DATA BRIEF

RURAL SANITATION FACTSHEET: DHENKANAL, ODISHA

DECEMBER 2020

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CENTRE FOR POLICY RESEARCH

SCI-FI SCALING CITY INSTITUTIONS FOR INDIA WATER SANITATION

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The document has been prepared by Ms Aastha Jain, Ms Anindita Mukherjee, and Ms Neha Agarwal. The authors are appreciative of the varied contributions by fellow CPR researchers towards the completion of the survey and the present Data Briefing.

A highly dedicated team of field investigators and supervisors at I-Concept Initiatives conducted the data collection, which forms the basis of this Report. The authors extend their immense gratitude to all the survey participants for their time and invaluable contributions.

SCI-FI, CPR is responsible for the content of this publication.

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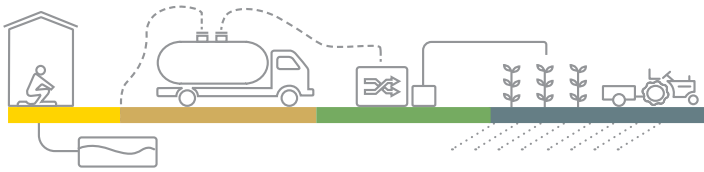


INTRODUCTION

Sanitation means safe management of solid and liquid waste. Under Phase I of the Swachh Bharat Mission – Gramin (SBM-G), the focus was the first step of safe sanitation, i.e., ensuring access to toilet facilities for all the citizens. The next important challenge of safe transport and disposal is now gaining attention under the second phase of SBM-G. Faecal sludge management (FSM) is at the core of the country's ongoing sanitation efforts, and many states have begun successfully scaling up systems and infrastructure for FSM in urban areas already.

Odisha has been at the forefront of FSM and urban sanitation in the country. The state is also emerging as a pioneer in rural sanitation with the issuing of the Odisha Rural Sanitation Policy, 2020, as the first step to ensure the achievement of total sanitation through Solid and Liquid Waste Management (SLWM) and Open Defecation Free – Sustainability (ODF-S). In response to the national and state-level sanitation imperatives and in line with the Sustainable Development Goal 6, the district of Dhenkanal is undertaking the 'Dhenkanal Pilot Project for Solid and Liquid Waste Management (SLWM)' in partnership with the Panchayati Raj and Drinking Water Department, Housing and Urban Development Department, UNICEF, and the Centre for Policy Research. The Project aims to, firstly, formalize the coordination mechanisms for catering the urban FSM system and services to peripheral rural areas, thus setting a novel example in urban-rural convergence for FSM, and secondly, to pilot a greenfield SLWM system for a cluster of Gram Panchayats in the district, where the former is not possible.

The Project aims to enable the Dhenkanal district to emerge as one of the first districts in India to have "safely managed sanitation" in alignment with the Government of Odisha's vision of Swachh Odisha, Sustha Odisha through a district-wide sanitation planning approach. Interventions under this Project could also provide a roadmap for rural areas nationwide to achieve Open Discharge Free villages[1] s envisioned by the Odisha Rural Sanitation Policy, 2020.

This Data Brief presents insights into the sanitation landscape in the Dhenkanal district as gleaned from a district-wide primary survey of rural households[2] and interviews with key sanitation stakeholders for informing the sanitation interventions in the district.

1 As per the Odisha Rural Sanitation Policy, 2020, "creating open discharge free villages entails retrofitting toilets with an environmentally suited containment system that also minimizes off-site treatment requirement, faecal sludge management, and greywater management at the household and community-level".

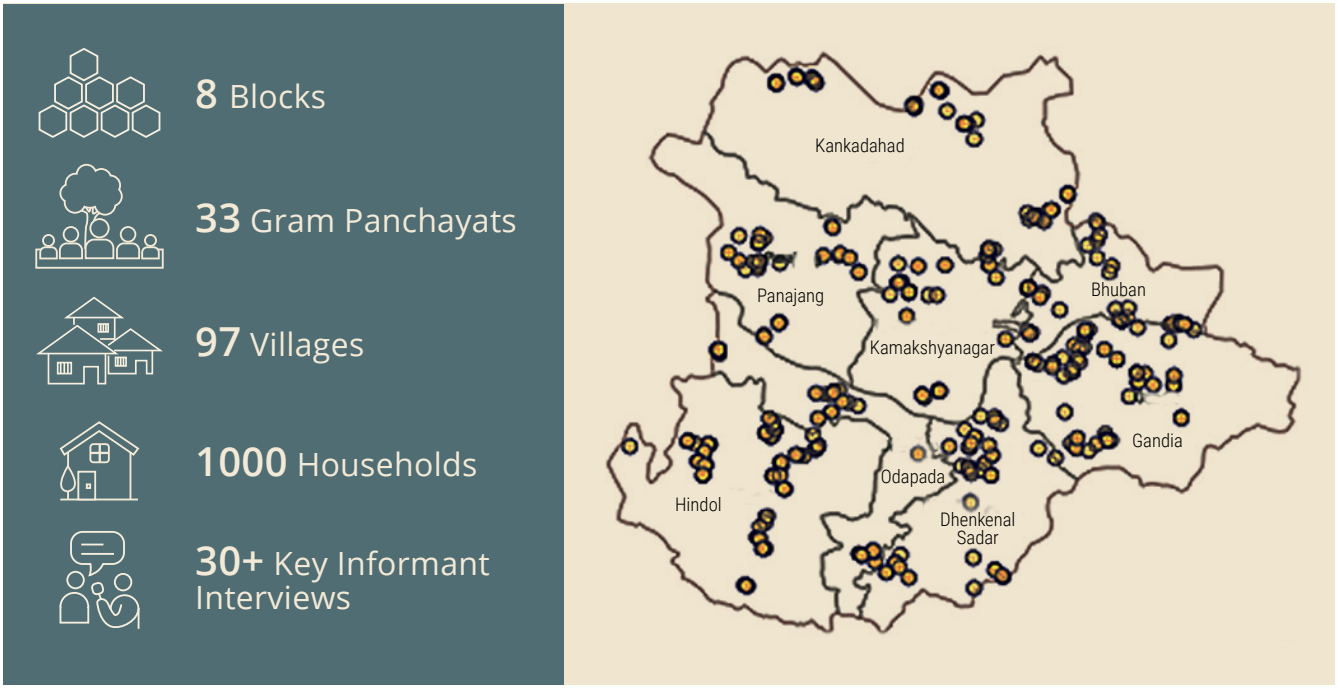
2 The district-level survey data has been disaggregated using the categories of 'Plug-in' and 'Greenfield'. Under the survey design, 'Plug-in' has been defined as rural areas within a 30 km distance from the Dhenkanal municipality. 'Greenfield' refers to those rural areas lying outside of this zone in the district.

SAMPLING METHODOLOGY OF SURVEY

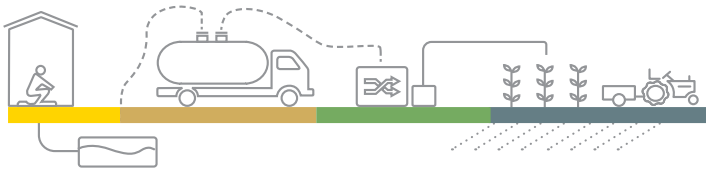
A sample survey of 1000 households across all eight blocks of the Dhenkanal district was conducted. The data findings have been reported with a margin of error of 4.07% at a confidence level of 99% in accordance with the Cochran formula[3]. The sample allocation followed a multistage stratified sampling design (stratified based on the tribal population at the district level) with a random selection of the units at each stage. In total, 1000 households were surveyed across 97 villages in 33 Gram Panchayats spread out over the eight blocks of the district.

To further contextualize and triangulate the survey findings, we interviewed 30 key sanitation stakeholders, including government officials, elected representatives, masons, desludging service providers, among others. However, the physical verification of specifications of septic tanks and leaching pits related to dimensions, water tightness, and outlet were outside the scope of the data collection process. The insights presented in the subsequent sections derive from an analysis of the raw and unweighted data.

FIGURE 1: SAMPLE OVERVIEW



3 The Cochran formula is used to calculate the ideal sample size for a desired level of precision and confidence based on the estimated proportion of the attribute present in the population and the size of the population.



KEY FINDINGS

1. RESPONDENT PROFILE

The sample consists of 60% male respondents and 40% female respondents. 30% of the sample is from the general category, while the rest of the sample is distributed among OBC (34%), SC (24%) and ST (13%). Most of the respondents are either self-employed in agriculture (35%) or are casual labourers in the non-agriculture sector (31%).

80% of the sample has Monthly per Capita Expenditure (MPCE) between INR 500-2,000. Also, 92% of the households have a ration card. It is found that the SC/ST households were concentrated in the lower consumption categories. Overall, nearly all households report residing in owned houses, with 28% of the sampled households residing in kutcha dwellings and 72% in pucca.

TABLE 1: PROFILE OF THE RESPONDENTS

Category	Type	Percent
Gender	Male	60%
	Female	40%
Social category	General	29%
	OBC	34%
	SC	24%
	ST	13%
Income source	Self-employed in agriculture	35%
	Self-employed in non-agriculture	17%
	Casual labour in agriculture	4%
	Casual labour in non-agricultural	31%
	Salaried-Public/Government	3%
	Salaried- Private	9%
	No source of Income	2%

Category	Type	Percent
Monthly per Capita Expenditure (MPCE)	<=INR 500	14%
	INR 500-1000	37%
	INR 1000-2000	42%
	> INR 2000	7%
House Type	Kutcha	28%
	Pucca	72%

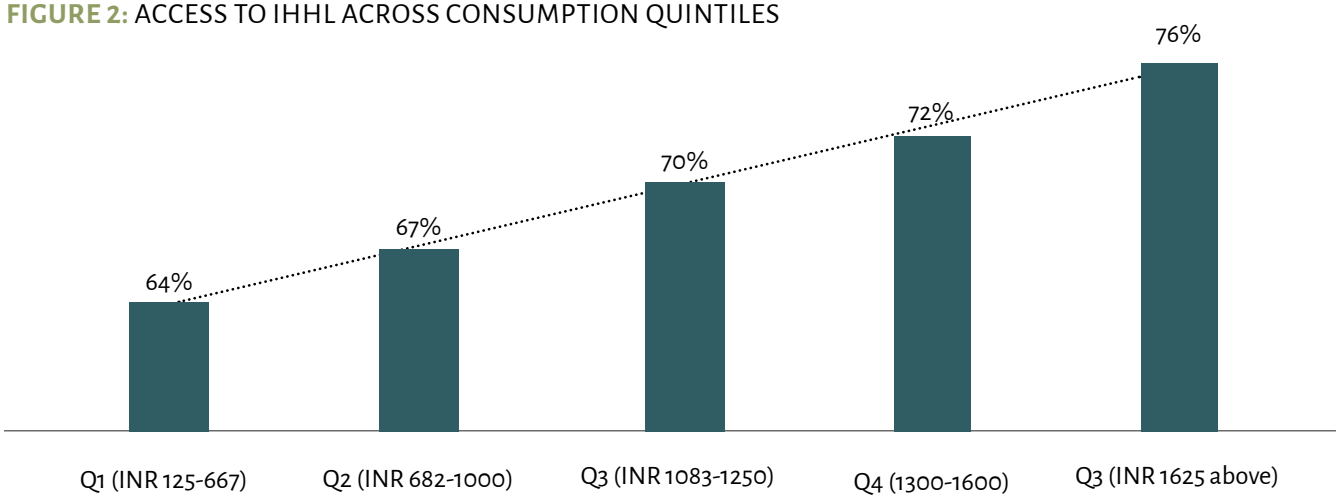
2. TOILET FACILITIES

a. Significantly high penetration of toilets owing to strong progress under SBM-G

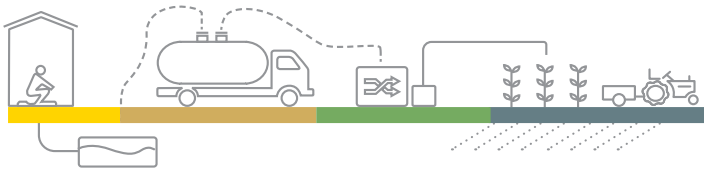
69% of the sampled households own a toilet. 95% of the toilets have been built after 2014. Access to IHHL does not vary across the social categories, except that the OBC category has marginally higher (72%) ownership than others (66-68%). Toilet ownership shows a positive relationship with the expenditure levels of the households.

Around 94% of the toilets are scheme-led, built majorly (99%) under SBM-G (less than 2% reported other schemes like Biju Pucca Ghar Yojana (BPGY) and PMAY). More than half (55%) of the scheme-led toilets have sourced both material and labour requirements from NGO/CSR, while 34% received both the inputs from the GP/GP contractor. However, less than 40% of the households were consulted while designing the toilet[1]. It is also found that the households in the lower consumption quintiles are more likely to have a scheme-led toilet relative to households with higher consumption levels.

FIGURE 2: ACCESS TO IHHL ACROSS CONSUMPTION QUINTILES



4 The stakeholder interviews also highlighted prevalence of contractor-led construction with minimal beneficiary involvement. The construction was reportedly target-oriented and rapid.



b. High toilet usage reported; although need to inculcate usage behaviour for sustainability remains

In 60% of the toilet owning households, all members use the toilet. Among the toilet-owning households, 66% of the household members reported always using the toilet, while 22% said they have never used it. Rest 12% use it sometimes or during emergencies. About half of the respondents had the perception that "some people" in the village practise open defecation, while 25% said "the majority of people" practise open defecation (OD). 23% of households pointed out that only "a few people" do it.

Having a non-functional toilet is the most common reason for practicing OD, despite owning a toilet. Other than that, more than one-fourth of the households reported finding OD as the preferred option, while 20% of the households often combine it with other household chores like fetching water and inspecting fields.

TABLE 2: REASONS FOR NOT USING A TOILET AMONG THE IHHL OWNING HOUSEHOLDS

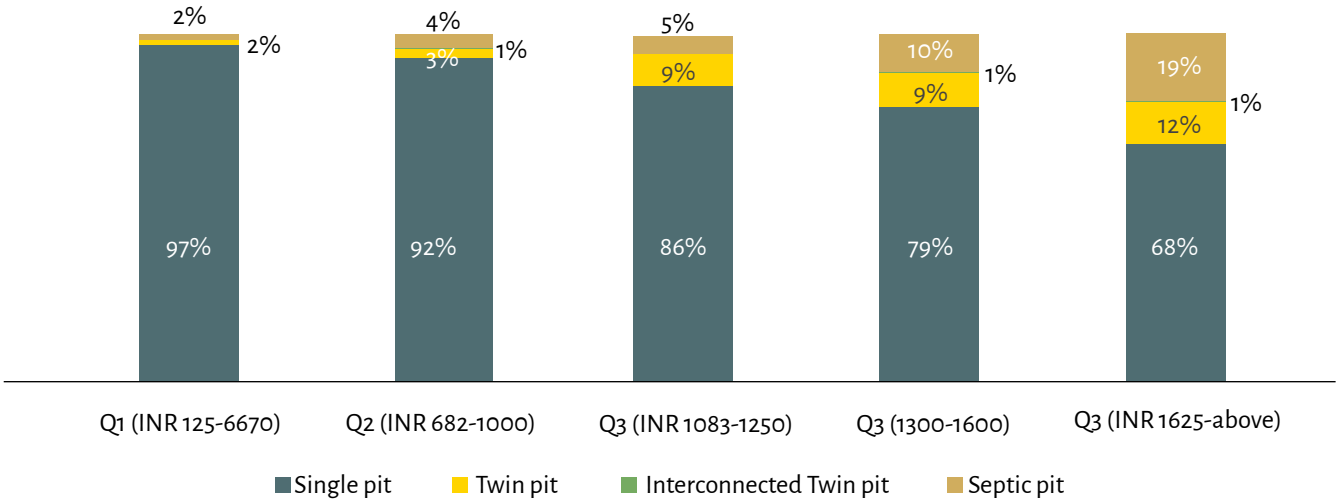
Reason for not using the toilet	Male Respondents	Female Respondents	Overall
Non-functional toilets	47%	40%	44%
Convenience of OD	45%	51%	48%
Tank/Pit gets filled	6%	11%	9%
Insufficient water for toilet use	10%	5%	8%
Toilets are impure, costly to build and unavailability of subsidy	3%	3%	3%
Others	3%	2%	2%

3. MAJORITY OF TOILETS ARE CONNECTED TO SINGLE PITS NECESSITATING LARGE-SCALE RETROFITTING OR ALTERNATIVELY OFF-SITE MANAGEMENT OF FAECAL SLUDGE

80% of the toilets in the sample are connected to single pits. While in the rural areas away from the municipality, both twin pits (8%) and septic tanks (7%) are also reported; the areas on the periphery of the municipality reported septic tanks (13%) but no twin pits. The toilets that are constructed under a scheme are predominantly connected to a single pit (84%). However, the majority of the non-scheme led toilets have septic tanks (55%), followed by single pits (38%). All the eight GP sarpanches that were interviewed confirmed single leaching pits to be the predominant system constructed under SBM-G initially.

Prevalence of single pit decreases and that of septic tank increases as one moves from lower to higher consumption quintiles. From the stakeholder interviews, it

FIGURE 3: TYPE OF OSS ACROSS EXPENDITURE QUINTILES

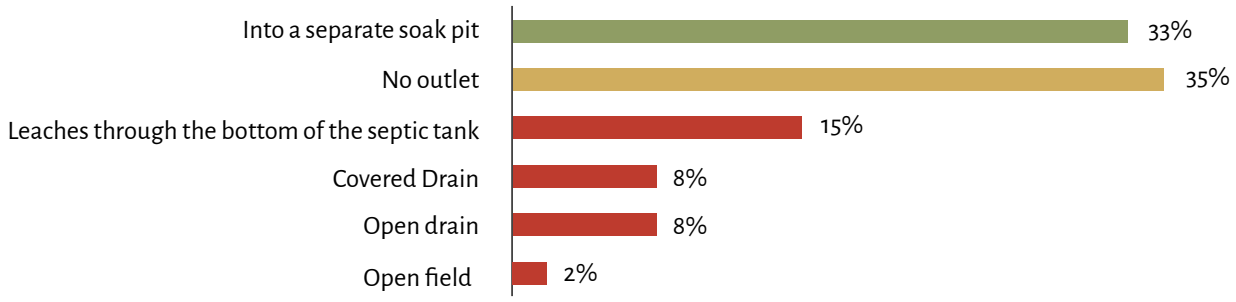


was found that the primary reasons for preferring single pits include low cost for household, rapid construction for the target-oriented contractor and norms of impurity with using Y-junction.

90% of the septic tanks are rectangular in shape, mostly 8-10 feet long (Range: 5-15 feet), 6-8 feet wide (range: 4-11 feet) and 8-10 feet deep (Range: 6-15 feet). Rest 10% are reported to be circular with a diameter of 3-5 feet and 7-8 feet deep. Barring a few, all the tanks have sealed walls and kutcha bottom that allows water seepage. Two-third of tanks are single-chambered and one-third are 2-chambered. Only 33% of the septic tanks are connected to a soakpit, while 35% do not have any outlet. Structures without an outlet cannot be regarded as safe until a further investigation, as they are often found with leaching bottoms. Rest 32% of the tanks are disposing of wastewater in an unsafe manner.

97% of the pits (single or twin pit) are circular in shape, mostly (95%) with a diameter of 3 feet (Range: 2-8 feet) and (79%) a depth of 3 feet (Range: 2-10 feet). Predominantly, the walls are lined with mortared rings (93%). The bottom is lined with gravel/sand (84%) and the remaining 14% had no lining at the bottom.

FIGURE 4: OUTLET FOR WASTEWATER FROM THE SEPTIC TANK



Of the people facing issues with their toilets, the majority cited OSS infrastructure-related concerns. 23% of the respondents do not find their OSS system to be suitable, 22% find its size to be too small, 13% reported it to be damaged, and another 11% said that their OSS system is missing.

Less than 2% of the reported single pits have a junction for connecting a second pit, thereby further complicating the retrofitting process. A district-wide retrofitting drive would also entail a comprehensive capacity building programme with only 1 out of 5 masons interviewed reporting any prior experience in retrofitting. Stakeholder interviews highlighted that retrofitting faces both financial and technical challenges. Though 25% of the households are of the perception that the addition of a second pit would make toilet use more convenient and maintenance easier, a lower fraction reported that they would be willing to pay for such an intervention. 73% of the households who expressed willingness to pay reported that they would be willing to pay less than or equal to INR 500 for retrofitting, a small fraction of the anticipated retrofitting costs. Swachhagrahis interviewed for the study said also reaffirmed that financial support or subsidy would be imperative to motivating households for retrofitting.

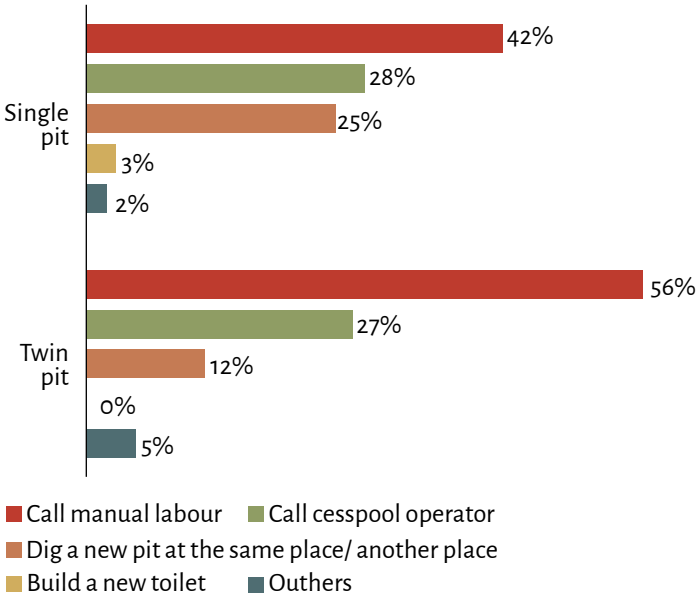
Any attempts to respond to these challenges and embarking on a retrofitting endeavour, however, must be preceded by a thorough investigation of the environmental suitability of retrofitting. As per SBM-G Phase II guidelines retrofitting to the twin pit system is recommended in areas where the groundwater table depth is 3 meters or more. Given that the state of Odisha at large has one of the highest water tables in the country, it will be imperative to assess the suitability of retrofitting as the preferred intervention based on the groundwater depths in different areas of the district

4. DESLUDGING DEMAND IS LIKELY TO RISE IN FUTURE; MECHANICAL EMPTYING NEEDS TO BE INSTITUTED TO IMPEDE MANUAL EMPTYING

Less than 3% of the OSS systems have been emptied at least once. While 7 of these 17 households opted for mechanical desludging either through a municipal operator (5, 29%) or a private operator (2, 12%), a higher share of the households (10, 59%) reported resorting to manual desludging. Households informed that sludge disposal is done primarily in vacant land in the vicinity of the premises. Such desludging services have cost about INR 1000-5000.

96% of the pits reported no desludging till now. Of these, 43% are planning to engage manual labour once the pit fills up, while the rest would call a cesspool operator (28%) or dig a new pit (24%). On self-emptying of twin pits, only 11% of the households reported that they would be willing to do it. Among these households, the willingness to pay for future desludging is quite low (51% of the households are willing to pay less than INR 500). During the stakeholder interviews, the GP sarpanches also exhibited high recognition of the need for publicly-provided desludging services.

FIGURE 5: ACTION THAT WILL BE TAKEN ONCE THE PIT FILLS UP



5. ACCESS TO TAP-WATER FOR TOILET HAS THE POTENTIAL TO PROMOTE AND SUSTAIN TOILET USAGE

Only 5% of the households have a water tap inside the toilet. The share decreases further to 3% in the case of scheme-led toilets but is much higher (43%) for non-scheme-led toilets.

All the toilets with a water tap are reportedly being used regularly by the household members (98% use "Always", 2% use "Sometimes"). However, toilet usage is much lower for households without a tap (21% reported to have never used the toilet where water is to be fetched from outside).

Water fetching from the house yard or from any public source, is done by the adult female members in 85% of the households. Moreover, 26% travel more than 50m to fetch water, in the case of piped public water, and around 50% of the households that depend on the non-piped water sources, have to travel more than 50m to fetch water (Of the houses with personal well or tubewell, one-third have installed motorized pumps). For all non-drinking purposes, including use in the toilet, water fetching thus becomes an added burden, thereby impacting toilet usage.

FIGURE 6 : WATER ACCESS ACROSS SCHEME-LED AND NON-SCHEME-LED TOILETS

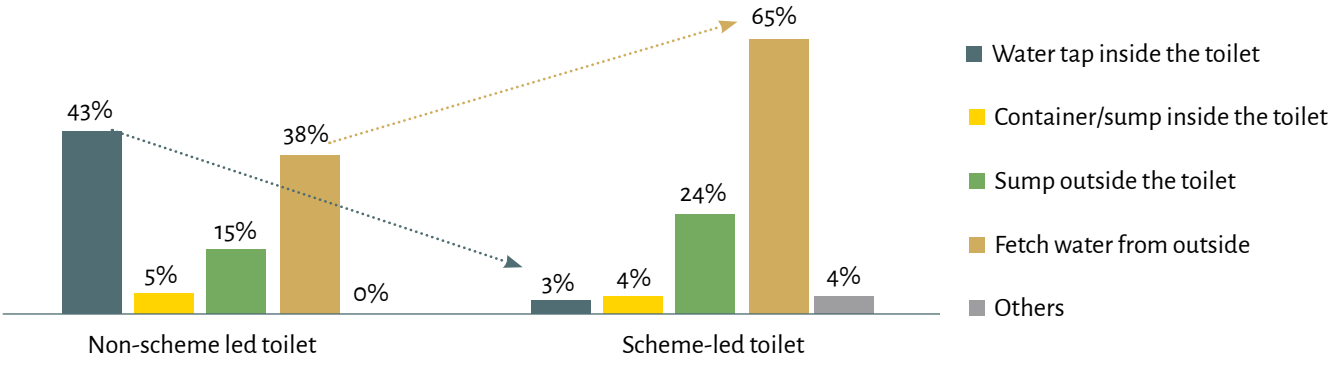
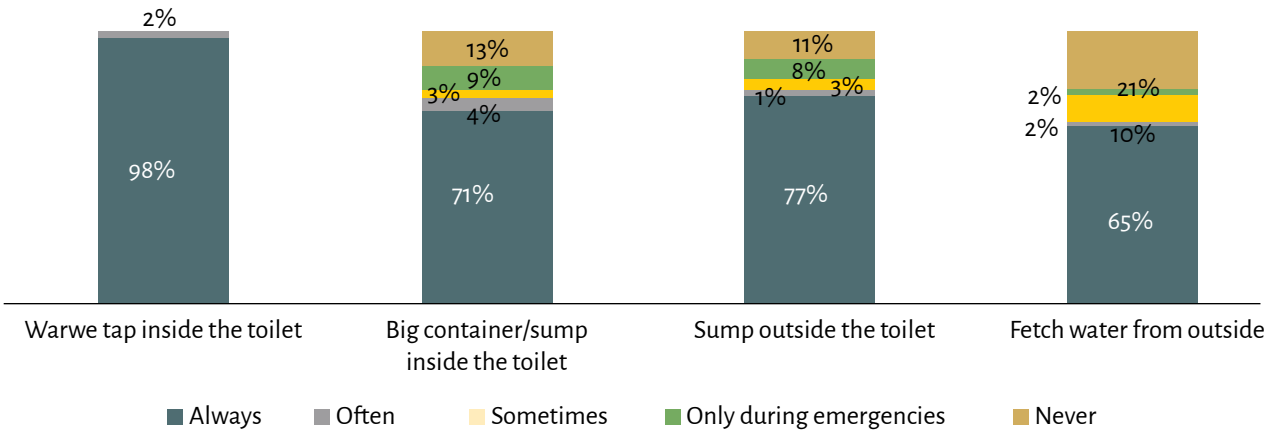


FIGURE 7: TOILET USAGE ACROSS VARIOUS WATER ARRANGEMENTS FOR TOILET



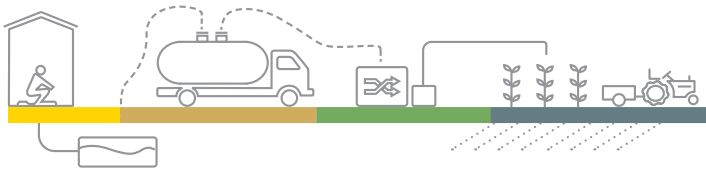


TABLE 3: DISTANCE OF WATER SOURCE FROM THE DWELLING

Distance from dwelling	Piped Public source	Non-piped source
Within the dwelling	4%	9%
Within 50m of the dwelling	71%	41%
50m to 200m	25%	41%
200m to 1 km	1%	9%
More than a km	0%	1%

For drinking purpose, 67% of the households rely on common water sources (both piped and groundwater). Areas peripheral to the Dhenkanal municipality exhibit a low share of public piped water (6%), and none of the surveyed households reported access to a personal piped water source. Reliance on surface water (river/pond) or tankers is quite low. 35% of households treat water before drinking, mostly by boiling or using cloth as a filter. Around 8% of households reported issue with water quality.

21% of the households relying on non-piped water source face water scarcity during summers. Households relying on public handpump or public well are the most affected. The poorest quintile is more water-stressed than others. Similarly, SC and ST reported more water scarcity as compared to other social categories.

Around 70% of the households, relying on non-piped sources, want government-supplied piped water. The willingness is higher among the households that are facing water shortage. 88% are ready to pay between INR 20-50 for the same.

TABLE 4: PRIMARY SOURCE OF DRINKING WATER

Primary source of drinking water	Dhenkanal District (Rural)
Piped water connection to the premises by Gram Panchayat	11%
Public standpipe/stand post	13%
Public borehole/tube well	22%
Public Handpump	6%
Public dug well	26%
Personal dug well	14%
Personal borehole/tube well	4%
River	1%
Water Tanker(Government)	1%
Others	2%

FIGURE 8: WATER SCARCITY FACED WITH NON-PIPED WATER SOURCES ACROSS EXPENDITURE QUINTILES

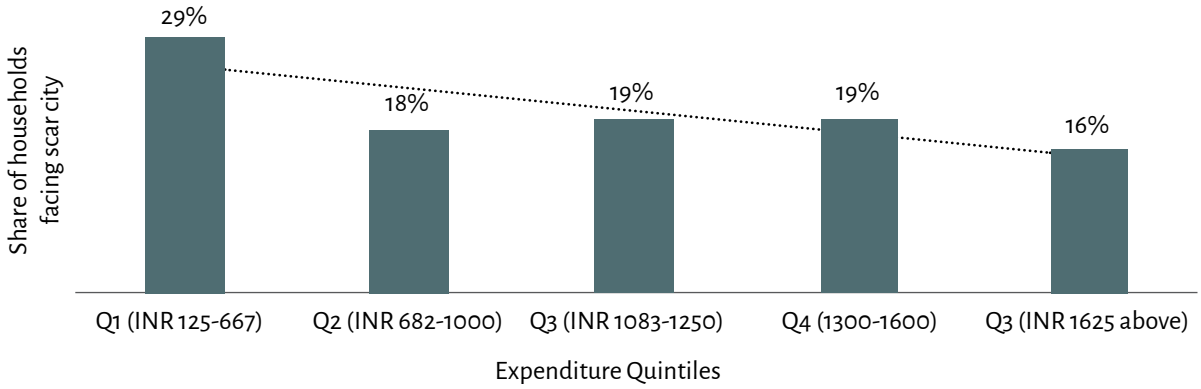
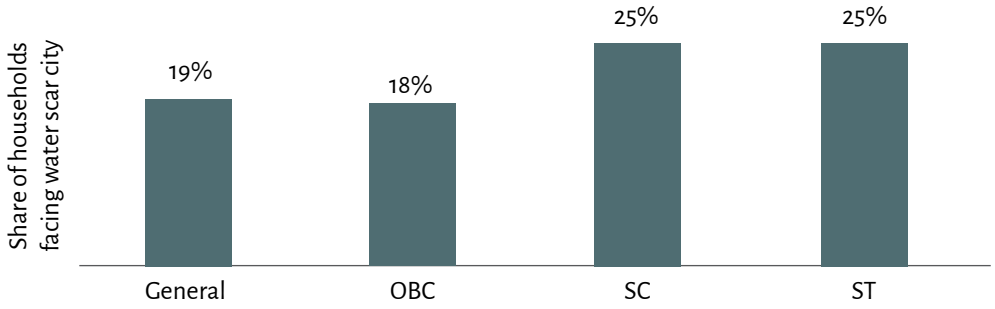


FIGURE 9: WATER SCARCITY FACED WITH NON-PIPED WATER SOURCES ACROSS SOCIAL CATEGORIES



6. LIMITED USE OF GREYWATER REPORTED; POTENTIAL FOR PROMOTING RECYCLING AT THE HOUSEHOLD LEVEL

The average reported daily water usage (for all potable and non-potable purposes) is 61 litres per capita. Assuming that 80% of the water used by a household is released as greywater, the average quantity of greywater being generated on a daily basis is 49 litres per capita. Households that rely on public sources of water have reported lower average greywater generation.

With respect to greywater disposal, it is found that the access to drainage is low in the district but relatively higher in rural areas peripheral to the Dhenkanal municipality. Disposal without treatment is the primary mode of greywater management. 91% of the households are disposing the greywater into the open field or backyard. Rest is disposing it in drains (4%) or using it in the kitchen garden (4%). Less than 1% reported water recharging or rainwater harvesting structures within the premises.

FIGURE 10: ACCESS TO DRAINAGE

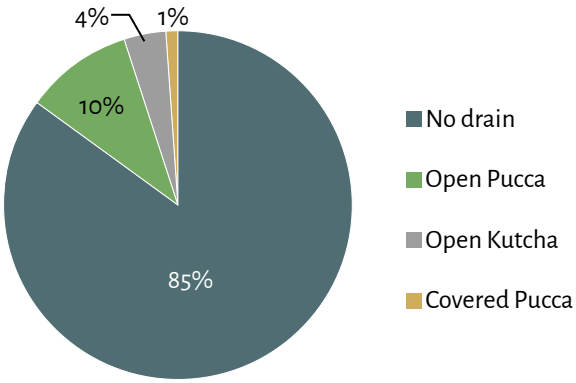
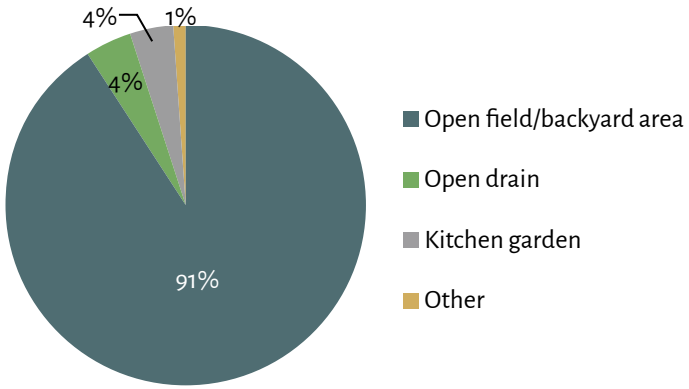


FIGURE 11: DISPOSAL OF GREYWATER



7. HOUSEHOLDS STEP UP TO MANAGE BIODEGRADABLE SOLID WASTE PRODUCTIVELY, WHILE SUSTAINABLE MECHANISMS FOR HANDLING NON-BIODEGRADABLE WASTE REMAINS A CONCERN

Households reported managing organic waste productively through avenues like composting, reusing as fuel or utilizing as cattle feed. However, plastic waste is largely reported to be either burnt or thrown/buried in the backyard. E-waste generation is limited. Used sanitary napkins and child faeces are either buried/ thrown in the backyard or dumped in the open.

74% of the respondents think that their village requires a solid waste management system. This perception is higher among the female respondents (80%) compared to the male respondents (71%). However, only 26% of the respondents showed a willingness to pay (predominantly between INR 10-30) for any solid waste management system.

TABLE 5: DISPOSAL OF SOLID WASTE

Disposal method	Kitchen waste	Cattle waste	Leaves/ Trees/ Crops residue Leaves/	Plastic bottles/ containers	Plastic sachet/ packaging	e-waste	Menstru-al waste	Child faeces
Bury/Throw it in the house/backyard	43%	4%	18%	42%	24%	2%	50%	21%
Reuse it as fuel	0%	1%	19%	0%	0%	0%	0%	0%
Reuse it as cattle feed	40%	0%	0%	0%	0%	0%	0%	0%
Compost it	14%	42%	33%	0%	0%	0%	0%	0%
Burn it	2%	0%	26%	43%	55%	3%	4%	0%
Dump it nearby road/ vacant plot/water body	1%	0%	1%	7%	5%	0%	18%	7%
Give it to a kabadiwala	0%	0%	0%	5%	0%	5%	0%	0%
Others	0%	1%	0%	0%	0%	0%	1%	0%
No such waste is generated	0%	52%	3%	2%	16%	90%	27%	72%

8. 'LEAVING NO ONE BEHIND' FOR TOILET ACCESS WILL BE KEY TO ODF-S

All the households with no access to IHHL rely on open defecation. Reliance on Public Toilet/Community Toilet (PT/CT) is negligible (less than 1%), and the reported reason for the same is that 'there is no PT/CT in the village' at the time of the survey.

77% of the households cited difficulty in accessing subsidy as the reason for not having a toilet. This is the most cited reason both for male as well as female respondents. Space constraint is a reason for 21% of the respondents. Compared to male respondents (16%), a higher share of female respondents (30%) expressed a lack of space as a challenge. Apart from this, maintenance costs and the perceived convenience of practising Open Defecation (OD) are other reported reasons for not having a toilet in the house.

Of the toilet owning households, 28% reported having or having had (at the time of construction) faced some issue with the toilet. Compared to other social categories, ST households are reporting more toilet issues. Similarly, the lower consumption quintiles are reporting more issues than the higher. Mostly OSS related issues have been cited besides damaged infrastructure like damaged toilet cubicle (14%), broken seat (11%), un-installed roof/door (12%), the small size of the cubicle (9%) etc.

TABLE 6: REASONS FOR NOT HAVING A TOILET AMONG THE NON-IHHL HOUSEHOLDS

Reason for not having a toilet	Male Respondents	Female Respondents	Overall
Could not access subsidy for constructing the toilet	80%	71%	77%
Do not have space for constructing a toilet	16%	30%	21%
Toilets are costly to build and maintain	15%	9%	13%
OD is more convenient	12%	8%	11%
Can do other works like fetching water/ inspecting fields/grazing cattle/collect forest produce	6%	3%	5%
Others	2%	0%	1%

FIGURE 12: OF HOUSEHOLDS THAT FACED ISSUES WITH TOILET ACROSS SOCIAL CATEGORIES

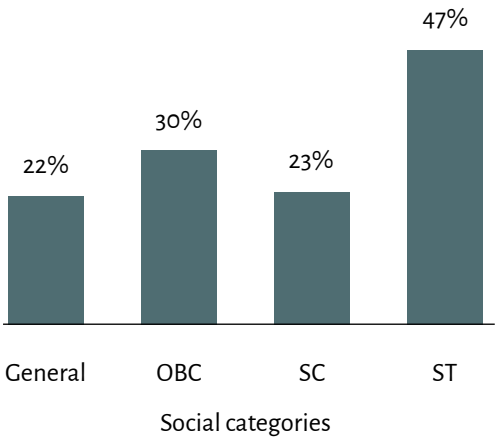
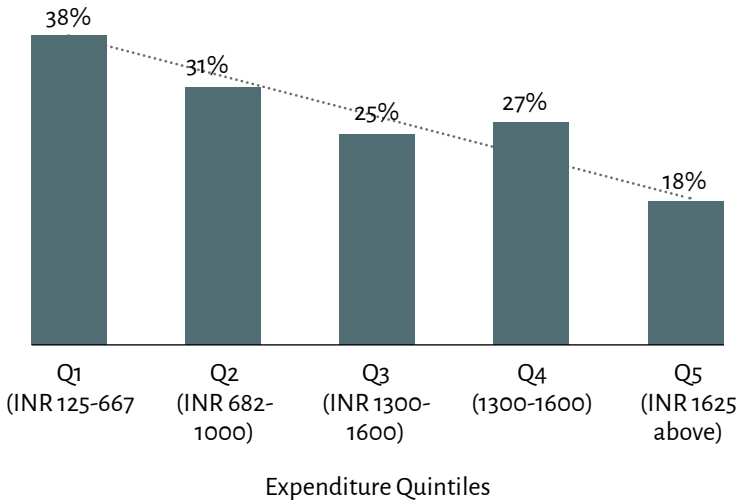
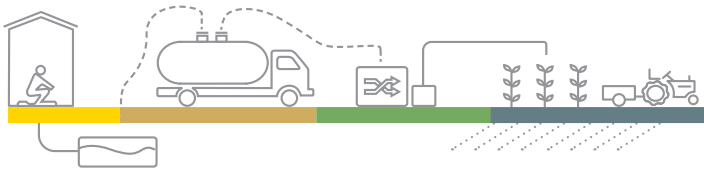


FIGURE 13: SHARE OF HOUSEHOLDS THAT FACED ISSUES WITH TOILET ACROSS EXPENDITURE QUINTILES





POST-SBM CHALLENGES AND WAY FORWARD

The Dhenkanal district has made steady, significant, and measurable gains in enabling access to toilets among its rural households – going from ~18% during Census of India 2011 to 69% at the time of the present survey. Second to access, 66% of households report that all members always use a toilet – indicating the overall effectiveness of the programmatic investments under SBM-G over the last five years despite a share of last-mile gaps in access and behaviour change persisting. Just as importantly, the survey underscored the need for a post ODF agenda for the district. Access to toilets is the first step towards safely managed sanitation, and the prevalence of on-site systems in the district, not unlike rural areas across the rest of the state and the nation, necessitates a closer consideration of the need for Faecal Sludge Management (FSM).

Among toilet-owning households, single pits are the most prevalent type of on-site system in use at 86%, followed by twin pits and septic tanks at 8% and 7%, respectively. With the district lying in a high water-table area, retrofitting of single pits to twin pits is rendered impractical as per the guidance from SBM-G Phase II. In limited areas within the district where feasible, raising household awareness and financial support is imperative to counteract the low willingness to pay for retrofitting reported by households. Taken together, ceteris paribus, the share of single pits and septic tanks results in 93% of all toilet-owning households in the district requiring safe services for the periodic evacuation of faecal sludge and its off-site treatment before safe disposal.

The institutionalization of FSM services would be critical to not just prevent risks to public health and the environment but also for the safety and dignity of those providing manual desludging services. The data showed that a high share of households engages manual labour for desludging their on-site sanitation system in the absence of widely available, affordable, and much safer mechanized desludging services. When asked to anticipate the need for such services in the future, a large share of both single pit and twin pit system owning households reported the engagement of manual labour as the go-to-solution – pointing to limited household awareness of these issues. Especially among those with the twin pit system, a clear need has emerged for raising awareness on the operating principle and maintenance of the twin pit system. The twin pit systems are designed to completely sanitize the faecal sludge through extended storage, with the end-product being safely emptiable by the households themselves, precluding the need for any desludging services and off-site FSM.

As per the data, while GP Sarpanches recognize these gaps in services for desludging and SLWM more broadly, they expressed limitations in their capacity to manage their provision and low confidence in households willing to pay during interviews. The data confirms the latter, with a significant proportion of households dismissing a need for SLWM services. Therefore, as the Dhenkanal district gears up to take on these second-order challenges, it will need to address two main overarching issues – first, the capacity building of Gram Panchayats (GPs) in managing the new set of services and second, Information, Education, and Communication (IEC) for households to boost cost recovery and financial sustainability.

The UNICEF-CPR anchored Dhenkanal Pilot Project for Solid and Liquid Waste Management (SLWM) aims to tackle these multi-dimensional challenges to enable FSM services for rural households district-wide. Building on the data insights from the present Brief, the Project hopes to emerge as a lighthouse for rural FSM initiatives, toward the protection of public health and the environment, in the state of Odisha and nationally.

SCALING CITY INSTITUTIONS FOR INDIA (SCI-FI)

The Water and Sanitation programme at the Centre for Policy Research (CPR) is a multi-disciplinary research, outreach and policy support initiative. The programme seeks to improve the understanding of the reasons for poor sanitation, and to examine how these might be related to technology and service delivery models, institutions, governance and financial issues, and socio economic dimensions. Based on research findings, it seeks to support national, state and city authorities to develop policies and programmes for intervention with the goal of increasing access to inclusive, safe and sustainable sanitation.

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