal system if they feel confident that their product - now or in the future- cannot be traced back to them.

4. Menstruators are burdened with keeping a "secret" everyone knows.

The power of taboos and social-cultural beliefs about menstruation influence and drive menstruators' product choice, usage, and disposal behavior.

These taboos and beliefs are not homogenous across regions but stem from a common concern that menstruation should be concealed.

There is no silver bullet disposal solution that will work in every context. Instead, successful design should be menstruator-led, reflect local preferences and beliefs around menstruation, and consider the practicalities of local solid waste management systems and infrastructure.

5.

Summary of Findings from the Field: Drivers, User Pain Points, and Opportunities

	Menstruation Practices	Product Choice	Disposal method	Waste management process	Product Usage
User Needs	MH education Reduced shame and stigma	Improved access to diverse products Affordable high quality products Adequate amount of pads distributed	Ability to conceal and transport used products Security of disposal location and technology Reliable water access	Assurance that there is no chance that their used products could be accessed or tampered with	Peace of mind about leakage and odors Convenient and discreet place for disposal and product replacement
Current Challenges	Stigma and shame, psychological burden Exclusion from design and investment decisions in WASH infrastructure	Limited products (participants await distribution from acting partners/NGOs) Lack of Agency Low affordability and availability	 Lack of water access and adequate disposal areas Fear of being seen (stigma), Common dustbin for all kind of solid waste 	 Pit latrines are the easiest/ most convenient disposal method (Uganda Fear of pads being taken and used for "witchcraft" 	Lack of privacy Discomfort and infection from product overuse
Future Opportunities	MHM knowledge exchange from elder woman community figures Engagement of non-menstruating people in MH education	Immediately biodegradable pads Free or low cost high quality menstrual products	Designing secure disposal technologies to keep products out of reach or sight of children, men, animals, and others	 Sensitizing workers and dignifying the waste collection process Designing final decomposition to occur at source of disposal (e.g., chute and on-site incinerator)* 	Safe, long-usage menstrual products

Design Principles and Opportunities

Disposal System Design Principles

To be successful, a disposal system needs to:

- 1. Be co-designed with diverse menstruating users* and community stakeholders in order to adapt to local sanitation infrastructure and beliefs about menstruation. For example, all designs need to respond actively to stigma around the disposal of menstrual blood, the specifics of which vary by cultural context.
- Complement "hardware"
 (infrastructure) with "software"
 (social behavioral interventions), with a
 particular focus on stigma-reduction
 and engaging the whole community,
 including men and boys, in MHM efforts.
- 3. Be compatible with existing regional and national waste management systems, rather than function as a stand-alone point-of-disposal technology.

- 4. Reassure the user of complete eradication of product or blood at or after the point-of-disposal.
- Provide the user privacy and safety during disposal or washing at any time of day or night.
- 6. Function with low upfront capital requirements and low-cost ongoing maintenance, or have mechanisms for cost recovery.

YLABS Project Flow

Disposal System Design: User Preferences

Users' Desired Features of a Community-level, Point-of-Disposal Facility*



Discreet disposal and supplies⁶⁰

- Clean water and soap needs to be located within individual private stalls/bath shelters
- Discreet drying lines for reusable pads, or paper bags to aid with used product transport and management
- Covered drainage from toilet and bath shelters to promote hygiene and discretion (hiding blood from view)
- Point-of-disposal technology should be accessible within the facility or individual stall
- Clear signage taking into account varying literacy levels



Privacy and security⁶⁰

- Gender segregated facilities
- Locks on doors
- No gaps in between the door, door frames, and wall to prevent peeping
- Light within the facility and outside the facility
- Centrally located within the community or neighborhood, providing easy and safe access at any time of day or night



Inclusivity and accessibility

- Grab bars for elderly/pregnant people
- Accessible for people with physical disabilities
- · Shelves and hooks to hang/hold items

*Based on user feedback in Uganda and India, and review of published research.

Note: This example does not include "software" interventions that might accompany the physical facilities, or features of the downstream waste management system

Summary and Moving Forward

Poorly designed and/or maintained menstrual waste disposal systems are an under-addressed barrier to menstruators effectively managing their cycles, with significant repercussions for their physical and mental health, as well as income and educational attainment.

Future investment and development is needed to **create dignified**, **sustainable**, **and safe disposal systems** in LMIC and humanitarian contexts.

Recommendations for Future Work

- Improve disposal systems and norms in partnership with menstruators. In future WASH, MHM, and/or waste management initiatives, we recommend exploring and testing improvements to disposal systems using participatory methods with menstruators in LMIC contexts, using the design principles identified in this report as a starting point. We also recommend also conducting sessions with non-menstruating people (e.g., men and boys) to explore opportunities for socially supportive "software" interventions.
- **Understand the disposal ecosystem** by conducting user research with waste pickers, de-sludgers, and other waste management system stakeholders on their needs and constraints with regard to effective, feasible disposal systems.
- Explore pathways for financial sustainability. Given the costs of installing and maintaining effective disposal systems, financial viability is a key success factor for any disposal system. We recommend future research and testing of opportunities for income-generating or incentivized disposal solutions that can benefit the community.

YLABS Project Flow

Imagining a Future State

Today we find Diana back outside in the afternoon sun doing her chores...but today is different.

Diana feels the all-too-familiar onset of strong cramps. She knows that it's about time to dispose of her pad. Instead of going to a latrine she makes the decision to approach a nearby household where she see a man sitting out on chair in his compound.

On arrival she asks him if she may use their household's bath shelter. He quickly understands why she needs the bath shelter and agrees to fetch her some water to use. Before she goes to wash he mentions to Diana that if she needs to throw anything away there is a small bucket in the bath shelter.

When she is finished Diana is also told to notify his eldest daughter so that the contents can be taken to their drying bin to prepare the bins contents for burning. Then it dawns to Diana that there have been a series of community dialogues for men on menstruation and is pleasantly surprised to learn that he had been attending the sessions. The man's openness makes her feel comfortable and she trusts that the eldest daughter will aid her with the disposal of her pad.

Diana leaves the household and continues her day with a feeling of support and acceptance.



Appendix

References and Resources

Full List of References

