The Challenges of Maintaining Hygiene in Rural Bihar

A Report prepared for SEWA

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# Table of Contents

Introduction ................................................................................................................................................... 2

Executive Summary ....................................................................................................................................... 4

   The Challenges of Practicing Hygiene in Public .................................................................................. 4

Study Design and Methodology .................................................................................................................. 12

   Study Area ............................................................................................................................................... 12

   Study Population & Sampling .................................................................................................................. 13

Results ......................................................................................................................................................... 15

   I Socio-Economic Background of Participants ......................................................................................... 15

   II Water access ........................................................................................................................................ 16

   III Latrine Access and Usage .................................................................................................................... 19

      Why are house latrines not used? ....................................................................................................... 20

   IV Bathing Facility & Drainage ................................................................................................................. 21

   V Access to Soap and Menstrual & Hand Hygiene .................................................................................. 23

   VI Menstrual Hygiene practices .............................................................................................................. 23

   VII Menstrual Hygiene and School Attendance ...................................................................................... 29

   VIII Menstrual Hygiene and Work .......................................................................................................... 31

   IX. Rainy Season and Hygiene ................................................................................................................. 32

      Soo Economic background and Unhygienic Conditions and Practices .................................................. 33

   X Socio-Economic background and Unhygienic Conditions and Practices .............................................. 33

Impact on Health ......................................................................................................................................... 39

Interventions Suggested .............................................................................................................................. 43

   Water: improving access & safety ............................................................................................................. 44

   Improving access and usage of latrines and private bathing spaces ..................................................... 47

      Behavior change to motivate latrine use .............................................................................................. 47

   Menstrual Management .......................................................................................................................... 48

   Hand washing with soap (HWWS) .......................................................................................................... 49

   Health Camps ......................................................................................................................................... 50

Conclusion ................................................................................................................................................... 50
Tables
Table 1 Water, Sanitation Deprivation and Hygiene Practices in Rural Bihar, Women & Girls
Table 2 Socio-economic Indicators, India and Bihar
Table 3 Socio-economic Background of Women and Girls in Rural Bihar
Table 4 Drying & Disposal Practices of Menstrual Cloth in Bihar
Table 5 Menstrual Hygiene Practices and School Attendance of Rural Girls in Bihar
Table 6 Work and Menstrual Hygiene Practices in Rural Bihar (N=98)
Table 7 Housing Quality of those Lacking Water, Sanitation and Hygiene
Table 8 Age & Caste Background of those lacking Water, Sanitation and Hygiene
Table 9 Educational Background of those Lacking Water, Sanitation, and Hygiene
Table 10 Family Occupation of those lacking Water, Sanitation and Hygiene
Table 11 Occupation of Women and Girls Lacking Water, Sanitation, and Hygiene

Figures
Fig. 1 Insufficient Water for Hygiene in Rural Bihar
Fig. 2 Menstrual Protection Options Used in Rural Bihar
Fig. 3 Reasons for using the Type of Menstrual Protection in Rural Bihar
Fig. 4 Frequency of Changing Menstrual Cloth among Women and Girls in Rural Bihar
Fig. 5 Places for Changing Menstrual Cloth in Rural Bihar, Women and Girls
Fig. 6 Difficulties of Managing Menstrual Hygiene in the Rainy Season in Rural Bihar
Fig. 7 Difficulties of Managing Menstruation in Rural Bihar
Fig. 8 Reasons Given by Girls for not changing in School

Boxes
Highlights – 5 boxes
Voices and Quotes from Focus Group Discussions – 7 boxes
Field Notes – 2 boxes

Pictures
Can Perineal Hygiene be maintained in public? Koyla village, Bhagalpur district, Bihar
Washing Utensils on river bank, Sitakund village, Munger District, Bihar
Introduction

Only 52 percent of rural households in Bihar get their daily supply of water throughout the year from piped water at home or public tap/standpipe (both for drinking and other household use)\(^1\), 66 percent have no bathing facility, and 82 percent have no latrine access at home (Census, 2011). Scheduled Caste households face even greater deprivation.

Given widespread insecurities in water, latrine, and bathroom access the primary purpose of this field research was to understand how these insecurities affect personal hygiene practices of poor women and girls in rural areas of Bihar.

The study focuses on hygiene practices of women not simply in their roles as mothers and caretakers of the sick and elderly but as individuals whose personal health, safety and dignity are also deeply impacted by WASH (water, sanitation, and hygiene) insecurities.

While drinking water and toilet scarcity have received considerable attention from policy makers and donors, hygiene tends to be neglected. When issues of hygiene are addressed, the focus is on hand-washing behavior. However, little is understood about the conditions under which the rural poor manage personal and menstrual hygiene. Do women have access to adequate amounts of water for daily hygiene (taking a bath, washing hair, laundry)?\(^2\) Do they have access to a safe, private place to bathe and perform perineal hygiene? How do women manage menstrual hygiene, when most cannot afford to buy disposable sanitary napkins? How does the rainy season impact hygiene behavior? In a culturally conservative society with strict norms about modesty in dress and behavior, women experience WASH insecurities more profoundly than men.

By broadening the focus on hygiene to include not only hand washing behavior but also personal and menstrual hygiene\(^3\) this study should improve understanding of the constraining circumstance

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2. Indian Census does not collect any information on this.
3. WASH is meant here to include not only water, sanitation, and hand hygiene but also menstrual hygiene. Personal hygiene is understood here to include bathing, hair wash, laundry, perineal hygiene and sometimes hand hygiene and
under which women and girls live their lives so effective policies and programs can be designed to address the needs that are fundamental to good health, dignity, and quality of life. As has been suggested in a Lancet article, the health benefits of increased investment in water and sanitation infrastructure are largely delivered through improvements in personal and domestic hygiene (Curtis et al., 2011).

**Executive Summary**

The study was carried out in 3 rural districts of Bihar (Bhagalpur, Munger, Katihar) to understand women’s daily and menstrual hygiene practices. 100 women and girls were surveyed and 6 focus group discussions (FGD) conducted.

The Challenges of Practicing Hygiene in Public

Water, Sanitation, and Hand Hygiene

The survey and FGDs reveal the daily challenges of practicing hygiene in public with the majority of women clearly unable to do so. The major findings of the study are summarized in Table 1 below.

While much of the focus has been on the indignities women suffer due to poor toilet access, lack of a private space to bathe or change menstrual cloth are also hardships poor women and girls suffer throughout their lives. When these obstacles are compounded by the cultural norms of modesty imposed on women, it makes it nearly impossible to practice good hygiene.

More details of the survey results are mentioned below.

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Where water shortages exist and latrines and bathroom facilities are lacking, it may not be an overstatement to say that a state of cleanliness is a luxury that women experience only on special occasions such as religious festivals, and weddings, etc.

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menstrual hygiene but not defecation practices. *Menstrual hygiene* includes menstrual protection option used, practices of washing, drying and storage of the cloth, and the frequency of changing the cloth.

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58 percent said they had insufficient water available to maintain personal hygiene (including for laundry, bath, hair wash, and washing of menstrual cloth) and even for ablution (FGD). Both supply and accessibility of water affect bathing practices.

73 percent had no latrine in the premises of the household. 35 percent of latrine owners still defecated outside. In some homes, the pit latrines were used only during emergencies as they overflowed quickly, especially during the rainy season with the women then burdened with cleaning the mess.

55 percent bathed outside the premises of the house.

None of the homes had a covered drain to channel waste water (46 percent had an open drain). This had a major impact on their bathing practices and laundry of menstrual cloth.

84 percent practiced poor hand hygiene with both access to soap and location of water source shaping behavior.
Poor women also bear tremendous hardships in managing the basic biological function of menstruation – from the use of unhygienic material and the rashes it causes, the lack of water and soap to wash the soiled cloth, to lack of private space to change or dry the cloth. Cultural taboos about menstrual blood further impose difficulties of washing, drying, storing, and disposing the cloth. Managing menstruation in the rainy season becomes even more difficult. Women and

| Table 1  Water, Sanitation Deprivation and Hygiene Practices in Rural Bihar, Women & Girls |
|----------------------------------------|-------------|-----------|
| **Water for personal grooming & laundry** |
| Do not have sufficient water for washing clothes; bath and hair wash | 49 |
| If I had more water available I could maintain better personal hygiene | 58 |
| **Latrines** |
| No latrine in premises | 73 |
| Defecate in the open | 79 |
| **Private Bathing facility** |
| Bathe outside house premises | 55 |
| Do not have private, safe place to bathe properly | 62 |
| **Menstrual Hygiene** |
| Use old rags or nothing Total N=98 | 85 (N 83) |
| Reuse menstrual cloth. Total N=83 | 34 (N 28) |
| Change menstrual cloth less than twice a day. Total N =98 | 20 (N 20) |
| Reuse same cloth 3 times ≥ in one monthly cycle Total N=28 | 82 (N 23) |
| Do not have private space to change menstrual cloth as often as desired N=98 | 38 (N 37) |
| Girls unable to change at school due to lack of toilets, clean toilets, pads, disposal bin (N=20) | 85 (N 17) |
| **No Drainage** |
| Soap |
| Do not have enough soap to wash menstrual cloth to my satisfaction (N=98) | 68 (N 67) |
| **Poor Hand Hygiene** |
| Those who cleaned hands by wiping on cloth; with water only or with water and mud or ash but not soap. (N=98) | 84 (N 82) |
girls suffer throughout their lives from the absence of these rudimentary requirements over and above the physical pain and discomfort of menstruation – deprivation few of their better-off sisters ever experience.

Lack of access to soap is a major problem affecting hygiene practices. For example, 68 percent said they did not have soap to wash soiled menstrual cloth properly.

84 percent used old cloth for menstrual protection.

Lack of privacy also impacted menstrual hygiene practice preventing women from changing the soiled cloth frequently.

62 percent of girls missed school when menstruating because of poor facilities at school.

Given that women’s earnings are essential for their family’s economic survival, majority of women who worked outside did not miss work during the menstrual cycle. As a woman in a group discussion said, “If we do not work how do we survive?” Those who do work outside in the fields have no option but to wear the same soiled cloth the whole day until they reach home.

Except for 2 women, none had benefited either from the government’s toilet construction scheme or received subsidized napkins.

Gendered use of space, social norms and hygiene

Lack of easy and safe access to water, toilets and bathrooms with drainage is a major burden affecting women’s ability to maintain personal hygiene in a manner that does not affect men who are equally deprived of water and sanitation facilities. Men face no social strictures when they urinate, defecate or bathe in the sight of others. For poor women who are deprived of safe access, the very act of performing what is basic to human needs also violates norms of decency imposed on them. And these burdens are not only about defecating in the open (which has received more attention) but also about bathing, daily perineal hygiene and special cleansing needs during menstruation.
Rainy season and hygiene

In the rainy season, lack of latrines, drainage, and a private place to bathe and change during menstrual cycle poses severe challenges. Even finding a place to defecate is not easy when villages are water-logged or the pit latrines overflow. In winter, the cold weather also affects bathing practices since women do not have access to an enclosed space but bathe in the open.

In Munger district, the villages near the river bank are especially prone to flooding. Even open defecation on the river bank is not possible. Government boats come to ferry villagers to the other side so they can defecate on dry ground but the service is unreliable. Women are forced to construct a temporary raised platform using bamboo which is unstable and poses a risk of falling in the water.

Water, sanitation, hygiene and socio-economic background

As would be expected, those who lived in poor quality homes (kutcha), whose families worked as casual laborers, were illiterate and also earned their livelihood as casual laborers were more likely to have less access to water and sanitation and also less able to practice good hygiene. More girls lived in better quality homes than women and so had better access. Caste background did not reveal the expected result. On many indicators Scheduled Caste had better access but since the sample contained only 28 from this caste group the result may not be representative of the conditions of this community.

Given the personal nature of the survey questions, the responses are subject to courtesy bias and may underestimate the problem of unhygienic behavior in the villages studied (such as in the case of sanitary napkin usage which was considered socially more desirable).

Health Impact

*Our hands smell of fecal matter because there is not enough water and soap to wash hands.*

*Our hands, our bodies and the menstrual cloth smell of stale blood even after bathing.*

Voices from Focus Group Discussions
Water and sanitation insecurities in the districts studied have led to infrequent bathing, poor perineal hygiene\(^5\) and hand washing practices, inability to launder clothes, wash menstrual cloth or change the cloth when needed, and community-wide open-defecation exposing women and their families to many health risks as the section below on health briefly outlines.

It is estimated that “unimproved hygiene, inadequate sanitation, and insufficient and unsafe drinking water account for 7% of the total disease burden and 19% of child mortality worldwide,” (Prüss-Üstün et al. 2008)\(^6\). Unsafe WASH is directly linked to infectious diarrhea, schistosomiasis, typhoid fever, malaria, dengue and many other infectious and non-infectious diseases. Improved water, sanitation and hygiene conditions are particularly vital to maternal and fetal health. In a cross-sectional, study using global databases for 193 countries, it was found that increased access to improved water source and sanitation led to a decline in maternal mortality rates (Cheng et al., 2012)\(^7\).

It has also been estimated that, poor sanitation, hygiene, and water are responsible for about 50% of the consequences of childhood and maternal underweight(Mara et al. 2010:3)\(^8\). Given the level of WASH deprivation noted in this study and the larger Census data, it may be a major factor contributing to malnutrition in Bihar. The state recorded the highest percentage of malnutrition among Hindu women (India Human Development Report, 2011)\(^9\).

There are also other conditions that are exacerbated by lack of water for washing and hygiene. These diseases are related to skin and eyes, such as scabies, trachoma and conjunctivitis. Trachoma is a chronic bacterial infection of the eye that causes blindness. Gendered relations determine the risk of exposure to many of these infections via multiple pathways. As primary caretakers of children and the sick women come in contact with infected people. For example, women are affected more than men with trachoma induced blindness because of close contact

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5 Although no direct questions were asked about perineal hygiene, given that most women and girls did not have access to latrines or bathrooms and bathed with clothes on it was assumed that daily perineal hygiene was not easy to perform especially in public.


Gendered relations determine the risk of exposure to many WASH related diseases via multiple pathways.

Some studies have shown that women are also at risk of exposure to reproductive tract infections (RTI), urinary tract infections (UTI), and Human papilloma virus (HPV infection which causes cervical cancer) due to poor WASH conditions and inability to afford sanitary material for menstrual protection. In communities where women have to haul water from long distances, defecate in the open, and bathe in public fully clothed not only do women bathe infrequently, they are unable to maintain vulvar and perineal hygiene on a daily basis increasing the risk of various infections. In this study, 76 percent of women and girls report suffering from rashes during the menstrual cycle. About 21 percent ever married women aged between 15-49 years report having symptoms of RTIs/STIs and nearly 18 percent have experienced abnormal vaginal discharge according to the District Level Household and Facility Survey of Bihar (2010)\(^\text{10}\). Cervical cancer in India ranks as the second most frequent cancer among women.\(^\text{11}\) The contribution of inadequate sanitation and water to these risks is rarely reported.

Although, the evidence from many of the studies linking hygiene practices with RTI and HPV infection is not conclusive, the negative health outcomes of poor menstrual and other hygiene practices under poor WASH conditions remain of concern and require further research.

Finally, performing the necessary rituals of ablution and hygiene under the public eye is emotionally stressful, especially for adolescent girls and takes a huge toll on their mental health.


and well-being - from the threat of sexual assault, to the shame and humiliation of defecating and bathing with no privacy.

Suggested interventions

First, it is important that WASH services be integrated with SEWA’s health services as there is no health security without WASH security.

Second, while providing piped water and latrines are essential to address health and hygiene issues, the cost and implementation of this hardware may not be easy for SEWA to manage. So the interventions proposed are low-cost and practical, many focused on hygiene promotion activities that SEWA should be able to implement and may already be doing so. In fact, many experts now consider hygiene promotion far more cost-effective, in terms of DALYs per dollar, than other hardware investments (Curtis et al. 2011). The estimated disease burden from inadequate hand hygiene is higher (297 000 deaths) than with inadequate sanitation (280 000 deaths).\(^\text{12}\)

Intervention strategies should focus on assisting with rain water harvesting, drainage, access to soap, and disposable sanitary cloth. These steps should be accompanied by software strategies that generate behavior change through awareness raising, education and information in water safety measures; hand-washing; bodily and menstrual hygiene; latrine usage; and dangers of contact with animal feces. Health camps to screen for reproductive tract infections and cervical cancer are also needed. Given that SEWA already has an active health and hygiene program in these 3 districts some of the suggestions mentioned in greater detail below may already be part of its programs while others can easily be included.

We all understand that water is essential for hygiene. But what this field study has revealed is that when private bathrooms, latrines, soap and clean menstrual protection material are unaffordable women cannot maintain basic hygiene – from bathing, cleaning genitalia, to the frequency of changing blood-soaked cloth, and washing the menstrual cloth properly.

\(^{12}\) The disease burden for inadequate drinking water is higher. Prüss-Ustün et al. (2014), estimate that in 2012, 502 000 diarrhea deaths were estimated to be caused by inadequate drinking water.
Study Design and Methodology

Study Area

This study was carried out in 3 rural districts of Bihar – Bhagalpur, Katihar, and Munger. Bihar has a much lower per capita income and a higher poverty head count ratio than rest of India (see Table 2) and is behind rest of India on many social development indicators such as education and infant mortality rate. Close to 89% of the population resides in rural areas compared to 69 percent in rest of India. Gender inequality in Bihar is very high. Bihari women are less literate and their life expectancy less than that of men. The female to male sex ratio in Bihar is lower than in India.\(^{13}\) The GDI index (Gender Development) for Bihar is hence much lower than for India (.479 versus .59).

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Socio-Economic Indicators, India and Bihar</th>
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<tbody>
<tr>
<td></td>
<td>India</td>
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<tr>
<td></td>
<td>India</td>
</tr>
<tr>
<td>Demographic</td>
<td></td>
</tr>
<tr>
<td>Population %</td>
<td>68.9</td>
</tr>
<tr>
<td>Sex Ratio all ages (females/1000 males)</td>
<td>949</td>
</tr>
<tr>
<td>Human Development</td>
<td></td>
</tr>
<tr>
<td>Infant Mortality (out of 1,000 live births); a,d</td>
<td>46</td>
</tr>
<tr>
<td>Literacy rate 7+ years Males %</td>
<td>77.15</td>
</tr>
<tr>
<td>Literacy rate, 7+ years Females %</td>
<td>57.93</td>
</tr>
<tr>
<td>Gender Related Development Index (GDI)-2007-08; c</td>
<td>0.59</td>
</tr>
<tr>
<td>Poverty Headcount Ratio (5) 20011-2012; b</td>
<td>21.9</td>
</tr>
</tbody>
</table>

Legend

Unless otherwise indicated all data are from Census of India, 2011
d: For India (2012) figures -Sample Registration System, 2012, Office of Registrar General of India

In all the 3 districts agriculture is the main source of income. Munger has two of Bihar’s most celebrated industrial units- ITC and Gun Factory. Bhagalpur houses small scale manufacturing,

\(^{13}\) Sex ratio at all ages is 921/1000 males in rural Bihar compared to 949/1000 males in rural India (Census, 2011).
such as the power looms of Nathnagar and Jagdishpur. Katihar serves as a vibrant market catering to nearby districts and border towns of Nepal and Bangladesh.

The main informal sector employment in the villages visited were agriculture, animal husbandry, vending, construction, carpentry work in wood furniture, repairing and servicing of electronic goods and vehicles and home based work such as rolling agarbattis (incense sticks), beedis (thin Indian cigarette), papad making, leaf plate making etc. These villages are on an average 10 to 15 kilometres away from major cities. They are well connected by roads but transportation is scanty.

In Munger, the villages of Bariyarpur selected for this study are under flood prone areas whereas the villages selected in Bhagalpur are both flood prone and drought prone. Katihar villages are less affected but water logging cannot be ruled out in the rainy season.

**Study Population & Sampling**

SEWA Bharat has been working in Bihar for more than two decades and its work has focused on livelihood and health interventions. It has a membership of approximately 1 lakh women in Bihar and is currently working in 6 of the 39 districts in Bihar, namely Bhagalpur, Katihar, Khagaria, Munger, Patna and Purnea. Out of these 6 districts, Bhagalpur, Katihar and Munger have a higher membership. Since SEWA’s entry in Khagaria, Patna and Purnea districts is more recent they were not chosen for this survey. The total sample size for the survey was 100, with 70 women and 30 girls chosen from all the rural parts of the districts. Participants were proportionately selected to reflect SEWA’s membership strength from each district - 63% of the sample selected from Bhagalpur, 13% from Katihar, and 24% from Munger.

Unmarried girls (between 15-20 years) and ever-married women (between 20-45 years) who had their periods in the last six months were selected for the study. All the women and girls’ mothers were members of SEWA.

The surveys were done in the rural areas where SEWA’s health team has been working for some time in the field of health awareness. Women were enrolled if they consented to participate after being informed of the objectives of the study. The participants were told the purpose of the study was to understand the water and sanitation conditions in the community and their personal and
menstrual hygiene practices. Participation was voluntary with participants assured that their responses would be kept confidential.

Two FGDs were done in each district, one separately with girls and the other with women. Between 10 to 12 girls and 15 to 18 women attended the discussion in each district. The discussions were hand recorded by three note takers in each group. Only school-going girls were selected for the discussion in order to understand water and sanitation conditions in their schools.

The questions for the survey and group discussion focused on issues of water, sanitation, and menstrual hygiene. Fifty questions were asked about access to water for hygiene, latrine usage and defecation practices, bathing practices, and hand-washing practice. Questions regarding menstrual hygiene focused on material used; washing, drying, and disposal practices; practices during the rainy season, at work and at school (for girls). Only women were asked questions about state assistance received for latrine construction and latrine usage habits of family members. Girls, but not women were asked if they had ever received sanitary napkins from the state. Because hygiene issues are very personal, the questions were designed as far as possible to be non-judgmental.

After the raw survey data were collected, three data analysts checked it. The codebook was refined; data were entered into excel files and further crosschecks conducted.

**Limitations & Strengths**

The main constraints faced during the study were time and resources so the sample size for the survey had to be kept small. But by also conducting field observations and focus group discussions it was possible to develop a deeper understanding of water, sanitation, and hygiene issues. In general, despite the small sample size the survey findings are consistent with those obtained from discussions with village residents.

It must be also noted, since 63 percent of the participants for the survey were selected from Bhagalpur district, the findings may be more representative of WASH conditions in that district rather than Katihar or Munger.
Results
Since resources were limited and the sample size small, the data presented are not analyzed to reflect differences across districts or provide statistical correlations. Also, as the numbers were small most tables present combined data for women and girls but the text below does discuss notable differences between the two groups.

I Socio-Economic Background of Participants
The mean age of survey participants was 28; 90 per cent were Hindus, 28 percent were Scheduled Castes, 68 percent were OBCs, and 4 percent were upper castes (Table3). Regarding marital status, 93 percent of women were married. Nearly one-third of the sample surveyed was illiterate, and a quarter had only primary education. Only 16 percent of the participants lived in *pucca* houses.

64 percent of the households engaged in casual labor (majority in non-agriculture occupations), 30 per cent were self-employed, with only 6 percent working as salaried workers. Only 25 percent of these households worked in agriculture. 42 percent of women and girls (77% of girls) were home based workers (engaged in *agarbatti* rolling, reeling and bobbin filling, etc.), 41 percent worked as casual laborers (agricultural, construction, building and repairing mud houses), and 16 percent were self-employed (vendors, small farm owners, animal husbandry).

Greater proportion of girls came from the Scheduled caste community and from families that were self-employed(practicing animal husbandry with one or two goats, chickens, pigs etc.) compared to women in the sample. Their education levels were higher and more of them lived in better quality houses built under the Indira Awas Yojana (IAY) government scheme.
<table>
<thead>
<tr>
<th></th>
<th>Girls N=30</th>
<th>Women N=70</th>
<th>Total 100</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% (n)</td>
<td>% (n)</td>
<td>% (n)</td>
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<tr>
<td><strong>Age</strong></td>
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<td></td>
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<tr>
<td>15-20</td>
<td>100 (30)</td>
<td>0</td>
<td>30</td>
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<tr>
<td>20-25</td>
<td>20 (14)</td>
<td>14</td>
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<td>26-30</td>
<td>34 (24)</td>
<td>24</td>
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<td>31-35</td>
<td>20 (14)</td>
<td>14</td>
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<tr>
<td>36-40</td>
<td>9 (6)</td>
<td>6</td>
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</tr>
<tr>
<td>41-45</td>
<td>17 (12)</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td><strong>Religion</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hindu</td>
<td>93 (28)</td>
<td>89 (62)</td>
<td>90</td>
</tr>
<tr>
<td>Muslim</td>
<td>7 (2)</td>
<td>11 (8)</td>
<td>10</td>
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<tr>
<td><strong>Caste</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>SC</td>
<td>37 (11)</td>
<td>24 (17)</td>
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<tr>
<td>Other Castes</td>
<td>63 (19)</td>
<td>75 (53)</td>
<td>76</td>
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<td><strong>Marital Status</strong></td>
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<td>Married</td>
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<td>93 (65)</td>
<td>93 (65)</td>
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<td>Divorced/Widowed</td>
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<td>7 (5)</td>
<td>7 (5)</td>
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<td><strong>Education</strong></td>
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<tr>
<td>Illiterate</td>
<td>3 (1)</td>
<td>47 (33)</td>
<td>34</td>
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<tr>
<td>Primary</td>
<td>3 (1)</td>
<td>33 (23)</td>
<td>24</td>
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<tr>
<td>Middle</td>
<td>27 (8)</td>
<td>4 (3)</td>
<td>11</td>
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<tr>
<td>Secondary</td>
<td>67 (20)</td>
<td>16 (11)</td>
<td>31</td>
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<tr>
<td><strong>Type of House</strong></td>
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</tr>
<tr>
<td>Kutcha</td>
<td>40 (12)</td>
<td>56 (39)</td>
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<td>Semi-Pucca</td>
<td>30 (9)</td>
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<tr>
<td>Pucca</td>
<td>30 (9)</td>
<td>10 (7)</td>
<td>16</td>
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<tr>
<td><strong>Family Occupation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-employed</td>
<td>50 (15)</td>
<td>21 (15)</td>
<td>30</td>
</tr>
<tr>
<td>Regular wage/salary</td>
<td>7 (2)</td>
<td>6 (4)</td>
<td>6</td>
</tr>
<tr>
<td>Casual labour</td>
<td>43 (13)</td>
<td>73 (51)</td>
<td>64</td>
</tr>
<tr>
<td><strong>Self Main Occupation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-employed</td>
<td>7 (2)</td>
<td>20 (14)</td>
<td>16</td>
</tr>
<tr>
<td>Regular wage/salary</td>
<td>0</td>
<td>1 (1)</td>
<td>1</td>
</tr>
<tr>
<td>Casual Labour</td>
<td>17 (5)</td>
<td>51 (36)</td>
<td>41</td>
</tr>
<tr>
<td>Home Based</td>
<td>77 (23)</td>
<td>27 (19)</td>
<td>42</td>
</tr>
</tbody>
</table>
II Water access

Water for domestic use is required for three reasons – consumption (drinking and cooking); hygiene (including basic needs for personal and domestic cleanliness); and production (food processing, animal keeping, small scale agriculture, etc.). This study was designed to examine water access for hygiene purposes.

It has been estimated that at least 50 liters of water per person per day is needed to ensure all personal hygiene, laundry and consumption needs (Howard and Bartram 2003). As the findings below reveal, majority of the households in the survey did not receive enough water to meet domestic needs.

Women and girls were asked if they had sufficient water for washing soiled menstrual cloth, laundry, bathing and washing hair. They were also asked the source of their bathing water. As Figure 1 shows, over a majority of the participants said they had insufficient water for laundry, bathing, and for washing menstrual cloth.

70 percent of them used the water from the public hand pump for bathing; 21 percent were dependent on well water; 3 percent on tank or pond. Only 6 percent used water from a public standpipe and only girls had access to this water source. None received piped water in the house.

When the participants were asked to choose between 2 statements: “if they had more water would they be able to maintain better personal hygiene” or “they had enough water available to maintain hygiene”, 58 per cent admitted that limited water access prevented them from maintaining better hygiene. Girls said they had better access to water for hygiene than women. Given courtesy bias, these may be underestimates.

From the FGDs, it emerged that water access varied in different districts. Women and girls from Makaipur village in Katihar district had water in the premises of the household both for drinking and other domestic use. Women and girls from Bhagalpur district had limited access to drinking water especially in the summer months and the water had to be fetched from a great distance. The village pond was the main source for laundry, bathing, and even washing of utensils. The pond was contaminated with human feces and animals that also use the pond.

In fact in Bhagalpur district water shortage was so acute most of the year that women admitted they bathed only every 2-3 days, could not wash clothes well, or clean the children’s anus after defecation. No house in the village had water at home.

Bathing practices were also affected by the distance of the water source. Girls in Bhagalpur district said if they wanted to bathe in the house they had to carry buckets of water from the public hand pump so they bathed only every 2 days.

In Munger district, water shortage was also acute in addition to being polluted. Very few women had hand pumps installed in their households. Women had to queue up for hours together to collect water from households with pumps, often leading to tensions with the owners. They also had no option but to use the polluted Ganges river water for laundry and bathing. All the women said that water shortages affected their hygiene practices.

The larger survey data support the impact of water shortage on personal hygiene. 54 percent of the participants (but 61% of women) said that they did not have sufficient water for bathing and washing hair. Regarding washing clothes, 57% of did not have enough water available to wash clothes (Figure 1). In Bhagalpur, they did laundry once a week near the village pond. The pond had a foul smell and according to the women caused rashes and boils. Women laundered their clothes separately because men’s clothing was not asfilthy, according to the women. Given water shortages, it is also possible that men’s clothes are laundered with more water and soap.
III Latrine Access and Usage

Besides bearing the burden of water insecurity, most households also did not have access to latrines. In Bhagalpur district during the FGD women said since the defecation area was at considerable distance hygiene was difficult to maintain.

> When we have diarrhea we sometimes accidentally shit in our clothes.
> Since where we defecate is far and there is no water there, we have to walk back to the public water hand-pump and stand in line to wash hands.
> When there is no water in the hand-pump we are unable to wash our hands after defecation.

FGD with women in Bhagalpur district

Only 27 percent had latrine in the premises of the house (11% flush/pour; 13% pit latrine with slab; and 3 per cent open pit latrine). 79 percent defecated in the open (Table 3). More girls had latrines in the premises than women and more girls used the latrine than women who lived in homes with latrines.
When women were asked why they did not construct a latrine, all said they did not have the financial resources to do so, and 32 percent also said they had no place to build one (not shown in Table). Only 2 women out of 17 received government help in constructing the toilets (girls were not asked this question).

**Why are house latrines not used?**

Several questions in the survey were designed to gain an understanding of latrine usage practices. But since the total numbers of participants with latrines were small (only 17 women had latrines and girls were not asked questions about usage), the answers should be treated with caution. In all the 17 households, the latrine was being used but in 35% of these homes family members still defecated outside. When asked why the latrine was not being used by everyone, 3 women said the latrines did not function well, 2 said the latrine space was too small, and 1 said because menstruating women use the latrines others did not want to use it.\(^{15}\)

The FGDs provide a better understanding of the reasons for dysfunctional latrines. In Katihar district, women said the pit latrines in the homes were built for emergency purposes. The latrine was not used regularly but only at night. If all family members were to use it, the pits would overflow especially when it rained. This created an additional burden on women as they were primarily responsible for cleaning up the mess in the yard.

> *When it fills up, the mess spreads all over and it is a big headache to clean up!*  
> FGD with women in Katihar district

In Munger district, 6 women present in the discussion had toilets constructed in their houses. Rest of the women went near the railway lines to defecate. In the months of July and

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\(^{15}\)While the sample size of this study was small, similar findings have been reported by other studies of latrine usage in India. In a study of the impact of Total Sanitation Campaign in 20 villages of Odisha, India (Barnard et al. 2013) found that 95% of ‘functional’ latrines were in use, compared to only 33% of those that were not considered as ‘functional’. Functional latrines – i.e. latrines which had walls over 1.5 meters, a closure over the entry, an unbroken and unblocked pan and a functioning pan-pipe-pit connection were more likely to be used than non-functional latrines. Barnard, S et al. (2013), “Impact of Indian Total Sanitation Campaign on Latrine Coverage and Use: A Cross-Sectional Study in Orissa Three Years following Program Implementation,” *PLOS One* vol.8, Issue 8.
August the whole village is water logged. Even those with toilets in their homes defecated outside.

**IV Bathing Facility & Drainage**

Lack of bathing and drainage facilities further add to the indignities women and girls experience on a daily basis trying to maintain personal hygiene. Women are unable to bathe daily, or even perform perineal or menstrual hygiene.

Women and girls were asked how far they had to go for bathing. 45 percent bathed in the premises of the household (Table 3), 46 percent bathed outside within 15 minutes walking distance from their homes. 9 percent said they walked more than 15 minutes away to bathe (not shown in Table). However, 62 percent admitted that their place of bathing was not private or safe. But more girls felt safe while bathing than women partly because more of them were able to bathe within the premises of their homes.

Even when a bathing facility is available within the premises of the house, it is typically an enclosure without walls, roof or a lockable door, located in the yard but detached from the house with no drainage for wastewater. More often the bathing space just has water and a cement platform, with walls constructed of tarp, etc. offering no privacy. For example, 79 percent of the bathing facilities in rural households in Bihar do not have a roof (Census 2011) and in Katihar district, 88 percent of rural households (68% in Bhagalpur and 67% in Munger) with bathrooms do not have a roof over the bathing enclosure.

Given lack of privacy, women and especially girls, rarely bathe nude even in their own homes. During FGDs, women and girls reported that when they bathed outside - on river banks, ponds, or hand pumps - they bathed fully clothed and then went home with wet clothes to change – a severe hardship to bear in the winter. Women, but especially girls complained that when men were around it was hard to bathe well. In addition, even in outdoor bathing areas, given shortages of public hand pumps and water, women had to stand in long queues to get their turn to bathe.

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*Both pictures from Koyla village*
Lack of drainage in the house also leaves women no choice but to bathe in public despite the shame and burden of doing so. In majority of homes there is no proper drainage to channel wastewater away from the house. In fact, none of the households in the survey had a covered drain. 54 percent had an open drain and the rest had no drainage. In some homes, a temporary pit is dug in the yard to collect waste water, which when full is emptied out in the village lane (a source of discord between households).

In summer months when water shortage is acute, women report bathing every 3-4 days. Given that many of them work outdoors, the need to wash and bathe daily after work is even greater. In Katihar district, although women who participated in the FGD all had access to water at home they still were not able to bathe properly because there was no private space to bathe. In Munger district too, the girls complained about the lack of private space to bathe. They bathed in full clothes and occasionally, when no one was around, they were able to wash themselves properly.

Lack of private bathing space and drainage also impacts women’s ability to maintain menstrual hygiene. It prevents women from changing the soiled cloth frequently or even washing it properly. In addition, when women bathe in public with their clothes, they are unable to maintain genital hygiene especially during their menstrual cycle. Further, because of taboos about menstrual blood, the soiled cloth cannot be washed in public and neither can it be washed in the premises of the household when there is no drainage. It is no wonder that during the FGDs, women and girls complained about the smell from their bodies during the menstrual cycle.

In Munger district, women reported that lack of proper drainage affected their menstrual hygiene practices. As there were no drains, the women were not able to wash menstrual cloth inside the house.
V Access to Soap and Menstrual & Hand Hygiene

When the survey asked participants how they cleaned their hands, of the 5 options to choose from (wipe on clothing, water only, water and mud, ash, and water and soap) only 16 percent said they used water and soap (Table 3). 68 percent used water and mud, and nearly a quarter said they washed only with water (not shown in Table). More girls had better hand hygiene than women.

In the FGD conducted in Bhagalpur district, women said soap was expensive and used mostly during religious festivals. Another reason soap was not used as often was because the water source was not inside the house but in a public place.

If we had our own personal tap we would keep soap near it but because water source is public we do not keep soap there.
FGD with women in Bhagalpur district

The surprising finding of the study was the soap expense that prevented better hygiene. 68 percent of women and girls said they did not have enough soap to wash the menstrual cloth to their satisfaction. More girls complained of this than women. Surprisingly, more women and girls admitted that soap expense was a burden (62 percent) in managing menstrual hygiene than those who found lack of water (39 per cent) a burden (see Fig. 7). Clearly households are unable to maintain hygiene because they cannot afford soap.

VI Menstrual Hygiene practices

Poor women bear tremendous hardships in managing the basic biological function of menstruation – from the use of unhygienic material and the rashes it causes, the lack of water and soap to wash the soiled cloth, to lack of private space to change or dry the cloth. Cultural taboos about menstrual blood further impose hardships of washing, drying, storing, and disposing the

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16 These numbers are for “most difficult” response only. In figure 7, the more difficult and less difficult frequencies are combined. The combined frequencies show “soap as a difficulty” identified by 82 percent and “water as a difficulty” mentioned by 66 percent of the respondents.
cloth. Managing menstruation in the rainy season becomes even more impossible. Poor women and girls suffer from the absence of these rudimentary requirements over and above the physical pain and discomfort of menstruation. Unable to maintain hygiene, their bodies smelled - as one woman said during the FGD, “during the menstrual cycle we smell even after bathing.”

84 percent of women and girls use pieces of old clothes for menstrual protection and only 14 percent bought commercial sanitary napkin, with girls and women responding similarly. 1 woman reported using only her garments to absorb the menstrual flow (see Fig.2). Nearly all wore it with underwear. The choice of material was dictated by cost and ease of finding it (see Fig.3). Only 13 percent said they do not like the material but could not afford anything else. 34% reuse the material, with 82 percent of them using the same cloth more than 2 times in one monthly cycle (Table 3). 80 percent said they changed the menstrual cloth two times or more in a day, with more girls reporting less frequent changes (Fig.4). None reported sharing clean menstrual cloth with any other person.

![Menstrual Protection options used in Rural Bihar](image)

Fig. 2
Participants were also asked questions on other aspects of managing menstruation – from availability of private space to washing, drying and disposal issues. 66 percent could change menstrual cloth/napkin inside the house but 15 percent had to change outside the premises of the house (bathing and defecation area outside-Figure 5). Yet in response to another question, 38 percent of women and girls admitted that they did not have a private place to change and hence could not change as frequently as they wanted (Table 3). Nearly 47 percent of girls could not change frequently because of lack of private space, even though nearly two-thirds (67 %) said they changed inside the house (not shown in Table). This indicates that even those able to change in the house did not have access to a private space when needed. In answer to another question, over a majority (56%) said there is insufficient water to wash menstrual cloth properly.
When drying the washed cloth, 62 percent did not dry in direct sunlight, covering the wet cloth with another fabric (28 percent) or dried it in a covered area not visible to others (34 percent – see Table 4 below). There are strong cultural taboos about menstruation that most communities follow – menstrual cloth should be washed, dried, and stored separately from other clothing. 17 percent dispose the soiled cloth by burying it and the rest throw it in the trash.

The rainy season is especially an onerous time for 80 percent of the participants (see Figure 6 below) because the cloth does not dry quickly (35 percent) or because it is harder to find a private, dry place to change outside the premises of the house (17 percent). 47 percent of women and girls said it is difficult to dispose the soiled cloth in the rainy season. This is probably because the cloth cannot be thrown in the premises of the house.
Finally, the survey asked participants to rate the difficulty level of each of the ten different menstrual management issues – physical pain/menstrual cramps; washing, drying, and disposal issues; access to water, toilet, and soap; cloth access and expense; and private space (Figure 7). As the graph below shows, fewer women reported menstrual cramps and pain as difficult to manage compared to the numbers that reported expense of buying cloth/napkin, followed by lack
of toilets, the expense of buying soap to wash the cloth, and drying the cloth. In the entire sample, all the issues were rated as difficult by at least 66 percent of the participants. In an economically well-off population, one would only expect “pain” to be rated as a difficult issue, indicating the tremendous hardships poverty imposes on menstruating women.

In an economically well-off population, one would only expect “pain” to be rated as a difficult issue, indicating the tremendous hardships poverty imposes on menstruating women.

The survey findings are further supported by FGDs. Women in Bhagalpur reported that lack of water and privacy prevented them from maintaining menstrual hygiene – from changing frequently to washing soiled cloth well.

When a SEWA team member commented that the cloth should be changed frequently, a village FGD with women in Bhagalpur district

We are not able to wash the soiled cloth soon after changing but often have to wash it 4-5 hours later when no one is around. By then the cloth becomes hard with dried blood and it is difficult to clean as there is not enough water.

FGD with women in Bhagalpur district.
woman replied, “…we know we should change 3-4 times in a day but unlike you we do not have a private place to change or even water to clean ourselves as often as we want.”

In Katihar district, women because of lack of private space to wash the soiled cloth or dry it threw the cloth in trash. They also said if the cloth was not washed and dried properly it had a bad odor and was hard to store. Because of the problems with washing and drying, they preferred using market napkins but the cost made it unaffordable. For girls in the district too, washing and drying was a problem as there was no private space to hide the cloth from the public eye. They were forced to dry the cloth behind bushes or bamboo railings in the back yard, risking attracting insects to the cloth.

In Munger district, the girls use cloth in the initial phase and later switch to using napkins. They learned about napkins from their friends or sister in laws. But girls are embarrassed about admitting they use old cloth, especially in front of other girls who were using market napkins. A few girls reported they use cloth in the first two days when the bleeding is heavy because old cotton clothes, when used properly, soak better. They reused the cloth twice in a cycle by rinsing it with water each time. However, they usually avoid reusing as it gives out a bad odor and also because they have to dry the cloth hidden from the public eye.

In the FGDs both women and girls complained of rashes and itching. In the survey, 76 percent said the menstrual cloth caused rashes. It is not clear if the rashes are caused by the quality of the material used, wearing wet, soiled cloth for too long, or because they were unable to wash and bathe frequently during the menstrual cycle.

**VII Menstrual Hygiene and School Attendance**

26 girls responded to questions about menstrual management issues in school. Because the sample size is very small, the findings should be treated with caution.

Of the 20 girls that were not able to change in school, 65 percent said toilets were of poor quality and unusable for changing; 25 percent said there was no place to dispose soiled cloth; 15 percent complained of not having any access to menstrual pads; 10 percent said the principal or teacher would not allow them to use the toilets when menstruating (a finding also noted during FGDs); and 5 percent reported there were no toilets in the school (Figure 8 below).
Of the 26 girls attending school, 62 percent missed school when menstruating. 81 percent of those who missed school did so because there was no place to change. 13 percent missed school because of menstrual cramps and 6 percent because they felt too weak to attend (see Table 5 below).

None of the girls received any sanitary napkins from the government.

In Katihar district, during the FGD it was learnt that most girls skipped school on the first day of the cycle. If they started bleeding in the school, they took leave from the teacher and came back home. They did not prefer staying in school as the bathrooms were dirty and no dustbins available to dispose of the cloth/pad. Often the toilets were locked with only teachers allowed to use them. In Munger district, almost all the girls said they did not attend school in the first day of the cycle due to stomach cramps and non-availability of a private space to change the pad/cloth.
Menstrual Hygiene and Work

Given that women’s earnings are essential for their family’s economic survival, majority of women who work outside do not miss work during the menstrual cycle.

Of the women and girls who worked outside the house, 43 percent (N=26) did not go to work when menstruating. Of these, over 60 percent did not go to work either because of menstrual cramps or because they felt weak. 8 percent said there was no place to change pads at their workplace (see Table 6 below). More self-employed women miss work than those who were casual laborers hence it is not surprising to find that majority (62 %, N=16) of women and girls said they did not lose any money when they missed work and only 31 percent (N=8) said they lost less than Rs. 100 per month. However, since the frequencies of responses were so low, the findings may not be representative of the community.

In the FGD, women from Bhagalpur and Katihar districts complained that while working in the field there was no place to change. If the cycle starts when they were at work in the field, they “let the blood drip in the dirt.” Otherwise they wear the same soiled cloth for 4-5 hours till they can get home and change. If the field is close to home then they are able to change at home and

<table>
<thead>
<tr>
<th>Table 5 Menstrual Hygiene Practices and School Attendance of Rural Girls in Bihar</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Those who miss school during monthly periods of those attending N=26</strong></td>
</tr>
<tr>
<td>There is no place to change menstrual cloth</td>
</tr>
<tr>
<td>Get menstrual cramps so do not attend for this reason</td>
</tr>
<tr>
<td>Feel too tired and weak during my periods so do not attend</td>
</tr>
<tr>
<td>Family has taboos about going outside during periods so have to miss school</td>
</tr>
<tr>
<td>Want to avoid the risk of embarrassment from a stained garment</td>
</tr>
<tr>
<td>Harassment from boys</td>
</tr>
<tr>
<td>Lack of understanding from teachers</td>
</tr>
</tbody>
</table>

Legend-# Multiple answers possible
go back to the field. In Munger district too, all the women went to work during the menstrual cycle and could only change once they went back home. In their words, “if we do not work how do we survive?”

<table>
<thead>
<tr>
<th>Table 6 Work and Menstrual Hygiene Practices in Rural Bihar (N=98)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Women &amp; Girls Total % (N)</td>
</tr>
<tr>
<td>Do not work outside during periods N=61</td>
</tr>
<tr>
<td>Reason for missing work during periods# N=26</td>
</tr>
<tr>
<td>Menstrual cramps</td>
</tr>
<tr>
<td>Feel tired and weak</td>
</tr>
<tr>
<td>Taboo on going outside the house or touching crops, food etc</td>
</tr>
<tr>
<td>Lack of toilet/privacy to change pads</td>
</tr>
<tr>
<td>Lack of water to wash</td>
</tr>
<tr>
<td>Worry about staining garment in public</td>
</tr>
<tr>
<td>Money lost per month when not working during periods N=26</td>
</tr>
<tr>
<td>Less than Rs. 100 per month</td>
</tr>
<tr>
<td>Between Rs. 100 – 200 per month</td>
</tr>
<tr>
<td>More than Rs. 200 to &lt; Rs. 300/ month</td>
</tr>
<tr>
<td>More than Rs. 300 per month</td>
</tr>
<tr>
<td>I do not lose any money</td>
</tr>
</tbody>
</table>

**IX. Rainy Season and Hygiene**

In the rainy season, lack of latrines, drainage, and a private place to bathe and change during menstrual cycle poses severe challenges.

- No place to wash or dry clothes. The menstrual cloth is often worn even if it is damp.

- Pit latrines overflow, spreading the waste water outside the yard into public lanes.

- Since there is no indoor space to wash menstrual cloth, it is hard to wash the cloth outside in the rainy season. Changing into a clean cloth is a problem as there is no covered, private space to change. Even disposing the cloth is a problem.

- Bathing is impossible when no covered bathing space exists or when the yard and entire village is water logged.
- In Munger district, the villages near the river bank are especially prone to flooding. Even open defecation on the river bank is not possible (see box below).

**In Munger district, in the months of July and August (saawan & bhado) the whole village is water logged. Even the people who have toilets in their homes defecate outside. During these months the government provides boats for people to go to the other side of the river bank to defecate. According to the women, this boat service is supposed to be twice a day, but this is rarely the case. So they are forced to construct a temporary raised platform using bamboo which is often unstable and poses a risk as there is danger of falling down in the water.**

Field notes from Munger district

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**X Socio-Economic background and Unhygienic Conditions and Practices**

Of the 50 questions asked about water, sanitation, and hygiene 9 indicators were selected to examine the socio-economic background of those lacking access to basic necessities and hence unable to practice good hygiene (see Tables 7-11). These measures cover all the basic necessities that a household requires: water, latrine, bathroom, drainage, sanitary napkins, and soap. 5 of them focus on menstrual hygiene management issues. 3 measures were used to operationalize the economic variable – quality of housing, employment (family and self), and caste background. Each indicator was defined in the following way:

*Lack of Access to Water for Hygiene* - All those who said that “If I had more water available I could maintain better personal hygiene” (for laundry, bath, hair wash, and washing of menstrual cloth – 58%).

*Lack of Latrine Access* - Those who said there was no latrine in the premises of the household (73%).

*Lack of Bathroom Access* - Those who said they bathed outside the premises of the house (55%).

*Lack of Drainage* – Those who said the house waste water was not connected to any drainage (46%).

*Lack of Access to Soap* for menstrual hygiene – Those who said they did not have soap to wash soiled menstrual cloth to their satisfaction (68%).

*Lack of Privacy for changing soiled menstrual cloth* – Those who said they did not have private space so could not change soiled cloth frequently (38%). Bathroom access does not ensure privacy for menstrual management in poor, traditional households. Not all women change in the
bathroom—either because bathrooms do not provide enough privacy or menstrual blood would “pollute” the space. In the survey, only 13 percent of women and girls changed menstrual cloth in the bathroom located in the premises, although 45 percent bathed in the premises of the household.

**Use of Old Cloth for Menstrual Protection**—(84%). Old cloth used for menstrual protection can be sanitary if washed with soap and stored properly. However, given shortages of water and soap, it is assumed here that women are unlikely to wash rags before using it.

**Reuse of Menstrual Cloth**—(34%). Once again, given shortages of water and soap it is assumed women are using unsanitary material. This observation is based on discussions with women and girls.

**Poor Hand hygiene**—All those who admitted not cleaning their hands with water and soap (84%).

As can be seen, majority of the population does not have access to water, latrine or bathroom. While 54% had open drainage, in none of the households was the wastewater connected to a covered drain. Only 16 percent used water and soap to clean hands. This may be either because of water scarcity or cost of soap. However, another reason is lack of water source within the premises of the house. As a woman in a focus group discussion mentioned, it is harder to wash hands with soap when the only source of water is a public hand pump or bore well where there is no soap available. Even menstrual hygiene cannot be maintained when not only water but soap is a scarce commodity and not available to clean the soiled cloth or when the cloth cannot be changed frequently because of lack of privacy.

Below isthe analysis of the socio-economic background of those living under poor hygiene conditions or practicing poor hygiene. However, since many cells had small N the findings are only suggestive. Since there were very few who used sanitary napkins or washed hands with soap (16 percent for both), there is less likely to be differences between various socio-economic groups in these practices.
### Table 7 Housing Quality of those Lacking Water, Sanitation and Hygiene

<table>
<thead>
<tr>
<th></th>
<th>Kutchha %</th>
<th>Semi-Pucca %</th>
<th>Pucca %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Women &amp; Girls N=100</td>
<td>51 (n)</td>
<td>33 (n)</td>
<td>16 (n)</td>
</tr>
<tr>
<td>No Latrine on premises</td>
<td>92 (47)</td>
<td>58 (19)</td>
<td>44 (7)</td>
</tr>
<tr>
<td>Bathe outside premises</td>
<td>71 (36)</td>
<td>39 (13)</td>
<td>38 (6)</td>
</tr>
<tr>
<td>Lack of Water for personal hygiene*</td>
<td>57 (29)</td>
<td>70 (23)</td>
<td>38 (6)</td>
</tr>
<tr>
<td>No Drainage</td>
<td>53 (27)</td>
<td>39 (13)</td>
<td>38 (6)</td>
</tr>
<tr>
<td>Use Old Rags</td>
<td>92 (47)</td>
<td>70 (23)</td>
<td>75 (12)</td>
</tr>
<tr>
<td>Reuse Menstrual Cloth</td>
<td>37 (19)</td>
<td>21 (7)</td>
<td>13 (2)</td>
</tr>
<tr>
<td>Poor Hand Hygiene&amp;</td>
<td>88 (45)</td>
<td>79 (26)</td>
<td>69 (11)</td>
</tr>
<tr>
<td>No private space to change cloth</td>
<td>59 (30)</td>
<td>18 (6)</td>
<td>6 (1)</td>
</tr>
<tr>
<td>Not enough soap to wash Menstrual cloth</td>
<td>71 (36)</td>
<td>70 (23)</td>
<td>50 (8)</td>
</tr>
</tbody>
</table>

**Legend:**
* If I had more water available I could maintain better personal hygiene
& All those who wipe on clothing, water only, water and mud and use ash but not soap.

### Table 8 Age & Caste Background of those lacking Water, Sanitation and Hygiene

<table>
<thead>
<tr>
<th></th>
<th>Age</th>
<th>Caste</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>≤20 yrs.</td>
<td>31-35 yrs.</td>
</tr>
<tr>
<td>Women &amp; Girls N=100</td>
<td>% (N)</td>
<td>% (N)</td>
</tr>
<tr>
<td>No Latrine on premises</td>
<td>62 (21)</td>
<td>81 (39)</td>
</tr>
<tr>
<td>Bathe outside premises</td>
<td>44 (15)</td>
<td>58 (28)</td>
</tr>
<tr>
<td>Lack of Water for Personal hygiene*</td>
<td>50 (17)</td>
<td>62 (26)</td>
</tr>
<tr>
<td>No Drainage</td>
<td>29 (15)</td>
<td>52 (25)</td>
</tr>
<tr>
<td>Use Old Rags</td>
<td>82 (28)</td>
<td>81 (39)</td>
</tr>
<tr>
<td>Reuse Menstrual Cloth</td>
<td>34 (11)</td>
<td>25 (12)</td>
</tr>
<tr>
<td>Poor Hand Hygiene&amp;</td>
<td>71 (24)</td>
<td>88 (42)</td>
</tr>
<tr>
<td>No private space to change cloth</td>
<td>41 (14)</td>
<td>40 (19)</td>
</tr>
<tr>
<td>Not enough soap to wash M cloth</td>
<td>74 (25)</td>
<td>65 (31)</td>
</tr>
</tbody>
</table>

**Legend:**
* If I had more water available I could maintain better personal hygiene
& All those who wipe on clothing, water only, water and mud and use ash but not soap.
### Table 9: Educational Background of those Lacking Water, Sanitation, and Hygiene

<table>
<thead>
<tr>
<th></th>
<th>Illiterate % (N)</th>
<th>Primary+Middle % (N)</th>
<th>Secondary &amp; above % (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Women &amp; Girls N=100</td>
<td>34 (31)</td>
<td>35 (71)</td>
<td>31 (25)</td>
</tr>
<tr>
<td>No Latrine on premises</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bathe outside premises</td>
<td>91 (31)</td>
<td>71 (25)</td>
<td>55 (17)</td>
</tr>
<tr>
<td>Lack of Water for Personal hygiene*</td>
<td>56 (19)</td>
<td>74 (26)</td>
<td>42 (13)</td>
</tr>
<tr>
<td>No Drainage</td>
<td>53 (18)</td>
<td>43 (15)</td>
<td>42 (13)</td>
</tr>
<tr>
<td>Use Old Rags</td>
<td>94 (32)</td>
<td>89 (31)</td>
<td>61 (19)</td>
</tr>
<tr>
<td>Reuse Menstrual Cloth</td>
<td>41 (14)</td>
<td>17 (6)</td>
<td>26 (8)</td>
</tr>
<tr>
<td>Poor Hand Hygiene&amp;</td>
<td>91 (31)</td>
<td>83 (29)</td>
<td>71 (22)</td>
</tr>
<tr>
<td>No private space to change cloth</td>
<td>41 (14)</td>
<td>34 (12)</td>
<td>35 (11)</td>
</tr>
<tr>
<td>Not enough soap to wash Menstrual cloth</td>
<td>71 (24)</td>
<td>69 (24)</td>
<td>61 (19)</td>
</tr>
</tbody>
</table>

**Legend:**

* If I had more water available I could maintain better personal hygiene

& All those who wipe on clothing, water only, water and mud and use ash but not soap.

### Table 10: Family Occupation of those lacking Water, Sanitation and Hygiene

<table>
<thead>
<tr>
<th></th>
<th>Self-employed % (N)</th>
<th>Casual Labour % (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Women &amp; Girls N=93</td>
<td>29 (19)</td>
<td>64 (24)</td>
</tr>
<tr>
<td>No Latrine on premises</td>
<td>66 (19)</td>
<td>81 (52)</td>
</tr>
<tr>
<td>Bathe outside premises</td>
<td>38 (11)</td>
<td>69 (44)</td>
</tr>
<tr>
<td>Lack of Water for Personal hygiene*</td>
<td>41 (12)</td>
<td>64 (41)</td>
</tr>
<tr>
<td>No Drainage</td>
<td>48 (14)</td>
<td>45 (29)</td>
</tr>
<tr>
<td>Use Old Rags</td>
<td>83 (24)</td>
<td>86 (55)</td>
</tr>
<tr>
<td>Reuse Menstrual Cloth</td>
<td>38 (11)</td>
<td>23 (15)</td>
</tr>
<tr>
<td>Poor Hand Hygiene&amp;</td>
<td>72 (21)</td>
<td>88 (56)</td>
</tr>
<tr>
<td>No private space to change cloth</td>
<td>28 (8)</td>
<td>44 (28)</td>
</tr>
<tr>
<td>Not enough soap to wash Menstrual cloth</td>
<td>69 (20)</td>
<td>70 (45)</td>
</tr>
</tbody>
</table>

**Legend:**

* If I had more water available I could maintain better personal hygiene

& All those who wipe on clothing, water only, water and mud and use ash but not soap.
Quality of House: A higher percent of those residing in poorer quality homes (Kutcha), were living with limited access to water or sanitation facilities (insufficient water for personal hygiene; lack of latrine, bathing, or drainage facilities). They also had limited access to soap and privacy to maintain menstrual hygiene and many more living in such homes were reusing the menstrual cloth. More of them also practiced poor hand hygiene. Compared to kutcha home dwellers, fewer semi-pucca home owners and even fewer pucca owners had water and sanitation scarcity or reported poor menstrual or hand hygiene practices (see Table 7).

These results are to be expected as the kutcha homeowners are from poorer background and unable to have the resources or space to build latrine or bathroom in the premises or buy soap. In fact, 69 percent of kutcha home dwellers said they did not have money to build latrine compared to 45 percent and 19 percent of semi-pucca and pucca home dwellers respectively.

Age: Except for menstrual hygiene issues, more women above the age of 20 lived under poor WASH conditions, including insufficient water, latrine, bathing, drainage facility, and even practiced poor hand hygiene. More of those aged 20 and younger, reported reusing menstrual cloth, lacking private space to change soiled cloth, and lacking soap to wash the soiled cloth. There was not much difference between the age groups on the use of rags as menstrual

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**Table 11 Occupation of Women and Girls Lacking Water, Sanitation, and Hygiene**

<table>
<thead>
<tr>
<th></th>
<th>Self-employed % (N)</th>
<th>Casual Labour % (N)</th>
<th>Home-based % (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Latrine on premises</td>
<td>63 (10)</td>
<td>78 (32)</td>
<td>74 (31)</td>
</tr>
<tr>
<td>Bathe outside premises</td>
<td>31 (5)</td>
<td>68 (28)</td>
<td>52 (22)</td>
</tr>
<tr>
<td>Lack of Water for Personal hygiene*</td>
<td>50 (8)</td>
<td>71 (29)</td>
<td>50 (21)</td>
</tr>
<tr>
<td>No Drainage</td>
<td>63 (10)</td>
<td>34 (14)</td>
<td>52 (22)</td>
</tr>
<tr>
<td>Use Old Rags</td>
<td>100 (16)</td>
<td>80 (33)</td>
<td>79 (33)</td>
</tr>
<tr>
<td>Reuse Menstrual Cloth</td>
<td>56 (9)</td>
<td>10 (4)</td>
<td>36 (15)</td>
</tr>
<tr>
<td>Poor Hand Hygiene&amp;</td>
<td>88 (14)</td>
<td>83 (34)</td>
<td>81 (34)</td>
</tr>
<tr>
<td>No private space to change cloth</td>
<td>31 (5)</td>
<td>44 (18)</td>
<td>33 (14)</td>
</tr>
<tr>
<td>Not enough soap to wash M cloth</td>
<td>75 (12)</td>
<td>68 (28)</td>
<td>64 (27)</td>
</tr>
</tbody>
</table>

**Legend:**
* If I had more water available I could maintain better personal hygiene
& All those who wipe on clothing, water only, water and mud and use ash but not soap.
protection. Here the relationship between age and WASH conditions and practices reflects better living standards of girls (ages 20 and under) than women above age 20. 63 percent of pucca home dwellers were under 20 years of age. In contrast, 65 percent of kutcha home dwellers were between 21-35 years of age (see Table 8). The difference between 21-35 years age group and those older are less clear.

**Caste Background:** Since there were only 4 participants that belonged to the upper caste category it was merged into the Backward caste group. On many of the WASH indicators, those belonging to the Backward caste community (OBC) had poorer access while more Scheduled castes had poorer menstrual hygiene. However, since the sample size was small these differences may not be significant. Both the communities come from poor economic backgrounds; primarily from families engaged in casual labor (see Table 8). Most families from the Scheduled Caste community in the survey had received assistance from the government for building a pucca house and this may be one reason for their better WASH conditions.

**Education:** The education category was merged to create 3 categories-illiterate, middle, and secondary and above education. More illiterate women and girls compared to those with secondary education and above had poor access to water, latrine, and bathing and drainage facilities. More of them also engaged in poor hand and menstrual hygiene practices. However, since more women were illiterate and less well educated compared to girls (47 percent of women were illiterate and only 16 percent had secondary and higher education compared with only 3 percent of girls who were illiterate and 67 percent who had secondary and higher levels of education) the relationship between education and WASH conditions primarily reflects the better living conditions of girls who also had higher education standards. The difference between those with middle school and secondary school education is not that clear (see Table 9).

**Family Occupation:** A higher percent of participants whose families worked as casual laborers (64% of the sample) compared to those who were self-employed (30% of the sample) reported living under poor WASH conditions (lacked access to water, latrines, bathing facilities, private space to change menstrual cloth, and had poorer hand hygiene). With regards to drainage access, and menstrual hygiene (use of rags, lack of access to laundry soap) both groups were similar. Casual laborers are generally worse off than those that are self-employed (see Table 10) so these findings are not surprising. The former work as construction workers, MGNREGA workers,
carpenters, build and repaired mud houses, etc. and earn less than those who are self-employed and work in their own small fields or own cattle, small shops etc.

**Occupation of Women and Girls:** A higher percent of women and girls who worked outside as casual laborers in general had less access to WASH facilities compared to self-employed women or home based workers (with the exception of drainage facility and access to soap - see Table 11). More women who were self-employed and home-based workers reused menstrual cloth than those who were casual laborers since both the former groups have the space and time to better manage their monthly cycle than casual laborers. If most casual laborers do not reuse menstrual cloth fewer of them may face the problem of soap access.

In general, access to water, sanitation, and some menstrual hygiene practices are highly correlated with economic standards of living rather than with age and education. However, some hygiene practices (such as hand hygiene and the use of sanitary napkins) may also be influenced by age and education levels. While no statistical analysis was done to determine which of the relationships were significant (in many cases N was too small), cross-tabulation of data does suggest poorer WASH conditions and practices among those families who worked as casual laborers and lived in *kutcha* homes. Since age and education were highly correlated with housing quality in this sample they are less useful in understanding the impact on hygiene practices. Caste background did not reveal the expected result. On many indicators Scheduled Caste had better access but since the sample contained only 28 from this caste group the results may not be representative of the conditions of this community. As mentioned earlier, many of these families had benefitted from government subsidized housing.

**Impact on Health**

As mentioned earlier, unsafe WASH is directly linked to infectious diarrhea, schistosomiasis, ascariasis, trichuriasis and hookworm disease. Inadequate WASH is also a determinant in a number of additional diseases, such as malaria, yellow fever, filariasis, dengue, hepatitis A and E, typhoid fever, arsenicosis, fluorosis, and legionellosis.\(^{17}\)

\(^{17}\) See reference above.
It has also been estimated that, poor sanitation, hygiene, and water are responsible for about 50% of the consequences of childhood and maternal underweight, “primarily through the synergy between diarrheal diseases and under-nutrition, whereby exposure to one increases vulnerability to the other” (Mara et al. 2010:3; see reference above). Given the level of WASH deprivation noted in this study and the larger Census data, it may be a major factor contributing to malnutrition in Bihar. The state recorded the highest percentage of malnutrition among Hindu women (India human Development Report, 2011). In fact, according to Indian Census Bureau’s National Health Profile, 45.1% of Bihari women’s Body Mass Index is below normal. The average for India was 35.6 percent. Bihar also has the third highest percent (67.4%) of ever-married women between the ages of 15-49 in the country who are anemic.\textsuperscript{18}

Although access to adequate WASH is critical in any context, it is particularly vital to maternal, fetal, and infant health. Several studies have shown a link between WASH and adverse health outcomes for maternal health (Benova et al. 2014; Rylander et al. 2013).\textsuperscript{19} There are numerous direct and indirect pathways through which poor water or sanitation can affect maternal health – from poor hygiene at the time of delivery, to water borne infections (such as Hepatitis E) during pregnancy, hookworm anemia through contact with soil contaminated with worm eggs found in feces, and exposure to mosquitoes that spread malaria and dengue – all these diseases pose high risk for pregnant women. In a cross-sectional, study using global databases for 193 countries, it was found that increased access to improved water source and sanitation led to a decline in maternal mortality rates (Cheng et al., 2012).

There are also other conditions that are exacerbated by lack of water for washing and hygiene. These diseases are related to skin and eyes, such as scabies, trachoma and conjunctivitis. Trachoma is a chronic bacterial infection of the eye that causes blindness. Poor hygiene practices also cause other skin infections such as staph, lice (head, body, pubic). Gendered relations determine the risk of exposure to many of these infections via multiple pathways. First, as primary caretakers of children and the sick women come in contact with infected people. For

\textsuperscript{18} National Family Health Survey-III (2005-06), MOHFW, GOI
example, women are affected more than men with trachoma induced blindness because of close contact with their infected children who infect their mothers repeatedly (Mabey et al., 2003). An estimated, three-quarters of people who get blinded by trachoma are women. The National Program for Control of Blindness (NPCB) in India estimates that the prevalence and incidence of blindness is higher in women than men in Bihar as it is in other states. Similarly, other water-washed infections such as scabies (Walton and Currie 2007) also put women with young children at greater risk as they sleep with them, and come in contact with the infected child’s or adult’s clothing, bed linen, etc.

Second, in communities lacking water for bathing and laundering clothes and lacking private bathing spaces the gendered use of space and notions of privacy prevent women from maintaining personal hygiene – from daily bathing to changing clothing. Third, given shortages of water and soap and time constraints, women place lower priority on their hygiene needs. From group discussions with women it was learnt that when water supply is limited, preference is given to laundering men’s soiled clothes.

Women and girls are also at risk of exposure to reproductive tract infections (RTI), urinary tract infections (UTI), and Human papilloma virus (HPV infection causes cervical cancer) due to poor WASH conditions and inability to afford sanitary material for menstrual protection. In communities where women have to haul water from long distances, defecate in the open, and bathe in public fully clothed not only do women bathe infrequently, they are unable to maintain vulvar and perineal hygiene on a daily basis increasing the risk of various infections. In addition, as this study has also shown, when there is acute water shortage and women cannot afford soap and disposable napkins it is difficult to keep the menstrual cloth clean. Lack of privacy to change the pad

There is little research and knowledge on how socio-cultural factors impact women’s hygiene and put women more at risk of exposure to WASH related diseases.

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frequently is an additional burden which exposes women to health risks - from rashes to RTI and HPV infections.

In this study, 76 percent of women and girls report suffering from a rash during the menstrual cycle. About 21 percent ever married women aged between 15-49 years report having symptoms of RTIs/STIs and nearly 18 percent have experienced abnormal vaginal discharge according to the District Level Household and Facility Survey of Bihar (2010). Cervical cancer in India ranks as the second most frequent cancer among women and the second most common female cancer in women aged 15 to 44 years in India. About 7.9% of women in the general population are estimated to harbor cervical HPV infection at a given time.22

While, RTIs are known to be significantly associated with invasive contraceptives, gynecological surgery, and with multiple sex partners some evidence suggest that lack of menstrual hygiene (using unsanitary material) increases the risk of RTI among women in the developing world (Baisley et al. 2009; Singh et al. 2001).23 Balsara et al. (2010)24 also found that among Afghan refugee women in Pakistan, personal hygiene behaviors of women, such as cleaning after defecation and intercourse, (such as cleaning with mud, unclean water, or old cloth) played a role in increasing the risk for developing RTI. Poor hygiene (use of unclean menstrual cloth, absence of daily genital washing, etc.) has also been suggested as a risk factor for HPV infection that can lead to the development of cervical cancer25 (Bayo et al. 2002; Varghese et al. 1999).26

Although these studies suggest a link between personal hygiene practices and RTI and HPV infection, the evidence is not conclusive as none of these studies set out to examine unsanitary cloth or personal hygiene as risk factors, and only some of the studies adjusted for potential


25 HPV is a necessary cause of cervical cancer, but it is not a sufficient cause. Other cofactors that are necessary for progression from cervical HPV infection to cancer include tobacco smoking, high parity, long term hormonal contraceptive use.

confounders. But, the negative health outcomes of poor menstrual and other hygiene practices under poor WASH conditions remain of concern and require further research.

Finally, performing the necessary rituals of ablution and hygiene under the public eye is emotionally stressful, especially for adolescent girls and takes a huge toll on their mental health and well-being - from the threat of sexual assault, to the shame and humiliation of defecating and bathing with no privacy.

In conclusion, given the numerous negative health and social outcomes due to inadequate water and sanitation, and insufficient hygiene addressing these insecurities should remain a top priority within the basket of programs designed to improve women’s lives.

**Interventions Suggested**

The survey and focus group discussions have clearly revealed the inadequate water, sanitation, and poor hygiene conditions in these rural districts of Bihar.

First, it is important that WASH services be integrated with health services. SEWA believes that work security is not possible unless members have health security. But health and well-being are also closely linked with WASH security. Unless water, sanitation, and menstrual hygiene needs are met, women and their families will always be at risk of exposure to many diseases and their dignity and well-being undermined. SEWA already has a well-established health care program that trains mid-wives and bare-foot doctors in many parts of the country. This program could be expanded to include water safety and handling, hygiene education (which may already be part of SEWA’s sanitation literacy), menstrual hygiene education and management. The end goal is to improve the health and well-being of SEWA members and their families and thus impact their earnings and livelihood.

Second, while providing piped water and latrines are essential to address health and hygiene issues, the cost and implementation of this hardware may not be easy for SEWA to manage. But even without improved water supplies and sanitation facilities, SEWA can still make a huge difference to health of villagers by promoting better hygiene. In fact, as a recent article in Lancet
noted, “without improvements in personal and domestic hygiene, the health benefits of water and sanitation infrastructure are harder to achieve” (Curtis et al. 2011).

In that spirit, most of the following solutions suggested are low cost - focus on software – Information, Communication and Education (IEC) and training (in water safety, hand hygiene, and menstrual hygiene), to mitigate the problems of poor WASH conditions. The few hardware activities suggested include provision of soap, sanitary napkins, water safety tools, and the more challenging task of installing covered drains. SEWA may already be addressing some of these issues in their health and hygiene awareness programs.

Water: improving access & safety

This survey was not designed to address the issue of drinking water but since a safe and reliable water supply which is easily accessible is essential for good health simple measures to improve safety of drinking water is discussed below.

SEWA’s knowledge and expertise in rain water harvesting and forming women led water committees to build and repair pumps may address some problems of water insecurity for drinking and hygiene purposes. Protection of water sources will also involve more complicated and expensive measures such as better watershed and natural resource management especially since villages next to the river bank get frequently flooded. However, instead of expensive engineering solutions, the suggestions below focus on providing members low cost, and practical means of improving hygiene and reducing the risks of many diseases.

Water treatment and handling at point of use: Census level data show a large proportion of households have to fetch water from great distances in districts such as Bhagalpur and Munger. In the 2 villages of Gosaidaspur and Kajrouli in Bhagalpur district, 25 and 35 percent of households respectively get drinking water from afar according to the Census. Many diarrheal diseases are caused by unsafe water. Household treatment of drinking water can reduce diarrheal

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2720% of rural households in Bhagalpur and 19% in Munger (in contrast to only 11% in Katihar) have to fetch drinking water from more than 500 meters away from the house (Census, 2011).
morbidity by 39 percent.\textsuperscript{28} Although, this study was not designed to study water quality issues women complained about the quality of water in the villages. It is also likely that many villagers are not aware they are drinking contaminated water. When NSS 69th Round 2012, asked households in Bihar how satisfied they were with the quality of the drinking water (bad in taste, bad in smell, bad in taste and smell, bad due to other reasons, no defect) – 80.1% of rural households in Bihar said the water had no defect, i.e. they were satisfied with the quality of water. But a large majority of rural households in the 3 districts derive their water from tube-wells.\textsuperscript{29} Most of this water source is likely to be contaminated.\textsuperscript{30} Only 3%, 4.7%, and less than 1% of rural households in districts of Bhagalpur, Munger, and Katihar respectively received treated tap water (Census of India, 2011). In fact, according to the NSS 69\textsuperscript{th} Round, when compared nationally, Bihar had the lowest percent (2.2%) of rural households that treated their water (in contrast to 32.3% of rural households in India). This disconnect between quality of water and perceptions regarding it highlights the importance of IEC tools - SEWA could educate households so they develop better understanding of safe water and the health consequences of drinking unsafe water. SEWA should also assist in accessing cheap treatment methods (such as chlorine). Most home treatments involve filtering the water through cloth which does not remove many contaminants. Water safety can also be improved by teaching women how to store and handle water safely\textsuperscript{31} and use clean water for washing utensils (see picture below of women washing utensils with polluted river water).

\textit{Protect drinking water from wastewater:} Other preventive steps can be taken to promote water safety. Water should be protected from contamination by waste water from washing clothes, utensils, bathing, and animals using the same source. By zoning this area the water supply could

\textsuperscript{28} UNICEF - \url{http://www.unicef.org/india/wes.html}
\textsuperscript{29} 79\%, 68\%, and 95 \% of rural households in Bhagalpur, Munger, and Katihar respectively derive their main source of drinking water from handpump/tubewell (Census, 2011). In Munger, close to 24\% of rural households access drinking water from the well (covered and uncovered).
\textsuperscript{30} Pratham’s survey of 8 Indian districts found that close to 70\% of households were using drinking water with bacterial contamination.
\textsuperscript{31} SEWA could link up with government schemes for drinking water. National Rural Water Drinking Program (NRWDP) provides for water testing kits for each Gram Panchayat and 100\% financial assistance for monitoring and surveillance of public drinking water supplies.
be protected. Covered drains to channel wastewater will prevent water stagnation and protect against mosquitoes.

*Avoidance of animal feces:* Animal feces are another major source of contamination and require community based solutions. Managing the spatial distribution of animals can avoid the build-up of high concentrations of animal feces near the water source used for drinking or for other domestic purposes (see picture below of women washing utensils next to goats using the same water source). Installing a fence around the water source can keep animals from entering, grazing, and defecating near the source. Using separate troughs for livestock watering is also important. FAO recommends restricting livestock watering areas to areas ‘downstream’ from extraction points for the community.\(^3\text{2}\)

![Washing utensils on the river bank](http://www.fao.org/ag/againfo/programmes/en/lead/toolbox/Mixed1/AnimWW1.htm)
Improving access and usage of latrines and private bathing spaces

In our sample, 73 percent did not have a latrine in the house and the major reason for not building one was financial. Lack of space to build was also mentioned by one-third of the participants who did not have a latrine. Here villagers need to be brought under the central and state government schemes of Nirmal Bharat Abhiyan/Swachh Bharat (only 2 women had received government assistance). Shared latrines may have to be built if there are many lacking space to build one on the premises. But villagers would first have to be motivated (through IEC) on the importance of building latrines and using their input to design strategies to eliminate open defecation.

On the other hand, as this field study revealed, many latrine owners did not use latrines for fear of the pit overflowing. Here, a technical solution (adding an additive to the pit) that slows the rate at which pit latrines fill would improve usage of latrines. Although not yet available, this is a promising low cost solution to improve latrine usage and reduce open defecation. Suggesting households build 2 pit latrines is another - though a more expensive solution. In waterlogged and high groundwater table areas ECOSAN toilets (also more expensive) may be a better solution than pit latrines.

Behavior change to motivate latrine use
Given that open defecation is still preferred by some households as revealed in the survey and FGDs, IEC becomes an important strategy to pursue a goal of defecation free villages. The importance of IEC to improve latrine usage has been found in several studies. Government’s own review of the variable success of the sanitation campaign found that not enough effort was given by states to the IEC component of the campaign. “Expenditure on IEC, which is an important component in generating demand for sanitation, was only 5 percent. Himachal Pradesh and Haryana, among the best performing states in terms of ODF status spent close to 70% of approved IEC funds. In contrast, Bihar, Jharkand, and Orissa less than 20% of the approved IEC funds were spent” (India Human Development Report, 2011). Within the IEC strategy, studies have found that health is less of a motivator for building a toilet but social pressure and status concerns are better motivators.
**Private Bathing spaces:** Regarding bathing spaces, women should be persuaded (and if needed, assisted financially) to build a bathing space with walls, roof, door and drainage in the premises of the house. Census data and our survey show that even those who bathe in the premises do not have privacy thus affecting their hygiene practices. Public bathrooms for women (although harder to build and maintain) should remain an option in villages where many lack the money or space to build on their own property.

**Drainage:** None of the households had covered drains to channel wastewater away. A village wide covered drainage system is an essential investment. Besides creating problems of water stagnation and contamination, lack of drains at the household level affects women’s bathing, and menstrual hygiene practices. Seeking assistance through the central government’s sanitation scheme may be one solution.

**Menstrual Management**

Given acute shortages of water, soap, and difficulty laundering and drying the menstrual cloth in the rainy season the use of disposable sanitary cloth should be the most convenient protection option promoted. In order to make sanitary material available at affordable cost to members, several approaches are possible:

- Partner with the National Institute of Design that has recently begun work on creating affordable sanitary napkin for women in rural areas. To reduce cost, they plan to use jute extracts instead of cotton.

- Several NGOs (Goonj, Eco-Femme among others) and self-help groups are manufacturing sanitary napkins that are cheaper than the commercial product. SEWA can partner with existing groups that have experience in manufacturing the product at low cost although the quality of these products is unknown.

- It can manufacture the product itself at an affordable cost as SEWA Gujarat is trying to do. Arunachalam Muruganantham of Jayaashree Industries has designed a low-cost sanitary napkin-making machine for sale.

- Link with government schemes that provide sanitary napkins to adolescent school girls at subsidized cost. Local ASHA workers are entrusted with the responsibility of monthly distribution of the napkins in villages and schools, although none of the girls in our study had received any napkins. The product may however be of inferior quality.³³

Besides the hardware, the software package is also essential and should include educational and training programs that generate behavior change in hygiene practices and inform women and girls about reproductive health and dispel myths about menstruation. While SEWA may already be offering these services, education classes should make a concerted effort to remove cultural taboos surrounding menstruation (which were not the subject of this study but are widely practiced) because of its serious negative effect on health and hygiene practices. Community-based solutions (involving women and their employers) are required to address the problem of women who work outdoors and are unable to change during the menstrual cycle (especially when their place of work is at a distance). Making disposable sanitary cloth/napkin more affordable should provide some relief. The poor sanitation and hygiene conditions at school require monitoring (functional toilets, with facilities to manage menstruation and accessible to all the girls and not just teachers).

**Hand washing with soap (HWWS)**

As noted earlier, the estimated disease burden from inadequate hand hygiene is higher than with inadequate sanitation. In this field study, only 16 percent of those surveyed washed hands with soap. Educating women and girls about the importance of hand hygiene (and correct fecal disposal practices) would save many lives. Studies have shown that the key motivations for hand-washing are disgust and desire to follow social norms.

IEC strategies may not be sufficient to change behavior, for soap appears to be a luxury in these rural communities. One woman even admitted that soap was mainly used to clean hands and bodies during religious occasions. Clothes and even menstrual cloth were not laundered properly. If cost is the main reason preventing hygienic behavior, then SEWA should consider providing access to soap for laundry, bathing, and hand-washing through loans/subsidies or by partnering with soap manufacturers to improve affordability.

However, cost may not be the only reason hand-washing with soap was not common practice. As mentioned earlier, most households to not have water pump at home and so have to wash hands at the public hand-pump. Since there is no soap available there, hands are washed without soap. Hence, making soap more affordable may help, but without private bathing spaces or in yard water access with a hand-washing station just outside latrines, soap usage may not increase.
**Dangers of animal feces**: Hand hygiene education is also important for rural women who use cow dung for cooking fuel. In Bihar, nearly 22 percent of households use cow dung cakes as cooking fuel (Census of India, 2011). These women are more likely to be exposed to zoonotic diseases although gender wise prevalence rates are not known. Neither have studies quantified the risks associated with the use of cow dung for fuel or in house maintenance (Curtis et al. 2011).

**Health Camps**

Given the poor quality of perineal and menstrual hygiene found through this survey, health camps should be set up to provide screening for RTI/STI, UTI, and cervical cancer and should be part of the reproductive health services women receive.

Finally, it must be remembered, that habits of personal and menstrual hygiene practices are deeply ingrained and shaped by social and cultural norms – from management of feces to menstrual blood. So intervention programs need to change community norms about cleanliness and hygiene to have positive health outcomes and should be targeted at men and adolescent boys too.

**Conclusion**

This field study has shown the dire conditions under which women and girls struggle to maintain hygiene in rural Bihar – conditions that resemble the temporary life of refugee or disaster victims in camps. But for women and their families in rural Bihar, the acute shortage of water and sanitation conditions and the hardships that entail are a permanent feature of their lives. Addressing these issues should have a significant impact on their health and personal dignity and meet a fundamental desire of all humans to feel clean.

**Suggestions for further inquiry**

Below are further suggestions that not much is known about and require further inquiry:

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34Cervical cancer can be prevented through regular screening. New cervical cancer screening programs (visual inspection with acetic acid - VIA) have reduced the screening cost and remain as the key intervention to control the disease. The introduction of cost-effective HPV mass vaccination program could also effectively reduce the burden of cervical cancer in the coming decades.
-IF WASH conditions (including access to soap) & social norms impact hygiene practices of men and women differently?

-How cultural taboos around menstrual blood affect hygiene and lifestyle?

-How hygiene is maintained during pregnancy and postpartum period under poor WASH conditions?

-How lack of toilet affects nutrition and food intake?\textsuperscript{35}

-How soap affordability affects hand, body hygiene, and even how well clothes are laundered?

-How does distance of defecation location to water source affect hand-washing behavior and perineal hygiene?

\textsuperscript{35}There is some research to indicate that lack of latrine access leads to dehydration as women avoid drinking water but there is less understanding of how poor latrine access affects type of food consumed.