

More or less: A rapid review of 'water for toilets' in rural India

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The approach

Rapid Topic Reviews are a time-bound but an otherwise flexible approach to finding out about a priority topic where knowledge has yet to be summarised in a particular context. Specific topics are generated in consultation with policy-makers and development partners. Researchers are required to assess the current state of knowledge and to seek insights and innovations from the field. Reviews triangulate from different sources including academic and grey literature, key informant interviews, preliminary insights from on-going research on progress and rapid and informal field investigations. Conditions for these reviews are (1) methods must be explained, (2) recommendations for practice and policy are provided, (3) work is completed in a set number of days (usually 20).

Outputs are written and disseminated quickly to policy-makers and practitioners so immediate relevant and timely actions can be taken.

This methodology is a work-in-progress. Comments and suggestions to strengthen and develop the process and method, as well as the content and structure of the notes would be very welcome. Or if you wish to do a rapid exploration into a topic that interests you, please contact us: clts@ids.ac.uk

Executive summary

Toilet construction is critical to ending open defecation, however most toilets built under SBM-G are water intensive. In the absence of piped water supply, rural households often rely on alternative sources of water or turn to OD or partial use. In such a scenario, water usage for cooking, drinking and washing takes precedence and using water for toilets becomes the last priority. According to the Ministry of Water Resources each rural household in India needs 40 litres of water every day, out of which 15 to 20 litres are required for sanitation. But as of August 2019, 55 per cent of rural habitations are yet to get connected to piped water supply and only 18 per cent of rural households have piped water supply.

This rapid research reviews 'water', examining both technical and behavioural aspects surrounding water collection, management and consumption related to toilet use in rural areas. Information for this study comes from a literature review, interactions and discussions with stakeholders (including men and women of different age groups, and children), and field visits to eight villages across Himachal Pradesh, Rajasthan and Haryana. The villages were selected based on the climate conditions and socio-religious composition of the communities. In all three states, water scarcity is experienced between April and June and in Himachal Pradesh pipelines burst due to freezing during extreme winter conditions, usually between December and January. In Himachal Pradesh water scarcity is seasonal, whereas in Rajasthan water scarcity is long-term due to depleting ground water resources and arid climatic conditions.

The following are some the key findings of this study:

- **Rural households in India rely on multiple sources of water** including piped water supply,

submersibles or tube-wells, wells, hand-pumps and surface water such as ponds. None of the villages visited had 100 per cent household piped water connections. Piped water supplies were found to be unavailable for households on village outskirts and newly formed habitations or colonies.

- Households that have piped water supply connection also depend on other sources of water such as submersibles or water collected from ponds and hand pumps. Ownership of submersibles is limited to wealthier households who supply water to other households at a charge (approximately Rs. 150 a month).
- **After each use, toilets are flushed with water until there are no visible faeces in either the pan or the water seal.** It is also common practice to wet the pan and footrests with a mug of water (approximately a litre) before use, not so much to lessen the amount of water required for flushing, but to clean the toilet before squatting.
- **Defecation is perceived as impure, and a considerable amount of water is used for purification practices.** There are elaborate practices pre- and post- toilet use that have a direct bearing on how much water is required for latrine use.
- Women are responsible for collecting water for purposes of drinking, toilet usage, and for cleaning latrines. Latrine cleaning is considered polluting and is always undertaken before bathing and followed by changing of clothes by women across all castes.
- Perceptions on water requirements for using a toilet did not vary between male and female respondents. Respondents believed that on average, a minimum of 10 litres was required to flush after each use whereas OD requires about three litres of water for anal cleansing, and washing of hands and feet.
- Perceptions about the amount of water required for using a toilet did not vary by substructure. However, most respondents felt that 'Desi-latrines' or Odisha-pans required less water than a Western Commode (WC).
- Communities do not associate high-incline rural pans, which are often used in toilets sponsored by the government, with water conservation. There is a strong perception among communities across all the villages visited in all three states that government sponsored toilets are sub-standard (including the rural pan) and are of poor quality.
- Usage of toilet brushes and detergents for cleaning toilets was found to be uncommon, although in some areas brooms are used for cleaning.
- Toilets are perceived to require more water compared to washing clothes, cooking, drinking or feeding cattle. It was observed that households accord low priority to water collection and storage for purposes of toilet usage. When water is scarce, open defecation or partial use is the preferred choice by men, women and children.
- The study did not find specific water saving practices being adhered to by communities, vis a vis toilet usage. In the study villages, none of the respondents reported use of grey water for flushing or cleaning latrines.

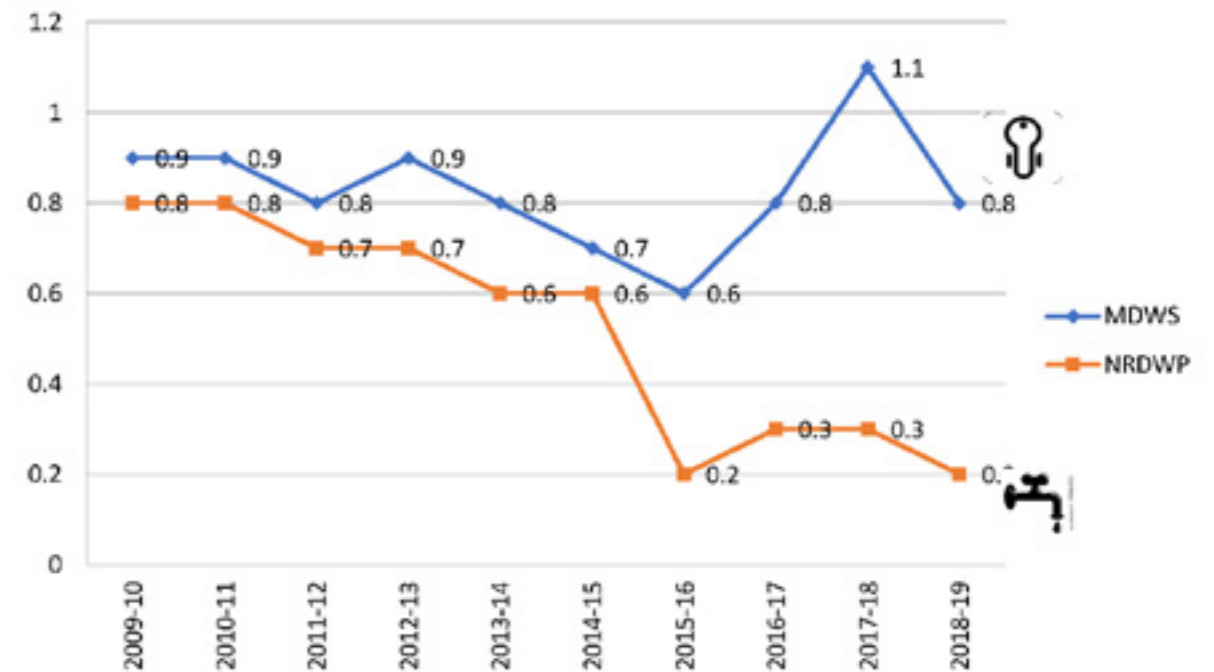
In conclusion:

- Absence of water in latrines, purity and sanitation rituals, extra work and effort associated with latrine use particularly by women, who shoulder the responsibility of fetching water for drinking and other purposes, are deterrents in the uptake of sustained toilet use.
- One of the key implications of the findings of the study is that perceptions and behaviours regarding water requirements for toilet usage are based on varying contexts-both spatial and cultural and other multiple interacting factors including caste, economic status and availability of water.
- In the context of the above findings, it is critical that policy makers and implementers of sanitation programs invest in intensification and re-orientation of information, education and communication (IEC) efforts tailored to specific geographical and cultural contexts in rural India. Since circumstances differ across rural India, similar exploratory research, such as this study, is needed for other environments so that context specific findings can form a strong basis for the development and implementation of strategies that encourage communities to turn to water saving sanitation behaviours and give up OD.

Introduction

India is set to become open defecation free (ODF) by October 2019. According to the Swachh Bharath Mission – Gramin (SBM-G) Management Information System, as of June 2019, 96.4 million toilets had been constructed since the launch of SBM-G in 2014 (Ministry of Jal Shakti, 2019a). Among other factors, availability of water is key to sustained use of these toilets. In rural areas, the National Rural Drinking Water Program (NRDWP) primarily focuses on providing potable water through piped household connections, but this water can be used for other purposes, including sanitation. Providing access for sanitation has been a focus of the Government of India (GoI), but water access through piped water supplies for rural households has not received as much attention. In fact, much of the spending by GoI has been on sanitation whilst funds for rural drinking water supplies have reduced over time (Figure 1).

Figure 1: % of total government spending on rural sanitation and water



Sources: MDWS and NRDWP

The lack of funding, combined with poor fund-management, was an important factor behind the failure of NRDWP to meet important targets, according to a 2018 Comptroller and Auditor General performance audit (CAG, 2018). The program's target was to provide at least 35 percent of rural households with piped water supply by 2017, and 80 per cent of households by 2020. Official data reveals that India is a long way from meeting these targets as only 18.2 per cent of rural households had piped water supply by 2018-19 (Ibid).

Most toilets built under SBM-G are water intensive. In the absence of a piped water supply, rural households often rely on alternative sources. In such a scenario, water usage for cooking, drinking and washing takes precedence and using water for toilets becomes the last priority. Consequently, lack of water or scarcity of water may often result in the non-use of toilets. The Ministry of Water Resources estimates that each rural household in India needs 40 litres of water every day, out of which 15 to 20 litres are required for sanitation. But as of August 2019, 7,79,085 out of 17,29,808 rural habitations are connected to a piped water supply. This suggests that about 55 per cent of rural habitations are yet to get connected (Ministry of Jal Shakti, 2019b). Even the households that do get piped water do not get 40 litres a day: on average, a well-supplied rural household receives 8-10 litres of water per day (Dasgupta, 2019).

Against this backdrop, this rapid research reviews 'water', examining both technical and behavioural aspects surrounding water collection, management and use with respect to toilet usage in rural areas.

Methodology

The study is based on a literature review, and interactions and discussions with stakeholders during field visits including men and women of different age groups, and children. Field visits were conducted in three states- Himachal Pradesh (HP), Haryana and Rajasthan - between May and June 2019. Eight villages across these states were selected for field visits, based on climatic conditions and socio-religious composition of communities. These states have diverse and distinct topographies and climatic conditions. Sources of water and the proportion of households with piped water connections in these states also vary.

Table 1: Details of field sites

State	District	Block	Village	Social-religious composition ¹
Himachal Pradesh	Shimla	Mashobra	Village 1	Upper Caste Hindus

¹ Information on religious background and caste composition of the field sites was gathered during key informant interviews and interactions with the community

Himachal Pradesh	Shimla	Mashobra	Village 2	Majority SC (over 75%)
Himachal Pradesh	Shimla	Basantpur	Village 3	Upper Caste Hindus
Rajasthan	Alwar	Tijara	Village 5	Majority Muslim (over 80%)
Rajasthan	Alwar	Mundanwar	Village 6	Majority Yadav
Haryana	Gurgaon	Gurgaon	Village 7	Mixed caste
Haryana	Gurgaon	Gurgaon	Village 8	Mixed caste

During visits to field sites, information and data were gathered primarily through the following methods:

Observation of the sources of water, toilet technologies, cleaning material available in and around toilets (broom, brush etc.), human settlement and the nature of houses (including distance from water sources), behaviours with respect to collection of water (who collects water) and how water is stored and types of containment structures. Detailed field diaries were kept.

Interviews and group discussions: This was the main source of information. Two types of interviews were conducted to inform the study:

1. Key persons interviews with those knowledgeable about the field site i.e. Gram Panchayat (GP) (villages)
2. Group discussions with men and women (including the elderly) and children. The following information was collected:
 - Sources of water (availability/sources drying up), both in the long term and short term (seasonal variations);
 - Coping mechanisms during spells of water shortage;
 - Village setting and infrastructure;
 - Sanitation facilities;
 - The gender division of work with respect to collection, management of water and cleaning of toilets;
 - Perceptions on how much water is required for personal cleaning, flushing and toilet cleaning;
 - Behaviours in relation to water usage for toilets.

In order to understand and gauge perceptions on a clean toilet, during discussions, participants were shown a drawing of an Indian latrine and were asked to point out the parts that required cleaning. This helped the respondents to point out specific areas of the toilet that required cleaning and flushing without the use of technical terms such as water-seal, slope or S bend.

Discussions and interviews were audio-recorded where possible, with prior permission from the respondents, and photographs were taken with informed consent.

Key findings

Technical aspects

Sources of water

'Hindustan mein paani khatam hogaya hai! (There is no water left in India).' Elderly male respondent, Rajasthan.

Rural households in India rely on multiple sources of water including piped water supplies, submersibles or tube-wells, surface water (such as ponds), wells and hand-pumps. None of the villages visited had 100% household piped water connections. A piped water supply was found to be unavailable for households on village outskirts or in newly formed habitations or colonies. In Himachal Pradesh, only a few households in the villages opted for a piped water supply and most households rely on a free water supply from community water tanks provided by the GPs. Water into these tanks comes from local springs or ponds.

In Haryana, it was observed that piped water connections are limited to households that are in the centre of villages and those on the outskirts do not have connectivity. In two of the villages visited in Rajasthan, households had no piped water connections and rely on submersibles or community hand-pumps which are limited.



Plastic hoses attached to community tanks.

'Earlier, the entire village drew water from three to four wells, since [sic] three years, water levels in these wells have gone down...there is no piped water supply, we get water from submersibles.' Elderly male respondent, Rajasthan.

In one of these villages, several attempts had been made by the local government to provide piped water connections and residents had paid an advance in the hope of getting a water supply. However, the projects were not completed. Across all villages visited, a piped water supply is perceived to be unreliable, irregular and inadequate to meet household needs, particularly during summer. Water supply hours do not adhere to a structured schedule and on average only last for about an hour. Moreover, supply is intermittent, particularly in summer, and interruptions in water supply can last over three days.

Consequently, households that have piped water supply connection also depend on other sources of water such as submersibles or water collected from ponds and hand pumps. Ownership of submersibles is limited to wealthier households who, in turn, supply water to other households at a charge (approximately Rs.150 a month). Those who cannot afford to pay this amount collect water from submersibles located in agricultural fields - what are known as 'three-phase' tube wells or community hand-pumps - for free. However, collecting water from submersibles located in agricultural land requires permission from landowners who do not always oblige.

'Land-owners do not agree to give us water always on a regular basis...we have to move from field to field in search of water and see who agrees to provide us with water for that day.' Female respondent, Rajasthan

Drawing water from submersibles is heavily dependent on an uninterrupted power supply which, as in rural areas power outages for prolonged periods and even for days are common, in turn affects availability of water.

Throughout the year, households store water in either over-head tanks with varying capacities, earthen pots, utensils, buckets or cement-tubs built for the purpose.

'In our village, every household has 2-3 storage tanks, so that when there is water scarcity due to pipeline leakages or irregular water supply, we have some water.' Female respondent, Himachal Pradesh.

In all three states water scarcity is experienced between April and June. In HP pipelines burst due to freezing during the height of the winter, usually between December and January. In HP, water scarcity is seasonal whereas in Rajasthan there is long-term water scarcity as a result of depleting ground water resources and arid climate conditions.

Behavioural aspects

What is perceived to be a 'clean toilet'?

After each use, toilets are flushed with water until there are no visible faeces both in the pan and water seal. This perception that toilets need to be flushed until there are no signs of faeces is widely held across all age groups and by men and women. It is also common practice to wet the pan and footrests with a mug of water (about a litre of water) before using, not so much to lessen the amount of water required for flushing post use, but to clean the toilet before squatting.

'The footrests, pan and water-hole needs to be clean.' Elderly male respondent, Rajasthan.

How much water is required for using a toilet?

In rural areas there are elaborate practices pre- and post-toilet use that have a direct bearing on how much water is required for latrine use. Defecation is perceived as impure, and considerable amounts of water are used for purification practices. Amongst those who own a latrine, water for flushing and other cleansing purposes is stored separately, usually outside of the house. Drinking water is usually stored in the kitchen. Amongst upper caste Hindus, usually Brahmins, ritual pollution may mean touching or entering the latrine, and in Rajasthan, if a latrine is used for defecating as part of daily morning routine it is usually followed by a bath and change of clothes. Changing of clothes is a common practice, but many poor families do not have extra dresses for changing during



Households store water in as many containers as possible.

defecation. It should be noted that the cleaning rituals, such as changing of clothes and bathing, post-defecation are dependent on multiple factors which include economic status and affordability of alternative sources of water. Washing of hands and feet with water (not necessarily soap)² after using a latrine was a practise reported by all communities in the three states.

The prevalence of gender-based labour division in rural India implies that women are responsible for collecting water for both drinking and toilet usage purposes. Upper caste women do not touch or access water points (tube wells or water meant for drinking and cooking) at home with clothes worn while defecating. Cooking is also done post-bathing after defecation. Therefore, women need to collect and store enough water not only for anal cleansing and flushing, but also for bathing and washing their clothes. Similarly, cleaning of a latrine is considered an impure activity and is almost always done by women. Latrine cleaning is considered polluting and is always undertaken before bathing and followed by change of clothes by women across all castes.

In Village 1, HP, which comprised predominantly upper caste Hindus, touching of public sources of water by hand by Dalits³ is strictly prohibited. For the purpose of collection water supply, hoses or pipes are usually held up by a stick when water is collected by Dalits.

'If a Dalit is caught touching the water hose while collecting water, a pandit⁴ is called and elaborate rituals follow to purify that source.' Female respondent, Village 1, HP.

Caste segregation was deeply entrenched in villages visited in Haryana and HP. Strict restrictions also exist on upper caste rural women touching drinking water containers or fetching water or entering the kitchen while they are menstruating (as menstruation is considered polluting).

Perceptions of water requirements for using a toilet did not vary between male and female respondents. On an average, respondents were of the opinion that for each toilet use one requires a mug (1 litre) of water to wet the pan, a minimum of 1 bucket of water to flush (irrespective of how sticky the faeces is), 1 mug of water for anal cleansing and about 2 litres for washing feet and hands. Across states the size of buckets used for toilet flushing varied. In HP, 5 litre buckets or empty paint tubs (5 litre capacity) are used for flushing toilets. In Rajasthan and Haryana, iron buckets with 10 litre capacity are widely used. Respondents believed that a minimum of 10 litres is required on an average to flush after every single use.

Those who resorted to OD or partial use felt that a litre of water was sufficient for anal cleansing and an additional 2 litres of water required for washing hands and feet when they returned home.

In the past people carried *lotas*⁵ or OD and the estimated volume of water in a *lota* is approximately 2/3 litre. Now it is common for people to carry used mineral water bottles of 1 litre capacity which may also be more convenient and less conspicuous to carry than a *lota*. Those that resort to OD or partial use due to water scarcity felt that OD required less than 5 litres of water (see Table 2).

'If we go out to defecate in the open, only a bottle of water is sufficient.' Female respondent, Rajasthan.

Table 2: Perceptions about the amount of water required (in litres) for using a toilet and OD.

Activity	Toilet	OD
Wetting the pan and footrests	1	0
Personal cleansing	1	1
Flushing	10	0
Washing feet and hands	2	2
Total amount of water (in litres) required for each use	14	3

² The focus of the study is restricted to behaviour and practices concerning water usage for toilets. The study did not get detailed information of hand washing practices and material used for hand washing.

³ Low-caste Hindu groups, formerly Harijans in traditional Indian society.

⁴ Upper caste Hindu - a Brahmin.

⁵ Small vessel used for carrying water in parts of South Asia for personal hygiene after urination and defecation.

The ratio of mugs (1 litre capacity) to buckets (10 litres capacity) for every single use is 2:1.50. In other words, for every single use of a toilet, approximately two mugs and one and half buckets of water is required. Faeces is considered dirty and physically filthy and full flushing is done for every single use, that is until there are no visible signs of faeces in the water seal. Both men and women strongly believe that water is used in similar amounts by men and women but indiscriminately and more by young children.



Toilet technology and perceptions on water requirement

Perceptions about the amount of water required for using a toilet did not vary by substructures or containment structures. Most rural households, except for the households in Rajasthan, have access to pour-flush, functional toilets. In Rajasthan, particularly in one of the villages, it was reported that less than 50 per cent of households have access to a functional toilet and that open defecation is widely prevalent. 'Desi-latrines' or Odisha-pans are widely preferred. Across all villages visited in the study, there is a strong perception among communities that toilets constructed by the Government are sub-standard, their super and substructures are weak, and the materials used are of poor quality.

Metal buckets or old used plastic paint buckets are used for flushing toilets.

'Government pits fill fast or collapse, so we have firma (perforated cement rings), each about two feet in height inserted into pits.' Male respondent, Haryana.

Consequently, communities do not associate high-incline rural pans, which are often used in toilets sponsored by the government, with water conservation. In some villages in HP and Haryana a few households have Western Commodes (WCs) constructed, particularly for the elderly. In one case in Haryana, a respondent who had a 5-litre flush-tank installed for a WC he had in his household held the opinion that WCs required less water in comparison to an Indian latrine. However, most respondents felt that 'Desi-latrines' or Odisha-pans required less water than WCs.

'At least two buckets of water is[sic] required to flush a toilet...Angrezi (western) toilets require more water.' Female respondent, HP.

Another common perception among respondents regarding WCs was that once the lever/handle for the flush is pressed the entire tank is emptied in one go, whereas with an Indian pour-flush latrine one has control over the amount of water that can be used for flushing.

Frequency of cleaning toilets

Among households that have toilets, cleaning of toilets is undertaken between once every four days and once a week. Toilet brushes and brooms are used for cleaning toilets with water and detergents in two villages. In the remaining GPs respondents reported using only water and brooms to clean the toilets. Usage of toilet brushes was not found to be common practice. Similarly, in all the field sites visited a separate pair of slippers was not observed outside of the toilets. In one of the villages in Tijara block, Rajasthan, women reported pouring an extra bucket of water once every 15 days to clean toilets. Women respondents believed that a minimum of two buckets of water is required to clean a toilet. The perception varied among men, who reported that about one to one and a half buckets was enough to clean a toilet. Brooms and brushes were regarded necessary to clean stains or avoid discolouration of pans, and not necessarily to save water.

'If we use 1 to 2 buckets of water in the latrine...praan nikal jayegi! (we will die!).' Male respondent, Village 3, HP.

Water saving practices

It was observed that households accord low priority to water collection and storage for the purposes of toilet usage. When water is scarce, open defecation is the preferred choice by men, women and children, particularly in Rajasthan. Men also reported bathing with half a bucket of water, not using soap and defecating in the open, in order to conserve water. In Rajasthan, toilet usage is not preferred as toilets are perceived to require more water, compared to washing clothes, cooking, drinking or feeding cattle.

In one of the villages of HP, men and women resort to open defecation during periods of water scarcity. Partial usage of toilets is also practiced in winter months, as water freezes in the storage tanks and takes a long time to thaw.

In both villages in Rajasthan young children and the elderly defecate in the open in order to conserve water. There are designated open defecation sites in both the GPs visited in Rajasthan. In Village 6, Rajasthan, women felt it was convenient to defecate in the open during summer as it lessens the amount of water they need to store and collect for the purpose.

'We go to the dry river-bed to defecate... there is enough privacy because there are plenty of tall bushes on the river-bed.' Female respondent, Village 6, Rajasthan.

In Haryana, some households utilise water from submersibles for using in the toilets.

'Water from our submersibles is not potable, it's brackish, but can be used for washing clothes and cleaning toilets.' Female respondent, Haryana.

Unlike in Rajasthan, in Haryana, households with submersibles provide water for free to those who do not have water either from a piped water supply or submersibles. In HP, in one of the GPs, some households have opted for expensive private sources of water through a 'lift' system. These households provide water to others only for drinking purposes and not for sanitation.

In HP, in villages that face water scarcity, schools and Anganwadi⁶ toilets are locked by the staff to prevent usage by children and students. Students often return home to use toilets or defecate in the open. A similar situation was also found in Village 5 in Rajasthan where schools lacked toilets and water for sanitation purposes. In Rajasthan, in the absence of toilets, school children resort to open defecation.

'Anganwadi workers warn parents that they are not going to clean after their children as there is no water and that they (children) should use toilets at home before coming to Anganwadis.' Female respondent, HP.

'There is no toilet in our school, only a bathroom that teachers use. Water from [the] hand-pump in our school is for drinking water.' Young schoolboy, Rajasthan.

Water scarcity was also found to be a deterrent to toilet usage in Marathwada region and Satara district in Maharashtra. Villagers are forced to defecate in the open for at least half of the year, despite having access to toilets, as there is no water in the village.

Villagers wait for hours at the hand pump to get drinking water and depend on the water supplied by government tankers for other uses.

A scoping study conducted by the Sehgal Foundation in villages of Aurangabad found that villagers only use toilets only during emergencies due to acute water scarcity in summer (pers. comms.). Such a situation is also common in Village 6, Rajasthan where cattle is sent to gaushalas (cattle camps) when there is water scarcity during summer.

In the study villages, none of the respondents reported use of grey water for flushing or cleaning latrines. In fact, both in HP and Rajasthan, women respondents believed that grey water or water that was used for washing clothes could not be used for flushing as it would kill the bacteria in the septic tanks or pits.



Rainwater collection tanks dry-up and water levels in wells recede during summer in Rajasthan.



When there is shortage of water a dried riverbed is used as designated site for OD.

Roles and responsibilities

Amongst households that do not have a piped water supply, the burden of fetching water falls exclusively on women and girls, except in Village 6, Rajasthan, at times young boys are also given the responsibility of fetching water. In HP, women travel about a kilometre to fetch water from village springs, particularly during summer or when the water supply is irregular.

'We go down to chashma (spring) to bring cool potable water in summer.' Female respondent, HP.

Women and girls, including elderly and pregnant women, make several trips, particularly in summer, to bring water to meet household requirements. On average, they spend two to three hours a day fetching and collecting water.

'At a time, a woman can hold two earthen pots on her head and carry two buckets of water at the same in each trip she makes from the hand pump.' Female respondent, Village 5, Rajasthan.

Even amongst households that have personal submersibles or reliable piped water supply, the onus of managing water falls on women. Both men and women strongly believe in gendered division of work.

'It is the house-wife who is responsible for managing water and deciding on the allocation of water for cooking and cleaning.' Female respondent, Village 7, Haryana.

'I have sparse hair in the middle of my head from carrying earthen pots over my head since ages [sic].' Female respondent, Village 6, Rajasthan.



It is also the responsibility of women to ensure that cattle get enough water to drink. Women either take the cattle to the ponds in the vicinity or fetch water for cattle as well. This puts additional burden and pressure on women who also have to tend to household chores and look after young children.

Toilet cleaning is also considered the responsibility of women particularly the elderly.

'Toilet cleaning is done by the eldest woman in the household, usually elderly mother or mother-in-law.' Female respondent, Rajasthan.

The task is perceived to be 'dirty', and something that is done after completing all household chores and before bathing.

'Women usually clean the toilets before bathing...some households have started engaging Bhangis⁷ and pay them for cleaning toilets.' Female respondent, Haryana.

Men usually clean the overhead tanks or large water containers, usually once a month. Smaller utensils and earthen pots are cleaned by women.

Conclusions

This rapid review focused on behavioural aspects and perceptions related to water usage for toilets. Lack of provision of any water supply to a toilet is strongly associated with non-use, given the perceived water quantities required for each use. In the face of seasonal shortages, irregular water supplies and depleting ground water levels, people in the villages visited resort to open defecation and the partial usage of toilets. In Indian society, defecation and anything related to faeces has long been considered impure and physically filthy, and water viewed as a necessary medium of purification and ritual cleansing. Together, these cultural beliefs and practices explain the strong importance households have placed on the need for water provision inside the latrine in order to accomplish required cleansing act following defecation.

The following key conclusions are drawn:

- In rural areas, people have elaborate processes of cleansing with water post defecation, meaning presence of a nearby water source is important. Other studies conducted in states such as Rajasthan (O'Reilly, 2010) and

⁷ A member of the Bhangi caste, considered un-touchable, traditionally restricted to cleaning latrines.

⁶ Rural child care centres in India that provide supplementary nutrition, non-formal pre-school education, nutrition and health education, immunization, health check-up and referral services of which the last three are provided in convergence with public health systems in the country.

Tamil Nadu (Banda et al., 2007) found similar associations between water availability and sustained toilet use. In places where water must be fetched from a distance, people prioritise fetching water for drinking purposes over collecting water for toilet use.

- The existing toilet technologies are perceived to be water intensive, requiring over 10 litres of water for every use and the collection and storing of water for sanitation is deemed as wasteful. The study did not find any difference in the perceptions on water requirements for different types of substructures such as septic tanks or pit latrines. During periods of water scarcity, water fetching for the latrine is perceived as an additional time-consuming task for women, whereas OD (by them and other family members) spares them from this workload as it requires less than 5 litres of water.
- The study also found that communities in all three states were not conversant with water conservation practices for latrine usage. For instance, rural pans were considered to be part of the subsidised toilets promoted by Government and not part of water-saving toilet technology. Participants in the study did not differentiate between rural pans as water-saving, and urban or Odisha pans as water-consuming. There was a widespread perception that WCs consume more water as compared to Indian latrines.
- Usage of brushes and detergents for cleaning toilets was found to be uncommon. Some households use brooms.
- Communities in this study did not report usage of grey water for toilet use to conserve water. Absence of water in the latrines, purity and sanitation rituals, and the extra work and effort associated with latrine use, particularly by women who shoulder the responsibility of fetching water for drinking and other purposes, are deterrents in the uptake of sustained toilet use.

Recommendations

One of the key implications of the findings of the study is that perceptions and behaviours regarding water requirements for toilet usage are based on varying contexts, both spatial and cultural, and other multiple interacting factors including caste, economic status and availability of water.

The GoI recently launched the Jal Jeevan Mission to ensure that all rural households have a piped water supply by 2024. Whilst that is a promising initiative, building pipelines is expensive and time consuming. It is therefore critical to invest in intensifying and re-orientating IEC efforts, tailored to specific geographical and cultural contexts in rural India. Since circumstances differ across rural India, similar exploratory research, such as this study, is needed in other environments so that context specific findings can form the basis of such IEC efforts. The following are some of the key recommendations for IEC and future research:

Intensify and re-orientate IEC efforts: Old habits, strongly ingrained beliefs about purity and pollution and the required behaviours for cleansing post defecation, and perceptions about the amount of water required for cleaning and cleansing may play an important role in the choice to turn to OD and partial use in the event of water scarcity. However, increasing awareness of water conserving practices for toilet usage could promote consistent sustained use of toilets:

- *Promotion of rural pans:* In this study, it was found that participants did not acknowledge differences between rural pans requiring less water, and urban pans that may require more water for flushing. A sustained emphasis and promotion of high-inclined pans needs to be undertaken through extensive IEC. At present, IEC on the usefulness of having rural pans is lacking. As highlighted in an earlier study about toilet technologies in India, efforts are needed to promote water-saving toilet technologies and debunk myths that they are a substandard option.
- *Usage of toilet brushes to save water:* Usage of toilet brushes has the potential to conserve the amount of water required for cleaning a toilet.
- *Information on water requirements for varying toilet technologies:* Technical information about how much water is needed to flush and clean a toilet needs to be disseminated amongst rural households. Behaviours related to water usage are vastly guided by perceptions and rituals of purity post defecation.

Areas for further research

- *Grey water for toilet usage:* Research into the feasibility of using grey water and the kind of grey water that could be used for flushing and cleaning purposes could increase the potential for conserving water. This might also reduce the burden of collecting water for toilets and the grey water could be stored in the same containers where water is usually stored for toilet usage.
- *Information on best practices across other states:* Seeking information about positive deviants (who could be potential change agents in their communities) who use rural pans to save water or use grey water, and sharing best practices related to water conservation for toilet usage can go a long way in promoting water saving behaviours.
- *Cultural and ritual practices post defecation:* Extensive research is needed to understand the relationship between dynamics of individuals and societal or cultural dynamics about defecation. Findings from

exploratory research on behaviours surrounding notions of purity and pollution (such as washing of clothes, bathing, and washing of hands and feet) could inform development or implementation of strategies that encourage communities to change to water saving sanitation behaviours.

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