Faecal Sludge and Septage Management in Odisha:
Baseline evaluation 2022

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Abbrevations

5T	Transparency, Technology, Teamwork, Time, and Transformation
HUDD	Department of Housing and Urban Development
DIGIT	Digital Infrastructure for Governance, Impact and Transformation
eGov	eGovernments Foundation
FSSM	Faecal Sludge and Septage Management
FSTP	Faecal Sludge Treatment Plant
G2C	Government-to-Citizen
GPS	Global Positioning System
GSDP	Gross State Domestic Product
IDI	In-Depth Interview
KLD	Kilo Liters per Day
MLD	Million Litres per Day
MSK	Mo Seva Kendra
NGO	Non-Government Organisation
ODF	Open-Defecation Free
OUSP	Odisha Urban Sanitation Policy
RBF	Results Based Framework
RTO	Regional Transport Office
SeTP	Septage Treatment Plant
SHG	Self Help Group
SPoC	State Point of Contact
ToC	Theory of Change
ULBS	Urban Local Bodies
WATCO	Water Corporation of Odisha

Chapter 1:
Introduction

1.1 About eGovernments Foundation

eGovernments Foundation (eGov) is a philanthropic mission that seeks to ensure that every person living in urban areas in India has easy and equal access to local government services, thereby guaranteeing better living conditions for all citizens. Its aim is to transform the delivery of municipal services to citizens and make governance more accountable, accessible, transparent, and efficient.

eGov has adopted an ecosystems approach to deploying Digital Infrastructure for Governance, Impact and Transformation (DIGIT) platform1, wherein 'samaaj' (society), 'sarkaar'(government) and 'bazar'(market) are the three key sector players2. The core strategy is to collaborate, catalyse, and co-create across these sectors and address the challenges of governance and service delivery together.

1.2 eGov Sanitation Mission

eGov has launched a Sanitation Mission (June 2021) to facilitate the participation of citizens, government and agencies, business and industry, civil society and research and academic institutes in the co-creation of solutions (applications) that can have an impact on the entire sanitation value chain, including the waste management streams.

The DIGIT platform is intended to extend access to sanitation services for citizens as well as enable civil society and the market ecosystem to participate. Working closely with stakeholders, the Sanitation Mission aims to ensure zero deaths, disease, and environmental contamination resulting from poor sanitation in the Global South.

The Sanitation Mission is currently working on the digital transformation of the faecal sludge and septage management (FSSM) service chain from on-site containment of faecal waste to its transport, safe treatment, reuse, and disposal. Over the course of the implementation of the FSSM project, the digital platform is expected to provide an integrated set of Business Services such as User Management, Billing, Collection, and more as well as Domain Services, including Emptying Application/ Scheduling, Containment Accessibility, Vehicle Tracking, Pricing Calculator, Treatment Compliance, Grievance Redressal, and more.

It has initiated activities in three pilot cities of Dhenkanal, Balasore and Behrampur in Odisha. The next step is to develop a state-wide prototype.

1. DIGIT is an open-source platform to facilitate transformation of urban services and quality of life at scale and speed.

2. The ecosystem includes the governments, administrators, businesses, academia, research institutions and civil society organisations, etc. as stakeholders

1.3 Baseline Study

A nonspecific evaluation methodology had been shared during the bidding process. The understanding of the interventions and thus the scope of evaluation improved during the participatory exercise undertaken with eGovernments foundation (eGov) team to develop the Results Based Framework (RBF) and Theory of Change (ToC).

1.3.1 Evaluation Design

Simple random sampling was proposed based on observations and data collected during the pilot testing visits. The baseline study will utilize a mixed method design where quantitative surveys as well as qualitative interviews will be conducted with key stakeholders.

1.3.2 Quantitative Sample Size Estimation

Following the standard practice of estimating the baseline sample size, the following proportion sample size formula was used for estimating the minimum required sample size:

$$n = (z2*p*[1-p]*N)/z2*p*[1-p]+(N-1)e2 = 785 \sim = 800$$

n = required minimum sample size

z = confidence level at 95 percent (standard value of 1.96) (Standard)

p = estimated prevalence of variable of interest (0.5) (Assumed)

e = margin of error (3.5%) (though 5% is the standard value for margin of error, to reduce the error and make the data more authentic, we are proposing to calculate sample size considering an even smaller margin of error)

N = population size (assuming population size is more than 500)

A minimum sample of 800 respondents was arrived at through the above rigorous calculation.

1.3.3 Quantitative Sampling Design

A list of 30 Urban Local Bodies (ULBs) was shared by eGov where phase one of implementation is to be initiated (Annexure 1). Out of these ULBs, first the pilot ULBs were eliminated as interventions had already begun there. The next step was to eliminate ULBs that did not have operational Faecal Sludge Treatment Plants (FSTPs). Within this cohort, the districts that had FSTPs equal to and more than 20 Kilo Liters per Day (KLD) capacity were shortlisted. The final step was to categorise them under the tribal and non-tribal category.

The list of 10 districts was shared with eGov for their inputs on selection of four districts for data collection, two each under tribal and non-tribal category, and two buffer districts. (Also refer to Annexure 2)

No.	List of ULBs	District	Tribal/Non-Tribal	Categorization
1	Cuttack	Cuttack	Non-Tribal	Data collection District 1
2	G-Udaigiri	Kandhamal	Tribal	
3	Balangir	Balangir	Non-Tribal	
4	Sundergarh	Sundergarh	Tribal	Data collection District 2
5	Rayagada	Rayagada	Tribal	Data collection District 3
6	Puri	Puri	Non-Tribal	Data collection District 4
7	Keonjhar	Keonjhar	Tribal	Buffer Tribal District 1
8	Nabarangpur	Nabarangpur	Tribal	
9	Bhadrak	Bhadrak	Non-Tribal	
10	Jharsuguda	Jharsuguda	Non-Tribal	Buffer No-Tribal District 1

Table 1: List of selected ULBs

1.3.4 Qualitative Sample size

Under the qualitative component of the study, the proposal was to cover at least 25 qualitative interviews. During the pilot testing of the tools, more categories of respondents were observed on the ground as compared to the categories mentioned in the RFP. Hence the qualitative sample was revised to 50 stakeholder interviews which were to be conducted in two phases. The stakeholders included municipality officers, eGov staff, local Non-Government Organisations (NGOs), if any, involved in similar interventions in the selected areas, etc. The break up is as follows:

Phase 1: 40 interviews (approximately 7-10 interviews per ULB):

 i. Sanitation In-charge/ Sanitation Inspector at ULB/ Municipal Engineer (senior or junior) at ULB
 ii. Swachh Supervisors/ Swachh Sathi
 iii. Local NGO member working on sanitation (if any)
 iv. Call Center operator/ ULB staff responsible for taking requests
 v. Plant Manager/ President Self Help Group (SHG)/ Private vendor
 vi. Plant operator/ SHG member responsible for operating plant/ Private vendor
 vii. Cesspool vehicle operator

Phase 2: 10 interviews at state level and with eGov team members:

 i. 3-4 interviews with state level government officials
 ii. 3-4 interviews with partner organisations working on sanitation
 iii. 3-4 interviews with concerned members from eGov

Note: Some of the Sanitation in-charge/ Sanitation Inspector and Senior Municipal Engineer at the ULB that demonstrate a better understanding of the sanitation space were to be considered as State level respondents.

1.3.5 Research Tools

Mix method tools were drafted based on the results framework (Annexure 3-6). Given that eGov did not have a presence in the sample districts/ULBs, a need was felt to understand the landscape prior to roll-out of data collection. Testing of tools and the dipstick assessment was dovetailed. Preliminary field visits were conducted in four selected districts (Cuttack, Puri, Raigarh, and Sundergarh). Telephonic discussions/ in-person conversations were held with a Sanitation Expert, Junior Sanitation Officer, FSTP Manager/ Operator, Call Center Operator, FSTP Technical State Point of Contact (SPoC), and Sanitation SPoC. The communication channels between the stakeholders were mapped out, and a list of potential district-level stakeholders for In-Depth Interviews (IDIs) was populated.

1.3.6 Training of data collection team

Online training on data collection tools and methodology was held for 11 members of the data collection team on 21st August 2022. A refresher training was conducted in-person in Odisha prior to data collection in September.

1.3.7 Data Collection

The process was divided into two phases, wherein phase one focused on data collection at FSTP and district level, and phase two focused on interviews with state-level stakeholders.

Phase 1			
District	Data collection dates (September 2022)	Target	
		Survey (800 households)	7-10 stakeholder interviews
Cuttack	1st- 4th	Achieved (210)	Achieved (7)
Rayagada	5th - 8th	Achieved (215)	Achieved (10)
Sundargarh	9th - 12th	Achieved (220)	Achieved (12)
Puri	14th - 20th	Achieved (225)	Achieved (10)

Phase 2		
Category	Target (IDIs)	Number of IDIs completed
State level government officials*	3 - 4	03
Partner organisations working on sanitation	3 - 4	02
Members from eGov	3 - 4	03

Also covered through stakeholder interviews in districts

1.3.8 Challenges and mitigation

Both scenarios of reluctance in sharing information as well as lack of adequate information were observed during interviews with senior stakeholders. In such cases, the interviews were conducted with junior officers. Additionally, senior stakeholders were unable/ unwilling to provide adequate time for interviews. To overcome this challenge, interviews had to be conducted over 2-3 days. Data collection amidst certain beneficiaries was hampered due to frequent and heavy rains. In these cases, the number of days allocated for data collection were increased.

Chapter 2:
FSSM in Odisha

2.1 Odisha at a glance

Odisha, located on the eastern coast of India along the Bay of Bengal, is one of the least urbanised States in the country. According to the 2011 Census, there were 223 towns in the State. The urban population accounted for around 17 percent of the total population of Odisha against 31 percent for the country. However, the Census also indicated that the decadal (2001-2011) urban growth rate in Odisha had been significantly high (27%). There has been an increase in the number of towns, but there is considerable inter-district variation in the level of urbanization — this has led to a skewed distribution of the urban population, as well as growth in slums and slum population.

The 2011 Census also showed that the State had a significantly high percentage of population belonging to the Schedule Caste (17.13%)1 and Schedule Tribe (22.85%),[3] together accounting for nearly 40 percent of its total population. The sex ratio was low, but marginally higher than the national average[4]. Poverty, vulnerability, and exclusions were an integral part of urban Odisha, with over 22 percent of the urban population living in slums without any security of tenure. Over 28 percent of the population was living in poverty, with a lower per capita income than the national average and deprived of adequate housing and basic services like water and sanitation. In 2011, among major cities and towns, Bhubaneswar and Cuttack had the highest slum population (1.64 lakh individuals each) followed by Rourkela (1.14 lakh). The State was predominantly dependent on the service sector (58% of the Gross State Domestic Product - GSDP) with industry and agriculture contributing to 26 percent and 16 percent of the GSDP respectively.

Since the last census, there has been significant development in the overall economy as well as in the urban sector in Odisha, primarily driven by proactive and inclusive policies and initiatives taken by the State Government.

The foundation of the change process is the 5T principles of Transparency, Technology, Teamwork, Time, and Transformation (5T) adopted by the State to improve the quality of governance and services in the urban areas, amongst other sectors, through participation and inclusion.

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3. Spread across 9 tribal districts of Mayurbhanj, Keonjhar, Sundargarh, Kandhamal, Gajapati, Koraput, Rayagada, Malkangiri and Nabarangpur

4. Total sex ratio: 979 against a national average of 943; Urban sex ratio: 932 against the national average of 929

Odisha is ahead of many other States in adopting e-technology and leveraging effective technology solutions for a wide range of services. The State has undertaken major e-governance transformation (5T) initiatives in various sectors to reduce compliance burden for citizens in availing Government services. A prime example is that of the "Odisha One" Portal, an integrated service delivery framework for over 430 Government-to-Citizen (G2C) services through self-mode or through Mo Seva Kendra (MSK) at the Gram Panchayat level.

Similarly, SUJOG, a transformative digital platform for online urban services, has also been operational since 2021. SUJOG has been developed to provide an enhanced quality of urban services to citizens through an online or single-window service delivery channel. This would offer citizens convenience and transparency, and also minimize the number of visits required by the citizens to the ULBs. This is also expected to build on internal efficiency and effectiveness in the performance of the ULB by automating and optimizing the back-office processes and helping to stay focused on the core functions. Aside from this, it can also integrate departments and functions within ULBs for better information flow and transparency and facilitate secure and cost-effective online payment options for taxes and fees.

2.2 Urban sanitation facilities and services

Odisha has a total of 223 towns, classified according to population size as defined in Census 2011; and 115 ULBs, consisting of 6 Municipal Corporations, 48 Municipalities and 61 Notified Area and a total of 2035 wards.

The ULBs function under a set of Acts, with the Odisha Municipal Act (1950), Odisha Municipal Corporation Act (2003), Odisha Town Planning and Improvement Trust Act (1956), Odisha Development Authorities Act (1982), being some of the pertinent ones. These Acts prescribe the roles and functions of the various categories of ULBs, and indicate the ULBs mandate on provisions of latrines, urinals and cesspools, cleaning and safe disposal of sewage and filth, public and private drains, and drainage and sewerage along with the civic responsibilities of citizens and households. While the mandate for providing services to slum communities is clearly outlined, special reference to women is made in the context of broadly ensuring that their specific needs are met.

The 2011 census indicated that Odisha was one of the poorest performers in urban sanitation in the country. According to the census, 33 percent of the urban households were without toilets and were defecating in the open; school sanitation was a concern, with little attention paid to separate facilities for girls, and community toilets were largely dysfunctional. The usage of on-site sanitation systems was the prevailing practice consisting of poorly constructed septic tanks, and negligible facilities for wastewater and septage treatment. Even as recently

as 2015, there were no septage treatment plants in the State, with only two percent of the faecal sludge generated reportedly being treated, and only 40 percent of the population having access to mechanized emptying systems. Municipal or private cesspool operators were few, and manual scavenging was very much prevalent with the community engaged in scavenging subject to discriminations and exclusions.

Sewerage systems were absent in most urban areas; only a little over 11 per cent of households with toilets had direct access to sewerage, and almost 50 percent of the households relied on septic tanks which were poorly constructed. A bigger concern, however, was that septage was safely collected for less than half of the households that relied on septic tanks (45 per cent). Further, some of the toilets were serviced manually, which confirms the continuing practice of manual scavenging. And the only 'guiding document' for urban sanitation then was the Odisha Urban Strategy, 2011.

In 2021, Odisha had 119 FSTPs across the State in various stages of construction and completion. Across the seven districts of Khurda, Sambalpur, Mayurbanj, Balasore, Denkanal, Angul and Ganjam, 45 FSTPs are being developed as pilots for extending the facility to identified groups of Gram Panchayats in its vicinity. This convergence model is unique, calling for close collaboration between the Department of Housing and Urban Development (HUDD) and the Department of Panchayati Raj. The State has reported 100 percent door-to-door collection of household waste, and door-to-door segregation in all the 2035 urban wards. Besides, 211 Material Recovery Facilities and 275 Waste to Compost units have been set up so far, together with 14 landfills and 75 dumpsites.

2.3 Sanitation Policies and guidelines

In December 2016, the Odisha Urban Sanitation Policy (OUSP) 2017, proposed for a period of 10 years, was notified by the State government. The basic premise of the policy was that the realities of increasing urban growth in Odisha must be taken into consideration and be at the core of the policy for sanitation; that the policy must incorporate a river basin pollution abatement component; and, that the governance of urban sanitation must be aligned to outcomes and should be supported by capacity building of institutions. Capacities of local bodies should be significantly enhanced to manage the expanding need for sanitation and FSSM in the State.

The Policy thus defined six outcomes, around which strategies and interventions were to be designed and implemented. The outcomes included: (i) urban areas are open-defecation and discharge free (ODF); (ii) Municipal Solid Waste is safely managed and treated; (iii) sewage, septage/ faecal sludge and liquid waste is safely managed, treated, and disposed; (iv) safety standards and guidelines are followed in the physical handling and management of waste; (v) women and girls have access to safe menstrual hygiene management (MHM); and (vi) cities/ towns do not discharge untreated waste (solid, liquid, and faecal waste) into the water bodies in the State of Odisha. These were to be achieved in three progressive stages wherein stage 1 would be the basic ODF stage; Stage 2 will be ODF+ with

no undesignated discharge of septage; and Stage 3 will be ODF++ with no open discharge of human faecal and liquid waste, and safe containment, transport, treatment, and disposal of all human faecal waste.

2.3.1 Sanitation worker safety and dignity

The most recent regulation that bears relevance to sanitation worker protection is the Model Faecal Sludge and Septage Management Regulations, 2018.

Key points in FSM Regulatory framework, 2018

- Connecting toilets to sewerage systems, onsite containment units or decentralized treatment units

- Mechanized emptying of containment units through sanitary workers and through registered operators and registered cesspool emptier vehicles

- Scheduled desludging of containment units

- Registration of operators and cesspool emptier vehicles

- Disposal only at treatment plant or designated site

- Treatment as per standards and norms

- Providing Urban Local Bodies the authority to inspect and ensure compliance

- Penalties for offence such as contravention

- Extracted from: E&Y, (2018); Odisha's Journey of Faecal Sludge and Septage Management — Towards Sustainable Sanitation Goals

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The regulations hold ULBs responsible for safe FSSM within their jurisdiction. The regulations also protect the interest of sanitation workers by providing checks and measures for regulating the cleaning of septic tanks. The onus of getting the septic tanks cleaned mechanically by the Municipality, or by cesspool operators registered with the Municipality, with adequate safety measures, is vested in the owners of the premises. No manual cleaning is allowed, and penalties are prescribed for non-compliance or violations. Besides, the cesspool operators must ensure that all workers are trained to use the protective gear and follow hygiene practices, ensure that all safety equipment are operational and in good condition, and first aid kit and safety equipment are readily available in the vehicle before proceeding to a collection site and, most importantly, the sanitary workers do not enter a septic tank under any circumstances.

In May 2020, HUDD notified the establishment of Emergency Response Sanitation Units in all ULBs to further secure the safety of sanitation workers in situations where they are required to enter septic tanks. In September 2020, Odisha launched the GARIMA scheme to ensure the safety and dignity of core sanitation workers who deal with faecal matter in toilets, septic tanks, sewers, and treatment facilities. The scheme is aimed at multiple outcomes, including the setting up of institutional and regulatory measures, creation of a corpus fund, provision of decent wages and a risk and hardship allowance, creation of a database of sanitation workers, a formalised and skilled and protected workforce, a zero fatality and

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5. GoO, HUDD, G. Mathi Vathanan, Principal Secretary; Non- sewer sanitation in urban Odisha; https://cdn.cseindia.org/userfiles/Mainstreaming-FSM-Odisha-Experience-Sharing.pdf

accident-free work environment, social security benefits, a robust monitoring system and accountability of key stakeholders. The components of the scheme therefore include technical modalities like safety equipment, protective back up, and emergency services; service benefits like decent wages, hardship allowance, health and life insurance, EPF and retirement benefits, etc.; social security benefits like pucca houses, education of children, mobility support, mobile support in order to access apps to log in for work, for grievance redressal, to apply for social security benefits and access social delivery structures, etc.

2.3.2 SHG Partnership

With the OUSP, FSSM interventions began with pilot projects in Dhenkanal and Angul, initiated in 2015 in partnership with Centre for Policy Reform (CPR) and Practical Action (supported by the Bill and Melinda Gates Foundation). Several City Sanitation Plans were again commissioned during the same years, and some selected ULBs also began to transfer all or many of the FSSM functions to women SHGs. In 2017, Behrampur became one of the first Municipal Corporations to pass a resolution to partner with a local SHG to promote mechanized

desludging and for the operation and management of the septage treatment plant in the city through a service contract. Subsequently, many other cities including Balasore, Bhubaneshwar, Bhadrak, Cuttack, also adopted similar initiatives — this model is now being scaled up to almost all the 115 ULBs in the State.

2.3.3 Private sector partnership

Private sector engagement in FSSM is encouraged by the State, which engages with private operators in a partnership model — HUDD procures the vehicles and transfers them to the ULBs, which in turn give the responsibility of operating and maintaining the cesspool emptier vehicles to private sector operators through annual licences. As a result, desludging activity is currently being carried out by both ULB-operated and ULB-contracted cesspool emptier vehicles. Other initiatives include Standard of Operations (SoPs) for improving the delivery of FSSM services; and taking measures to ensure financial sustainability for smooth FSSM service delivery.[6]

6. E&Y, (date); Odisha's Journey of Faecal Sludge and Septage Management - Towards sustainable sanitation goals.

Chapter 3:
Study Findings

3.1 Profile of Households covered in the study

Prior to initiation of data collection, the average time gap between desludging of the same septic tank was shared as seven years. Desludging services are mostly hired by the owners of the households. To ensure inclusion of owners in the study, preference was given to respondents living in self-owned houses. We did capture data from respondents living on long-term rent agreement or lease of at least seven years.

Data analysis shows that on an average, the respondents/their families had been living in their current house for 31 years. With regard to range, the average duration of stay in the current house was between 24 years in Rayagada to 36 years in Cuttack. This helped us capture data from households that had hired desludging services more than 7 years ago.

3.1.1 Households

A total of 1036 households were covered under the study across four districts – Cuttack (n=246), Puri (n=259), Rayagada (n=256) and Sundargarh (n=275).
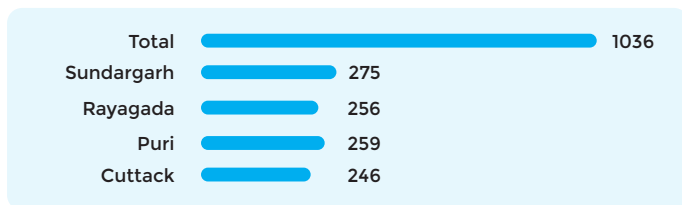
Figure 1: District wise number of households covered

3.1.2 Religion

A majority of the households covered during the study were Hindus (97.1%, n=1006) followed by Muslims (2.4%, n=25) and Christians (0.5%, n=5). Please refer to annexure 7 for district wise religion of respondents – Table A7-01.

3.1.3 Social category

Of the 1036 households covered, 57.3% (n=594) were from general category, 18.2% (n=189) were from the Other Backward Castes, 12% (n=124) were from Scheduled Tribes, 11.3% (n=117) were from Scheduled Castes, while 1.2% (n=12) chose not to respond to the question. Please refer to annexure 7 for district wise social category of respondents – Table A7-02.
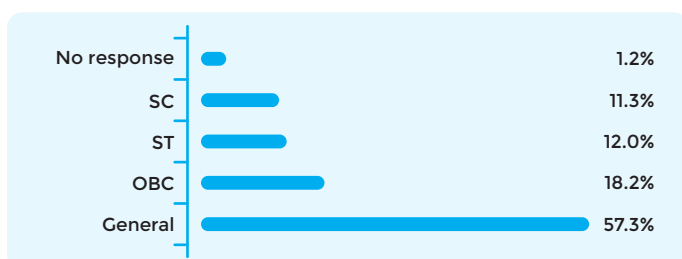
Figure 2: Social category of respondents

3.1.4 Head of household

A majority of the households (89.2%, n=924) were reported to be headed by men, while 10.8% (n=112) households were headed by women. Among the four districts, Cuttack had the lowest number of women-headed households (8.5%, 21 out of 246) in the survey, followed by Rayagada (10.2%, 26 out of 256). Please refer to annexure 7 for district-wise head of households in the study – Table A7-03.
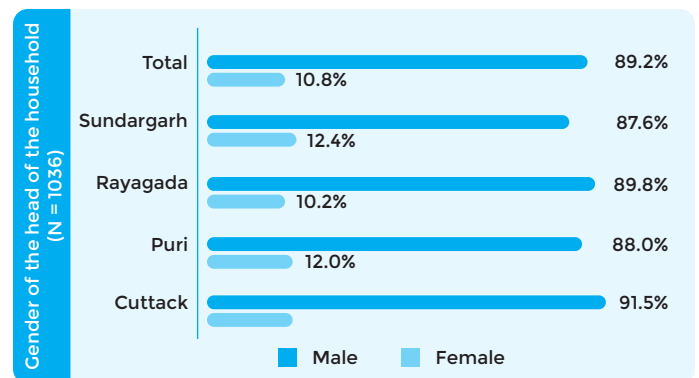
Figure 3: District-wise gender of head of household (n=1036)

The study also looked at the linkage between head of the households and their role as primary economic decision makers. Out of 924 households where men were reported to be head of the household, 894 (96.8%) were said to be making economic decisions in their families. Similarly, out of 112 women who were reported to be heading their households, 86 (76.8%) were said to be making economic decisions on behalf of their families. The percentage of women making economic decisions in women-headed households was found to be the lowest in Puri (65%), and highest in Rayagada (92%) followed by Cuttack (76%).
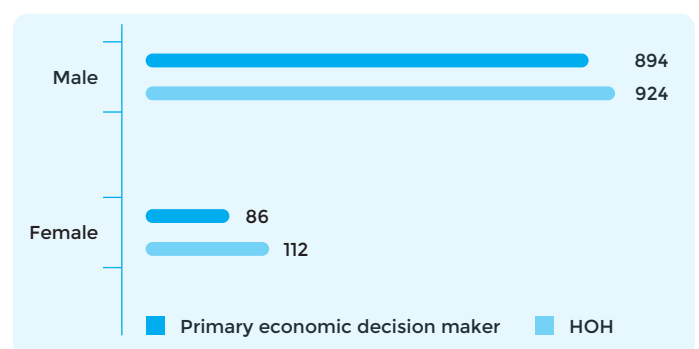
Figure 4: Gender-wise head of household vs primary economic decision-makers

3.1.5 Economic decision making and gender

A Chi-square association test was conducted between the gender of the head of the household and their role as the economic decision maker. The table below allows us to understand that a higher percentage of males (head of the household) (96.8%, 894 out of 924) are economic decision makers as compared to females (76.8%, 86 out of 112). Please refer to annexure 7 for district wise list of gender-wise head of household vs primary economic decision makers – Table A7-04.

Phi Coefficient and Cramer's V Coefficient were used to test the strength of the association between the variables. A statistically significant association between the gender of the head of the household and their role as economic decision maker was found (p-Value<0.01); that is, more male heads of the households are economic decision makers. However, the strength of the association was found to be medium (φC 0.274) with one degree of freedom.

Coefficient	P-Value[7]	φC[8]
Phi	0.00	0.274
Cramer's V	0.00	0.274
Contingency	0.00	0.274

Table 2: Association and strength of association between primary economic decision making and gender

3.1.6 Primary income of the household

The primary income for the households in the study was reported to be from non-agricultural self-employment (38%, n=393), regular wage/salary in public sector (27%, n=275) and private sector (14%, n=147), casual labour in non-agricultural occupation (11%, n=115) and agriculture (3%, n=35), and self-employment in agriculture (6%, n=62).

Puri had the highest percentage of households who were self-employed in non-agricultural occupation (55%, n=143), whereas Rayagada had the lowest percentage (28%, n=72). Regular wage/ salary in the public sector was
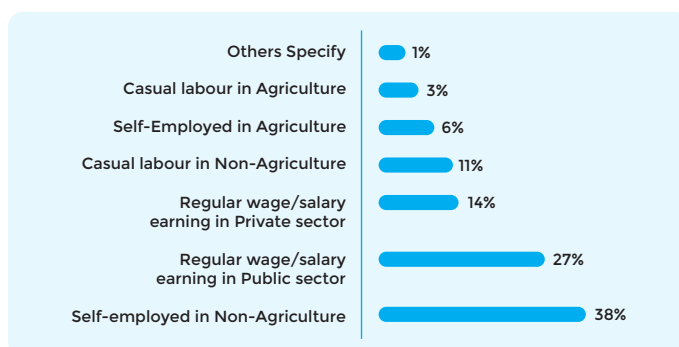
Figure 5: Occupation of primary earning family members

found to be the highest in Sundargarh (34%, n=93) and the lowest in Puri (16%, n=41). Please refer to annexure 7 for district-wise primary income of households covered in the study – Table A7-05.

> **Inference:** The data has been collected from all social categories, majority of religions, women as well as men headed households, and families from all economic backgrounds. Hence it can be said that the sample is representative of the state.

3.2 Profile of Respondents covered in the study

3.2.1 Relationship of respondent with head of the household

Out of the 1036 respondents, the top three categories of respondents were 56.2% (n=582) head of the household – 16.7% (n=97) women and 83.3% (n=485) men; 26.9% (n=279) wife of the head of the household, 9.7% (n=101) were sons of the head of the household, 3.5% (n=36) were daughters-in-law.

Please refer to annexure 7 for district-wise relationship of respondent with head of households covered in the study – Table A7-05.
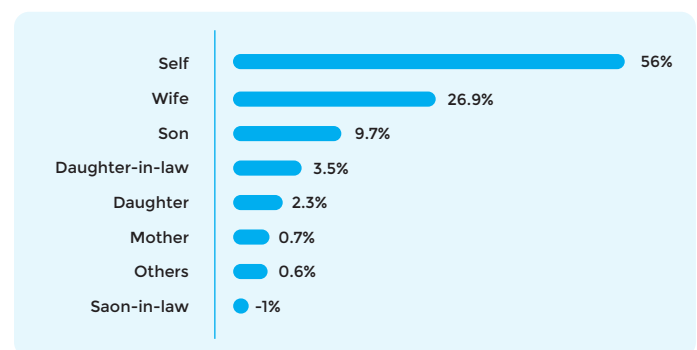
Figure 6: Relationship of respondent with head of the household

3.2.2 Gender of respondents

Out of the 1036 respondents, 56.8% were men (n=588) and 43.2% were women (n=448). In Puri district, a higher percentage of respondents were found to be men (62.2%). Please refer to annexure 7 for the district-wise number of respondents by gender – Table A7-07.
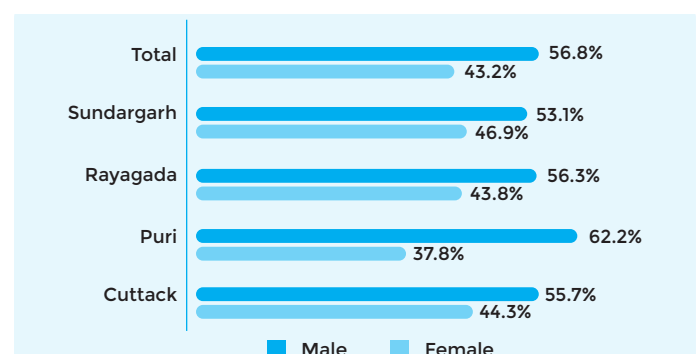
Figure 7: District-wise respondents by gender

3.2.3 Education level of respondents

A majority of the respondents (26%, n=274) shared that they had studied up to secondary school, followed by primary level (22%, n=223), graduation (18%, n=184), intermediate school (11.7%, n=121). Of the total, 8.3% respondents shared they were literate with no formal education, while 6.6% shared that they were illiterate. Please refer to annexure 7 for district-wise break-up of level of education of respondents – Table A7-08.
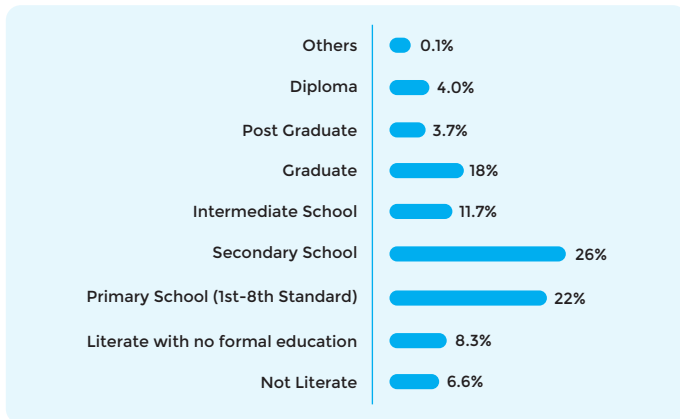
Figure 8: Education level of respondents

Inference: The study had 92.8% respondents that were either head of households or in first relationship with the head of household. This category of respondents are more likely to be aware of the desludging services accessed by the household. The profile of the respondents is representative of key decision makers, both genders and represents all education levels as well as those who were illiterate or literate with no formal education. Hence, the quantitative findings are inclusive and likely to have a high accuracy.

3.3 Current awareness vs Awareness required for behavioural change

3.3.1 Awareness of link between sanitation and disease prevalence

Awareness of the link between sanitation and disease prevalence in the community was found to be low (59.6%, 618 out of 1036 respondents).

Within districts, more respondents from Sundargarh (n=184) and Rayagada (n=181) were found to be aware of the link as compared to respondents from Puri (n=129) and Cuttack (n=124). Please refer to annexure 7 for district-wise break-up of awareness of link between sanitation and disease prevalence.
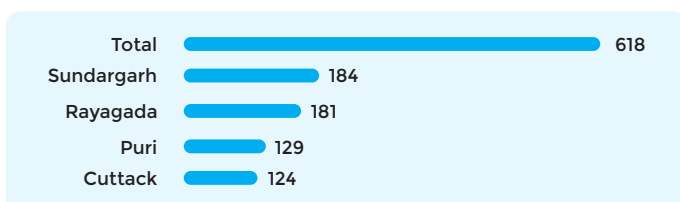
Figure 9: Awareness of link between sanitation and disease prevalence

3.3.2 Awareness of the link between sanitation and disease prevalence, and gender

A Chi-square association test was conducted between the gender of the respondents and the awareness of the link between sanitation and disease prevalence in the community. The following table demonstrates that a higher percentage of females (61.8%, 277 out of 448) are aware of the link between sanitation and disease prevalence as compared to men (58%, 341 out of 588). Please refer to annexure 7 for district-wise break-up of the gender of respondents and their awareness of the link between sanitation and disease prevalence – Table A07-10.

Gender	No link between sanitation and disease prevalence		Yes, there is a link	
	Count	%	Count	%
Female (n=448)	171	38.2%	277	61.8%
Male (n=588)	247	42.0%	341	58.0%

Table 3: Association between sanitation and disease prevalence and gender

Phi Coefficient and Cramer's V Coefficient were used to test the strength of the association between the variables. A statistically insignificant association between the gender of the respondents and awareness of the link between sanitation and disease prevalence (p-Value 0.039) was found; that is, both males and females are equally aware of the link between sanitation and disease prevalence. However, the strength of the association was found to be weak (φC 0.212)

Coefficient	P-Value[9]	φC[10]
Phi	0.039	0.212
Cramer's V	0.039	0.212
Contingency	0.039	0.212

Table 4: Strength of association between sanitation and disease prevalence and gender

3.3.3 Awareness of the link between sanitation and disease prevalence, and education

A Chi-square association test was performed between the education status of the respondents and their awareness of the link between sanitation and disease prevalence in the community. The following table reveals that a higher percentage of respondents are aware of the link between sanitation and disease prevalence in each education category. Please refer to annexure 7 for district-wise break-up of the education status of respondents and the awareness of the link between sanitation and disease prevalence – Table A07-11.

9. A p-Value less than 0.05 is typically considered to be statistically significant

10. In Phi Coefficient 0 equals no relationship, 1 equals a perfect positive relationship and -1 is a perfect negative relationship.

Educational status	No link		Yes, there is a link	
	Count	%	Count	%
Not Literate (n=68)	26	38.2%	42	61.8%
Literate with no formal education (n=86)	27	31.4%	59	68.6%
Primary School (n=223)	107	48.0%	116	52.0%
Secondary School (n=274)	109	39.8%	165	60.2%
Intermediate School (n=121)	49	10.5%	72	59.5%
Graduate (n=173)	65	37.6%	108	62.4%
Post Graduate (n=34)	12	35.3%	22	64.7%
Diploma (n=41)	15	36.6%	26	63.4%
Other (n=16)	8	50.0%	8	50.0%
Total	418	40.3%	618	59.7%

Table 5: Association between the education status of the respondents and the awareness of the link between sanitation and disease prevalence

Phi Coefficient and Cramer's V Coefficient were used to test the strength of the association between the education status of the respondents and their awareness of the link between sanitation and disease prevalence in the community. No statistically significant association between the education status of the respondents and awareness of the link between sanitation and diseases prevalence (p-Value 0.099); that is, each education category of respondents were equally aware of the link between sanitation and diseases prevalence. Similarly, the strength of the association was found to be weak (φC 0.251).

Coefficient	P-Value	φC
Phi	0.099	0.251
Cramer's V	0.099	0.251
Contingency	0.099	0.251

Table 6: Strength of association between the education status of the respondents and the awareness of the link between sanitation and disease prevalence

3.3.4 Awareness of desludging

Out of 970 respondents who belonged to households that owned a flush to septic tank toilet, 95.4% (n=925) were aware that it required desludging while 4.6% (n=45) were not aware. With regards to the district, 21 out of these 44 respondents were from Cuttack, 11 and 8 were from Rayagada and Sundargarh respectively. Please refer to annexure 7 for district-wise break-up of awareness of desludging – Table A7-12.
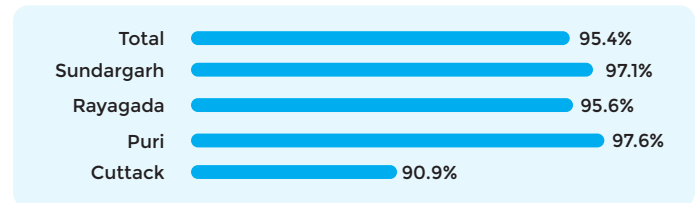
Figure 10: Awareness that a septic tank requires desludging by district

3.3.5 Awareness of desludging and gender

A chi-square distribution test was conducted between awareness of desludging and gender of respondents. The following table allows us to understand that a higher number of females (397 out of 422) and males (528 out of 548) are aware of the desludging of septic tanks. Please refer to annexure 7 for district-wise break-up of the awareness of desludging of septic tanks – Table A07-13.

Gender	Not aware		Aware	
	Count	%	Count	%
Female (n=442)	25	5.9%	397	94.1%
Male (n=588)	20	3.6%	528	96.4%

Table 7: Association between awareness of desludging and gender

Phi Coefficient and Cramer's V Coefficient were used to test the strength of the association between the variables. No statistically significant association was found between the gender of the respondents and awareness of desludging of the septic tank (p-Value 0.054); that is, both males and females are equally aware of desludging of the septic tank. Strength of association between the gender of the respondents and the awareness of desludging of the septic tank was found to be weak (φC 0.095).

Coefficient	P-Value	φC
Phi	0.054	0.095
Cramer's V	0.054	0.095
Contingency	0.054	0.095

Table 8: Strength of association between gender and awareness of desludging

3.3.6 Awareness of the desludging and education

A Chi-square association test was performed between the education status of the respondents and the awareness of desludging in the community. The following table reveals that a higher percentage of respondents were aware of the desludging of septic tanks in each education category. Please refer to annexure 7 for district-wise break-up of the education status of respondents and the awareness of desludging among respondents – Table A7-14.

Educational status	No link		Yes, there is a link	
	Count	%	Count	%
Not Literate (n=61)	56	91.8%	5	8.2%
Literate with no formal education (n=79)	70	88.6%	9	11.4%
Primary School (n=205)	190	92.7%	15	7.3%
Secondary School (n=258)	250	96.9%	8	3.1%
Intermediate School (n=118)	115	97.5%	3	2.5%
Graduate (n=160)	158	98.8%	2	1.2%
Post Graduate (n=33)	32	97%	1	3%
Diploma (n=40)	38	95%	2	5%
Other (n=16)	16	100%	0	0.0%
Total (n=970)	925	95.4%	45	4.6%

Table 9: Association between education status and awareness of desludging

Phi Coefficient and Cramer's V Coefficient were used to test the strength of the association between the variables. A statistically significant association (p-Value 0.007) was found between the education status of the respondents and awareness of desludging; that is, as education status increases, awareness of desludging of the septic tank also increases. However, this relationship was found to be weak (φC 0.147).

Coefficient	P-Value	φC
Phi	0.007	0.147
Cramer's V	0.007	0.147
Contingency	0.007	0.147

Table 10: Strength of association between education status and awareness of desludging

3.3.7 Awareness of reason for desludging

Out of 925 respondents who were aware that a flush to septic tank toilet required desludging, only six respondents from Sundargarh reflected planned desludging, while the remaining respondents believed that desludging was a corrective measure to a problem – tank overflow (55%, n=511), back flow (40%, n=370), foul smell (15%, n=137) and leakage because of breach in tank structure (2%, n=20). Please refer to annexure 7 for district wise break-up of reason for desludging – Table A7-15.

Figure 11: Reasons for desludging
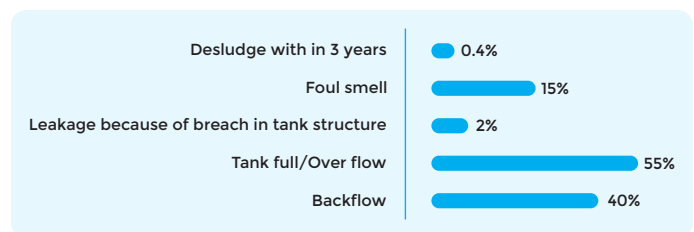
Figure 11: Reasons for desludging

925 respondents were asked if they knew when a septic tank is due for desludging. 71% (659 out of 925) respondents were of the opinion that a septic tank needs to be emptied every seven years. Respondents from Cuttack were an exception and mentioned five years. Overall, 29% (266 out of 925) were not aware why a septic tank must be emptied.

Figure 12: District-wise breakup of respondents that were unaware of why desludging must be undertaken

3.3.8 Actual Desludging of septic tanks

970 respondents were from households that owned a flush to septic tank toilet. 50.4% (489 out of 970) respondents shared that they were aware that the septic tank for their toilet had been emptied at least once. Cuttack had the highest number of respondents that reported desludging of septic tanks (61.2%, 142 out of 232) while Rayagada reported the least (39.4%, 99 out of 251). Please refer to annexure 7 for district-wise break-up of respondents who reported that their septic tank was desludged in the past – Table A7-16.

Figure 13: Septic tank in the house desludged/emptied ever (n=970)

In 94% (458 out of 489) households, the decision was taken by the head of the household and the tank was emptied after an average of three years. Average number of years was reported to be higher (four years) in Puri and Rayagada. A majority of these head of the household were men (90%, n=411).

3.3.9 Reason for desludging of septic tank

The 489 respondents were further asked to share the reason for desludging the tank for their toilet. In 70% (n=337) households, the desludging was undertaken after observing back flow in the toilet, accompanied by foul smell and/or leakage from the septic tank. In only 18% (n=88) cases, desludging was undertaken as the emptying was overdue. Highest number of scheduled desludging was reported in Sundargarh (n=29) and Rayagada (n=27), and the lowest was reported in Cuttack and Puri (n=16). Please refer to annexure 7 for district-wise break-up of reason for desludging of septic tank – Table A7-17.
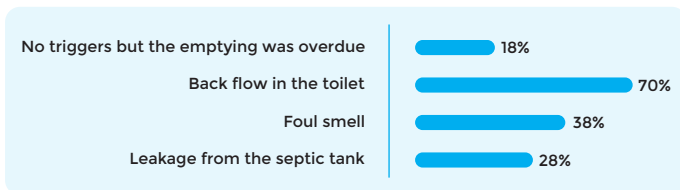
Figure 14: Reasons for desludging of septic tank

Inference: Desludging behaviour is predominantly guided by leakage/ foul smell/ back flow. Majority of respondents felt that desludging is a corrective measure to be undertaken post occurrence of problems or after seven years. Only four respondents were aware that desludging needs to be a planned activity and needs to be undertaken every three years. These factors will need to be taken under consideration at the time of planning and execution of the IEC campaign.

3.4 Desludging after problem vs scheduled desludging

3.4.1 Ownership of a toilet

Out of 1036 households, 99.2% (n=1028) had their own toilet while 0.87% (n=8) households used a toilet that was owned by another family. All respondents in Sundargarh district had their own toilets. Please refer to annexure 7 for district-wise break-up of ownership of toilets – Table A7-18.

Figure 15: Ownership of toilet

3.4.2 Location of toilet

1028 households that had their own toilet were further asked to share the location of the toilet. 73.1% (n=751) toilets were said to be located inside the house of the respondent. 19% (n=195) toilets had been constructed outside the house and in the family's yard/plot. 7.9% (n=81) respondents shared that they owned a house in a building which had common toilets. Cuttack had the least number of households (2.1%, n=5) that had shared toilets in their buildings, whereas the other districts reported between 9%-10.2% (range 23-27) families in this category. Please refer to annexure 7 for district-wise break-up of location of toilet – Table A7-19.
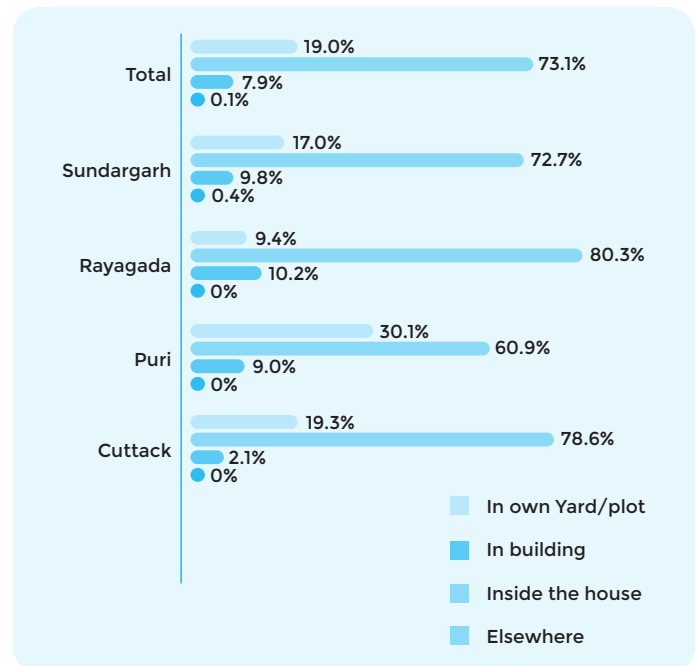
Figure 16: Location of toilet

Interestingly, 42 households (4.1%) who owned a toilet reported sharing it with other families. A majority of these respondents were from Puri (6.3%, n=16) and Sundargarh (5.5%, n=15) and Cuttack (4.1%, n=10).

3.4.3 Sharing of toilet

The aforementioned 42 households were asked for the number of households that were sharing their toilet. 57.1% (24 out of 42) households reported sharing the toilet with two other households, implying that one toilet was being used by an average of 12 adults (@4 adults plus one member per family). 21.4% (Nine out of 42) households were sharing the toilet with one other household. 11.9% (n=5) households were sharing their toilet with three other households, and 4.8% (n=2) households were sharing their toilet with four other households. Two respondents were not aware how many families were sharing their toilets. Please refer to annexure 7 for district-wise break-up of sharing of toilets – Table A7-20 and 21.
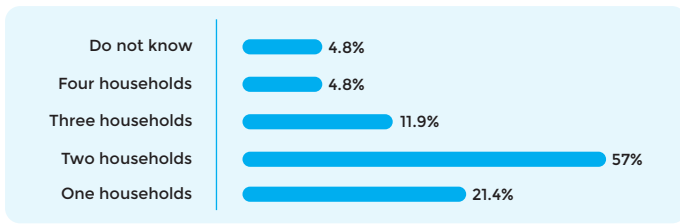
Figure 17: Number of households sharing a toilet (n=42)

The average household size was found to be five across all districts. An average household consisted of two male and female members each, between the age of 16-60 years, and one more family member who could be a child or a young adult or an old person above 60 years of age. This implies that at least four adults need to use a toilet. Hence, each toilet is being shared by at least 4 to 16 adults. Please refer to annexure 7 for district household size of respondents in the study – Table A7-22.
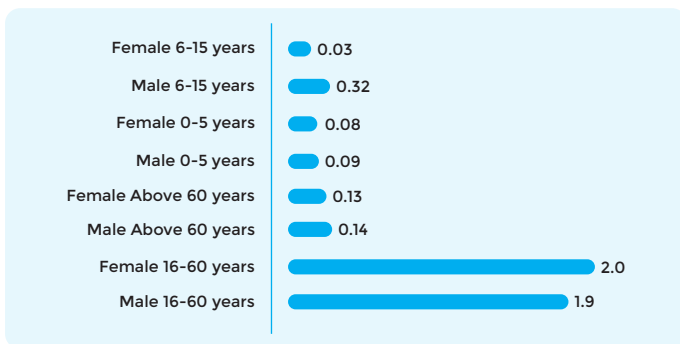
Figure 18: Average age and gender of family members

3.4.4 Years of construction of toilet

1028 respondents that owned a toilet were asked to share the number of years since the construction of the toilet. 42% (n=439) toilets were found to have been constructed in the last 10 years, while 588 households had constructed a toilet more than 10 years ago. Six respondents were not aware when the toilet in their household was constructed. Please refer to annexure 7 for district-wise break-up of years since construction of toilets – Table A7-23 and 24.
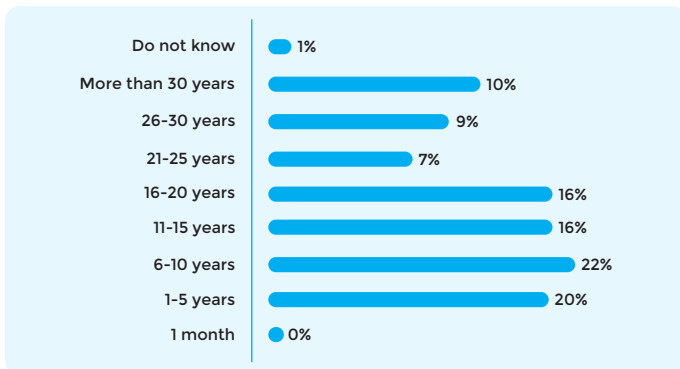
Figure 19: Years since construction of toilet in the household

3.4.5 Years of construction and sharing of toilets

The table below presents the point-biserial correlation between toilets' years of construction and sharing of toilets with other families in the community.

There is a positive correlation between both the variables, which was statistically significant (p-Value 0.040). However, sharing of toilets accounts for only 0.41%[11] of the variability in the age of toilet construction, indicating a very weak correlation, and other determinants are playing an important role.

	Sharing Toilets with other families	
Toilets' years of construction (in years)	Pearson Correlation rpb	0.064*
	Sig. (2-tailed) p	0.040
	n	1022

Table 11: Correlation between toilets' years of construction and toilets sharing with other families in the community

3.4.6 Location of toilet and sharing of toilet

A Chi-square association test was run between the location of the toilet and sharing of a toilet with other families in the community. The below table reveals that a higher percentage of households having toilets in their own dwelling were sharing the toilets with other families (73.7%). Similarly, a higher percentage of households with toilets in their own dwelling were also sharing toilets with others (57.1%). Please refer to annexure 7 for district-wise break-up of location of the toilet and sharing of the toilet – Table A7-25.

Status of toilet		Toilet location (in own dwelling)	
		No	Yes
Toilet not shared (n=986)	Count	259	727
	%	26.3%	73.7%
Toilet shared (n=42)	Count	18	24
	%	42.9%	57.1%

Table 12: Association between location of the toilet and sharing of the toilet with other families

To gain more clarity, Phi Coefficient and Cramer's V Coefficient were run to test the strength of the association between the variables. No statistically significant association (p-Value 0.074) was found between the toilets built inside dwellings and sharing of toilets with other families in the community. Similarly, the strength of the association was found to be weak (φC 0.018).

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11. Variability = sq(rpb)*100 = sq(0.064)*100 = 0.41%

Coefficient	P-Value	φC
Phi	0.074	0.018
Cramer's V	0.074	0.018
Contingency	0.074	0.018

Table 13: Strength of Association between location of the toilet and sharing of the toilet with other families

3.4.7 Sewage management

A majority of the households (94.4%, n=970) own a flush to septic tank toilet. 100% respondents from Sundargarh reported having the same. Flush to piped sewer system type of toilets were reported by 4.6% (n=47) respondents. A majority (n=43) of these respondents were from Puri. 1.1% (n=11) respondents reported flush to open drains or open land toilets. 8 out of 11 of these toilets were in Cuttack. Please refer to annexure 7 for district-wise break-up of type of toilets – Table A7-26.

IDIs with private cesspool operators also point out that several households within the municipalities had connected their septic tanks or overflow pipes directly to open drains.
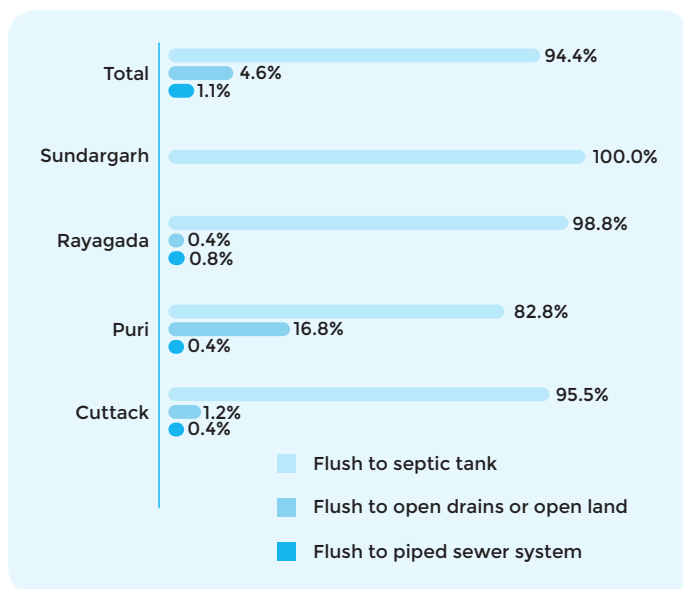
Figure 20: District wise type of toilet

970 respondents who had reported owning a flush to septic tank toilet were asked if they were aware of the structure of their septic tank. Majority of the respondents (56.7%, n=550) reported having a two chambered septic tank, 41.1% (n=399) reported having a single chambered septic tank. Interestingly, 1.8% (n=17) respondents reported having a three chambered septic tank, while 0.4% (n=4) were not aware. Please refer to annexure 7 for district-wise break-up of type of septic tank – Table A7-27.
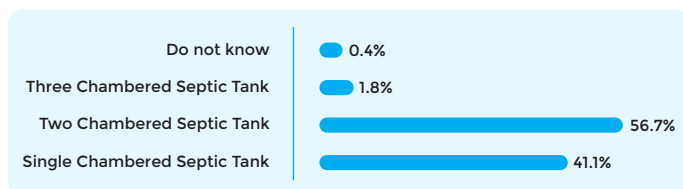
Figure 21: Structure of septic tank

3.4.8 Type of toilet and years of construction

The table below presents the biserial and point-biserial correlations between the variables. The flush-to-septic tank was found to be insignificantly related to the number of years of toilet construction (r_{pb} = -0.03104, n = 1022, p = 0.81).

There is a negative correlation between both the variables, which was statistically insignificant (r_{pb} = -0.015, n = 1022, p = 0.81). This means the newly constructed toilets and older toilets were equally likely to have flush to septic tank type of toilet. This in turn indicates absence of sewage connection in the newer constructions as well.

	Flush to septic tank toilet	
Toilets' years of construction in years	Pearson Correlation r_{pb}	-0.015
	Bi-serial Correlation r_b	- 0.03104
	Sig. (2-tailed) p	0.81
	n	1022

Table 14: Correlation between years of construction of toilet and type of septic tank

3.4.9 Awareness of dimension of septic tank

A Awareness of dimensions was found to be low among the respondents. Only 19.8% (192 out of 970) respondents were found to be aware of the dimensions of their septic tank. Average dimension shared by respondents was 8 X 6 X 8 feet.

3.4.10 Data requirement for desludging and scheduled desludging

As per in-depth interviews conducted with stakeholders in the four districts, Puri municipality had data on about 36,000 households that have toilets and septic tanks. However, the respondent shared that no one has time to study the data and track whether the household needs a desludging service.

Sundargarh municipality has data related to community toilets and public toilets where septic tanks are emptied every six months. The municipality is planning to conduct a survey through *Swatch Sathis* to collect information on several parameters — such as, whether the household has a septic tank and the type of its structure; whether the household has a soak pit; whether the household has twin-pit; year of construction and when the septic tank was emptied; user fees paid to the municipality, etc.

Cuttack and Rayagada municipalities have no data, but they were willing to explore possibilities of tracking desludging requirements.

Inference: It cannot be assumed that a majority of septic tanks are 8 X 6 X 8 ft size and are being used by five members of one family.
In terms of requirement of desludging services, very few houses have flush-sewage pipe connection. This is indicative of a gap in required infrastructure, and also higher dependence on desludging services for the foreseeable future.

In terms of capturing data on number of years of construction, regardless of number of years of construction, a majority of toilets are flush-septic tank. Additionally, houses built in the last decade are equally likely to have toilet to open drain/land connection as houses built prior. On one hand, this indicates gaps in monitoring by the concerned department, and on the other, it indicates that number of years of construction of toilet or septic tank may not be a relevant indicator.

In terms of capturing data on location of the toilets, toilets built inside a house are equally likely to be shared with other families as the toilets built in the private yard/plot. However, location of the toilet can help ascertain the degree of difficulty the sanitation workers are likely to encounter. This will be covered later in the report.

To conclude, inclusion of number of years of construction as an indicator on the digital platform will not offer any inference.

Indicator	Cuttack	Puri	Rayagada	Sundargarh
State designated toll-free number			Yes	
Visibility of the toll-free number		Only in municipality and call centre building		
Human Resource for service provision		Designated municipality staff		
Functionality of the toll-free number	No	Yes	No	No
Municipality level toll free numbers	+91 67123 10472 +91 67123 11244	+91 95564 48558	None	+91 76089 13403
Sharing booking details/Advance slip	Yes		Yes	Yes
Information sharing through Whats App group		Yes		

Table 15: District wise Telephonic booking of services

3.5 Current service delivery mechanisms

3.5.1 Booking request for desludging

A municipality staff has been given responsibility of receiving requests, booking service, dispatching the cesspool vehicles and coordinating with private cesspool operators. There are two ways for the residents to book requests – through a physical visit to the ULB or via phone call to a designated toll-free number.

3.5.2 Telephonic booking of service

A State-dedicated toll-free helpline number 14420 has been provided by BSNL. The visit to the households, ULB and the Call center showed that the toll-free number had not been advertised anywhere except at the Municipality office and the call center.

IDIs in Rayagada highlighted the challenges with the toll-free number. The respondents shared that there were network issues with BSNL in the district. This had resulted in connectivity issues, call drops, poor and unclear audio, etc. At the time of the survey only one call had been received in the last one month through the State-dedicated toll-free helpline number. The toll-free number was reported to be working well in Puri Municipality. The helpline number 14420 was not functioning in Cuttack and Sundargarh at the time of the survey due to non-payment to BSNL.

Municipalities such as Cuttack had designated two numbers as toll-free numbers. The assistant call operators attended all calls related to sanitation services and complaints, and forwarded the calls related to desludging to the relevant staff on their mobile number. Similar practice was reported in Sundargarh and Puri.

Puri also reported having a WhatsApp group for sharing details of booking requests with the third-party cesspool supervisor.

Interestingly, phone numbers owned by private cesspool operators were seen extensively advertised in the districts as well as on cesspool vehicles operated by them. These numbers are also being used by households to book desludging services.

3.5.3 Process for booking request

A Upon visit or a call by the beneficiary, the designated municipality staff enquires about the street's size, the last point the vehicle can reach, and the distance between the last accessible point and the septic tank. The notes are made in their own diary or register.

If the distance is 100 feet or less, an advance payment slip is generated. Request for desludging is either not registered or forwarded to private cesspool operators, in cases where it requires a pipe length of more than 100 feet. In cases where an advance slip is generated, one copy is given to the beneficiary and the other copy is shared with the Cesspool Operator.

3.5.4 Cesspool Operations

Three models are functional in the surveyed districts.

1. The cesspool vehicle is owned, operated, and maintained by the Municipalities.

2. The cesspool vehicle is owned by the municipality, but is leased to the private cesspool operator for operations. In this case, the maintenance of the vehicles is ensured by the private cesspool operator.

3. The cesspool vehicles are owned by the private cesspool operator. In this case, the maintenance of the vehicles is ensured by the private vendor.

In the second and third model, a desludging service contract is signed between the municipality and the private cesspool operator. The private cesspool operator is required to pay a desludging fee to the municipality, which is based on the number of visits made by a cesspool vehicle.

The Municipality staff coordinates over phone with private cesspool supervisors for desludging service. In the case of Puri, a WhatsApp group has been created to share the 'service request' with the private cesspool operators, the cesspool supervisor, and other concerned staff. Upon receiving the service request, the cesspool supervisor dispatches the cesspool vehicle. The septic tank is emptied and the sludge is expected to be unloaded at a designated FSTP.

Cuttack: At the time of the survey, three registered private cesspool operators were operating in the municipality area. The fleet comprises a total of seven cesspool vehicles with a capacity of 4,000 and 1,500 liters. The private cesspool operators pay an annual license fee of Rs. 24,000 per 4,000 liters capacity vehicle, and Rs. 12,000 per 1,500 liters capacity vehicle.

The relationship between the municipality and the private cesspool operators is largely limited to the issuance of annual licenses and some cursory checks on compliance. The private cesspool operators who own cesspool vehicles reported receiving very few calls in a day

and hence, find it difficult to sustain their operations.

Rayagada: At the time of the survey, around three-five unregistered private cesspool operators were operating in the municipality area. The municipality is yet to make a list of all private cesspool operators and vehicles running in the district. The municipality's Executive Officer held a meeting with three unregistered private cesspool operators working in the district, and invited them to sign a contract and work with them. The response was positive but the municipality has not signed a contract yet. The private cesspool operators were also invited to the FSTP plant and had been offered all possible support.

Swachh Sathis have been instructed to monitor private and municipal cesspool operators. Instructions have been given to the Regional Transport Office (RTO) to confiscate private cesspool vehicles engaging in illegal dumping. Municipality has a provision to impose a fine of Rs. 50,000 on illegal dumping.

The municipality has caught private cesspool operators illegally dumping sludge outside/in the forest, and has issued a warning. So far, no operator has been fined.

Sundargarh: No private cesspool operator is operating in the district. There were one or two instances of desludging by a private cesspool operator from Andhra Pradesh. The municipality staff has asked him to either sign a contract with them or terminate his operations in the district.

Puri: The municipality is working on a 'no-profit and no-loss' basis with one private vendor. It does not charge any contract fee from the vendor. The municipality has provided the private cesspool operator with a total of five cesspool vehicles — four vehicles with a capacity of 3,000 liters and one with a capacity of 1,000 liters.

As per desludging service contract, the private cesspool operator is required to pay a desludging fee of Rs. 970 per 3,000 liters vehicle and Rs. 630 per 1,000 liters vehicle to the municipality. The entire amount received from the beneficiaries is refunded to the private cesspool operator towards management of cesspool operations and maintenance.

Indicator	Cuttack	Puri	Rayagada	Sundargarh
Private cesspool operators				
Registered private operators	3	1	0	0
Unregistered private operators	0	0	3-5	0
Capacity of Cesspool vehicles owned by Municipality				
1000 liters		1		2*
1500 liters	2*			
3000 liters		4	2	1
4000 liters	1			
Functional cesspool vehicles with municipalities	1	5	2	1
Cesspool vehicles leased to private vendors	0	5	0	0

Table 16: District wise cesspool vehicles
* Pending with the RTO office for on-road permission

During the IDIs, the private cesspool operators registered with the Cuttack Municipality shared that they had invested in their own cesspool vehicles. However, given the scale of operations, the business was not viable.

Inference: The state designated toll-free number was found to be functional only in one out of the four districts. Municipalities have provided alternate phone numbers; however, the numbers have not been advertised adequately.

A majority of cesspool vehicles purchased by the municipalities are of a large capacity and have shorter pipes (80-100 ft), which means that houses in narrower lanes are not serviceable by these vehicles.

Smaller capacity cesspool vehicles (1-1.5K liters) have been purchased recently but were found to be functional only in 1 out of 4 municipalities (Puri). In Cuttack and Sundargarh, smaller capacity cesspool vehicles have been purchased but are pending RTO approval.

Private cesspool operators have been registered by Municipalities in Cuttack and Puri. Registration of private cesspool operators is an issue in Sundargarh as no private operators are running a business in the district. Rayagada has private cesspool operators but none of them have been registered thus far.

3.6 Service seeking behaviour

3.6.1 Desludging service seeking pattern

Of the total households, those 47% (489 out of 1036) who had undertaken desludging in the past were asked to share information about the service provider. 51% (250 out of 489) had received services from the local municipality. A majority of the respondents from Sundargarh (80%, 113 out of 141) and Cuttack (50%, 71 out of 142) reported this.

Of those who had undertaken desludging, 33% (160 out of 489) received services from a private service provider. A majority of the respondents from Rayagada (75%, 74 out of 99) and 42% from Cuttack (60 out of 142) reported this.

A total of 16% (77 out of 489) respondents reported manual cleaning. A majority of the respondents from Puri (53%, 57 out of 107) reported thus. Please refer to annexure 7 for district-wise break-up of service provider – Table A7-28.
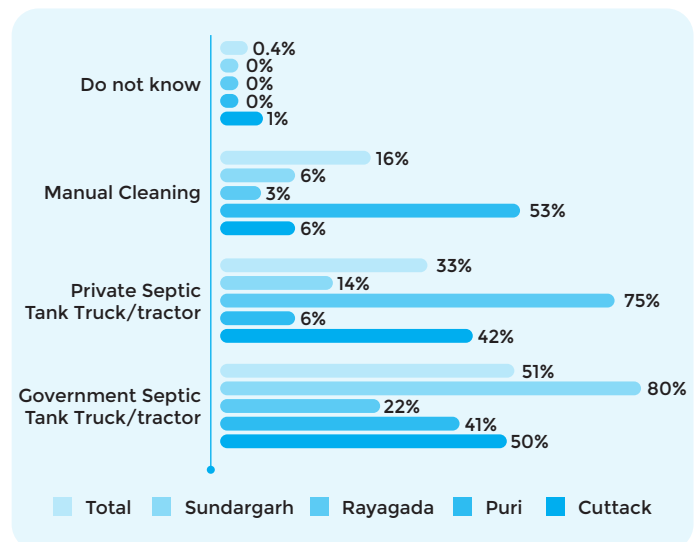
Figure 22: District-wise break-up of service providers

489 households who had undertaken desludging in the past were asked about mode of booking services. 46% (223 out of 489) respondents had called the local service provider, 32% (156 out of 489) had visited the ULB office or local service provider, while 8% (40 out of 489) respondents were not aware how the service was booked as it was booked by a family member. It needs to be highlighted that 15% (71 out of 489) reported calling a local cleaner (for manual cleaning or digging of another pit). Please refer to annexure 7 for district-wise break-up of booking of desludging service – Table A7-29.

None of the 489 respondents who had accessed services for desludging were aware of any App/Website for the booking of such services.
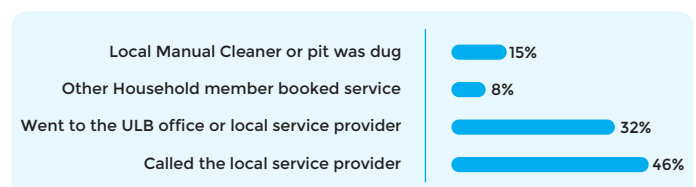
Figure 23: Mode of booking services

3.6.2 Telephonic booking of service

As mentioned earlier, 46% of respondents (223 out of 489) had booked the service over the phone. Telephonic booking was found to be more prevalent in Cuttack (41.7%, n=93) and Rayagada (38.6%, n=86). Please refer to annexure 7 for district-wise break-up of telephonic booking of desludging service.
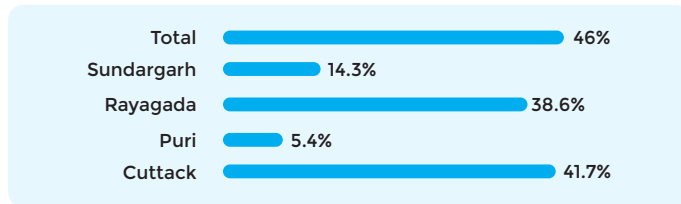
Figure 24: Telephonic booking of service

i. Telephonic booking of service and gender

A Chi-square association test was performed between the gender of the respondents and telephonic booking of service. The table below reveals that a higher percentage of respondents that booked the service telephonically were men.

Out of the 223 respondents that had called the local service provider, 137 (61%) were men and 86 (39%) were women. In Rayagada and Cuttack, a higher proportion of respondents in this category were men, whereas Sundargarh and Puri presented a more comparable scenario. Please refer to annexure 7 for district-wise break-up of gender of the respondents and telephonic booking of service – Table A7-30.

Gender (n=223)	Cuttack (n=93)		Puri (n=12)		Rayagada (n=86)		Sundargarh (n=32)	
Female (n=86, 39%)	32	34%	5	42%	24	37%	16	53%
Male (n=137, 61%)	61	66%	7	58%	54	63%	0	47%

Table 17: Association between telephonic booking of service and gender

No statistically significant association between the gender of the respondents and telephonic booking of service (p-Value 0.422); that is, both male and female respondents were equally booking services telephonically. Similarly, strength of the association was found to be very weak (φC 0.036).

Coefficient	P-Value	φC
Phi	0.427	0.036
Cramer's V	0.427	0.036
Contingency	0.427	0.036

Table 18: Strength of association between telephonic booking of service and gender

ii. Ease of connectivity via phone

A total of 167 out of 222 respondents (75.2%) shared that they were able to connect easily while 55 respondents (24.8%) faced some difficulty. Out of the 55 respondents that faced challenges, the majority of them were from Rayagada (n=34) and Cuttack (n=18). Please refer to annexure 7 for district-wise break-up of ease of connectivity via phone for booking of desludging service – Table A7-31.

iii. Gender and ease of connectivity

A Chi-square association test was performed between the variables. The table below reveals that a higher percentage of respondents that reported ease of connectivity were men (77%, 105 out of 167) as compared to women (72%, 62 out of 167). Please refer to annexure 7 for district-wise break-up of gender and ease of connectivity via phone for booking of desludging service – Table A7-32.

Eases of connecting via phone (n=222)	Gender	Cuttack (n=92)		Puri (n=12)		Rayagada (n=86)		Sundargarh (n=32)	
Was able to connect easily (n=167, 75.2%)	Male (n=105, 77%)	48	80%	7	100%	36	67%	14	93%
	Female (n=62, 72%)	26	81%	4	80%	16	50%	16	94%
Was able to connect to some extent (n=55, n=24.8%)	Male (n=31, 23%)	6	20%	1	0%	16	33%	1	7%
	Female (n=24, 28%)	12	19%	0	20%	18	50%	1	6%

Table 19: Association between ease of connecting via phone and gender

No statistically significant association between the gender of the respondents and ease of connectivity via telephone (p-Value 0.890); that is, both male and female respondents were equally able to connect easily telephonically. Similarly, strength of the association was found to be very weak (φC 0.009).

Coefficient	Was able to connect easily		Was able to connect to some extent	
	P-Value	φC	P-Value	φC
Phi	0.908	0.009	0.890	0.011
Cramer's V	0.908	0.009	0.890	0.011
Contingency	0.908	0.009	0.890	0.011

Table 20: Strength of association between ease of connecting via phone and gender

iv. Perceived understanding of process

A total of 68.5% (152 out of 222) respondents shared that they were able to understand the process explained to them telephonically. 30.6% (68 out of 222) respondents stated that they had understood the process to a certain extent while 0.9% respondents (2 out of 222) had not understood the process. Respondents from Rayagada were found to have a lower percentage than the average with only 52.3% (45 out of 86) sharing that they had understood the process completely. Please refer to annexure 7 for district-wise break-up of respondents and their perception of understanding of process explained to them telephonically – Table A7-33.
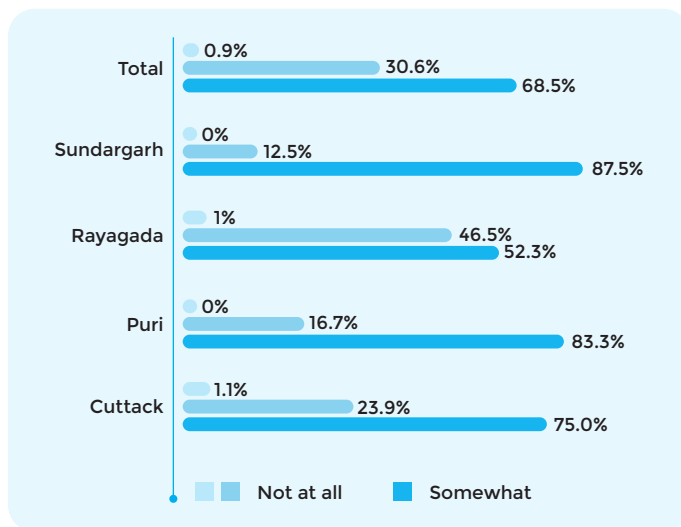
Figure 25: Perceived understanding of process (Telephonic)

v. Perceived understanding and gender

A Chi-square association test was performed between the gender of the respondents and their perception of how well they understood the service process. The table below reveals that a higher percentage of respondents that perceived to have understood the process completely were men (69%, n=95) as compared to women (66%, n=57). Please refer to annexure 7 for district-wise break-up by gender and their perception of understanding of process explained to them telephonically – Table A7-34.

No statistically significant association between the gender of the respondents and their perception of the clearly understood process (p-Value 0.633); that is, both male and female respondents were equally able to understand the process completely over telephone. Similarly, the strength of the association was found to be very weak (φC 0.032).

	Clearly able to understand the process			Somewhat able to understand the process			Did not understand the process		
Coeffi-cient	P-Value	φC		P-Value	φC		P-Value	φC	
Phi	0.633	0.032		0.596	0.036		0.851	0.013	
Cram-er's V	0.633	0.032		0.596	0.036		0.851	0.013	
Con-tin-gency	0.633	0.032		0.596	0.036		0.851	0.013	
Y	0.633	0.032		0.596	0.036		0.851	0.013	

Table 22: Strength of association between gender and perceived understanding of process (Telephonic)

3.6.3 Visit to ULB office for booking service

As mentioned earlier, 32% of respondents (156 out of 486) had visited the ULB office to book the service. Visits to the ULB office for booking services were found to be most prevalent in Sundargarh (69.5%, n=98), followed by Puri (28%, n=30) and Cuttack (14.8%, n=21). Lowest prevalence was found in Rayagada with only seven respondents reporting so. Please refer to annexure 7 for district-wise break-up of respondents visiting ULB office for booking services – Table A7-39.
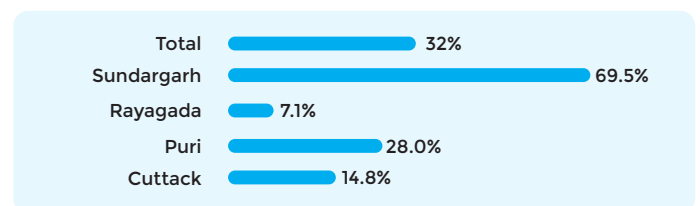
Figure 26: Visit to ULB office for booking service

Perceived understanding of process (n=222)	Gender	Cuttack (n=92)		Puri (n=12)		Rayagada (n=86)		Sundargarh (n=32)	
Understood process completely (n=152, 68.5%)	Male (n=95, 69%)	44	73%	6	86%	31	57%	14	93%
	Female (n=57, 66%)	24	78%	4	80%	14	44%	14	82%
Understood process to a certain extent (n=68, 30.6%)	Male (n=40, 29%)	15	25%	1	14%	23	43%	1	7%
	Female (n=28, 33%)	7	22%	1	20%	17	53%	3	18%
Did not understand the process (n=2, 0.9%)	Male (n=1, 1%)	1	2%	0	0%	0	0%	0	0
	Female (n=1, 1%)	0	0%	0	0%	1	3%	0	0

Table 21: Association between gender and perceived understanding of process (Telephonic)

i. Visit to ULB office and gender

A Chi-square association test was performed between the gender of the respondents and opting to visit the ULB office. The table below reveals that a higher percentage of respondents that visited the ULB office for booking services were men (57%, 89 out of 156) as compared to women (43%, 67 out of 156).

No statistically significant association was found, meaning that men and women are equally likely to visit the ULBs to book desludging services.

Number of women visiting the ULB office was found to be the highest in Sundargadh (n=38) and the lowest in Rayagada (n=6). Please refer to annexure 7 for district-wise break-up of gender of the respondents and visit the ULB office for booking of service – Table A7-40

Gender (n=156)	Cuttack (n=21)		Puri (n=30)		Rayaga-da (n=7)		Sund-argarh (n=98)	
Female (n=67, 3%)	11	52%	12	40%	6	86%	38	39%
Male (n=89, 7%)	10	48%	18	60%	1	14%	60	61%

Table 23: Association between visit to ULB office and gender

ii. Availability of concerned ULB staff for booking service

156 respondents who had visited the ULB office to book services were asked to share their understanding of the official working hours of the ULB office. A majority of the respondents (86.5%, 135 out of 156) mentioned the timings to be 10am-5pm, while 9.6% (15 out of 156) mentioned 10am-4pm.

Do not know	1.3%
9 am to 5pm	.6%
9 am to 2 pm	.6%
10 am to 6 pm	1.3%
10 am to 5 pm	86.5%
10 am to 4 pm	9.6%
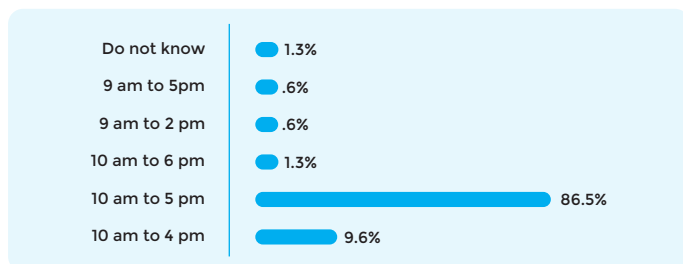
Figure 27: Understanding of Office hours at ULB

The respondents were further asked if the concerned ULB staff were available during their visit. 80.1% respondents (125 out of 156) shared that the staff member was available when they visited the ULB office. 19.9% (31 out of 156) respondents shared that the concerned staff was not available. A majority of these respondents were from Sundargarh (n=15) and Cuttack (n=11). Please refer to annexure 7 for district-wise break-up of availability of concerned ULB staff during visits by respondents – Table A7-41.

Gender (n=156)	Cuttack (n=21)		Puri (n=30)		Rayaga-da (n=7)		Sund-argarh (n=98)	
Available (n=125, 80.1%)	10	47.6%	28	93.3%	4	57.1%	83	84.7%
Not Available (n=31, 19.9%)	11	52.4%	2	6.7%	3	42.9%	15	15.3%

Table 24: Availability of concerned ULB staff during respondent's visit

Non-availability of concerned ULB staff is a concern as on an average respondents reported spending 30 minutes to travel to the ULB office. Additionally, 39.7% (62 out of 156) reported having to leave their work to visit the ULB office to book requests for service.

iii. Perceived understanding of process

A majority of respondents (84%, 131 out of 156) shared that they were able to completely understand the instructions provided to them during the booking of service. 15.4% (24 out of 156) shared that they were able to understand the instruction to a certain extent while 0.6% (1 out of 156) were not able to understand anything. Please refer to annexure 7 for district-wise break-up of respondents and their perception of understanding of process explained to them during their visit to ULB – Table A7-42.

	Not at all	Somewhat	Completely
Total	0.6%	15.4%	84.0%
Sundargarh	0.0%	15.3%	84.7%
Rayagada	0.0%	28.6%	71.4%
Puri	0.0%	13.3%	86.7%
Cuttack	4.8%	14.3%	81.0%
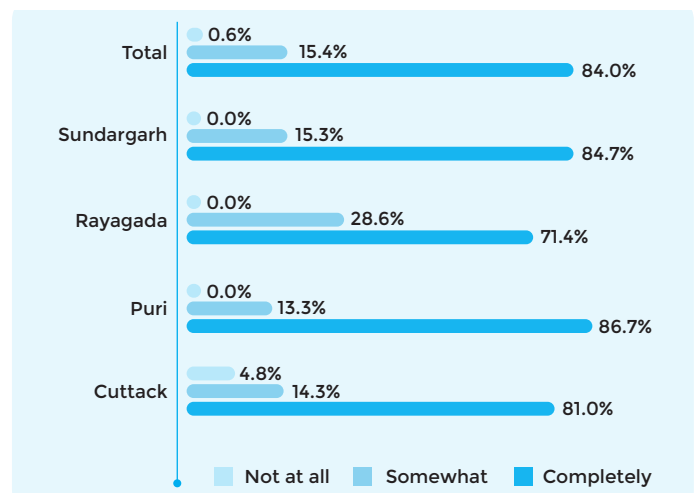
Figure 28: Perceived understanding of process (Visit to ULB)

iv. Perception of understanding and gender

A Chi-square association test was performed between the gender of the respondents and their perception of how well they understood the service process. The table below reveals that an equal percentage of respondents (84%), men and women, perceived to have understood the process completely. Please refer to annexure 7 for district-wise break-up of gender and their perception of understanding of process explained to them during their visit to ULB – Table A7-43.

Perceived understanding of process (n=156)	Gender	Cuttack (n=92)		Puri (n=12)		Rayagada (n=86)		Sundargarh (n=32)	
Were able to understand process completely (n=131, 84%)	Male (n=75, 84%)	8	80%	16	89%	100%	50%	50	83%
	Female (n=56, 84%)	9	82%	10	83%	67%	33%	33	87%
Were able to understand process to a certain extent (n=24, 15.4%)	Male (n=14, 16%)	2	20%	2	11%	0%	10%	10	17%
	Female (n=10, 15%)	1	9%	2	17%	33%	5%	5	13%
Did not understand the process (n=1, 0.6%)	Male (n=0, 0%)	0	0%	0	0%	0	0%	0	0%
	Female (n=1, 1%)	1	9%	0	0%	0	0%	0	0%

Table 25: Association between gender and perceived understanding of process (Visit to ULB)

No statistically significant association between the gender of the respondents and their perception if they clearly understood the process (p-Value 0.446); that is, both male and female respondents were equally able to understand the process completely during service booking. Similarly, the strength of the association was found to be very weak (φC 0.051).

	Clearly able to understand the process		Somewhat able to understand the process		Did not understand the process	
Coefficient	P-Value	φC	P-Value	φC	P-Value	φC
Phi	0.446	0.051	0.373	0.060	0.427	0.053
Cramer's V	0.446	0.051	0.373	0.060	0.427	0.053
Contingency	0.446	0.051	0.373	0.060	0.427	0.053
Y	0.446	0.051	0.373	0.060	0.427	0.053

Table 26: Strength of association between gender and perceived understanding of process (Visit to ULB)

Inference: Desludging services are currently being sought from private vendors/ individuals as well as the local municipality. Manual cleaning is prevalent (majorly in Puri).

Only 32% respondents reported visiting the municipality office and the remaining had either called the municipality office or the private service provider. The respondents who reported booking services telephonically were primarily men from Cuttack and Rayagada. Interestingly, no digital exclusion was observed through further analysis — this means that men and women were equally likely to book services telephonically. The same was observed among the respondents who had visited the municipality office to book services. None of the respondents were aware of any App or digital platform to book desludging services. Perception of understanding of service was found to be higher among those who had called to book the service as compared to those who had visited the municipality office. This can be attributed to better communication by the individuals dedicated to the toll-free numbers or the private vendors. No difference was observed between perception among men and women.

Non-availability of concerned ULB staff during office hours is concerning as respondents reported an average travel time of 30 minutes to the ULB office and having to leave their work to do so. Having to make multiple visits to book service could result in inconvenience as well as delays in addressing the problem. Non availability could also mean that a dedicated staff member has not been assigned yet and the staff member is responsible for multiple tasks.

3.7 Verification and desludging of septic tanks

Once the cesspool operator receives the information on the booking of service, a visit is made to the locality to verify the location; check the origin of the foul smell or leakage, if the septic tank is required to be emptied or repaired, or the toilet need to be unclogged; the accessibility of the septic tank is checked; and required length of the pipe is assessed; presence of any gas in the tank is checked. Once verified, a vehicle of appropriate size with the required length of pipe is dispatched to empty the tank.

In case there is gas, after informing the sanitation expert, the cesspool operator makes a hole in the tank or in the structure to let the gas out. Once the gas is drained from the tank, staff empties the tank with permission from the sanitation expert.

After emptying the tank, the cesspool supervisor/ driver/ helper collects the user fee through the PoS machine or in cash, gives a receipt to household members, and deposits the cash at their office (private operator/ municipality).

In cases where the cesspool operator refuses to empty the septic tank for any reason, the beneficiary details are shared with the other registered private Cesspool Operator.

Inference: The user fees charged by municipalities is only for desludging. However, the cesspool operators provide other services as well — not capturing this data will likely leave scope for discrepancies.

3.8 Faecal Sludge Treatment Plants

The FSTPs and Septage Treatment Plants (SeTPs) were handed over to the municipalities by the Department of Public Health.

Cuttack Municipal Corporation (CMC), bordering Bhubaneswar, has a population of 6,10,189 (2011 Census) spread across 59 wards. An FSTP/ SeTP of 60 Kilo Liters per Day (KLD) capacity was commissioned in 2020.

The plant employs co-treatment for septage management. The solids present in the septage are separated in a settling-cum-thickener tank, which is then taken to the sludge drying bed for drying and disposal. The liquid part is treated in the STP located adjacent to the plant. An STP of 36 Million Litres per Day (MLD) has been constructed at CDA Bidanasi area, Cuttack. The STP treats 36 MLD of effluent and provides sewage services in Cuttack. The executive agency of this STP is Odisha Water Supply and Sewerage Board, Govt. of Odisha, supported by the Japan International Cooperation Agency (JICA).

Puri Municipality (PM) has a population of 200,564 (2011 Census) spread across 32 wards. An FSTP/ SeTP of 50 KLD capacity was commissioned in 2018. The operation and maintenance of the SeTP is handled by the Water Corporation of Odisha (WATCO).

The FSTP has been installed as a co-treatment unit along with the waste stabilization pond-based sewage treatment with a capacity of 15 MLD. It is situated on the banks of the Dhaudia river, Mangala Ghat.

Rayagada Municipality (RM), bordering Parvatipuram, Andhra Pradesh, has a population of 71,208 (2011 Census) spread across 24 wards. An FSTP/ SeTP of 30 KLD capacity was commissioned in 2021.

Sundargarh Municipality (SM) has a population of 45,036 (2011 Census) spread across 19 wards. An FSTP/ SeTP of 20 KLD capacity was commissioned in 2021.

Item	Cuttack	Puri	Rayagada	Sundargarh
Population	6,10,189	200,564	71,208	45,036
No. of wards	59	32	24	19
FSTP/SeTP capacity	60 KLD	50 KLD	30 KLD	20 KLD
Commissioned in	2020	2018	2021	2021

Table 27: District-wise FSTP details

3.8.1 Operation and Maintenance of FSTP

Two models of FSTP management were observed in the four evaluation districts:

i. Private model

In Puri, the WATCO has hired private vendors to manage the FSTP and to provide desludging services. 'Puja Construction' has been hired to manage the FSTP's operations and 'OM' Construction has been hired to provide desludging services. This will be dealt with in detail under Cesspool vehicles and desludging further down in this report.

ii. SHG Model

FSTPs in Cuttack, Rayagada and Sundargarh are being managed by SHGs, one of which is an SHG composed of transgender individuals.

Cuttack: Since 2020, the operation and maintenance of the SeTP is handled by the Bahucharamata Transgender Self-Help Group (TG-SHG). The SHG has been awarded an annual contract value of Rs. 1.32 lakhs per month, including enumeration paid to the lab technician, male sanitation workers, and guards.

The SHG has 10 members – one president, one secretary, and eight members. Out of 10, seven members are working in various roles in the FSTP. The President is working as a Gardner; a secretary and three members are working as sanitation workers; and two members are responsible for the security of the FSTP and other activities of the plant. Additional resources have been hired such as a lab technician, sanitation workers and a guard.

Designation	No.	Salary range	Roles and responsibilities
TG-SHG members	7	Rs. 7,000 -10,000.	Gardner, sanitation workers, security
Lab technician	1		- Day-to-day technical operations (training not received yet) - Coordinating with the municipality for repairing and maintaining pumps, motors, pipes, etc. at the FSTP
Male guard	2	Rs. 7,000 - 8,000	Night duty
Male sanitation worker	3	Rs. 7,000 - 10,000	cleaning settler and drying beds; gardening, etc.

Table 28: Bahucharamata Transgender Self-Help Group

Rayagada: Since November 2021, the operation and maintenance of the SeTP has been handled by the Sandhya Self-Help Group (S-SHG). The SHG has been awarded an annual contract value of Rs. 92,000 per month including enumeration paid to the lab technician, sanitation workers, and guard. Rs. 2,000 per month has been earmarked for the maintenance cost of the plant.

The SHG has 10 members – one president, one

secretary, and eight members. Out of 10, seven members are working in various roles in FSTP. The President is working as a Gardner, and the secretary and five members are working as sanitation workers. The members of SHG support the SHG-President and the Lab Technician in carrying out the activities of the plant. Additional resources have been hired such as a lab technician, sanitation workers and a guard.

Designation	No.	Salary range	Roles and responsibilities
SHG members	7	Rs. 5,000	Gardner, sanitation workers, support in plant operation
Lab technician	1		- Day-to-day technical operations - Coordinating with the municipality for repairing and maintaining pumps, motors, pipes, etc. at the FSTP
Male guard	1	Rs. 5,000	Night duty
Male sanitation worker	2	Rs. 10,000	Cleaning settler ponds and drying beds; gardening, etc.

Table 29: Sandhya Self-Help Group

Sundargarh: The operation and maintenance of the SeTP is handled by the Netaji Self-Help Group (N-SHG) since November 2021. The SHG has been awarded an annual contract value of Rs. 93,000 per month, including enumeration paid to the lab technician, sanitation workers, and guard. Maintenance is taken care of by the municipality. If there is any wear and tear in the plant or any motor/ pump breaks down, the N-SHG shares details with the municipality. Later, the municipality gets the equipment repaired or reimburses the repair cost. The SHG has 10 members – one president, one secretary, and eight members. Out of 10, six members are working in various roles in the FSTP. The President is working as the plant manager, the secretary is working as the gardener, and the remaining members are working as sanitation workers, sweepers, and morning security, respectively. Additional resources have been hired as — i.e, lab technician, sanitation workers and guard.

Designation	No.	Salary range	Roles and responsibilities
SHG members	6	Rs. 10,000	Plant manager, sanitation workers, sweeper, security guard
Lab technician	1	Rs. 15,000	- Day-to-day technical operations - Coordinating with the municipality for repairing and maintaining pumps, motors, pipes, etc. at the FSTP
Male guard	2	Rs. 9,000	Night duty
Male sanitation worker	2	Rs. 10,000	Cleaning settler, ponds and drying beds; gardening, etc.

Table 30: Netaji Self-Help Group

3.8.2 Unloading sludge at FSTP/STP

FSTP Matagajapur in Cuttack; FSTP Raniguda in Rayagada; FSTP Sankara in Sundargarh and STP Mangla Ghat in Puri were indicated as the preferred unloading sites by the respondents in the four districts.

Municipal corporation cesspool vehicles were said to unload the sludge at the designated FSTPs. The private cesspool operators were said to be factoring in quality of road, traffic time and distance to FSTP/STP to decide if they wanted to unload at an FSTP/STP or illegally dump the sludge.

For example, private cesspool operators in Cuttack preferred to unload at STP, CDA as they had provided an inlet of the tank/ settler outside the facility where the cesspool operator can unload the sludge. Private operators also mentioned bad roads, railway crossings, and heavy traffic on the road to FSTP Matagajapur. There are also instances where the cesspool operators were required to re-route their vehicles from the FSTP to STP on account of unloading not being permitted due to low capacity and frequent overflows due to faulty equipment at FSTP. The FSTP management themselves call the truck drivers and inform them to go to STP. Instances of illegal dumping were shared by respondents from all districts except Puri. Instances were shared by SHG members and concerns were raised about possibility of collusion between night time security personnel and the unregistered cesspool operators, leading to emptying of their sludge at the FSTP without making an entry in the books.

Inference: On an average, 7-8 out of 10 SHG members have been employed at the FSTP but mostly work as gardeners, sanitation workers, day time security, etc., indicating gaps in capacity building efforts by the municipalities. Sundargarh was the only exception where the President of the SHG was working as a Plant Manager. Non-SHG members (men) have been hired as night time security personnel because the women/ transgender individuals do not feel safe to take on the night shift.

An interim arrangement has been arrived upon by offering a dual role to the lab technicians where they have been given the responsibility to coordinate with the municipality for repairing and maintaining pumps, motors, pipes, etc., at the FSTP. Interestingly, Cuttack FSTP was handed over to the SHG in 2020 but the lab technicians are yet to receive official training.

3.9 Current Service Tracking Mechanisms

3.9.1 Tracking of service request by customers

Currently there exists no tracking mechanism through which customers can track the day or time when the cesspool operator will arrive for desludging.

An informal system has been adopted where the phone number of the truck driver is shared with the customers after the verification visit by a representative of the cesspool operator.

31.5% (154 out of 489) respondents reported tracking their service request. More respondents from Rayagada (55.6%, n=55) and Cuttack (31%, n=44) reported tracking as compared to Sundargarh (27%, n=38) and Puri (15.9%, n=17). Please refer to annexure 7 for district-wise break-up of respondents who reported tracking service requests – Table A7-44.
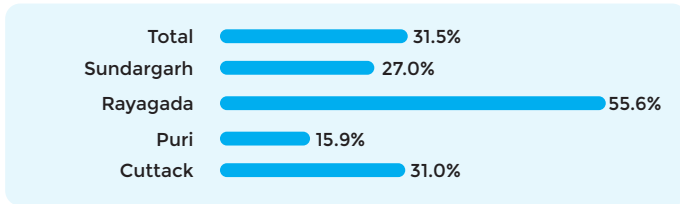
Figure 29: Tracking of service request

i. Service tracking and gender

A Chi-square association test was performed between the gender of the respondents and tracking of service requests. The table below reveals that a higher percentage of respondents that tracked services were men (57%, n=88) as compared to women (43%, n=66). Please refer to annexure 7 for district-wise break-up of respondents by gender who reported tracking service requests – Table A7-45.

Gender	Cuttack		Puri		Rayagada		Sundargarh	
Female (n=66, 43%)	20	45%	6	35%	24	44%	16	42%
Male (n=88, 57%)	24	55%	11	65%	31	56%	22	58%

Table 31: Association between gender and being able to track the status of request for services (n = 154)

No statistically significant association between the gender of the respondents and tracking of service requests (p-Value 0.470); that is, both male and female respondents were equally able to track the process. Similarly, the strength of the association was found to be very weak (φC 0.033).

Coefficient	P-Value	φC
Phi	0.470	0.033
Cramer's V	0.470	0.033
Contingency	0.470	0.033

Table 32: Strength of association between gender and being able to track the status of request for services

ii. Mode of tracking and successful tracking

154 respondents reported being able to track their service request. Overall use of the phone to follow up on services was found to be more common as compared to visiting the ULB office. 23% (n=36) respondents reported going to the ULB office to follow-up on their request, 36% (n=55) respondents reported calling the local service

provider, 35% (n=54) respondents reported calling the truck driver. Please refer to annexure 7 for district-wise break-up of respondents who reported tracking service requests – Table A7-46.
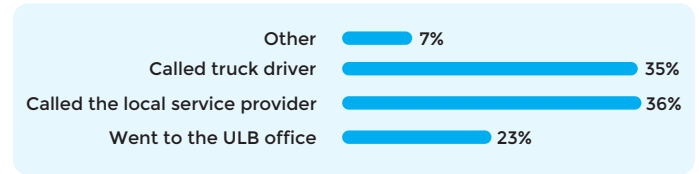
Figure 30: Association between successful tracking and mode of tracking

3.9.2 Tracking of Cesspool Vehicles by municipality

Global Positioning System (GPS) devices are required to be installed in all cesspool vehicles to enable live tracking from on-site containment to emptying of sludge at the FSTP. This is expected to curb illegal dumping of sludge.

Three out of four municipalities are yet to install GPS trackers in their cesspool vehicles. Only Rayagada municipality has installed GPS trackers in its cesspool vehicles. As mentioned earlier, Cuttack municipality has also registered a private operator (with his own cesspool vehicles); no GPS trackers have been installed by the private operator.

In most cases, the municipality staff call the cesspool drivers to track the cesspool vehicles; the only exception is Rayagada municipality which is using GPS application 'letstrack'.

Tracking of cesspool vehicles	Cuttack	Puri	Rayagada	Sundargarh
Registered private operators have installed GPS trackers	Yes	No	NA	NA
Municipality has installed GPS trackers	No	No	Yes	No
Mode of tracking				
Call to cesspool drivers	Yes	Yes	No	Yes
Call to FSTP	Yes	No	No	No
Using GPS application	No	No	Yes	No

Table 33: District-wise tracking of cesspool vehicles

Inference: Only 1 out of 4 municipalities, Rayagada, has installed GPS trackers and is using a GPS application 'letstrack' for live tracking of cesspool vehicles. Municipality staff in 2 out of the 3 municipalities are tracking the cesspool vehicles by calling the cesspool drivers. Cesspool vehicles are plying in 2 out of 4 municipalities without GPS trackers (Puri

3.10 Quality of service and Grievance redressal

3.10.1 Timeliness of service

379 out of 489 respondents could share information on timeliness of service provision. On an average, a two-day waiting period was reported. Waiting period was reported to be higher in Rayagada (3 days).

In total, 76% (289 out of 379) respondents shared that the services were provided in two days. Highest number of these respondents were from Sundargarh (n=116), Cuttack (n=79) and Rayagada (n=58). Lowest number of respondents who reported timely services were in Puri (n=36).

23.7% (90 out of 379) respondents shared that the services were delayed by more than three days. Highest number of these respondents were from Cuttack (n=35) and Rayagada (n=35). Please refer to annexure 7 for district-wise break-up of respondents who reported on timeliness of services – Table A7-47.
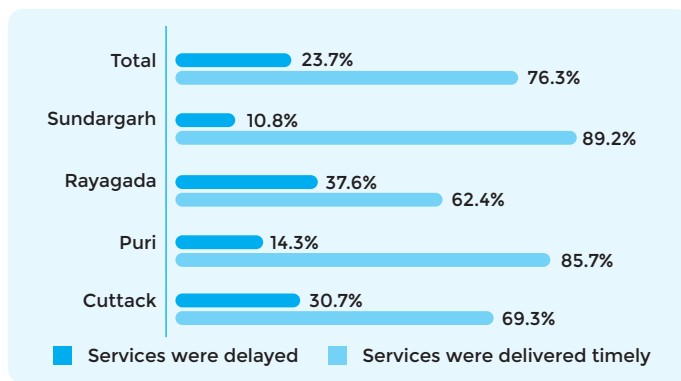
Figure 31: District-wise perceived timeliness of service provision

i. Association with mode of booking

A Chi-square association test was performed between mode of booking service and timeliness of service. The table below reveals that a higher percentage of respondents reported receiving timely service (within 2 days) had visited the ULB office to book services (80.8%, 126 out of 156) as compared to 73% (156 out of 379) respondents that had booked the service telephonically. Please refer to annexure 7 for district-wise break-up of mode of booking and timeliness of service – Table A7-48.

Mode	Delivery of service	Cuttack		Puri		Rayagada		Sundargarh	
Went to the ULB office (n=156)	Received the service on time (n=126, 80.8%)	9	42.9%	25	83.3%	7	100.0%	85	86.7%
	Service was delayed (n=30, 19.2%)	12	57.1%	85	16.7%	0	0.0%	13	13.3%

Mode	Delivery of service	Cuttack		Puri		Rayagada		Sundargarh	
Telephonic booking (n=2223)	Received the service on time (n=163, 73%)	70	76.0%	11	91.7%	51	59.3%	31	96.6%
	Service was delayed (n=59, 27%)	22	24.0%	1	8.3%	35	40.7%	1	3.1%

Figure 32: Association between mode of booking service and perceived timeliness of service provision (n=379)

There is a statistically significant association between the mode of booking service and timely delivery of service (p-Value<0.01); that is, respondents were able to receive timely service for in-person booking service i.e., by visiting the ULB. Similarly, the strength of the association was found to be moderate (φC 0.307).

Coefficient	P-Value	φC
Phi	0.000	0.307
Cramer's V	0.000	0.307
Contingency	0.000	0.307

Table 34: Strength of association between mode of booking service and perceived timeliness of service provision (n=379)

3.10.2 Quality of service

87 out of 489 respondents had faced challenges while availing desludging services. 30 respondents were from Cuttack, 28 from Rayagada, 16 from Puri and 13 from Sundargarh. Interestingly, only one respondent from Rayagada had filed a complaint.

The top 5 challenges included delay in services, continued backflow and/or foul smell (poor service quality), multiple visits to municipality office, poor accessibility to septic tank due to bad road and low-capacity cesspool truck requiring two visits (and double charges) to desludge a septic tank. Please refer to annexure 7 for district-wise break-up of challenges – Table A7-49.

S.No.	Challenge	Frequency (n=87)
1.	Delay in service	64
2.	Continued backflow and/or foul smell (poor service quality)	12
3.	Multiple visits to municipality office	6
4.	Challenges in accessibility to septic tank due to bad road	2
5.	Low-capacity cesspool truck requiring two visits for desludging a septic tank	1

Table 35: Top 5 suggestions/feedback to improve desludging services

3.10.3 Grievance Redressal

Easy process for registering complaints is a prerequisite to ensure that consumers avail the facility, and also contribute to improvement in service quality.

Of the 87 respondents who had shared that they had faced challenges, only one respondent from Rayagada had filed a written complaint. No one had responded to the complaint till the time of data collection.

Inference: The municipalities indicated that they aim to provide desludging services with 24 hrs. However, there is a delay of 2-3 days in service provision to all customers. If we factor in 48 hours as an acceptable period for service provision, there is a three-day delay in service provision to every 4th customer.

The service is more likely to be provided in two days for those who visit the ULB office to book service as compared to those who book the service telephonically. The customers make multiple follow up visits and/or calls which appears to not have been documented.

3.11 Sludge Treatment

Across the three SHGs, concerns were shared about the quality of sludge treatment. However, no reports were available to corroborate these concerns.

The SHG members mention that thus far no compost had been sold as there are no buyers.

The Cuttack FSTP was reported to be overflowing during monsoons. A budget has been allocated for maintaining the FSTP, but it is inadequate to address the root-cause of the problem — this was stated to be non-compliance with the recommended design and construction quality.

These issues have been raised with the Department of Public Health, but action was yet to be taken at the time of data collection.

3.12 Other challenges being faced by communities

The top 5 challenges shared by 1036 respondents included roads and other infrastructure, drainage related problems, drinking water, management of toilet and kitchen waste water, and electricity. Please refer to annexure 7 for district-wise break-up of challenges – Table A7-50.

S.No.	Challenge	Frequency (n=87)
1.	Roads and other infrastructure	412
2.	Drainage related problem	379
3.	Drinking water	377
4.	Toilets and kitchen waste water	257
5.	Electricity	151

Table 36: Other challenges being faced by the communities

Chapter 4:
Recommendations

Most of the households (94%, 970 out of 1036) own a flush to septic tank toilet. Most of these respondents believed a septic tank needs desludging once in seven years. Only 489 respondents reported that their septic tank had been emptied at least once in the last five years. Desludging behaviour is predominantly (337 out of 489) undertaken after the members of the household observe leakage, foul smell, or back flow in the toilet. The decision to desludge the septic tank is taken by the head of the household — in 90% cases these are men and 10% are women.

Only 19.8% (192 out of 970) respondents were found to be aware of the dimensions of their septic tank. The 489 respondents that had reported desludging of their septic tank in the last 4 years, shared that 250 had accessed the services from the local municipality, while 160 had used a private service provider and 77 had arranged for manual cleaning.

4.1 Information Education and Communication (IEC) Campaign

Awareness of the link between sanitation and disease prevalence in the community was found to be 59.1% (612 out of 1036 respondents).

An IEC campaign will play a key role in the necessary shift from need-based desludging to scheduled desludging. The following factors will need to be taken under consideration at the time of planning and execution of the IEC campaign:

INFORMATION: The communication material/ messaging will need to factor in ease of understanding by illiterate and literate people without formal education; self-explanatory infographics will be easier to understand for all stakeholders. The communication material/ messaging will need to be gender-neutral in text as well as images. IEC campaign will need to include information on:

- Link between sanitation and disease prevalence due to both – the sludge as well as contamination of ground water by sludge

- Information on number of users of toilet and the size of septic tanks to make a decision on scheduled desludging

- Information on toll free numbers that can be used to book services

- Information on digital platform that can be accessed to self-book services

- Information on feedback and grievance redressal

TARGET AUDIENCE: The campaign will need to target both men and women. The timing of the campaign will need to factor in availability and thus participation of both genders. Or, as complementary efforts, the campaign will need to cover the location of the households as well as their place of work.

4.2 Primary data for scheduled desludging

Some of the below-mentioned data points are being used currently* by the municipalities. However, a database is required for all households to shift to scheduled desludging.

Interestingly, the cesspool operators have been collecting useful data which can be leveraged. They visit the locality to verify the location of the complaint and check the origin of the foul smell or leakage/ backflow. The data captured falls into two broad categories:

NATURE OF SERVICE REQUIRED: The septic tank is required to be emptied, repaired or both; the toilet needs to be unclogged.

DESLUDGING REQUIREMENT: Accessibility of the septic tank, required length of the pipe, presence of any gas in the tank.

Additionally, the user fees being charged by municipalities is only for the desludging service — whether data on other services also need to be captured has to be discussed with the concerned department.

A list of potential indicators on which data needs to be captured is provided below:

- Name and address of the client*

- Width of the access street*

- Distance between the last point a four wheeled vehicle can reach and the septic tank*

- Number of adults sharing the toilet

- Type of toilet (flush to septic tank, flush to sewage or flush to open land/drain)

- Dimensions of the septic tank

- Type of septic tank (with or without a soak pit; single or twin-pit)

- Month and Year of last desludging

- Reason for desludging

- Service provider (FSTP/ government or private service provider)

- Number of trips made by the cesspool vehicle

- Amount paid for desludging

- Number of days between booking of service and service provision

- Feedback on quality of service

- Any complaints towards the service provider

GIS mapping of septic tanks could be an option worth exploring.

4.3 Service booking operators

There is a clear preference for booking services telephonically, however, State-designated tollfree number not being functional and non-dissemination of the alternate toll free numbers by the municipalities is a concern that will need to be addressed urgently. Designating a call centre operator or a municipality staff has been done by all the municipalities.

Capacity building of service booking operators is critical to ensure they communicate respectfully and appropriately, capture the required data on the digital platform, provide services in a timely manner, and record and escalate customer and cesspool operator grievances. Most critically, the service booking operators need to be skilled in the use of the digital platform in order to educate the citizens on how to use it independently.

4.4 Cesspool vehicles

Majority of cesspool vehicles purchased by the municipalities are of a large capacity and have shorter length of pipe (80-100 ft). Longer pipes are available, but the compressor in the cesspool vehicles is not calibrated to work efficiently with longer pipes. Smaller cesspool vehicles are better suited to servicing individual households as they offer higher accessibility to septic tanks on account of their smaller size and longer pipes up to 250 feet.

Additionally, the cesspool vehicles will need to be adequately equipped to handle solid sludge, clogging of toilets and drains due to the bulk materials disposed of in toilets, etc.

Given the current load for desludging, the operations can be managed with the existing vehicles; but as the demand increases, the municipalities will need to consider procuring more cesspool vehicles or bringing in more cesspool operators with their own vehicles.

4.5 Cesspool Vehicle Tracking

GPS devices are required to be installed in all cesspool vehicles.

There are three distinct models of cesspool operations in practice; it is unclear who is responsible for installing GPS trackers in the cesspool vehicles. A clear direction from the concerned department to the municipalities will be required to ensure installation of GPS trackers in all cesspool vehicles.

Additionally, tracking app 'letstrack' is being successfully used by Rayagada Municipality to live track its own cesspool vehicles from containment to emptying of the sludge at the FSTP. Live tracking is critical not only for curbing illegal dumping of sludge, but also for:

- - Tracking the FSTP/ STP where the sludge was emptied

- How many septic tanks were desludged during each trip

- How many trips were made to empty each septic tank

- Verification of user fees charged for the service

4.6 Sanitation Workers

Model Faecal Sludge and Septage Management Regulations, 2018 holds each ULB responsible for the safe management of FSSM within their jurisdiction. The regulations require the cesspool operators to ensure that all workers have protective gear and are trained to use the protective gear, and follow hygiene practices. Cesspool operators are required to ensure that all safety equipment are operational and in good condition, and that a first-aid kit and safety equipment are readily available in the vehicle before proceeding to a collection site.

Cesspool drivers, helpers, and sanitation workers at the FSTP are constantly exposed to wet as well as dry sludge. None of the sanitation workers (government or private) have been provided with protective gear as per regulations. The ULBs need to ensure that these regulations are adhered to. Additionally, the regular medical check-up of sanitation workers is recommended to ensure they are in good health.

A majority of the sanitation workers come from poor socio-economic backgrounds. Instances were reported where some households do not allow the sanitation workers inside their houses to check the overflow/ backflow/ foul smell. This cultural barrier could be addressed through soft skill training and on-site use of clean protective gear.

4.7 Sludge Treatment

Sludge treatment, in line with standards and norms, is critical for environmental safety as well as income generation through sale of treated waste. Some of the FSTPs were commissioned without adequate filling of the anaerobic baffled reactor tank and planted gravel filter. This could lead to seepage of sludge water into groundwater, as well as inadequate sludge treatment. Not only does this necessitate an inspection of all the FSTPs, but also points to the need for rigorous monitoring of lab reports for sludge treatment and groundwater.

The treated waste must be safe for use as compost; a certification should be provided/marked on each bag of compost that is sold.

4.8 Self Help Groups

Currently, the majority of SHG members are working as gardeners, sanitation workers and security guards. Only

one municipality has the President of an SHG working as a Plant Manager. Interim measures have been adopted by making the lab technicians ad-hoc plant managers. However, it needs to be emphasised that there is a need for:

- Capacity building and handholding of the SHG members to manage the FSTPs

- Re-evaluation of budget allocated for management of FSTP

- Timely payments to SHG

- Issuance of Registered ID cards/ registration number, and provision of benefits under the GARIMA Scheme

SHGs have been registered under the GARIMA scheme, however, no registered ID card/ registration number along with the scheme's benefits have been provided yet.

4.9 Stakeholder convergence

Currently there are no mechanisms to streamline the coordination between the private vendors, municipalities, Department of Public Health and WATCO, resulting in delayed sharing of data and information. eGov could consider adding more:

- 'Sarkaar' features in DIGIT, to improve stakeholder coordination.

- 'Bazaar' features that enable SHGs to network with agencies and individuals for sale of treated waste (compost).

4.10 Monitoring

There is a clear need for an interactive dashboard for regular monitoring by the department. While data will need to be captured on the above-mentioned indicators, not all of them are critical for monitoring. Dashboard could include indicators such as:

- Daily service booking calls and grievances received

- Daily service provision and grievance redressal

- Number of septic tanks emptied

- Number of trips made to empty each septic tank

- Location(s) where the service was provided

- Total payment received, and payment received by the municipal staff and cesspool operator (online and/or in cash)

- Quantum of compost sold

- Income through sale of compost

- Instances of flush-open drain toilets reported; Action taken by municipality

- Instances of illegal dumping reported; Action taken by municipality

- Action taken on cesspool operators/ households

- Instances of manual cleaning of septic tank reported; Action taken by municipality

Annexure 1:
List of 30 ULBs was provided by eGovernments Foundation

S.No.	Challenge	NAME OF THE FSTP (ULB)
1	Angul	Angul
2	Angul	Talcher
3	Balangir	Balangir
4	Balangir	Patnagarh
5	Balasore	Nilgiri
6	Bhadrak	Bhadrak
7	Cuttack	Cuttack
8	Cuttack	Choudwar
9	Gajapati	Paralakhemundi
10	Gajapati	Kashinagar
11	Ganjam	Aska
12	Ganjam	Hinjilicut
13	Ganjam	Surada
14	Jagatsinghpur	Jagatsinghpur
15	Jharsuguda	Belpahar
16	Jharsuguda	Brajarajnagar
17	Jharsuguda	Jharsuguda
18	Keonjhar	Joda
19	Khurda	Jatani
20	Khurda	Khordha
21	Nuapada	Khariar Road
22	Puri	Puri
23	Puri	Nimapara
24	Rayagada	Gunupur
25	Rayagada	Rayagada
26	Sambalpur	Sambalpur
27	Sambalpur	Kuchinda
28	Sonepur	Sonepur
29	Sundergarh	Rourkela
30	Sundergarh	Sundergarh

Annexure 2:
List of shortlisted ULBs

S.No.	LIST OF ULBs	DISTRICT	Tribal/Non-Tribal	Age of FSTP (Start Date of Operation)	Who is managing the FSTP - ULB, SHG or Private entity	Who is paying to SHG	CESSPOOL VEHICLE OPERATION MODE (Figures indicate no. of vehicles)		
							ULB Owned and Operated	ULB Owned and Private Operated	Privately Owned and Operated
1	Cuttack	Cuttack	Non-Tribal	01-01-2020	SHG	ULB	1		
2	G-Udaigiri	Kandha-mal	Tribal	27-04-2021	SHG	ULB	1		
3	Balangir	Balangir	Non-Tribal	31-03-2021	SHG	ULB	2		
4	Sundergarh	Sunder-garh	Tribal	31-03-2021	SHG	ULB	1		
5	Rayagada	Rayagada	Tribal	31-03-2021	SHG	ULB	2		2
6	Puri	Puri	Non-Tribal	31-10-2017	SHG	ULB		5	
7	Keonjhar	Keonjhar	Tribal	30-04-2022	SHG	ULB	2		1
8	Nabarangpur	Nabarang-pur	Tribal	03-09-2021	SHG	ULB	1		
9	Bhadrak	Bhadrak	Non-Tribal	21-03-2021	SHG	ULB	5		
10	Jharsuguda	Jharsug-uda	Non-Tribal	23-03-2021	SHG	ULB	3		

Annexure 3:
Beneficiary Survey Form

Section 1: Introduction and Consent of Household

1.1 Introduction:

"Greetings. We're with a research organization from Mumbai. We're conducting a survey on behalf of e-governments Foundation (eGov) on the provision of FSSM services in ULBs of Odisha. The objective of this survey is to understand the nature of FSSM services available to households. The findings of the survey shall be used to recommend necessary FSSM service-related policies. Hence, we would request you to please spare about half an hour of your time."

1.2 Qualifying Questions

Are you the person who is most knowledgeable and responsible for providing information on septic tank and FSSM services availed by the Household?

Yes	1	Start with the survey (Go to Q1.3)
No	2	Ask for the relevant person and recheck; If responsible person not available ask Q1.3 and close survey

1.3 In your opinion what are the main issues faced by the people in this locality?

Drinking water	1	
Toilets and waste water	2	
Solid waste management	3	
Roads and other infrastructure	4	
Healthcare	5	
Public safety	6	
Electricity	7	
Education	8	
Others	9	
All of the Above	10	Specify
None	11	

1.4 Consent

Thanks for answering the questions. If you're interested in participating in this survey, I would like to take approximately 30 minutes of your time or of any other HH member who you think is better suited to furnish this information.

Your participation is entirely voluntary. You may choose to discontinue the survey at any point or may choose to not answer any questions.

The information that you provide would remain confidential and anonymous, and only researchers who are involved in this study will have access to it. You will not receive any monetary benefit from this survey, however the information that you provide may give us important information that may be used by policy makers to improve the FSSM services in Odisha.

Would you like to participate in the survey? Yes/ No

Section 2: Identification Details

Q201	State	Odisha	
Q202	District	Cuttack	01
	(Single Response)	Puri	02
		Rayagada	03
		Sundargarh	04
Q203	Subdivision Name		
Q204	Tehsil Name		
Q205	Block Name		
Q206	Urban Local Body Name		
Q207	Ward		
Q208	Locality Name		
Q209	Whether the locality is a Slum? (Single Response)	Yes	01
		No	02
Q210	Household ID/address		
Q211	Name of respondent		
Q212	Age of respondent	_____ Years	

Q213	Gender of respondent	Male	01
	(Single Response)	Female	02
		Others	03
Q214	Literacy Level of Respondent	Not Literate	01
		Literate with no formal education	02
	(Single Response)	Primary School (8th Standard) (Drop out)	03
		Primary School (8th Standard) (Pass)	04
		Secondary School (10th Standard) (Drop out)	05
		Secondary School (10th Standard) (Pass)	06
		Intermediate (12th Standard)	07
		Diploma	08
		Graduate	09
		Post Graduate	10
		Other Specify	98
Q215	Relationship of respondent to Head of Household	Self	01
		Son	02
		Daughter	03
		Husband	04
		Wife	05
		Son-in-law	06
		Daughter-in-law	07
		Father	08
		Mother	09
		Others Specify	98
Q216	Gender of Head of Household	Male	01
		Female	02
	(Single Response)	Others	03
Q217	Who is the primary economic decision maker of the household?	Head of Household	01
		Oldest male adult	02
		Oldest female adult	03
		Other male adult	04
	(Single Response)	Other female adult	05

Q218	Nature of your occupancy in the house	Owned	01
		Rented/Leased	02
Q219	Duration of stay at present location (Approximate)	No. of Years	
		No. of Months	
Q220	Occupation of the Primary Earning Member	Self-employed in agriculture	01
		Self-employed in non-Agriculture	02
		Regular wage/salary earning in public sector	03
		Regular wage/salary earning in Private sector	04
	(Single Response)	Casual labour in agriculture	05
		Casual labour in non-agriculture	06
		Others Specify	98
Q221	Household Size (Number of Members)		

Q222	Number of family members in the family	Male	<=5 years		Female	<=5 years	
			6-15 years			6-15 years	
			16-60 years			16-60 years	
			>60 years			>60 years	

Q223	Religion	Hinduism	01
		Islam	02
	(Single Response)	Christianity	03
		Sikhism	04
		Jainism	05
		Buddhism	06
		Zoroastrianism	07
		Others Specify	98
		No Response	99
Q224	Social Group (Caste)	General	01
		OBC	02
	(Single Response)	SC	03
		ST	04
		Others Specify	98
		No Response	99
Q225	Contact/Mobile details		

Section 3: Access to FSSM Service

S. No.	Main Question	Response		Skip
Q301	Do you think using a toilet has any link with disease prevalence in the community? Give reason for your response. (Single Response)	Yes	01	
		No	02	
		Reason for response:		
Q302	Do you have a toilet in your house?	Yes	01	If No, End survey
		No	02	
Q303	Where is the toilet facility located? (Single Response)	In own dwelling	01	
		In own yard/plot	02	
		In building	03	
		Elsewhere	04	
Q304	Do you share this toilet facility with other households? (Single Response)	Yes	01	
		No	02	
		If yes, how many other households		
Q305	When was the toilet constructed? (Approximate month and year) (Single Response)	No. of Years		
		No. of Months		
		Do not know	98	
Q306	What type of toilet do you have?	Flush to septic tank	01	If code ≠ 01, End survey
		Flush to piped sewer system	02	
		Flush to pit latrine	03	
		Flush to open drains or open land	04	
		Flush to somewhere else	05	
		Flush, don't know where	06	
		Ventilated improved single Pit/ biogas latrine	07	
		Single pit latrine with slab	08	
		Single pit latrine without slab/ Open pit	09	
		Twin pit/ composting toilet	10	
		Dry toilet serviced by human	11	
		Dry latrine serviced by animal	12	
		No facility/ uses open space or field	13	
		Other Specify	98	

Q307	What is Septic Tank Structure (If code = 01 in Q306) (Single Response)	Three Chambered Septic Tank	01	
		Two Chambered Septic Tank	02	
		Single Chambered Septic Tank	03	
		Do not know	99	
Q308	Are you aware of the dimensions of the septic tank? (If code = 01 in Q306)	Yes	01	
		No	02	If No, Skip to Q310
Q309	If yes, please provide dimensions of the septic tank (mention unit of measurement in ft)	Length:		
		Breath:		
		Height:		
Q310	Are you aware if a septic tank requires to be emptied?	Yes	01	If No, skip to Q312
		No	02	
Q311	If yes, why must a septic tank be emptied?	Reason:		
Q312	How often should a septic tank of this size be emptied?	No. of Years		
		No. of Months		
		Do not know	99	
Q313	Have you ever gotten the septic tank in this house desludged/ emptied?	Yes	01	If No, End interview
		No	02	
		In the process	03	
Q314	If yes, what triggered the decision to get the septic tank emptied? (Single Response)	Leakage from the septic tank		
		Foul smell	02	
		Back flow in the toilet	03	
		No triggers but the emptying was overdue	04	
		Other Specify	98	
Q315	Who decided to get the septic tank emptied?	Head of Household	01	
		Oldest male adult	02	
		Oldest female adult	03	
		Other male adult	04	
		Other female adult	05	
Q316	Where was the septic tank emptier truck/tractor or the manual cleaner from?	Government Septic Tank Truck/ tractor	01	
		Private Septic Tank Truck/ tractor	02	
		Manual Cleaning	03	
		Other Specify	98	
		Do not know	99	
Q317	When was the Septic tank emptied? (Approximate month and year)	No. of Years		
		No. of Months		
		Do not know/ remember	99	

Q318	What was the waiting period for receiving desludging services after the request was made?	Number of days		
Q319	Are you aware of any application (app) or website that can be used for booking services?	Yes	01	If No, Skip to Q322
		No	02	
Q320	If yes, could you share the name of the App or Website.			
Q321	How did you come to know about the app or website? (Multiple Response)	Heard from peers/family members	01	
		Received a demo from an FLE	02	
		Heard through media	03	
		Heard from an NGO	04	
		Saw an advertisement	05	
		Other Specify	98	
Q322	How did you access the services?	Went to the ULB office or local service provider	01	If code = 04 or 98 Skip Q326
		Called the local service provider	02	
		Booked the service using an online App/website	03	
		Other Household member booked service	04	
		Other Specify	98	
Q323	If response is code = 01 in Q324: In-person engagement with ULB office and local service provider	Travel time	_____ min/hrs	
		ULB Office timings	___am - ___pm	
		I had to leave work to visit the ULB Office	01	
		I did not leave work to visit the ULB Office	02	
	Select any one option	Concerned staff available during office hours	03	
		Some concerned staff available during office hours	04	
		No concerned staff available during office hours	05	
	Select any one option	I was able to clearly understand the process shared by the office staff	06	
		I was able to understand some of the process shared by the office staff	07	
		I was not able to clearly understand the process shared by the office staff	08	
	Select any one option	Received the service on time	09	
		Service was delayed	10	

Q324	If response is code = 02 in Q322: Telephonic engagement with local service provider Select any one option	I was able to connect easily via phone	01	
		I was able to connect to some extent via phone	02	
		I was not able to connect via phone	03	
	Select any one option	I was able to clearly understand the process shared by the office staff	04	
		I was able to understand some of the process shared by the office staff	05	
		I was not able to clearly understand the process shared by the office staff	06	
	Select any one option	Received the service on time	07	
		Service was delayed	08	
Q325	If response is code = 03 in Q322: Online engagement via app/ website	I was able to connect easily via app or website	01	
		I was able to connect to some extent via app or website	02	
		I was not able to connect via app or website	03	
	Select any one option	I was able to clearly understand the process shared on the app or website	04	
		I was able to understand some of the process shared on the app or website	05	
		I was not able to clearly understand the process shared on the app or website	06	
	Select any one option	I was able to book the service easily	07	
		I somehow able to book the service	08	
		I was not able to book the service	09	
	Select any one option	Received the service on time	10	
		Service was delayed	11	
Q326	Were you able to track the status of your request for service?	Yes	01	If No, Skip to Q328
		No	02	
Q327	If yes, how were you able to track your request? (Multiple responses)	Went to the ULB office	01	
		Called the local service provider	02	
		Checked online	03	
		Called truck driver	04	
		Other Specify	98	
Q328	Did you face any challenge in accessing services or with the service provided?	Yes	01	If No, Skip to Q336
		No	02	
Q329	If yes, please elaborate on the nature of challenge you faced			
Q330	Have you filed any complaint?	Yes	01	If No, Skip to Q336
		No	02	
Q331	If yes, please elaborate on where the complaint has been filed.			

Q332	Were you able to track the status of your complaint?	Yes	01	
		No	02	
Q333	If yes, how were you able to track your complaint?	Went to the ULB office	01	
		Called the local service provider	02	
		Checked online	03	
		Other	98	
Q334	Has any action been taken on your complaint?	Yes	01	
		No	02	
Q335	If yes, please elaborate			
Q336	Do you think anything needs to be done to improve the services?	Yes	01	
		No	02	
Q337	If yes, please elaborate			
Q338	Would you like to provide any other feedback on the service you accessed?	Yes	01	
		No	02	
Q339	If yes, please elaborate			

Annexure 4:
Service Provider Survey Form

Name of respondent	
Age	_____ Years
Sex	Male: Female: Other:
Designation	
Role	
Name of Organisation/Institution/Entity	
Tenure in current role (Approximate month and year)	No. of Years: _____ No. of Months: _____

S. No.	Main Question
1	Are you responsible for receiving requests for FSSM services? i. If yes, how do you receive requests for services? ii. If No, are you aware of how the FSSM services are booked? (Probe: visits to households, calls by beneficiaries, informed by ULB/ SHG/ Private operator of FSTP, informed by superiors, receive information through an app – ask for the name of the App, etc.
2	Are you responsible for booking service requests? i. If yes, how do you book requests for FSSM services? (Probe: data recorded on paper/ personal diary/ excel sheets/ Website) ii. If No, are you aware how requests are booked for FSSM services? If yes, probe if the data recorded on paper/ personal diary/ excel sheets/ Website)
3	If response to use or awareness of app is Yes How did you come to know about the app or website? (Probe: Heard from peers/seniors, underwent training, heard through media, heard from an NGO, saw an advertisement, etc.)
4	Have you used any App or website to book FSSM services for yourself or for citizens? If yes, could you please rate the ease of use of FSSM services through app or website on a scale of 0-5, 5 being the highest. Connectivity: Easy to navigate: Easy to understand language: Promptness of service:

5	Are you required to track when pits are due for desludging in your jurisdiction? i. If yes, how do you track when a pit is due for desludging? (Probe: if data is available on location, type of construction, date of construction and size of pits; number of family members using the toilet, tentative duration for desludging) ii. If No, are you aware if there is a mechanism in place to track when a pit is due for desludging? (Probe: if data is available on location, type of construction, date of construction and size of pits; number of family members using the toilet, tentative duration for desludging)
6	Are you aware if there is a system in place to track the movement of the cesspool trucks while they are enroute to the household/ emptying the pit/ transporting the sludge/ emptying the sludge? i. If yes, probe how the movement is tracked; if the tracking is available in real time, periodically or as and when required. ii. If No, are there any mechanisms through which the ULB or service providers are able to receive information on where the truck has been unloaded? If yes, please elaborate.
7	Are you aware of where the cesspool trucks usually unload the FS? i. If yes, please elaborate (Probe: a site designated by the authorities, a site that is not authorised, at an FSTP, just anywhere, etc.)
8	Have you received any complaints from beneficiaries regarding poor service provision or lack of service provision? i. If yes, please elaborate ii. If no, are you aware if any beneficiary complaints have been received by your office regarding poor service provision or lack of service provision? If yes, please elaborate iii. If response to i or ii is Yes How do the beneficiaries' complain? (Prove: verbal complaints through calls, beneficiaries visit the office and inform us verbally, beneficiaries submit a written complaint, we write their complaint and register it, etc.) iv. Are mechanisms in place to keep the beneficiaries informed on the progress of their complaints? If yes, please elaborate v. Has any action been taken on the complaints? If yes, pls elaborate
9	Do you face any challenge in service provision? If yes, pls elaborate (Probe areas: Manpower, budget, service equipment, cesspool trucks, IT equipment and skills, access to pits, containment, transportation, emptying and treatment)
10	Do you think anything needs to be done to improve the services? If yes, please elaborate
11	Would you like to provide any other feedback on the service being provided? If yes, please elaborate

Annexure 5:
State Officials Survey Form

Name of respondent	
Age	_____ Years
Sex	Male: Female: Other:
Designation	
Role	
Name of Organisation/Institution	
Tenure in current role (Approximate month and year)	No. of Years: _____ No. of Months: _____

S. No.	Main Question
1	What are the current practices in FSSM in the state? (Probe: containment, transportation, treatment, reuse)
2	Are there mechanisms in place to track the services? i. If yes, please elaborate. ii. If no, what are the challenges in setting up such mechanisms?
3	In your opinion, what are the FSSM data parameters that can help in monitoring and decision making?
4	Are data on all these parameters available? (If yes, probe: frequency – Real time/ periodic/ as and when required; format – Excel/ Word/ PPT; completeness of indicators – are there any missing indicators?)
5	Is there scope for improvement in data and its availability for monitoring and decision making? If yes, please elaborate (Probe: frequency – Real time/ periodic/ as and when required; format – Excel/ Word/ PPT; completeness of indicators – are there any missing indicators?)
6	Are any apps or websites being used to enable service provision to citizens? If yes, could you share the year since when the apps/ websites were launched? Also, can you please share the name of the app/ website?
7	Have you used any app or website? If yes, could you please rate the ease of use of FSSM services through app or website on a scale of 0-5, 5 being the highest. Connectivity: Easy to navigate: Easy to understand language: promptness of service:
8	Are the citizens and FLEs using these apps/ websites? If yes, did the department play any role in awareness or capacity building of these stakeholders? If yes, please elaborate – for citizens, for FLEs, etc.
9	Has any other initiative been taken to ensure use of an app/ website by FLEs? If yes, please elaborate (Probe: if any notifications have been issued. If yes, take details)
10	Are any incentives being provided to FLEs to use the apps/ websites? If yes, please elaborate
11	In your opinion, is there a need to improve services? If yes, please elaborate on what are the areas that require action. (Probe: Manpower, budget, IT equipment and skills, containment, transportation, emptying and treatment)
12	In your opinion, how can the Department be strengthened to improve the FSSM services? (Probe: support required and also who can provide the support)
13	Are you aware of any papers or case studies published on FSSM platform (digital platform) in Odisha? If yes, have you had the time to review these publications? If yes, in your opinion, how effective have these publications been in building readers' understanding on the digital platform or the issue of sanitation in the state? Please elaborate.

Annexure 6:
NGO/Partner Organisation Survey Form

Name of respondent	
Age	_____ Years
Sex	Male: Female: Other:
Designation	
Role	
Name of Organisation/Institution	
State	
Tenure in current role (Approximate month and year)	No. of Years: _____ No. of Months: _____

S. No.	Main Question
1	What is your organisation's role in FSSM in Odisha?
2	What are the current practices in FSSM in the state? (Probe: containment, transportation, treatment, reuse)
3	Are there mechanisms in place to track the services? i. If yes, please elaborate. ii. If no, what are the challenges in setting up such mechanisms?
4	In your opinion, what are the FSSM data parameters that can help in monitoring and decision making?
5	Is data on all these parameters available? If yes, (Probe: frequency – Real time/ periodic/ as and when required; format – Excel/ Word/ PPTl completeness of indicators – are there any missing indicators?)
6	Is there scope for improvement in data and its availability for monitoring and decision making? If yes, please elaborate (Probe: frequency – Real time/ periodic/ as and when required; format – Excel/ Word/ PPT; completeness of indicators – are there any missing indicators?)
7	Are any apps or websites being used to enable service provision to citizens? If yes, could you share the year since when the apps/ websites were launched? Also, can you please share the name of the app/ website?
8	Have you used any app or website? If yes, could you please rate the ease of use to FSSM services through app or website on a scale of 0-5, 5 being the highest. Connectivity: Easy to navigate: Easy to understand language: Promptness of service:
9	Are the citizens and FLEs using these apps/ websites? If yes, did the government play any role in awareness or capacity building of these stakeholders? If yes, please elaborate – for citizens, for FLEs, etc.
10	Has any other initiative been taken to ensure use of an app/ website by FLEs? If yes, please elaborate (Probe: if any notifications have been issued. If yes, take details)
11	Are any incentives being provided to FLEs to use the apps/websites? If yes, please elaborate
12	In your opinion, is there a need to improve the services? If yes, please elaborate on what are the areas that require action? (Probe: Manpower, budget, IT equipment and skills, containment, transportation, emptying and treatment)
13	In your opinion, how can the sanitation govt. department be strengthened to improve the FSSM services? (Probe: support required and also who can provide the support)
14	Are you aware of any papers or case studies published on FSSM platform (digital platform) in Odisha? If yes, have you had the time to review these publications? If yes, in your opinion, how effective have these publications been in building readers' understanding on the digital platform or the issue of sanitation in the state? Please elaborate.
15	Are you a part of any advocacy group or coalition? If yes, has the group/ coalition made any efforts to advocate on the issue with government stakeholders at state or national level? If yes, pls elaborate.
16	Do you think the advocacy thus far has been productive? Give reason for your response (Probe: what more is required to be done in advocacy space)

Annexure 7:
District-wise Findings

TableA7-01: Religion of respondents (N=1036)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Hinduism	237	96.3%	259	100.0%	250	97.7%	260	94.5%	1006	97.1%
Islam	9	3.7%	0	0%	6	2.3%	10	3.6%	25	2.4%
Christianity	0	0%	0	0%	0	0%	5	1.8%	5	0.5%

Table A7-02: Social category of respondents (N=1036)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
General	138	56.1%	182	70.3%	133	52.0%	141	51.3%	594	57.3%
OBC	51	20.7%	51	19.7%	57	22.3%	30	10.9%	189	18.2%
ST	10	4.1%	7	2.7%	38	14.8%	69	25.1%	124	12.0%
SC	42	17.1%	19	7.3%	26	10.2%	30	10.9%	117	11.3%
No Respose	5	2.0%	0	0%	2	.8%	5	1.8%	12	1.2%

Table A7-03: Head of households (N=1036)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Female	21	8.5%	31	12.0%	26	10.2%	34	12.4%	112	10.8%
Male	225	91.5%	228	88.0%	230	89.8%	241	87.6%	924	89.2%

Table A7-04: Gender-wise head of household vs Primary economic decision makers (N=1036)

		Cuttack		Puri		Rayagada		Sundargarh		Total	
		n	%	n	%	n	%	n	%	n	%
Female	Head of Household	21	8.5%	31	12.0%	26	10.2%	34	12.4%	112	10.8%
	Primary Economic Decision maker	16	76.2%	20	65.5%	24	92.3%	26	76.5%	86	76.8%
Male	Head of Household	225	91.5%	228	88.0%	230	89.8%	241	87.6%	924	89.2%
	Primary Economic Decision maker	215	95.6%	223	97.8%	223	97%	233	96.7%	894	96.8%

Table A7-05: Primary income of households (N=1036)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Self-employed in Non-Agriculture	97	39%	143	55%	72	28%	81	29%	393	38%
Regular wage/salary earning in public sector	58	24%	41	16%	83	32%	93	34%	275	27%
Regular wage/salary earning in private sector	29	12%	39	15%	36	14%	43	16%	147	14%
Casual labour in non-agriculture	28	11%	25	10%	36	14%	26	9%	115	11%
Self-Employed in agriculture	29	12%	5	2%	17	7%	11	4%	62	6%
Casual labour in agriculture	4	2%	6	2%	7	3%	18	7%	35	3%
Others-specify	1	0%	0	0%	5	2%	3	1%	9	1%

Table A7-06: Relationship of respondent with head of households (N=1036)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Self	121	49.2%	170	65.6%	143	55.9%	148	53.8%	582	56.2%
Wife	77	31.3%	58	22.4%	68	26.6%	76	27.6%	279	26.9%
Son	33	13.4%	16	6%	25	9.8%	27	9.8%	101	9.7%
Daughter-in-law	6	2.4%	10	3.9%	7	2.7%	13	4.7%	36	3.5%
Daughter	5	2.0%	3	1.2%	8	3.1%	8	2.9%	24	2.3%
Mother	1	0.4%	0	0.0%	4	1.6%	2	0.7%	7	0.7%
Other specify	3	1.2%	1	0%	1	0%	1	0.4%	6	0.6%
Son-in-law	0	0.0%	1	.4%	0	.0%	0	.0%	1	.1%

Table A7-07: Gender of the respondents (N=1036)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Female	109	44.3%	98	37.8%	112	43.8%	129	46.9%	448	43.2%
Male	137	55.7%	161	62.2%	144	56.3%	146	53.1%	588	56.8%

Table A7-06: Relationship of respondent with head of households (N=1036)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Not Literate	6	2.4%	24	9.3%	22	8.6%	16	5.8%	68	6.6%
Literate with no formal education	14	5.7%	24	9.3%	32	12.5%	16	5.8%	86	8.3%
Primary School	69	28%	81	31%	40	16%	33	12%	223	22%
Secondary School	68	28%	62	24%	73	29%	71	26%	274	26%
Intermediate School	20	8.1%	23	8.9%	29	11.3%	49	17.8%	121	11.7%
Graduate	47	19%	34	13%	39	15%	64	23%	184	18%
Post Graduate	15	6.1%	4	1.5%	12	4.7%	7	2.5%	38	3.7%
Diploma	6	2.4%	7	2.7%	9	3.5%	19	6.9%	41	4.0%
Other	1	0.4%	0	0.0%	0	0.0%	0	0.0%	1	0.1%

Table A7-09: Awareness of link between sanitation and disease prevalence (N=1036)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Clean environment	26	11%	35	14%	18	7%	20	7%	99	10%
Preventing diseases	124	50%	129	50%	181	71%	184	67%	618	59%
Privacy	8	3%	76	29%	16	6%	48	17%	148	14%
Safety - Women and Child	15	6%	85	33%	28	11%	59	21%	187	18%
Shelter from sun and rain	7	3%	3	1%	11	4%	4	1%	25	2%
Support in maintaining dignity and respect and mental peace	1	0%	3	1%	2	1%	3	1%	9	1%
No linkages	0	0%	2	1%	1	0%	0	0%	3	0%
Do not know	70	28%	5	2%	14	5%	7	3%	96	9%
Other	5	2%	4	2%	8	3%	5	2%	22	2%
Total	246	100%	259	100%	256	100%	275	100%	1036	100%

Table A7-10: Gender of the respondents and the awareness of the link between sanitation and disease prevalence (n=618)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Female	58	46.8%	52	40.3%	80	44.2%	87	47.3%	277	44.8%
Male	66	53.2%	77	59.7%	101	55.8%	97	52.7%	341	55.2%

Table A07-11: Education of the respondents and the awareness of the link between sanitation and disease prevalence (n=618)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Not Literate	4	3.2%	13	10.1%	15	8.3%	10	5.4%	42	6.8%
Literate with no formal education	6	4.8%	15	11.6%	24	13.3%	14	7.6%	59	9.5%
Primary School	30	24.2%	39	30.3%	29	16.0%	18	9.8%	116	18.7%
Secondary School	38	30.6%	30	23.3%	55	30.4%	42	22.9%	165	26.7%
Intermediate	13	10.5%	10	7.8%	18	9.9%	31	16.8%	72	11.7%
Graduate	19	15.3%	16	12.4%	25	13.8%	48	26.1%	108	17.5%
Post Graduate	6	4.8%	2	1.6%	8	4.4%	6	3.3%	22	3.6%
Diploma	4	3.2%	4	3.1%	3	1.7%	15	8.2%	26	4.2%
Others	4	3.2%	0	0.0%	4	2.2%	0	0.0%	8	1.3%

Table A7-12: Awareness of desludging (N=970)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Yes	211	90.9%	207	97.6%	240	95.6%	267	97.1%	925	95.4%
No	21	9.1%	5	2.4%	11	4.4%	8	2.9%	45	4.6%

Table: A07-13: Gender of the respondents and awareness of the desludging of septic tank (n=970)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Female	90	89.1%	82	98.8%	101	92.7%	124	96.1%	397	94.1%
Male	121	92.4%	125	96.9%	139	97.9%	143	97.9%	528	96.4%

Table A7-14: Education of the respondents and awareness of the desludging of septic tank (n=970)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Not Literate	5	100.0%	19	95.0%	18	90.0%	14	87.5%	56	91.8%
Literate with no formal education	9	64.3%	19	100.0%	27	90.0%	15	93.8%	70	88.6%
Primary School	56	87.5%	64	94.1%	37	92.5%	33	100.0%	190	92.7%
Secondary School	59	92.2%	50	100.0%	72	98.6%	69	97.2%	250	96.9%
Intermediate	18	90.0%	20	100.0%	29	100.0%	48	98.0%	115	97.5%
Graduate	40	97.6%	23	100.0%	33	100.0%	62	98.4%	158	98.8%
Post Graduate	13	100.0%	3	100.0%	9	90.0%	7	100.0%	32	97%
Diploma	5	100.0%	7	100.0%	8	88.9%	18	94.7%	38	95%
Others	6	100.0%	2	100.0%	7	100.0%	1	100.0%	16	100%
	211	90.9%	207	97.6%	240	95.6%	267	97.1%	925	95.4%

Table: A7-15: Reason for desludging (n=925)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Backflow	83	39%	83	40%	108	45%	96	36%	370	40%
Tank full/Over flow	115	55%	118	57%	120	50%	158	59%	511	55%
Leakage because of breach in tank structure	1	0%	5	2%	10	4%	4	1%	20	2%
Foul smell	32	15%	36	17%	36	15%	33	12%	137	15%
Desludge within 3 years	0	0%	0	0%	0	0%	1	0%	1	0.1%
No reason (to keep toilet clean)	0	0%	0	0%	0	0%	3	1%	3	0.3%

Table A7-16: Respondents who reported that their septic tank was desludged in the past

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Yes	142	61.2%	107	50.5%	99	39.4%	141	51.3%	489	50.4%
No	90	38.8%	105	49.5%	152	60.6%	134	48.7%	481	49.6%

Table A7-17: Reason for emptying the septic tank

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Leakage from the septic tank	25	18%	36	34%	28	30%	48	34%	137	28%
Foul smell	49	35%	45	42%	35	38%	54	38%	183	38%
Back flow in the toilet	105	74%	82	77%	52	56%	98	70%	337	70%
No triggers but the emptying was overdue	16	11%	16	15%	27	29%	29	21%	88	18%

Table A7-18: Ownership of Toilets (N=1036)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Yes	243	98.8%	256	98.8%	254	99.2%	275	100.0%	1028	99.2%
No	3	1.2%	3	1.2%	2	0.8%	0	0.0%	8	0.8%

Table A7-16: Respondents who reported that their septic tank was desludged in the past

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Elsewhere	0	0%	0	0%	0	0%	1	.4%	1	.1%
In the building	5	2.1%	23	9.0%	26	10.2%	27	9.8%	81	7.9%
Inside the house	191	78.6%	156	60.9%	204	80.3%	200	72.7%	751	73.1%
In own yard/plot	47	19.3%	77	30.1%	24	9.4%	47	17.1%	195	19.0%

Table A7-20: Sharing of toilets (n=1028)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Yes	10	4.1%	16	6.3%	1	.4%	15	5.5%	42	4.1%
No	233	95.9%	240	93.8%	253	99.6%	260	94.5%	986	95.9%

Table A7-21: Number of households sharing a toilet with other households (n=42)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
One household	1	10.0%	2	12.5%	1	100.0%	5	33.3%	9	21.4%
Two Households	5	50.0%	12	75.0%	0	0%	7	46.7%	24	57.1%
Three households	1	10.0%	2	12.5%	0	0%	2	13.3%	5	11.9%
Four households	1	10.0%	0	0%	0	0%	1	6.7%	2	4.8%
Do not know	2	20.0%	0	0%	0	0%	0	0%	2	4.8%

Table A7-22: Average household size (N=1036)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Avg. household size (in years)	5	5	5	5	5	100.0%	5	33.3%	9	21.4%
Male - Avg. number of family members - 16-60 years age group	2	2	2	2	2	0%	7	46.7%	24	57.1%
Female - Avg. number of family member- 16-60 years age group	2	2	2	2	2	0%	2	13.3%	5	11.9%
Male - Avg. number of family members - Above 60 years age group	0.2	0.1	0.1	0.2	0.1	0%	1	6.7%	2	4.8%
Female - Avg. number of family member- Above 60 years age group	0.1	0.2	0.1	0.1	0.1	0%	0	0%	2	4.8%
Male - Avg. number of family members - 0-5 years age group	0.1	0.1	0.1	0.1	0.1	100.0%	5	33.3%	9	21.4%

Female - Avg. number of family member- 0-5 years age group	0.1	0.1	0.1	0.1	0.1	0%	7	46.7%	24	57.1%
Male - Avg. number of family members - 6-15 years age group	0.5	0.3	0.3	0.3	0.3	0%	2	13.3%	5	11.9%
Female - Avg. number of family member- 6-15 years age group	0.4	0.3	0.2	0.3	0.0	0%	1	6.7%	2	4.8%

Table A7-23: Years of construction of toilets (n=1028)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Average (in years)	19		18		15		16		17	
1 month	0	0%	1	0%	0	0%	0	0%	1	0%
1-5 years	35	14%	44	17%	66	26%	62	23%	207	20%
6-10 years	54	22%	60	23%	61	24%	56	20%	231	22%
11-15 years	42	17%	33	13%	39	15%	48	17%	162	16%
16-20 years	45	19%	36	14%	33	13%	50	18%	164	16%
21-25 years	15	6%	18	7%	18	7%	17	6%	68	7%
26-30 years	25	10%	29	11%	17	7%	18	7%	89	9%
More than 30 years	22	9%	35	14%	20	8%	23	8%	100	10%
Do not know	5	2%	0	0%	0	0%	1	0%	6	1%

Table A7-23: Years of construction of toilets (n=1028)

Sharing of toilets	Construction of toilets	Cuttack		Puri		Rayagada		Sundargarh		Total	
		n	%	n	%	n	%	n	%	n	%
Not sharing toilets with other households	0-5 years	34	14.9%	45	18.8%	66	26.1%	60	23.2%	205	20.9%
	6-10 years	53	23.2%	54	22.5%	61	24.1%	52	20.1%	220	22.4%
	11-15 years	42	18.4%	31	12.9%	39	15.4%	44	17.0%	156	15.9%
	16-20 years	40	17.5%	35	14.6%	32	12.6%	49	18.9%	156	15.9%
	21-25 years	15	6.6%	17	7.1%	18	7.1%	15	5.8%	65	6.6%
	26-30 years	23	10.1%	29	12.1%	17	6.7%	16	6.2%	85	8.7%
	More than 30 years	21	9.2%	29	12.1%	20	7.9%	23	8.9%	93	9.5%
Sharing toilets with other households	0-5 years	1	10.0%	0	0.0%	0	0.0%	2	13.3%	3	7.1%
	6-10 years	1	10.0%	6	37.5%	0	0.0%	4	26.7%	11	26.2%
	11-15 years	0	0.0%	2	12.5%	0	0.0%	4	26.7%	6	14.3%
	16-20 years	5	50.0%	1	6.3%	1	100.0%	1	6.7%	8	19.0%
	21-25 years	0	0.0%	1	6.3%	0	0.0%	2	13.3%	3	7.1%
	26-30 years	2	20%	0	0.0%	0	0.0%	2	13.3%	4	9.5%
	More than 30 years	1	10%	6	37.5%	0	0.0%	0	0.0%	7	16.7%

Table A7-25: Location of the toilet and construction of a toilet (n=1028)

Location of toilets	Construction of toilets	Cuttack		Puri		Rayagada		Sundargarh		Total	
	Years	n	%	n	%	n	%	n	%	n	%
Elsewhere	0-5 years	1	20.0%	3	13.0%	11	42.3%	6	22.2%	21	25.9%
In building	6-10 years	1	20.0%	7	30.4%	9	34.6%	4	14.8%	21	25.9%
	11-15 years	0	0%	4	17.4%	0	0%	6	22.2%	10	12.3%
	16-20 years	2	40.0%	3	13.0%	3	11.5%	5	18.5%	13	16.0%
	21-25 years	1	20.0%	3	13.0%	1	3.8%	4	14.8%	9	11.1%
	26-30 years	0	0%	1	4.3%	2	7.7%	1	3.7%	4	4.9%
	More than 30 years	0	0%	2	8.7%	0	0%	1	3.7%	3	3.7%
In own dwelling	0-5 years	26	13.9%	24	15.4%	48	23.5%	38	19.0%	136	18.2%
	6-10 years	43	23.0%	33	21.2%	47	23.0%	40	20.0%	163	21.8%
	11-15 years	30	16.0%	18	11.5%	35	17.2%	36	18.0%	119	15.9%
	16-20 years	38	20.3%	22	14.1%	28	13.7%	41	20.5%	129	17.3%
	21-25 years	11	5.9%	13	8.3%	14	6.9%	10	5.0%	48	6.4%
	26-30 years	21	11.2%	21	13.5%	14	6.9%	14	7.0%	70	9.4%
	More than 30 years	18	9.6%	25	16.0%	18	8.8%	21	10.5%	82	11.0%
In own yard/plot	0-5 years	8	17.4%	18	23.4%	7	29.2%	18	39.1%	51	26.4%
	6-10 years	10	21.7%	20	26.0%	5	20.8%	12	26.1%	47	24.4%
	11-15 years	12	26.1%	11	14.3%	4	16.7%	6	13.0%	33	17.1%
	16-20 years	5	10.9%	11	14.3%	2	8.3%	3	6.5%	21	10.9%
	21-25 years	3	6.5%	2	2.6%	3	12.5%	3	6.5%	11	5.7%
	26-30 years	4	8.7%	7	9.1%	1	4.2%	3	6.5%	15	7.8%
	More than 30 years	4	8.7%	8	10.4%	2	8.3%	1	2.2%	15	7.8%

Table A7-26: Type of toilets (n=1028)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Flush to open drains or open land	8	3.3%	1	0.4%	2	0.8%	0	0.0%	11	1.1%
Flush to piped sewer system	3	1.2%	43	16.8%	1	0.4%	0	0.0%	47	4.6%
Flush to septic tank	232	95.5%	212	82.8%	251	98.8%	275	100.0%	970	94.4%

Table A7-27: Type of Septic tank (n=970)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Single Chambered Septic Tank	98	42.2%	87	41.0%	107	42.6%	107	38.9%	399	41.1%
Two Chambered Septic Tank	128	55.2%	121	57.1%	140	55.8%	161	58.5%	550	56.7%
Three Chambered Septic Tank	3	1.3%	3	1.4%	4	1.6%	7	2.5%	17	1.8%
Do not know	3	1.3%	1	0.5%	0	0%	0	0%	4	0.4%

Table A7-28: Service provider (n=489)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Government Septic Tank Truck/tractor	71	50%	44	41%	22	22%	113	80%	250	51%
Private Septic Tank Truck/tractor	60	42%	6	6%	74	75%	20	14%	160	33%
Manual Cleaning	9	6%	57	53%	3	3%	8	6%	77	16%
Do not know	2	1%	0	0%	0	0%	0	0%	2	0.4%

Table A7-29: Booking of desludging service (n=489)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Called the local service provider	93	65.5%	12	11.2%	86	86.9%	32	22.7%	223	46%
Went to the ULB office or local service provider	21	14.8%	30	28.0%	7	7.1%	98	69.5%	156	32%
Other Household member booked service	21	14.8%	5	4.7%	6	6.1%	8	5.7%	40	8%
Local Cleaner	8	5.6%	60	56.1%	0	0.0%	3	2.1%	71	15%

Table A7-30: Telephone engagement (n=223)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Called the local service provider	93	41.3%	12	5.4%	86	38.6%	32	14.3%	223	100%

Table A7-31: Ease of connectivity via phone for booking of desludging service (n=222)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
I was able to connect easily via phone	93	41.3%	12	5.4%	86	38.6%	32	14.3%	223	100%
I was able to connect to some extent via phone	18	19.6%	1	8.3%	34	39.5%	2	6.3%	55	24.8%

Table A7-32: Gender and ease of connectivity via phone for booking of desludging service (n=222)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Female	32	34%	5	42%	32	37%	17	53%	86	39%
I was able to connect easily via phone	26	81%	4	80%	16	50%	16	94%	62	72%
I was able to connect to some extent via phone	6	19%	1	20%	16	50%	1	6%	24	28%

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Male	60	66%	7	58%	54	63%	15	47%	136	61%
I was able to connect easily via phone	48	80%	7	100%	36	67%	14	93%	105	77%
I was able to connect to some extent via phone	12	20%	0	0%	18	33%	1	7%	31	23%

Table A7-33: Respondents' perception of understanding of process explained to them telephonically (n=222)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Completely	69	75.0%	10	83.3%	45	52.3%	28	87.5%	152	68.5%
Somewhat	22	23.9%	2	16.7%	40	46.5%	4	12.5%	68	30.6%
Not at all	1	1.1%	0	0%	1	1%	0	0%	2	0.9%

Table A7-34: Gender and their perception of understanding of process explained to them telephonically (n=222)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Female										
Completely	25	78%	4	80%	14	44%	14	82%	57	66%
Somewhat	7	22%	1	20%	17	53%	3	18%	28	33%
Not at all	0	0%	0	0%	1	3%	0	0%	1	1%
	Cuttack		Puri		Rayagada		Sundargarh		Total	
Male										
Completely	44	72%	6	86%	31	57%	14	93%	95	69%
Somewhat	15	25%	1	14%	23	43%	1	7%	40	29%
Not at all	2	3%	0	0%	0	0%	0	0%	2	1%

Table A7-39: Respondents visiting ULB office for booking services (n=156)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Yes	3	14.3%	16	53.3%	2	28.6%	41	41.8%	62	39.7%
No	18	85.7%	14	46.7%	5	71.4%	57	58.2%	94	60.3%

Table A7-40: Gender of the respondents and visit to ULB office for booking of service (n=156)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Female	11	52%	12	40%	6	86%	38	39%	67	43%
Male	10	48%	18	60%	1	14%	60	61%	89	57%

Table A7-41: Availability of concerned ULB staff during visits by respondents (n=156)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Yes	10	47.6%	28	93.3%	4	57.1%	83	84.7%	125	80.1%
No	11	52.4%	2	6.7%	3	42.9%	15	15.3%	31	19.9%

Table A7-33: Respondents' perception of understanding of process explained to them telephonically (n=222)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Completely	17	81.0%	26	86.7%	5	71.4%	83	84.7%	131	84.0%
Somewhat	3	14.3%	4	13.3%	2	28.6%	15	15.3%	24	15.4%
Not at all	1	4.8%	0	0%	0	0%	0	0%	1	.6%

Table A7-43: Gender and their perception of understanding of process explained to them during their visits to ULB (n=156)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Female										
Completely	9	82%	10	83%	4	67%	33	87%	56	84%
Somewhat	1	9%	2	17%	2	33%	5	13%	10	15%
Not at all	1	9%	0	0%	0	0%	0	0%	1	1%
	Cuttack		Puri		Rayagada		Sundargarh		Total	
Male										
Completely	8	80%	16	89%	1	100%	50	83%	75	84%
Somewhat	2	20%	2	11%	0	0%	10	17%	14	16%
Not at all	0	0%	0	0%	0	0%	0	0%	0	0%

Table A7-44: Respondents who reported tracking service request (n=489)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Yes	44	31.0%	17	15.9%	55	55.6%	38	27.0%	154	31.5%
No	98	69.0%	90	84.1%	44	44.4%	103	73.0%	335	68.5%

Table A7-45: Respondents by gender who reported tracking service request (n=489)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Female										
Yes	20	45%	6	35%	24	44%	16	42%	66	43%
No	37	38%	33	37%	18	41%	44	43%	132	39%
	Cuttack		Puri		Rayagada		Sundargarh		Total	
Male										
Yes	24	55%	11	65%	31	56%	22	58%	88	57%
No	61	62%	57	63%	26	59%	59	57%	203	61%

Table A7-46: Respondents who reported tracking service request – Mode of tracking (n=154)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Went to the ULB office	4	9.1%	8	47.1%	0	0.0%	24	63.2%	36	23%
Called the local service provider	18	40.9%	4	23.5%	25	45.5%	8	21.1%	55	36%
Called truck driver	19	43.2%	0	0.0%	30	54.5%	5	13.2%	54	35%
Other	3	6.8%	5	29.4%	1	1.8%	2	5.3%	11	7%

Table A7-47: Timeliness of service (n=379)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Received the service on time	79	69.3%	36	85.7%	58	62.4%	116	87.7%	289	76.3%
Service was delayed	35	30.7%	6	14.3%	35	37.6%	14	12.3%	90	23.7%

Table A7-48: Mode of booking and timeliness of service (n=489)

Mode	Delivery of service	Cuttack		Puri		Rayagada		Sundargarh		Total	
Went to the ULB office (n=156)	Received the service on time (n=126, 80.8%)	9	42.9%	25	83.3%	7	100.0%	85	86.7%	126	80.8%
	Service was delayed (n=30, 19.2%)	12	57.1%	5	16.7%	0	0.0%	13	13.3%	30	19.2%
Telephonic booking (n=2223)	Received the service on time (n=163, 73%)	70	76.0%	11	91.7%	51	59.3%	31	96.9%	163	73.4%
	Service was delayed (n=59, 27%)	22	24.0%	1	8.3%	35	40.7%	1	3.1%	59	26.6%

Table A7-49: Challenges faced by respondents (n = 87)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Delay in service provision	19	63.3%	13	81.3%	27	96.4%	5	38.5%	64	73.6%
Continued backflow and/or foul smell (poor service quality)	7	23%	0	0%	0	0%	4	31%	12	13%
Multiple visits to the Municipality	1	3.3%	1	6.3%	1	3.6%	3	23.1%	6	6.9%
Poor accessibility to septic tank due to bad road	0	0.0%	2	12.5%	0	0.0%	0	0.0%	2	2.3%
Low-capacity cesspool truck requiring two visits (and double charges) to desludge a septic tank	1	3.3%	0	0.0%	0	0.0%	0	0.0%	1	1.1%
Took extra charge	1	3.3%	0	0.0%	0	0.0%	0	0.0%	1	1.1%
No visit by the Municipality staff after registering complaint	1	3.3%	0	0.0%	0	0.0%	0	0.0%	1	1.1%
Very expensive	0	0.0%	0	0.0%	0	0.0%	1	7.7%	1	1.1%

Table A7-50: Other challenges faced by communities (N=1036)

	Cuttack		Puri		Rayagada		Sundargarh		Total	
	n	%	n	%	n	%	n	%	n	%
Drinking water	162	66%	67	26%	79	31%	69	25%	377	36%
Toilets and kitchen waste water	80	33%	52	20%	56	22%	69	25%	257	25%
Household/community waste management	4	2%	58	22%	16	6%	33	12%	109	11%
Roads and other infrastructure	67	27%	128	49%	75	29%	142	52%	412	40%
Healthcare	1	0%	22	8%	3	1%	37	13%	63	6%
Public safety	2	1%	21	8%	0	0%	14	5%	37	4%
Electricity	6	2%	43	17%	54	21%	48	17%	151	15%
Education	4	2%	13	5%	3	1%	19	7%	39	4%
Drainage related problem	29	63%	155	92%	80	84%	115	89%	379	86%
Cleanliness related issues	15	33%	13	8%	14	15%	12	9%	54	12%
Absence of street lights	0	0%	1	1%	0	0%	2	2%	3	1%
None	4	2%	13	5%	19	7%	2	1%	38	4%

About eGov

eGov is a philanthropic mission to catalyse the achievement of Sustainable Development Goals, enhance ease of living, and improve governance through the adoption of Digital Public Infrastructure (DPIs). Leveraging DIGIT, an open-source service delivery, and good governance platform we foster collaboration, capacity building, and market ecosystems to create open policies and ecosystems.

Urban **Sanitation** **Health** **Public Finance**

3 GOOD HEALTH AND WELL-BEING
6 CLEAN WATER AND SANITATION
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
11 SUSTAINABLE CITIES AND COMMUNITIES
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS

eGOV FOUNDATION | DIGIT

Catalyse achievement of SDGs