Landscape study on Fecal Sludge Management

Report on study findings

Submitted to
WASH Institute & PSI

Submitted by

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List of Abbreviations

- FSM – Fecal Sludge Management
- SEC – Socio-Economic Class
- WB – West Bengal
- FGD – Focus Group Discussion
- IDI – In depth Interviews
- NBA – Nirmal Bharat Abhiyan
- GP – Gram Panchayat

Executive Summary

Background:

Currently there is very less conversation regarding fecal sludge management. There is a perception that rural areas have less knowledge regarding fecal sludge management. There is a need to understand the demand side of the FSM, to know what are the current practices, barriers, drivers and attitude towards FSM. Also there is a need to understand the supply side; to get knowledge about the various service providers; what are their roles and challenges in proving fecal sludge disposal services in the rural areas.

Target Respondents:

The study was conducted with the primary provider of healthcare needs in the family (head of household or primary caregiver o children) and the household should be using single pit toilet or septic tank.

Methodology:

The study captured the community behaviour practices of demand and supply services in four of the districts (3 in Bihar and 1 in West Bengal). The study included personal interviews through questionnaire surveys, focus group discussions, key informant interviews etc. Key informant interviews were done with pit emptying service providers, corporation/municipal officials, labourers involved in the services, gram pradhans, NBA officials and government or private sludge treatment plant operators to understand the holistic aspects of Fecal Sludge Management (FSM).

Findings – The Fecal Sludge Landscape story:

The fecal sludge story starts with the demand from a household. The study dealt with only those households which have single pit or septic tank as the type of toilet in their household. These two type of toilet will require fecal sludge disposal. So when the pit or the septic tank is full, the sludge is required to be disposed.

To dispose the sludge the household either clears it themselves or calls a service provider. The service providers are usually the manual scavengers, who clear the sludge manually from the households. Other options are the private operators and government agencies which have trucks and tankers and use mechanized approach to clear sludge from the households.

The major barriers for creation of demand from the household level are financial constraints, lack of knowledge and not having proper vendor in the rural areas. The private operators charge a lot of money, and the charge is more for a rural household because, they have to travel longer distance to travel. The government agencies procedures are very cumbersome and also not very cheap. Most of the families are not financially capable to pay such amounts for clearing sludge.
Another major barrier is lack of knowledge. There is not much knowledge when it comes to sanitation and fecal sludge management. They are not aware of the issues which can be caused

due to lack proper FSM. Another barrier is a proper vendor in the rural area for fecal sludge disposal. So when time to clears the sludge, which is in most of the cases at the last moment, when the pit or the tank is full.

The major requirements as per the households for fecal sludge management are timely disposal of sludge, financial support, proper construction of toilets and better service after construction of toilets. If the above barriers can be broken and requirements met, then the fecal sludge disposal and management will take place in a timely and efficient manner.

Most of the households, who have cleared sludge, have been done mostly by manual scavengers, mainly because they are cheaper, and are local to the area and hence can provide the service quickly. Manual scavengers collect the sludge manually and the private operators use trucks and tankers to transport and collect the sludge, while the sludge itself is collected using mechanical process.

The sludge once collected is mostly dumped in the nearby barren land or water body by both manual scavengers as well as private operators. No attempt is made for safe disposal. In some cases farmers buy the sludge and use the sludge as manure.

But most of the respondents say that they are willing to pay to private operators, as they are viewed as efficient. But the amount they are willing to pay is extremely less.

Conclusion:

Fecal sludge management is quite an ignored area. The demand for fecal sludge is quite less because knowledge is extremely less, people don't quite link it some immediate threats, and is not high on importance of a rural household. Financial constraint is a big obstacle, as private operators are mostly out of reach of most of the households, and hence sludge is disposed mostly by manually scavengers. Also there are no operators in the rural areas, and the villagers are not sure who to approach when it comes to clearing sludge.

Private operators are willing to go to the rural areas, but charge as per the extra kilometres to the village, and hence the rate comes out to be very high, even more than the urban area where they are located. The private operators have trucks/ tractors with tankers on top, with mechanized techniques to extract the sludge.

Mostly households feel the need for fecal sludge management, but they are not willing to spend a lot of amount, as it is considered a way of life. Many of the respondents think it is their responsibility also and they think fecal sludge disposal and sanitation needs improvement. But converting these concerns into actions is hardly there.

The requirements for proper FSM are mostly timely disposal, proper construction of toilets and financial support, and though private operators are expensive they are also considered the most effective, while government agencies are considered lethargic and procedures cumbersome.

Community has very low involvement as of now, and whatever involvement is there, is with raising awareness and nothing in terms of finance and logistics support.

1. INTRODUCTION

1.1. Background

The sanitation coverage in India has increased from 1% during 1981 to over 60% in 2013. There is an increasing trend in toilet usage among the peri-urban and rural communities. The technology choices are varying from simple and low cost pit latrines to high cost septic tank models. Though the rural sanitation campaign focuses on twin pit latrine, the capital investment required at the time of construction restricts the households to end-up with single pit latrines. The average depth of these pits varies from 3 to 6 ft. Though the water from these pit latrines leach out in ground to an extent depending on the geographical and climatic conditions of the localities, the sludge gets accumulated in the pit itself. Hence, these pits need to be emptied at an interval of 3 to 6 years depending on the number of users in the household. In case of septic tanks in the peri-urban and rural areas, they are sealed tanks; there is no possibility of leaching other than emptying it at frequent intervals.

To understand the demand and supply of services around FSM (Faecal Sludge Management) a detailed landscaping study is required. Water, Sanitation & Hygiene institute (WASHi) along with financial and technical support of PSI (Population Services International), Water For People is undertaking this study which will be done at two levels – 1, Demand and Supply services at the customer front in selected three districts of Bihar (Patna, Samastipur & Begusarai) and one district (South 24 Parganas) of West Bengal. Level 2 will involve mapping of best practices of managing faecal sludge (right from collection, transportation, treatment and disposal) being followed by six or seven states in India. The resource panel experts from WASHi will directly conduct level 2 studies where WASHi is looking for a reputed agency to undertake a baseline study of demand and supply of FSM services in the four districts in two states.

The community behaviour practices of demand and supply services study at four districts involves personal interviews through questionnaire surveys, focus group discussions, key informant interviews etc. Key informant interviews will be done with pit emptying service providers, corporation/municipal officials, labourers involved in the services, gram pradhans, NBA officials and government or private sludge treatment plant operators to understand the holistic aspects of Faecal Sludge Management (FSM).

1.2. Objectives of study and areas of information

The objectives of the study are the following-

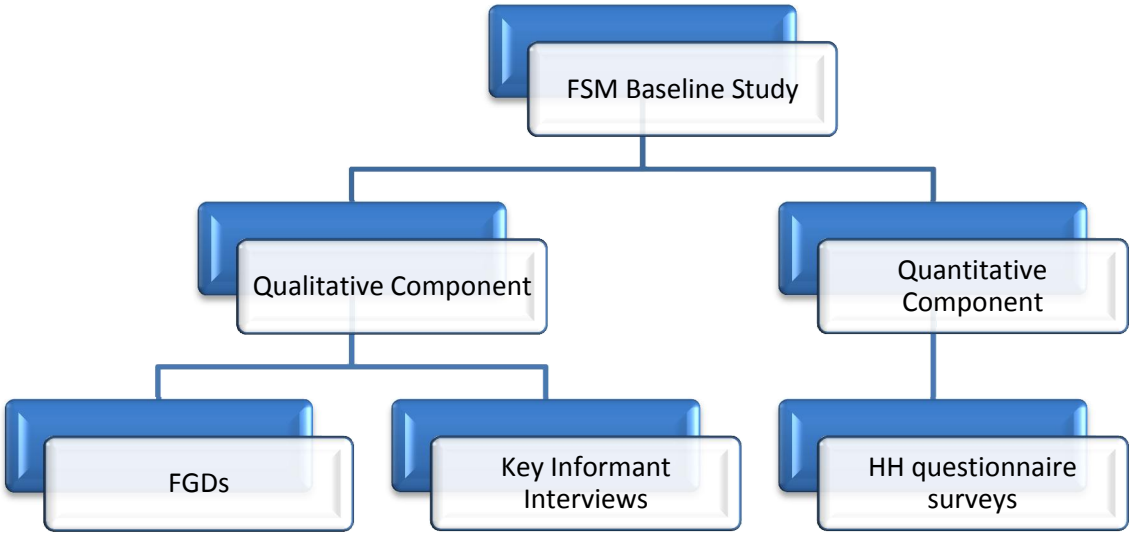
- Mapping behavior practices of customers/consumers for FSM and demand for improved services.
- Identification/mapping the service providers right from collection to disposal including mapping of technical, human resources and economic aspects of FSM services.
- Conducting/organizing focus group discussions among men, women and adolescent girls to map social norms around FSM including gender role into dealing FSM related aspects.

- In depth interview with various key stakeholders to understand the issues, opportunities and challenges for effective FSM services.

1.3. Research Design

Research methodology and tools: The study consisted of **two main components.** The **first component is the quantitative component** whereby household survey was conducted with structured questionnaire.

The **second component of the study was qualitative component.** The qualitative consisted of focus group discussions with general population and depth interviews with key stakeholders.



Target Respondents:

To get this information, the study population consisted of the general population respondents are defined as any person above 18 years of age who fulfils the following criteria –

- The respondent must be the primary provider of healthcare needs in the family (head of household or primary caregiver of children).
- The household should be using single pit toilet or septic tank.

Sample size calculations: The sample size was decided to be 800, 200 in each district. The breakup of the sample is shown below:

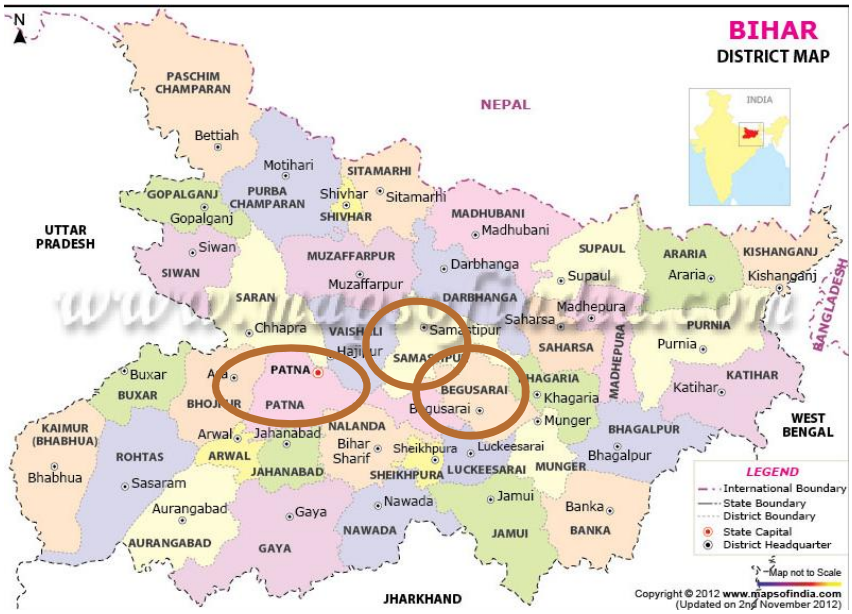
State	District	No of Villages	PI per Village	Total PIs
Bihar	Patna	20	10	200
Bihar	Samastipur	20	10	200
Bihar	Begusari	20	10	200
West Bengal	South 24 Parganas	20	10	200
Total		**80**	**10**	**800**

In each of the selected rural villages and urban wards, the details on the list of Providers available were gathered by speaking to key informants from random intercept points providing for the complete picture of the sampling point and thereby leading to the development of the sampling frames.

For the qualitative study the following was the sample size:

Action	Respondent	Total (4 districts)
FGD (GP Level)	Male	**20**
	Female	
	Key Village Members (the key decision makers, like gram pradhan, elderly people)	
Key Informant Interview (GP Level)	Pit emptying service providers (Private operators using mechanized techniques)	**25**
	Corporation/municipal officials	
	Labourers involved in the services (laborers working with the private operators)	
	Gram Pradhans	
Key Informant Interview (District Level)	NGO working in the field of manual scavenging	**14**
	Community toilets	
	Sanitary Inspectors	
	NGOs (NGO involved in broader issues of sanitation in general)	
Key Informant Interview (State Level)	NGOs working with Scavengers	**4**
	State NBA Coordinator/Director	
Total Qualitative Activities		**63**

Geographical Coverage: Three districts from Bihar and one district from West Bengal were pre decided as they were the study areas for the study.



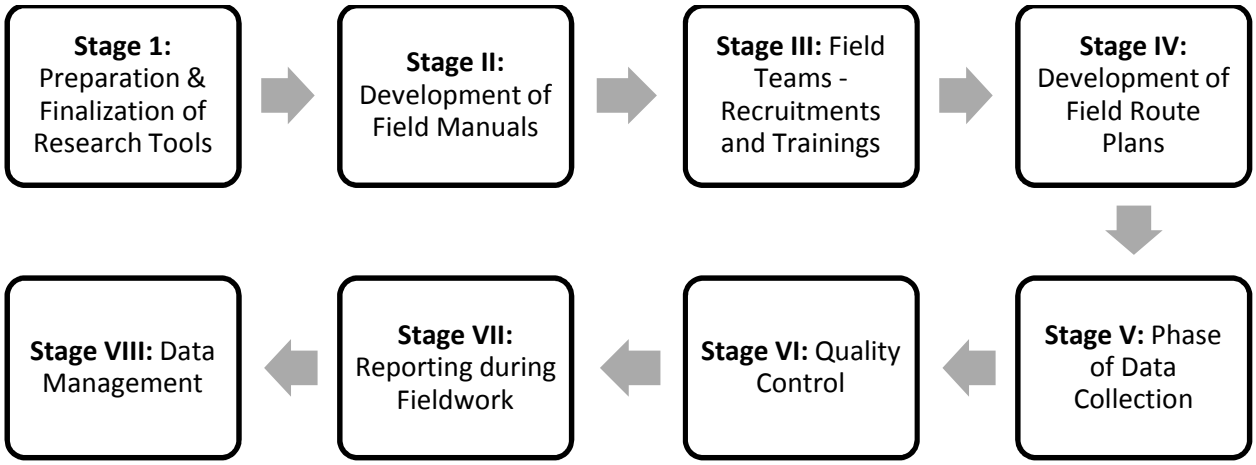
Sampling Methodology:.

- In the first stage , 4 districts were selected as per the study requirements and those are Patna, Samastipur and Begusarai from Bihar and South 24 Parganas from West Bengal.
- In the second stage of sampling, for each selected district rural villages were selected, based on probability proportional to population size (PPS), in a proportion equal to the district's urban/rural population distribution. It was decided that the villages chosen will have a population of at least 5000.

The households were selected randomly. The interviewer went to a household, and if they satisfied the condition if they gave their consent, then the interview was done.

1.4. Project Implementation

The flowchart below shows the various stages of project implementation:



Each of these stages is explained in brief in this section.

Development of Questionnaires

The questionnaires for the study were drafted based on the program indicators. A total of 1 quantitative questionnaire and 11 discussion guides were designed:

1. Household survey questionnaire
2. Discussion guide for focus group discussion at village level
3. Discussion guide for corporation official at village level
4. Discussion guide for gram pradhans at village level
5. Discussion guide for labourers involved in the services at village level
6. Discussion guide for pit cleaning operators at village level
7. Discussion guide for community toilets at district level
8. Discussion guide for NGO working with manual scavengers at district level
9. Discussion guide for NGO at district level
10. Discussion guide for sanitation inspectors at district level
11. Discussion guide for NGO at state level
12. Discussion guide for state NBA coordinators at state level

All the research instruments were developed by a team of researchers under the direct supervision of the project leader and finalization was based on findings of the pilot exercise and the needed information areas.

Translation of questionnaires in local languages

The draft questionnaires were translated in Hindi and Bengali and reviewed by a team of reviewers for the accuracy of the translations. The process of translation was two-fold. First, questionnaires were translated from English to Hindi and Bengali. Second, the Hindi and Bengali questionnaires were back translated to English in order to ensure quality translations of the questionnaires. This process ensured that there was no loss of information due to the process of translating the questionnaires to the local languages.

For the study, Hindi questionnaires were administered in Bihar, and Bengali questionnaires in the state of West Bengal. The questionnaires were bi-lingual in order to maintain standardization across the languages. This also helped in conducting quality checks at the time of data collection and data entry.

Pre-test/Pilot test of Questionnaires

After the finalization of the first draft of the questionnaires, the questionnaires were pre-tested in rural areas around Patna. Pre-testing helped improve the questionnaire in the following areas:

- Flow of the questions
- Comprehensiveness in terms of information coverage
- Appropriateness of skip patterns and instructions for field investigators
- Ease in recording the responses and the appropriateness of the response codes
- Understanding of the translations
- Length of the questionnaire and impact of the questionnaire length on response clarity and respondent fatigue
- Logistic planning for data collection based upon observations during the pre-test exercise

Based on observations during the pre-test, the questionnaires and study protocol were further modified and finalized in consultation with PSI.

Development of field manuals

Manuals for training purposes were developed with the primary objective of standardization of interpretations across the geographic locations. The field manuals included the following sections:

- A brief introduction to the study purpose and objectives
- Introduction to the specific components of the study
- Survey design (flow chart of activities)
- Detailed sampling methodology
- Ethical considerations and instructions for conducting field work
- Canvassing of the questionnaire and coding related instructions
- Scrutiny instructions
- Overall field work plan

Training of field teams

Team Structure: In order to ensure reliable and valid data collection, data collection teams consisted of one supervisor overseeing 4 field investigators.

Training of field teams: The field teams selected for each state were trained, through an extensive training session to ensure the investigators were fully adept at administering the survey tools, adhering to the protocol in the study, and explaining the background and objectives of the study to the respondents. Trainings were conducted in a participatory manner, and trainees were given adequate practice in scrutinizing the filled questionnaires. Due emphasis was placed on the importance of informed consent and ethical considerations during the training.

Development of Field Route Plans

Prior to launch of fieldwork, the state coordinators developed a route plan for the movement of the data collection teams across the selected enumeration centers.

The route plans developed in the beginning of the data collection were adhered to by all the data collection teams.

Data Collection

Data collection began once the teams reached the assigned sampling units for administering the questionnaires. The overall processes were as follows:-

After training and selection of field surveyors, a detailed field plan which explains the teams' field movement was developed and shared. The work plan for fieldwork included the following steps-

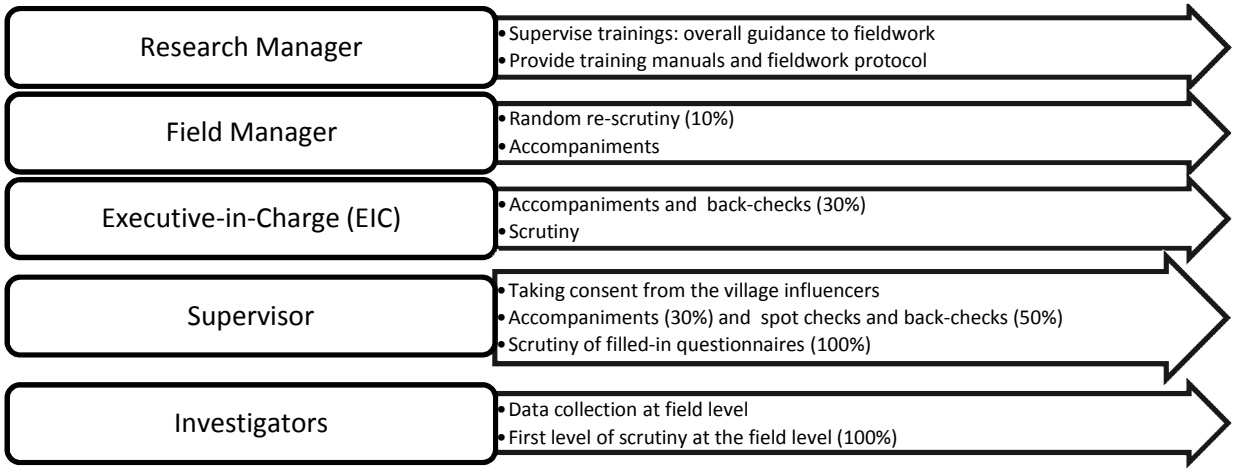
Step 1 – On arrival to the village, the field team drew a detailed map of the entire village with the help of key informants in the village like Panchayat members, senior citizens, school teachers living in the area or any other responsible member of the society who is familiar with the selected area. Such a map allowed the team to get a dependable estimate of the number of households in the village.

Step 2 – 10 households were chosen at random, and those matching the selection criteria were interviewed after they gave their consent.

Step 3- The same selection criteria was used to select the respondents for the focus group discussions in the male and female category. The key members of the village were chosen for the third category of the focus group discussion. Also the gram pradhans for few of the villages were chosen for interview.

Quality control during fieldwork phase

The data collected from the field passed through several different levels of scrutiny before data entry. At the field level, the quality mechanisms comprised a five layered structure, as presented here:



At the base, **the investigators** had the primary responsibility of interviewing the respondents and filling in the questionnaires for data collection. First level of scrutiny (100%) of the questionnaire was done by the investigators before leaving the respondent to ensure that all questions were answered and marked appropriately.

The questionnaires were then handed over to **the supervisors** who carried out 100% re-scrutiny of the questionnaires. Supervisor also accompanied the interviewers in 30% of the interviews and ensured that the questions were being asked as per the desired standards of the quality.

The following methods were used for ensuring quality data at each level:-

- **Scrutiny:** Investigators/Supervisors and field editors inspected each and every question of all the completed questionnaires for coding and logical checks.

- **Accompaniments:** In an accompaniment, the supervisor/EIC/ field manager attended an interview along with the investigator, to see if the investigator is comfortable with the flow of the questionnaire, is canvassing the questions as they should be and is recording the responses correctly.

- **Back-checks:** These were done after an interview had been completed and the questionnaire reviewed by the investigator and handed over to the supervisor. The supervisor visited the same respondent and ensured that the respondent had indeed been interviewed. The supervisor also asked key questions from the questionnaire to ensure correct responses.

- **Mystery quality checks:** Quality control in MPS, subsequent to the completion of the interview was not possible due to the requirement for anonymity. However, to ensure the validity of the findings, a checking mechanism was instituted by preparing a short questionnaire which sought to report whether the respondent had been aware of the fact that one of the patients that visited him had been there for a mystery check. A sub-sample of all mystery respondents was revisited by a different interviewer who sought to identify whether the respondent could identify the fact that a mystery interview had been conducted in the recent past, and recall further details.

Ethical Considerations

The following ethical considerations were taken into account for the purpose of this study:

Informed consent/assent: The study warranted a free and fair execution of respondents' right to know the purpose of the visit by the investigator. The investigator informed the respondents the nature and purpose of the study clearly, and prior consent of the participants was taken before interviewing them. In some cases (like in case of women farmers) the consent of the husband was also taken. For caregivers under age 18, the interviewer sought a verbal informed assent from the caregivers and a verbal informed consent from an adult within the household, such as her husband, parent, or mother-in-law.

Freedom to terminate the interview & not to respond to questions: Respondents were given complete freedom to not respond or to terminate the interview at any point in the course of the interview. Participation in the survey was voluntary and all respondents were presented with an opportunity for non-participation, if they did not feel comfortable.

Privacy and confidentiality: Interviews were conducted in a safe setting and privacy of the respondents was maintained. The respondents of the interview were informed that though their name was recorded, it would not be disclosed, and only the information (based on their responses) would be shared with others.

Respect and dignity of the respondent: The investigators, moderators, recruiters and researchers were respectful of the rights and dignity of all participants.

Addressing power imbalance: The respondents were treated as being engaged in a process, rather than being mere information givers. Gender roles and cultural factors were taken into account while conducting the field work.

2. Household Profile

This section gives in details household profile of the respondents. The details about the education, assets and other demographic details are mentioned below.

Table 1 – Gender

Figures in %	All	States		Districts		
		Bihar	WB	Patna	Begusarai	Samistipur
Base (n)	802	597	205	198	199	200
Male	66	60	83	57	58	66
Female	34	40	17	43	42	34

Majority of the respondents are male. But the percentage is more even in Bihar, where 60% of the respondents were male whereas the figure stands at 83% in case of West Bengal.

Table 2- Age

Figures in %	All	States		Districts		
		Bihar	WB	Patna	Begusarai	Samistipur
Base (n)	802	597	205	198	199	200
18-25	10	11	7	11	12	11
26-35	23	24	20	25	21	28
35-45	27	26	30	26	26	26
46-55	18	18	20	15	21	18
56 and above	20	20	19	23	20	18
Mean Age	43	43	44	43	43	42

Majority of the respondents fall under 26 to 35 and 35 to 45 age bracket. This holds true across states and districts.

Table 3– Marital Status

Figures in %	All	States		Districts		
		Bihar	WB	Patna	Begusarai	Samistipur
Base (n)	802	597	205	198	199	200
Never married/ Single	7	7	7	6	9	6
Married	87	86	89	86	83	90
Separated/ Divorced	0	0	0	0	1	1
Widow	5	6	3	8	7	4

Majority of the respondents are married in all the districts.

Table 4– Is there any children

Figures in %	All	States		Districts		
		Bihar	WB	Patna	Begusarai	Samistipur
Base (n)	802	597	205	198	199	200
Yes	95	95	96	95	96	94
No	5	5	4	5	4	6

Majority of the households have at least one child.

Table 5– Social Category

Figures in %	All	States		Districts			Type of toilet in Bihar	
		Bihar	WB	Patna	Begusarai	Samistipur	Single Pit	Septic Tank
Base (n)	802	597	205	198	199	200	211	384
General	51	51	50	45	56	53	45	55
Schedule Castes	17	9	41	10	10	7	10	8
Schedule Tribes	2	1	7	0	1	1	1	0
Other Backward Classes	30	39	1	44	33	40	44	36

Majority of the respondents belong to General category. In Bihar there are quite a high percentage of respondents belonging to other backward classes. In Bihar, General category households use septic tank more with 55% of the general category using septic tank. Whereas respondents belonging to other backward classes use septic tank more, with 44% of households uses single pit belonging to other backward classes' category.

Table 6– Religion

Figures in %	All	States		Districts			Type of toilet in Bihar	
		Bihar	WB	Patna	Begusarai	Samistipur	Single Pit	Septic Tank
Base (n)	802	597	205	198	199	200	211	384
Hindu	81	86	67	98	82	79	82	88
Muslim	18	13	31	2	17	22	17	11
Christian	0	0	0	0	1	0	0	0
Sikh	0	0	1	0	1	0	0	0

Majority of the households are Hindus. The district in West Bengal has higher number of Muslim respondents, with 31% of the respondents being Muslims. In Patna, number of Hindu respondents is extremely high with 98%. Among the single pit users in Bihar, the percentage of Muslims respondents is slightly more at 17% than 11% when it comes to septic tank.

Table 7–Education

Figures in %	All	States		Districts			Type of toilet in Bihar	
		Bihar	WB	Patna	Begusarai	Samistipur	Single Pit	Septic Tank
Base (n)	802	597	205	198	199	200	211	384
Illiterate	18	19	13	24	20	14	27	15
Semi-literate (No formal schooling)	6	6	6	6	8	5	8	5
School up to 4 yrs	7	3	18	3	4	3	5	2
School 5-9 yrs	26	21	39	16	22	26	22	21
SSC/ HSC	25	27	19	28	25	29	22	30
Some college but not grad	3	4	0	7	4	2	5	4
Grad/ Post grad. (General)	13	16	4	16	14	20	9	20
Grad/ Post grad. (Professional)	2	3	0	2	4	3	1	3

The number of septic tank users increases as education level increases. 20% of the septic tank users are graduates or post graduates whereas the percentage is only 9% for the single pit users. 27% of the single pit users are illiterates, whereas the percentage is 15% in case of septic tank users.

Table 8– Structure of House

Figures in %	All	States		Districts			Type of toilet in Bihar	
		Bihar	WB	Patna	Begusarai	Samistipur	Single Pit	Septic Tank
Base (n)	802	597	205	198	199	200	211	384
Kutcha	16	3	54	3	6	2	8	1
Semi-pucca	31	33	25	26	39	34	53	22
Pucca	53	64	20	71	55	65	39	77

77% of the septic tank respondents have pucca house. In comparison only 39% of the single pit users have pucca house. Majority of the respondents using single pit have semi-pucca houses with percentage of 53%.

3. Current Practice

This section will give the current landscape of the households in terms of sanitation and fecal sludge management. It is very important to understand the current habits and infrastructure in the rural areas, in order to improve the condition and come up with sustainable business model for the rural sector.

Table 9– Who constructed the toilet?

Figures in %	All	States		Type of Toilet in Bihar		SEC				
		Bihar	WB	Single Pit	Septic Tank	SEC E	SEC D	SEC C	SEC B	SEC A
Base (n)	802	597	205	211	384	165	235	186	153	63
Self-financed	89	91	82	80	97	73	87	94	97	100
Government	8	8	7	19	2	16	11	5	1	0
NGO	2	1	7	1	0	8	1	0	1	0

Majority of the toilets have been constructed by the households themselves, through their own finance. The percentage is higher in Bihar than West Bengal. Around 73% of the SEC E has built the toilets in the house themselves from their own pocket. The percentage increases as the SEC level increases, and the households belonging to the SEC A category have all constructed their own toilets. Government still has a very role to play when it comes to construction of toilets. The percentage is slightly higher in case of lower level SECs like SEC E which has a 16% government constructed toilets and SEC D which has 11%. Though the percentage is higher when compared to higher SECs, still it is quite low, as the poorest households still have to pay for constructing their own toilets. In Bihar, the 97% of the households who have constructed the septic tank have paid for it themselves. The percentage of households who have constructed single pit toilet on their own stands at 80%, whereas 19% of the households using single pits have government aided toilets in their house.

Table 10- Total number of people using the toilet

Figures in %	All	State		Gender		Age					SEC				
		Bihar	WB	Male	Female	15-25	26-35	36-45	46-55	>56	E	D	C	B	A
Base (n)	802	597	205	531	271	83	186	216	147	161	165	235	186	153	63
1 – 3 (%)	11	9	17	11	12	12	10	7	13	14	7	13	17	8	6
4 – 6 (%)	37	36	43	37	38	41	39	43	38	27	42	40	36	31	35
7 – 10 (%)	32	35	26	33	31	31	37	32	28	32	33	31	27	37	40
More than 10	19	21	14	19	18	16	15	18	21	26	18	17	19	24	19

The percentage for toilet usage by the number of people in a household is highest for 4 – 6 people with 37%, while in 32% of the households; 7 – 10 people use the toilet. There is not much difference when it comes to SECs.

Table 11- Do all female members use toilets?

Figures in %	All	States		Type of toilet in Bihar		SEC				
		Bihar	WB	Single Pit	Septic Tank	E	D	C	B	A
Base (n)	802	597	205	211	284	165	235	186	153	63
Yes	99	98	100	98	98	98	100	98	99	97
No	1	2	0	1	2	2	0	2	1	3

Almost all the female members in the households use toilets in their homes. In West Bengal, the percentage is 100%, while in Bihar in 98% of the households all the female members use the toilets. The type of toilets also does not make any difference when it comes to females using toilets. The percentage is almost consistent across the SEC levels as well. Surprisingly in around 3% of the households in the SEC A category, all the female members are not using the toilet present in the household.

Table 12- Do all male members use toilets?

Figures in %	All	States		Type of toilet in Bihar		SEC				
		Bihar	WB	Single Pit	Septic Tank	E	D	C	B	A
Base (n)	802	597	205	211	284	165	235	186	153	63
Yes	96	95	100	91	97	93	97	96	98	97
No	3	5	0	9	2	7	3	2	2	3

The percentage of all male members in a household using the toilet is 96% overall. But in Bihar 5% of the households have male members who are not using the toilet present in their household. There is a difference in the toilet usage by male members when it comes to type of toilets in a household. When it comes to single pit toilets, around 9% of the households have male members who are not using toilet present in their household, but the in case of households with septic tanks, around 97% of the households have all the male members using toilet present in their house.

Table 13– Do all children use toilets?

Figures in %	All	States		Type of toilet in Bihar		SEC				
		Bihar	WB	Single Pit	Septic Tank	E	D	C	B	A
Base (n)	802	597	205	211	284	165	235	186	153	63
Yes	84	83	86	85	81	88	85	78	86	78
No	8	7	9	6	8	6	8	11	5	8
No Response	2	3	0	3	3	2	1	2	3	6

The percentage of children using toilets is quite low as compared to the adult members in the households. Around 84% of the households have all the children in the households using the toilet present in the house. This figure is quite less as compared to 96% for all male members and 99% for all female members.

Table 14– Type of Toilets

Figures in %	All	Bihar	WB	E	D	C	B	A
Base (n)	802	597	205	165	235	186	153	63
Single Pit	49	35	91	73	61	47	26	6
Septic Tank	51	65	9	27	39	53	74	94

The type of toilet is almost the same, with 49% households with single pit, whereas 51% households have septic tank. But if we look at the state data, the types of toilets are absolutely contrasting. In Bihar, 65% of the households have septic tanks whereas 35% of the households have single pits. But in case of West Bengal, an extremely high, 91% of the households have single pit toilets as compared to only 9% households with septic tank. This high percentage may because of the district chosen which is primarily rural. SEC A households has mostly septic tank, whereas SEC E have mostly single pit. The percentage of households having septic tanks increases as we go up the SEC ladder.

Table 15– Who clears the sludge

Figures in %	All	States		Type of toilet in Bihar		SEC				
		Bihar	WB	Single Pit	Septic Tank	E	D	C	B	A
Base (n)	168	83	85	19	64	37	50	40	26	15
Private Operator	13	13	13	5	16	14	12	10	12	27
Government agency	1	1	0	5	0	0	0	3	0	0
Manual Scavengers	55	48	62	63	44	57	62	58	46	40

Figures in %	All	States		Type of toilet in Bihar		SEC				
		Bihar	WB	Single Pit	Septic Tank	E	D	C	B	A
Self	2	2	1	5	2	3	0	3	4	0
No Response	15	28	4	21	30	11	8	18	27	27

Most of the clearing is still done by manual scavengers. Private operator is a very small player in the rural areas, whereas government agencies are mostly negligible. In Bihar private operators are used more in case of households with septic tank, whereas in case of single pit, manual scavengers are used more as compared to households with septic tank. As expected, SEC A uses the private operators the most, mostly because, they have more paying capacity.

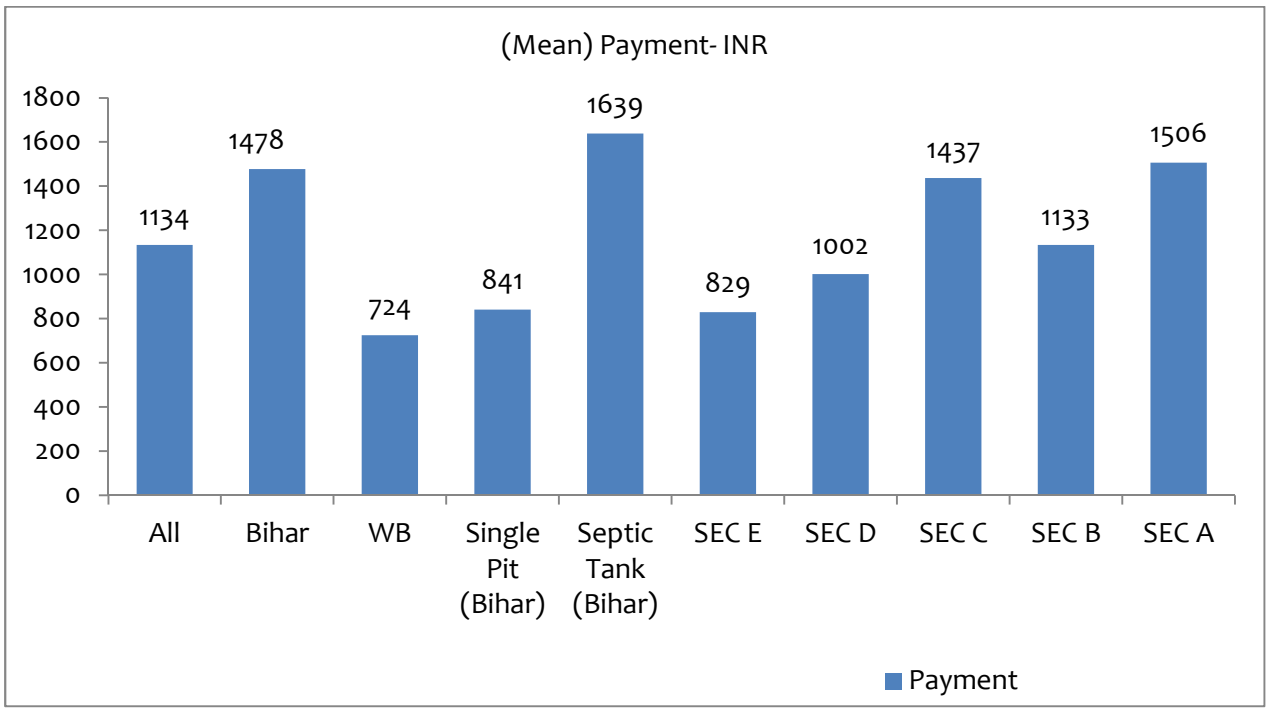


Chart 1 – Last Payment Made

Average last payment made was Rs 1134, but there is a big difference in the average last payment in Bihar and West Bengal. The average last payment in Bihar was Rs 1478 whereas in West Bengal it was Rs 724. Also, there is a big difference in the last payment made in Bihar when we compare households with single pit toilets and households with septic tank. While for single pit, the average last payment made in Bihar was Rs 841, for septic tank it was Rs 1639, almost 50% increase. As expected there is a big difference between the payments made by SEC E which was Rs 829, and SEC A which was Rs 1506.

Table 16 – Awareness of sludge disposal

Figures in %	All	States		Type of toilet in Bihar		SEC				
		Bihar	WB	Single Pit	Septic Tank	E	D	C	B	A
Base (n)	802	597	205	211	284	165	235	186	153	63
Yes	69	73	55	68	76	64	68	63	78	75
No	30	25	43	30	22	32	30	34	22	25

69% of the respondents believe that they are aware how sludge is disposed. In Bihar 73% of the respondents claim they are aware of how sludge is disposed, while the percentage comes down to 55% in case of West Bengal. The percentage is marginally more in case of septic tank households in Bihar, with 76% respondents are aware as compared to 68% in case of households with single pit.

Table 17– Awareness of sludge disposal - Methods

Figures in %	All	States		Type of toilet in Bihar		SEC				
		Bihar	WB	Single Pit	Septic Tank	E	D	C	B	A
Base (<n)	550	437	113	144	291	106	159	118	120	47
It is taken to sewage disposal Unit	31	39	2	31	43	22	27	34	38	43
It is dumped in nearby pit	61	54	84	63	50	68	65	64	53	40
Some farmer buys it and stores it for using it as manure	6	6	6	3	7	7	5	5	7	5
It is dumped in nearby water body	10	12	4	12	12	6	6	11	18	13

61% of the respondents believe that the sludge is dumped in a nearby pit, whereas 31% believe that the sludge is taken to a sewage disposal unit. The state wise data is very contrasting. The percentage of respondents answering that the sludge is taken to a sewage disposal unit is only 2% in case of West Bengal, whereas it is 39% in case of Bihar. 84% of the respondents in West Bengal believe that the dumped in nearby bit, in case of Bihar the figure stands to be about 54%. Around 43% of the respondents belong to SEC A category answered that sludge is disposed in the sewage disposal unit, whereas the figure stands at 22% for SEC E. But in case of sludge being dumped in nearby pit, 68% of the SEC E category respondents positively.
Around 6% of the respondents answered that some farmer buys the sludge and stores it as manure; while 10% answered that the sludge is dumped in the nearby water body.

Table 18– Is Toilet effective?

Figures in %	All	States		Type of toilet in Bihar		SEC				
		Bihar	WB	Single Pit	Septic Tank	E	D	C	B	A
Base (n)	802	597	205	211	284	165	235	186	153	63
Yes	79	85	63	71	92	65	74	84	91	94
No	20	15	37	28	7	34	26	16	9	5

Around 79% of the respondents are finding their toilets to be effective. The percentage is higher in case of Bihar than West Bengal, where the figure stands at 85% as compared to 63% in West Bengal. In Bihar, 92% of the households with septic tank find their toilets to be effective, while the percentage drops to 71% in case of households with single pit. There is big difference in the effectiveness of toilets in the households belonging to SEC A category where the percentage is 94% while the percentage drops to 65% in case of SEC E. The difference may be because of the fact that SEC A households was able to spend more on constructing better toilets.

Table 19– What are the Issues?

Figures in %	All	States		Type of toilet in Bihar		SEC				
		Bihar	WB	Single Pit	Septic Tank	E	D	C	B	A
Base (<n)	163	88	75	60	28	56	60	30	14	3
Not properly constructed	61	67	55	73	54	73	62	50	50	0
Need frequent maintenance	41	32	52	28	39	21	47	60	43	100
It is very difficult to clear sludge	33	32	33	38	18	23	37	43	36	0

Of all the respondents who believe that their toilet is not effective, the major reason stated was that the toilets were not properly constructed, with 61% agreeing with the statement. 41% believes that the toilet needs frequent maintenance and around 33% believe that it is very difficult to clear sludge. 73% of the single pit users in Bihar think their toilets are not properly constructed, but the percentage drops to 54% in case of households with septic tank users.

Table 20- Involved in farming?

Figures in %	All	States		Type of toilet in Bihar		SEC				
		Bihar	WB	Single Pit	Septic Tank	E	D	C	B	A
Base (n)	802	597	205	211	284	165	235	186	153	63
Yes	61	64	50	54	71	40	54	63	80	87
No	37	35	41	46	28	56	43	33	20	11

Around 61% of the respondents are involved in farming. The percentage is less for SEC E, while highest for SEC A. Also Bihar has higher percentage of 64% of households involved in farming as compared to West Bengal where the percentage stands at 54%

Table 21– Is fecal sludge used as manure?

Figures in %	All	States		Type of toilet in Bihar		SEC				
		Bihar	WB	Single Pit	Septic Tank	E	D	C	B	A
Base (<n)	487	385	102	113	272	66	126	118	122	5
Yes	7	3	23	4	3	17	6	9	2	7
No	92	97	75	96	97	82	94	91	97	93

Of all the respondents who are involved in farming, only 7% use fecal sludge as manure. The percentage is highest for SEC E category, where 17% of the households use fecal sludge as manure.

4. Perception, Attitude & Knowledge

This section tries to understand the perception of the respondents regarding toilets and fecal sludge management. This section will also try to understand the current knowledge level and attitude of the people to take some action regarding toilets and fecal sludge management.

Table 22– Toilets need of improvement?

Figures in %	All	States		Type of toilet in Bihar		SEC				
		Bihar	WB	Single Pit	Septic Tank	E	D	C	B	A
Base (n)	802	597	205	211	284	165	235	186	153	63
Yes	97	97	98	97	97	96	97	97	99	94
No	3	3	2	2	3	4	3	2	1	6

Majority of the respondents across all categories believe that toilets in their locality need improvement. The figure is constant across all segments, be it across states, type of toilets, or SEC categories.

Table 23– Can current state of toilets cause harm?

Figures in %	All	States		Type of toilet in Bihar		SEC				
		Bihar	WB	Single Pit	Septic Tank	E	D	C	B	A
Base (n)	802	597	205	211	284	165	235	186	153	63
Yes	80	83	73	84	82	79	80	80	82	76
No	20	17	27	16	18	21	20	19	17	24

Around 80% of the households think that the current state of toilets can cause harm to them. The belief is more in Bihar, where 83% of the respondents believe this, whereas in West Bengal the figure is comparatively less at 73%.

Table 24– Problems related to sanitation

Figures in %	All	States		Type of toilet in Bihar		SEC				
		Bihar	WB	Single Pit	Septic Tank	E	D	C	B	A
Base (n)	802	597	205	211	284	165	235	186	153	63
Solid Waste Management	35	32	42	38	29	37	34	33	35	37

Figures in %	All	States		Type of toilet in Bihar		SEC				
		Bihar	WB	Single Pit	Septic Tank	E	D	C	B	A
Closed and Cleanliness of Toilets	25	21	39	19	22	32	26	27	18	21
Garbage disposal	63	67	54	63	68	55	65	66	63	71
Drainage facilities	51	55	38	55	55	44	45	49	58	76
Lack of Clean water	34	34	35	33	35	38	27	37	35	43

Majority of respondents still associate sanitation with garbage disposal. 63% of the respondents have said garbage disposal and 51% have said drainage facilities. Only 25% have mentioned toilets. The data is fairly standard across the segments.

Table 25– FSM in need of improvement?

Figures in %	All	States		Type of toilet in Bihar		SEC				
		Bihar	WB	Single Pit	Septic Tank	E	D	C	B	A
Base (n)	802	597	205	211	284	165	235	186	153	63
Yes	96	95	97	95	96	97	97	96	93	95
No	4	4	4	4	4	2	3	4	7	5

Majority of the respondents across categories believe that fecal sludge management is in need of improvement. So when a direct question was asked, whether improvement in FSM is required or not, and almost everyone said yes.

Table 26– Can current FSM cause harm?

Figures in %	All	States		Type of toilet in Bihar		SEC				
		Bihar	WB	Single Pit	Septic Tank	E	D	C	B	A
Base (n)	802	597	205	211	284	165	235	186	153	63
Yes	88	93	75	96	92	89	86	88	93	87
No	9	4	24	2	5	9	13	10	5	8

When asked whether, the current FSM can cause harm to them and their family, almost 88% of the respondents agreed to that. The percentage is much higher in Bihar with 93% as compared to West Bengal with 75%.

Table 27– Health hazards due to lack of proper FSM

Figures in %	All	States		Type of toilet in Bihar		SEC				
		Bihar	WB	Single Pit	Septic Tank	E	D	C	B	A
Base (n)	802	597	205	211	284	165	235	186	153	63
Diarrhoea	76	78	71	80	77	68	74	76	82	94
Cholera	51	54	44	54	54	43	44	58	59	63
Dysentery	21	12	50	13	11	28	21	24	17	8
Typhoid	18	16	25	8	20	13	14	21	24	22
Stomach Complications	20	13	41	14	13	24	20	20	17	16
Malaria	71	80	43	77	82	67	68	69	76	84
Dengue	16	18	9	18	18	14	16	14	15	25

A very high percentage of respondents think diarrhea and malaria are results of lack of proper fecal sludge management. The figure stands at 76% and 71% for diarrhea and malaria respectively. Cholera also has a fairly good response with 51% of the respondents mentioning it. In Bihar 80% of the respondents think malaria is spread due to lack of proper FSM, whereas the figure stands at 43% in West Bengal. But in West Bengal, around 50% of the respondents feel dysentery is caused due to proper FSM. When it comes to SECs, the major difference can be found in case of diarrhea with 94% of SEC A think that it is caused due to improper FSM, as compared to 68% in case of SEC E.

During the qualitative study also, many respondents mentioned malaria and diarrhoea as major issues due to lack of proper FSM.

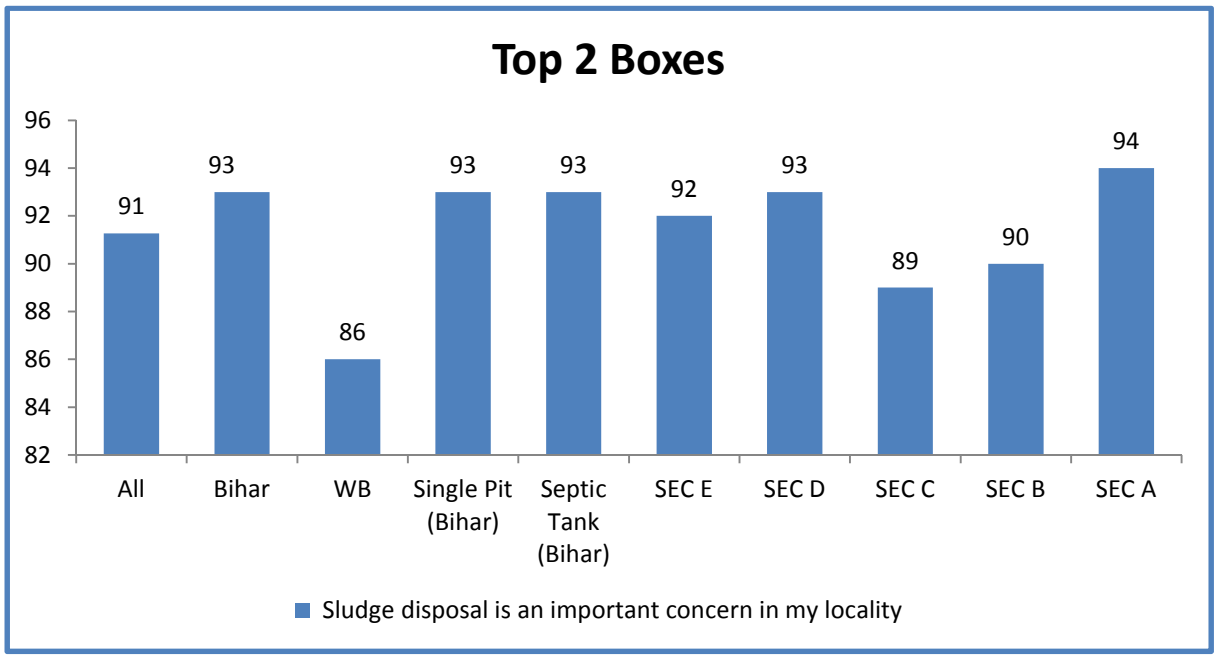


Chart 2– Sludge disposal is an important concern in my locality

Majority of the respondents feel that the sludge disposal in an important concern in their locality. In West Bengal the percentage is slightly lower at 86% than Bihar, which is at 93%.

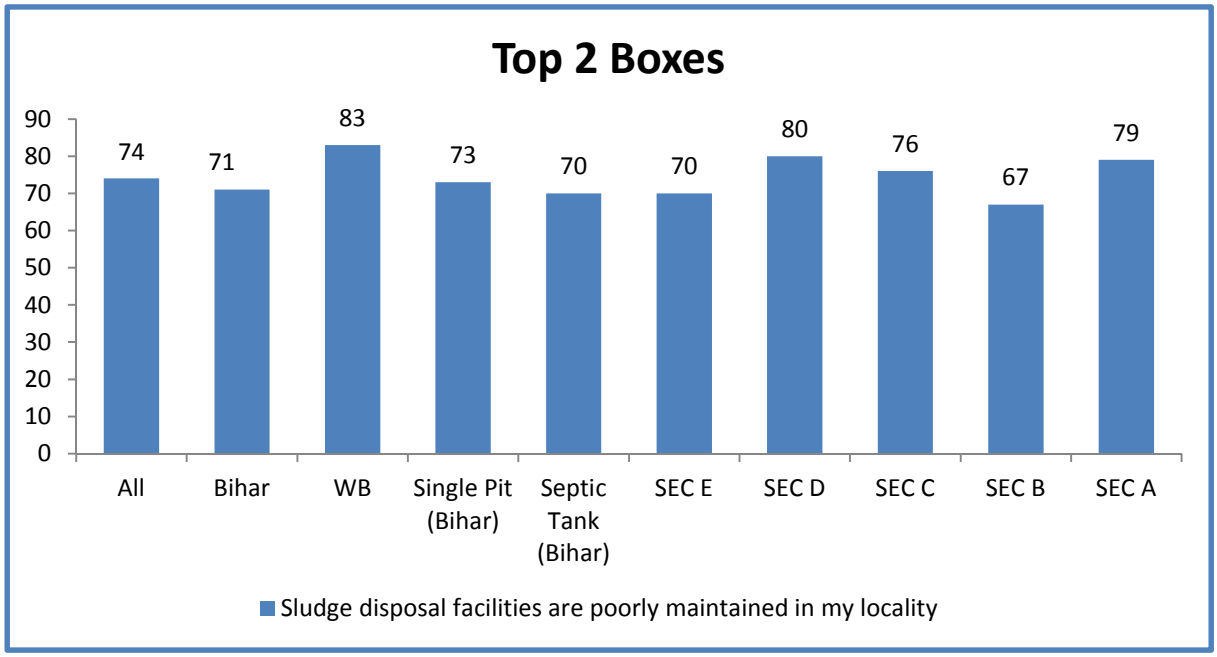


Chart 3– Sludge disposal facilities are poorly maintained in my locality

Around 74% of the respondents feel that the sludge disposal facilities are poorly maintained in the locality. The figure slightly more in case of West Bengal with 83% of the respondents agreeing with the statement as compared to 71% in Bihar.

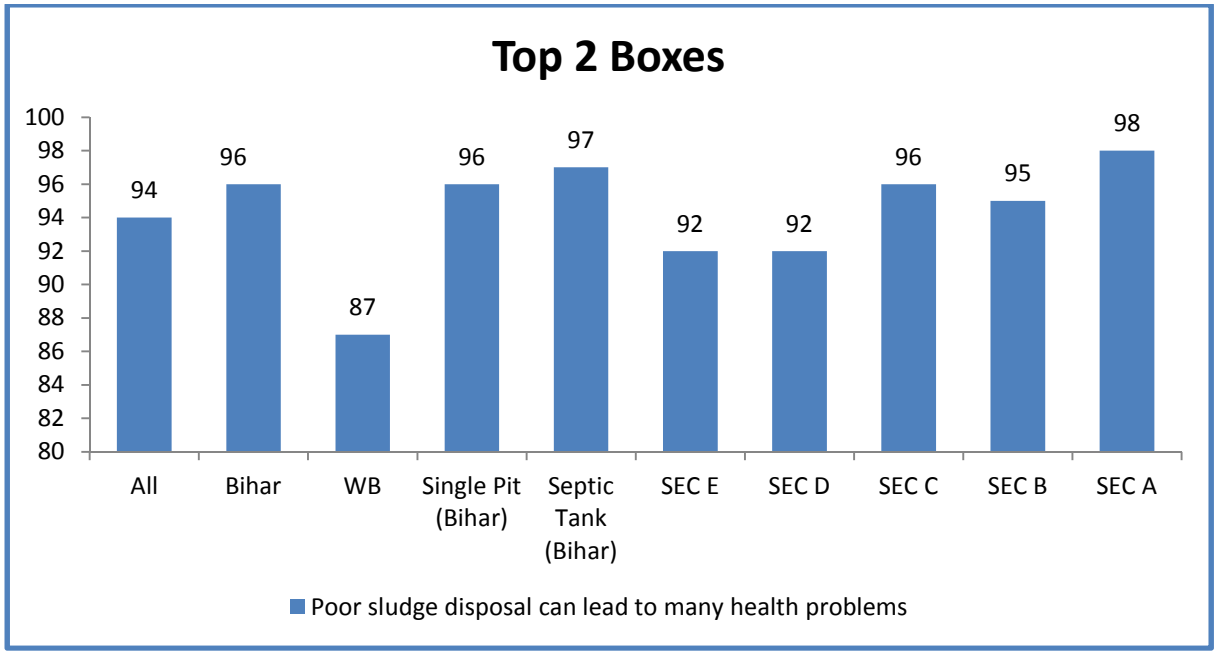


Chart 4– Poor sludge disposal can lead to many health problems

Again majority of the people believe that poor sludge disposal can lead to many health problems. Even though all the figures are encouraging, but there are very action taken by the households when it comes to sludge disposal or adopting proper sanitation habits.

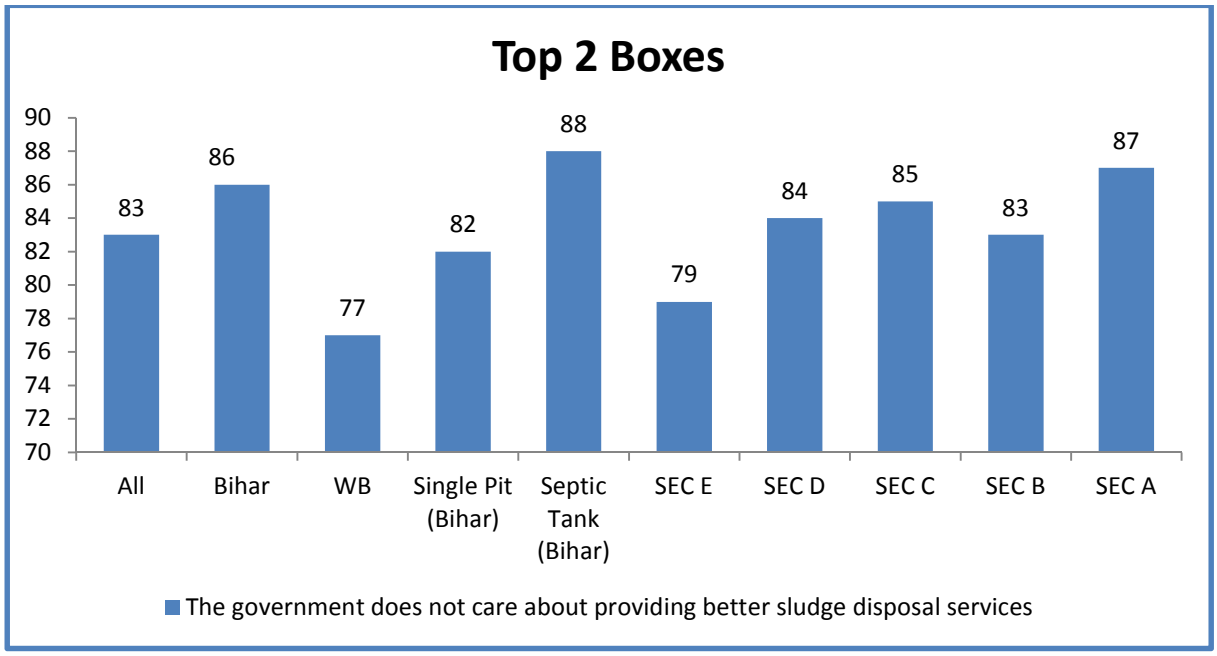


Chart 5– The government does not care about providing better sludge disposal services

There are a lot negative sentiments towards the government when it comes to providing better sludge disposal services. Majority feel that government does not care enough. Though the sentiment is little less in West Bengal, where 77% of the households feel that the government does not care, in Bihar it is around 86%. SEC E have little more trust on the government, where 79% of the households belonging to SEC E, feels government does not care, while the percentage is as high as 87% in case of SEC A households.

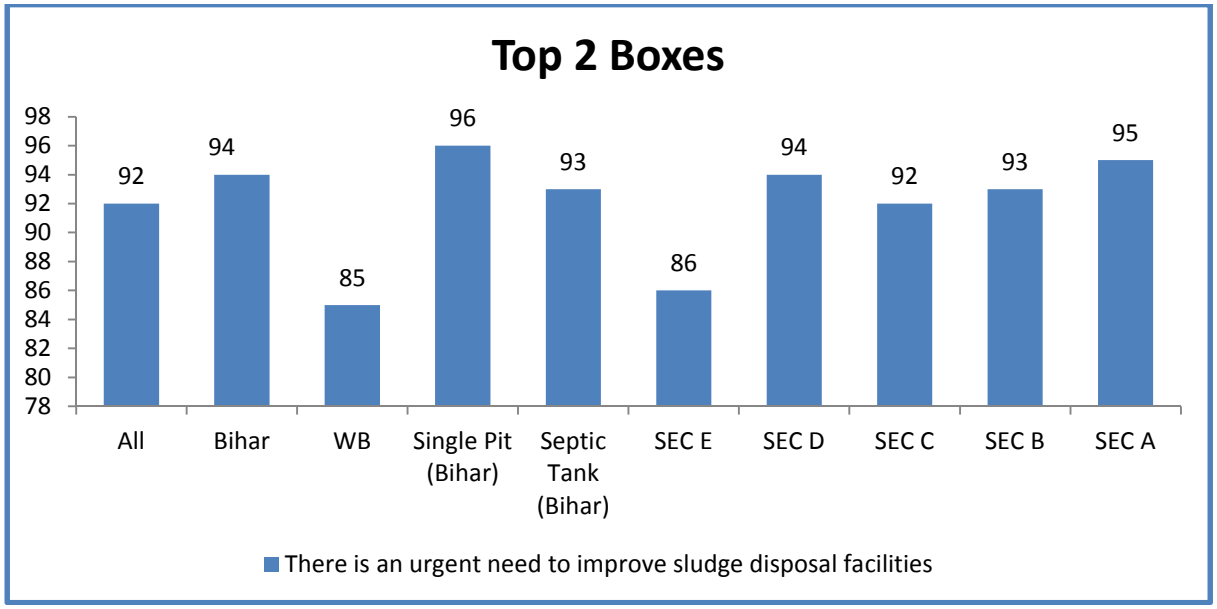


Chart 6– There is an urgent need to improve sludge disposal facilities

Majority of the households believe that there is an urgent need to improve the FSM facilities. But again, how much action they will take on their own is extremely susceptible. And the point is further justified from the following table.

Table 28– Involved in activity to improve FSM

Figures in %	All	States		Type of toilet in Bihar		SEC				
		Bihar	WB	Single Pit	Septic Tank	E	D	C	B	A
Base (n)	802	597	205	211	284	165	235	186	153	63
Yes	5	6	5	4	7	5	5	5	6	10
No	94	94	95	96	93	95	95	95	94	90

As can be seen, the households who have been any activity to improve fecal sludge management at any level are miniscule. SEC A is the category with highest number of active respondents, which is 10%.

Table 29– Social Support System

Statements (Figures in %) *Top 2 boxes*	All	States		SEC				
		Bihar	WB	E	D	C	B	A
Base (n)	802	597	205	165	235	186	153	63
Don't have enough resources	67	76	40	70	65	70	70	48
Family wouldn't approve	34	31	43	26	36	38	32	19
Lack access to information	73	81	50	68	77	74	78	71
Need government support	89	94	76	92	89	88	94	81

In the social support system, most of the respondents feel they need government support, and they lack access to information. Also they don't have enough resources to take actions regarding fecal sludge management. But most of them believe that family will approve if they take actions. It is truer for SEC A category, where for only 19% of the households belonging to SEC A, family would not approve.

Table 30– Attitude Statements

Statements (Figures in %) *Top 2 boxes*	All	States		SEC				
		Bihar	WB	E	D	C	B	A
Base (n)	802	597	205	165	235	186	153	63
Not a problem for me	14	16	9	8	13	11	20	15
No one I know is acting	48	54	31	44	48	51	48	51
Not my responsibility	18	18	20	23	16	17	17	23

Statements (Figures in %) *Top 2 boxes	All	States		SEC				
		Bihar	WB	E	D	C	B	A
I have other priorities	42	44	37	48	44	39	39	57
Does not fit with beliefs	18	15	28	23	19	15	14	6

In the Attitude statements, most of the respondents have fairly positive attitude towards taking actions. This is especially true for the following statements:

1. Most of the respondents believe that improper sanitation or fecal sludge disposal is a problem for them.
2. Most of the respondents believe that it is their responsibility to take action.
3. It fits with their beliefs

Table 31– Self Efficacy Statements

Statements (Figures in %) *Top 2 boxes	All	States		SEC				
		Bihar	WB	E	D	C	B	A
Base (n)	802	597	205	165	235	186	153	63
Will not make any difference	45	48	35	52	46	43	40	43
Powerless to contribute	46	46	44	49	47	48	40	31
Won't get an opportunity	39	45	22	41	36	36	41	45

Around 61% of the respondents believe that they will get opportunity to contribute meaningfully to improve issues related to fecal sludge management. This is especially true in case of West Bengal, where 78% of the respondents believe that they will get chance to improve the situation. Around 54% people believe that they have power to contribute meaningfully when it comes to issues related to poor fecal sludge management. And around 55% of the respondents believe that actions taken from their side will make a difference. Again in case of West Bengal, this is figure is much higher, where 65% of the respondents belief that their actions will make a difference.

5. Support, Service Requirements and Expectations

This section tries to understand the support and service requirements and expectations from the rural households when it comes to fecal sludge management. This section will try to comprehend what the rural households' belief are the best ways to improve fecal sludge management, and what sort of support they require.

Table 32– Have the requirements for proper sanitation been met?

Figures in %	All	States		Type of toilet in Bihar		SEC				
		Bihar	WB	Single Pit	Septic Tank	E	D	C	B	A
Base (n)	802	597	205	211	284	165	235	186	153	63
Yes	34	42	8	34	47	18	29	34	42	67
No	66	57	92	66	52	82	71	63	58	33

Around 66% of the households believe that there requirements for proper sanitation have not been met. In West Bengal majority of the households are unsatisfied, where 92% of the households think that their requirements for proper sanitation have not been met. The story is very contrasting when comparing SEC E and SEC A, where 82% of the SEC E category households have unmet requirements, whereas in SEC A, 67% of the households, think that their requirements have been met.

Table 33– Have the requirements for proper FSM been met?

Figures in %	All	States		Type of toilet in Bihar		SEC				
		Bihar	WB	Single Pit	Septic Tank	E	D	C	B	A
Base (n)	802	597	205	211	284	165	235	186	153	63
Yes	25	30	9	24	34	15	21	26	31	49
No	75	69	91	75	66	85	79	73	69	49

75% of the households feel that their requirements for fecal sludge management have not been met. Again, in case of West Bengal, the majority of the respondents are unsatisfied, with overwhelming 91% of the respondents said that their requirements have not been met. While satisfaction with current situation is highest with the SEC A category, but in case of FSM it is not so much as compared to satisfaction with sanitation, with 49% reporting, that their FSM requirements have not been met.

Table 34– Some of the requirements for proper FSM

Figures in %	All	States		Type of toilet in Bihar		SEC				
		Bihar	WB	Single Pit	Septic Tank	E	D	C	B	A
Base (n)	802	597	205	211	284	165	235	186	153	63
Proper construction of the toilets	61	66	49	72	63	59	57	69	62	59
Financial Support to build proper toilets	40	31	65	34	29	48	40	35	37	33
Timely disposal of fecal waste	47	47	47	46	47	38	44	50	52	59
Better service after construction of toilets	43	40	51	37	41	44	40	42	41	51
Better and prompt service in disposing of fecal waste	23	28	7	25	30	17	21	22	31	25

The major requirement for proper fecal sludge management, as mentioned by the respondents is proper construction of toilets, with 61% of the households stating this. The percentage is higher in case of single pit toilets in Bihar with 72%, as compared to 63% of the septic tank toilets.
Timely disposal of sludge comes as the second requirement, with again households with single pit requiring it more than septic tank users, with 34% and 29% respectively.
Better service after construction of toilets and financial support to build proper toilets comes as the other requirements, with percentages of 43% and 40% respectively. In West Bengal the major requirement is of financial support with 65% of the households mentioning this as the requirement, whereas in Bihar the major requirement is proper construction of toilets with 66% of the respondents agreeing with this.

Table 35– Best service provider for FSM?

Figures in %	All	States		Type of toilet in Bihar		SEC				
		Bihar	WB	Single Pit	Septic Tank	E	D	C	B	A
Base (n)	802	597	205	211	284	165	235	186	153	63
Government	58	53	73	61	49	69	58	59	51	46
NGO	23	17	40	18	16	25	17	28	23	24
Private Company	37	39	31	34	42	32	37	35	42	43
Community driven initiatives	9	10	7	4	13	5	8	14	9	11
Don't Know	6	6	4	7	6	5	8	4	5	6

The households feel that the government can best provide the service for fecal sludge management. 58% of the households feel government is the best bet in providing the best FSM service. Private operators come second in the mind of the respondents with 37% choosing them. In Bihar, there is contrasting story if two types of toilets are compared. The percentage of users preferring government is higher in case of single pit with percentage of 61% as compared to septic tank users which has a percentage of 49%. The percentage of users preferring private operators is higher in case of septic tank with 42% users preferring them, as compared to 34% single pit users. NGO has overall percentage of 23% households saying that they think NGOs can provide the best service.

Table 36– Willingness to pay private operators?

Figures in %	All	States		Type of toilet in Bihar		SEC				
		Bihar	WB	Single Pit	Septic Tank	E	D	C	B	A
Base (n)	802	597	205	211	284	165	235	186	153	63
Yes	66	79	27	70	85	53	60	70	76	84
No	32	18	71	27	14	44	37	28	20	16

Percentages of people willing to pay private operators have a comfortable majority of 66%. This is especially true in case of Bihar where an overwhelming 79% of the households saying that they are willing to pay private players for their service. There is a contrasting picture in case of West Bengal, where 71% of the respondents are unwilling to pay private operators. Septic tank users are more

Table 37 – Amount the households are willing to pay

Figures in %	All	States		Type of toilet in Bihar		SEC				
		Bihar	WB	Single Pit	Septic Tank	E	D	C	B	A
Base (n)	802	597	205	211	284	165	235	186	153	63
Less than 100	45	47	30	43	48	45	51	47	40	34
100-300	38	37	45	44	34	41	30	40	41	43
300-500	11	11	13	7	12	7	11	7	15	17
500-800	1	1	4	1	1	0	1	0	2	4
800-1000	1	1	4	1	1	2	3	1	0	0
More than 1000	2	1	5	1	1	1	1	2	3	0
Don't Know	2	2	0	1	3	2	1	4	1	2

Even though the households are willing to pay to private operators, the amount is very less. So a private operator who wishes to start a service in rural area needs to price it accordingly so that it is affordable to the poor. In the qualitative study it came out that people are ready to pay small

amounts every year instead of a large amount at the end of 4 to 5 years. So an EMI type of price structure can be explored.

Table 38– What will help in better FSM?

Figures in %	All	States		Type of toilet in Bihar		SEC				
		Bihar	WB	Single Pit	Septic Tank	E	D	C	B	A
Base (n)	802	597	205	211	284	165	235	186	153	63
Timely Clearing of Sludge	71	77	54	72	79	65	67	77	69	84
Use of new technology	35	32	45	20	38	32	35	35	36	44
More support from the government	44	36	67	41	34	48	44	43	45	35
Better access to the nearest town	23	27	12	27	27	12	20	24	29	44

71% of the households believe that timely clearing of sludge will result in better fecal sludge management. The same sentiments are shared by septic tank users in Bihar, where 79% of the respondents using septic tank say that, timely clearing of sludge is the best way to help in proper FSM. 35% of the households think that use of new technology will lead to better FSM, whereas 44% says more support will lead to better FSM.

Table 39– Problems facing current toilets

Figures in %	All	States		Type of toilet in Bihar		SEC				
		Bihar	WB	Single Pit	Septic Tank	E	D	C	B	A
Base (n)	802	597	205	211	284	165	235	186	153	63
Very poor quality and hence can't be used	5	3	10	2	4	7	4	7	1	5
Technology Problems	18	14	31	14	15	21	16	22	14	22
The current practice is very unhygienic	28	26	31	26	27	22	28	30	26	40
Proper service not available	57	53	71	54	52	59	60	60	52	49
Very infrequent services	35	35	37	30	37	33	33	39	33	44
Sludge Left behind	30	37	10	33	39	24	27	31	37	35
Leakages in the tanker itself	8	10	0	12	9	5	5	6	12	17

Proper service being not available is stated as the major problem facing the current toilets, with 57% of the households. Proper service being not available is more in case of West Bengal, where 71% of the households stated this problem. The second problem being identified is very infrequent services, where 35% of the households identified this issue.

Table 40– Things to improve in FSM

Figures in %	All	States		Type of toilet in Bihar		SEC				
		Bihar	WB	Single Pit	Septic Tank	E	D	C	B	A
Base (n)	802	597	205	211	284	165	235	186	153	63
Better Toilet infrastructure	48	52	38	64	45	55	42	46	52	48
Proper services in sludge disposal	35	32	45	30	33	32	34	39	35	40
Frequent sludge disposal	54	63	30	57	66	45	54	55	62	60
Proper maintenance	26	22	36	18	25	27	26	27	24	24

Frequent sludge disposal has been stated as the better major thing to do to improve fecal sludge management. 54% of the respondents have identified it as the major point. In Bihar, especially 63% of the households think that to improve in FSM, frequent sludge disposal is required. Better toilet facilities are the second thing to do to improve in FSM, with 48% of the respondents stating it. In case of households using single pit in Bihar, better toilet facilities are stated as the major thing to do, with 64% of the households saying it, whereas in households using septic tank in Bihar, frequent sludge disposal is the major thing to do in FSM with 66% of the households stating it.

Table 41– Is community involved?

Figures in %	All	States		Type of toilet in Bihar		SEC				
		Bihar	WB	Single Pit	Septic Tank	E	D	C	B	A
Base (n)	802	597	205	211	284	165	235	186	153	63
Yes	20	23	11	16	28	13	20	24	20	27
No	74	73	79	80	69	78	76	72	76	67
Don't Know	5	4	10	5	3	9	4	4	4	6

74% of the households believe that community is not involved when it comes to proper sanitation and fecal sludge management. In Bihar, this percentage is even higher with 79% of the households believing that the community is not involved.

Table 42– In what ways is the community involved?

Figures in %	All	States		Type of toilet in Bihar		SEC				
		Bihar	WB	Single Pit	Septic Tank	E	D	C	B	A
Base (<n)	161	139	22	33	106	22	46	45	31	17
Raise awareness about proper sludge disposal	74	76	59	76	76	68	74	71	74	88
Give support in terms of finance	14	15	9	12	16	14	15	18	16	0
Give support in terms of logistics	7	4	23	9	3	14	7	7	3	6
Organized to discuss local community	1	1	0	0	1	0	0	0	0	6

Raising awareness about proper sludge disposal is the way community can be involved. Out of all those respondents who said, community is involved, 74% say that community should be involved in raising awareness about proper sludge disposal. This is more so in the case of Bihar, where 76% agreed to this.

6. Media Usage

This section tries to understand the media usage habits of the households. This will be useful in trying to build a media campaign, if required, and the best way to convey the message.

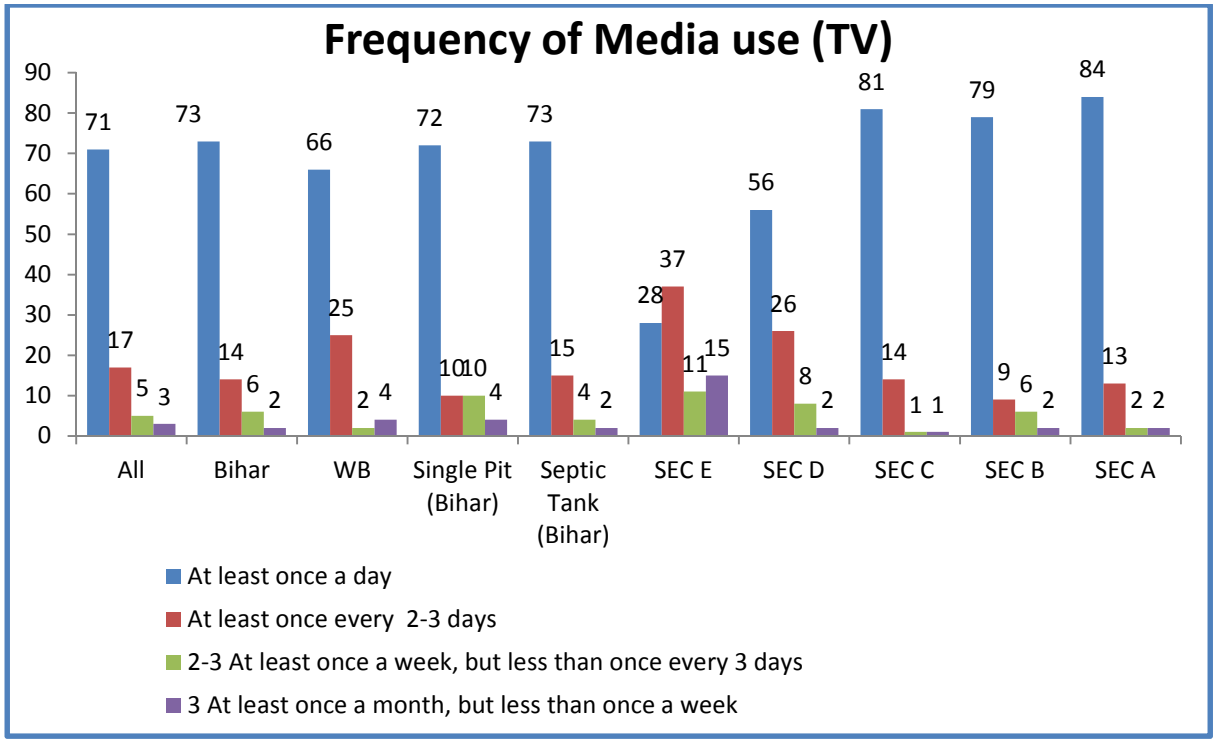


Chart 7– Frequency of media use (TV)

State	All	Bihar	WB	Single Pit (Bihar)	Septic Tank (Bihar)	SEC E	SEC D	SEC C	SEC B	SEC A
Base	464	327	137	79	248	46	87	136	132	63

Television has a very high access among the households, with 71% of the respondents watching television at least once a day. Except in SEC E and SEC D categories, all the rest of the SEC categories watching television are very high.

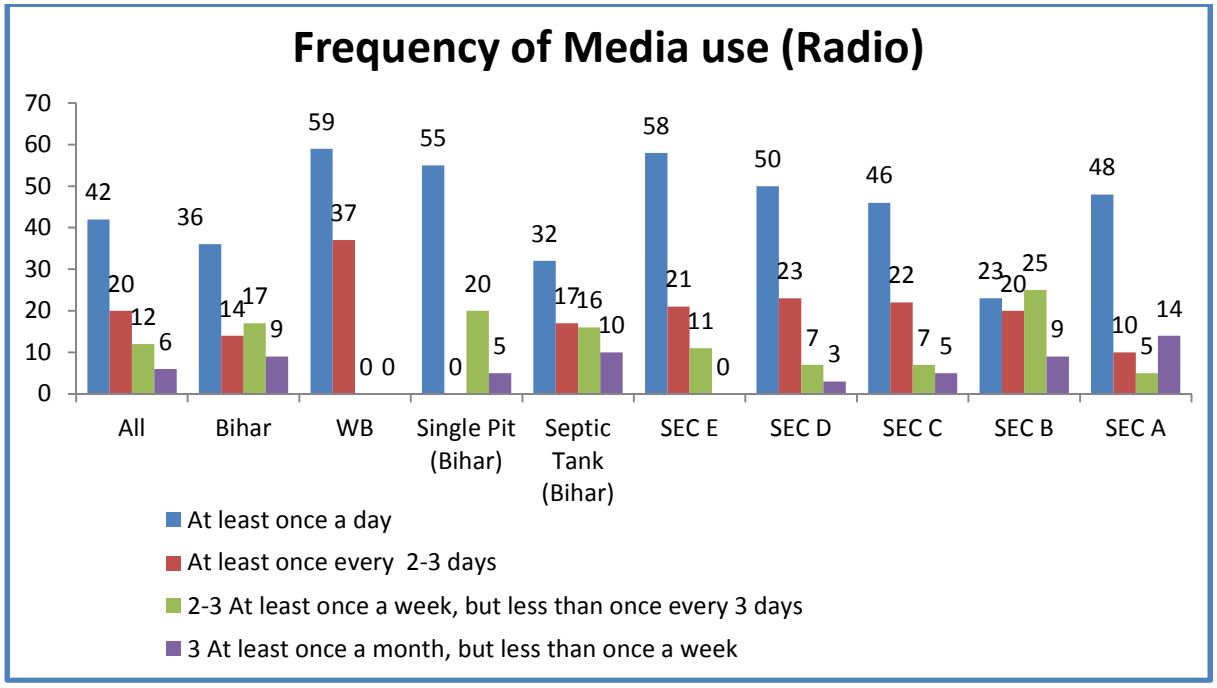


Chart 8– Frequency of media use (Radio)

State	All	Bihar	WB	Single Pit (Bihar)	Septic Tank (Bihar)	SEC E	SEC D	SEC C	SEC B	SEC A
Base	155	114	41	20	94	19	30	41	44	21

Radio has very less access and very less frequency among the respondents who listens to radio. West Bengal has the highest percentage of respondents who listens to radio at least once a day. SEC E has the highest percentage of respondents who listens to radio at least once a day with the figure standing at 58%.

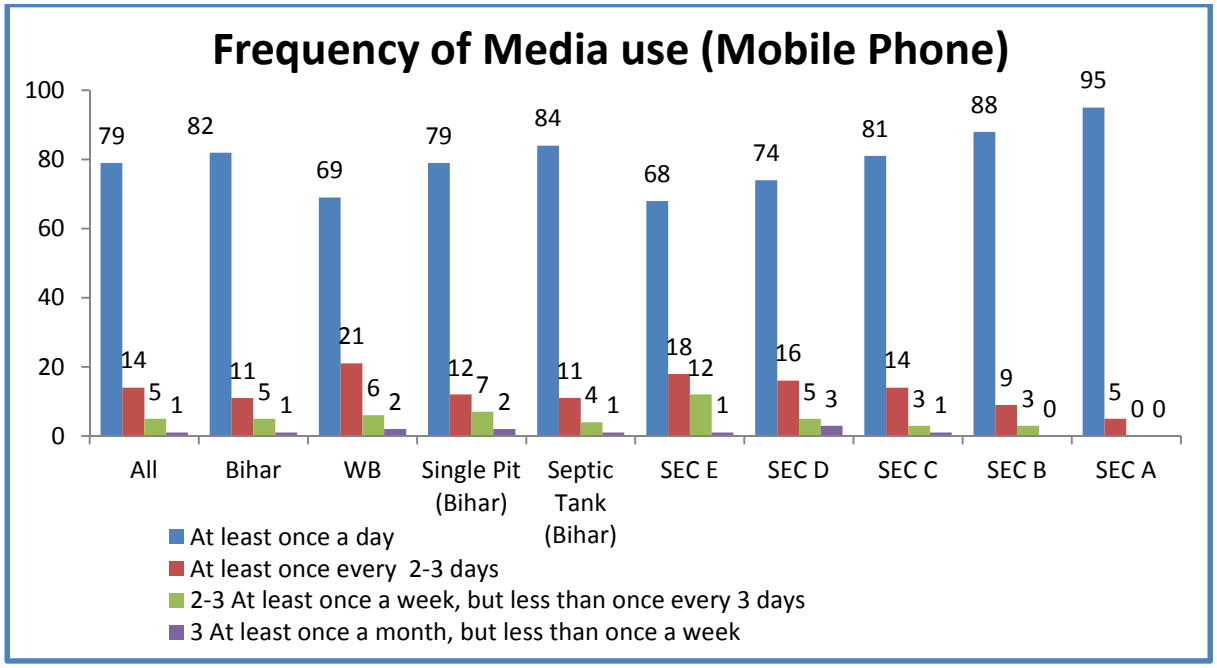


Chart 9– Frequency of media use (Mobile Phone)

State	All	Bihar	WB	Single Pit (Bihar)	Septic Tank (Bihar)	SEC E	SEC D	SEC C	SEC B	SEC A
Base	767	578	189	199	377	148	223	181	152	63

Almost everyone has access to the mobile phone. And majority of the respondents who have access to mobile phone, uses it at least once a day, with the figure standing at 79% overall, and Bihar recording the maximum number of respondents using mobile at least once a day. As expected SEC A has the maximum number of respondents who uses at least once a day, with percentage as 95%.

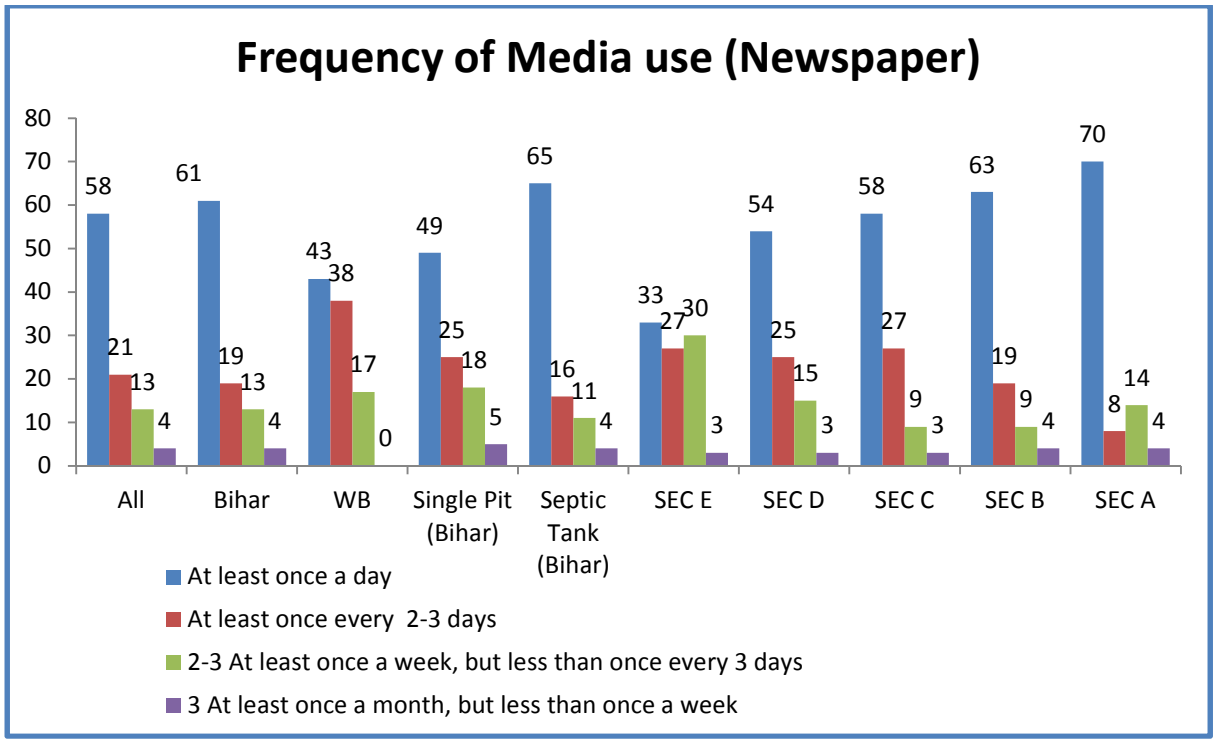


Chart 10 – Frequency of media use (Newspaper)

State	All	Bihar	WB	Single Pit (Bihar)	Septic Tank (Bihar)	SEC E	SEC D	SEC C	SEC B	SEC A
Base	311	269	42	77	190	30	72	66	93	50

58% of respondents who has access to newspapers, reads it at least once a day, 21% of them reads newspaper at least once every 2-3 days. Again the frequency of viewership is more in Bihar than West Bengal. And again as expected SEC A has the highest percentage of respondents who reads the newspaper daily.

Table 43– Method of accessing information

Figures in %	All	States		Type of toilet in Bihar		SEC				
		Bihar	WB	Single Pit	Septic Tank	E	D	C	B	A
Base (n)	802	597	205	211	284	165	235	186	153	63
Television	51	48	61	34	55	26	37	65	67	89
Radio	12	9	22	11	8	15	9	16	12	10
Newspaper	35	34	37	28	37	24	29	36	46	56
Mobile phone	13	10	22	12	9	15	11	12	14	17
Internet	2	3	0	1	3	2	0	2	4	5
Posters, leaflets	11	10	13	13	9	17	7	13	9	8
Neighbourhood meetings	51	61	22	71	56	62	50	45	48	54
Schools	13	13	15	14	12	19	11	10	13	19
Film screenings	6	3	13	4	3	6	6	8	3	5
Public events	1	1	2	0	1	1	3	0	1	2
Street theatre	4	3	9	4	2	5	5	6	1	2
Traditional entertainment	1	2	0	1	2	1	0	2	2	2
Religious institutions	11	14	3	20	11	8	11	15	10	10
Local /community radio	5	7	1	11	5	4	6	6	5	5
From members of my community	51	67	4	73	64	52	49	47	56	54
Agricultural extension worker/health worker	22	23	18	27	21	21	18	30	21	19

Most popular methods of accessing information are television, neighbourhood meetings and from member of their community with all three having an overall percentage of 51%. Bihar mostly prefers information from neighbourhood meetings or members of their community with percentages of 61% and 67% respectively. Television has a percentage of around 48% for Bihar. West Bengal prefers television the most with a percentage of 61%. For SEC E the preferred method of accessing information is neighbourhood meetings and from members of their community with percentages of 62% and 52% respectively. For SEC A, television was mentioned most by around 89% of the respondents belonging to SEC A.

Table 44– Most preferred media

Figures in %	All	States		Type of toilet in Bihar		SEC				
		Bihar	WB	Single Pit	Septic Tank	E	D	C	B	A
Base (n)	802	597	205	211	284	165	235	186	153	63
Television	26	20	43	8	26	9	19	38	34	38
Radio	3	1	7	1	1	6	3	2	1	0
Newspaper	13	14	11	9	17	6	17	11	16	17
Mobile phone	5	2	13	2	2	6	5	4	5	5
Internet	1	1	0	0	2	1	0	2	1	5
Posters, leaflets	2	1	3	1	1	4	1	1	0	2

Figures in %	All	States		Type of toilet in Bihar		SEC				
		Bihar	WB	Single Pit	Septic Tank	E	D	C	B	A
Neighbourhood meetings	23	28	11	40	21	30	27	20	16	17
Schools	2	1	4	2	1	3	2	2	1	0
Film screenings	1	1	1	0	1	0	2	0	1	2
Public events	0	0	0	0	0	1	0	0	0	0
Street theatre	1	0	2	0	0	1	2	0	0	0
Traditional entertainment	0	0	0	0	0	0	0	1	0	0
Religious institutions	0	1	0	0	1	1	1	0	0	0
Local /community radio	1	1	0	1	1	1	1	1	2	0
From members of my community	21	27	2	31	26	27	22	18	20	11
Agricultural extension worker/health worker	3	2	7	2	2	4	4	2	2	2

The most preferred media are television with 26%, neighbourhood meetings with 23% and members of their community with 21%. In Bihar, the preference is spread across television, neighbourhood meetings and members of their community with 20%, 28% and 27% respectively. But in West Bengal there is one clear winner that is television with 43%

Table 45– Best Person to share information

Figures in %	All	States		Type of toilet in Bihar		SEC				
		Bihar	WB	Single Pit	Septic Tank	E	D	C	B	A
Base (n)	802	597	205	211	284	165	235	186	153	63
People like me	22	24	14	23	25	16	22	22	25	30
Community Leader	36	42	18	37	45	28	34	40	38	41
Religious Leader	9	9	9	9	9	7	11	11	9	3
Politicians or local representatives	21	10	55	8	11	26	25	20	12	21
Someone in the Family	20	20	18	23	18	22	17	26	18	6
Someone in the locality	25	22	35	28	19	29	26	27	24	14
Film stars	15	19	3	15	21	13	9	13	20	29
Other celebrities like sportsmen	6	8	0	9	7	7	4	6	7	6
Reputed journalists	5	7	0	5	7	3	4	5	4	16
Social activists	44	48	33	56	43	42	40	48	47	44
Foreign Experts	0	0	0	0	0	0	0	0	0	2
Scientists or academics	1	1	1	0	1	1	0	1	3	2

The person they want to share information, or the trusted source are the social activists with 44% and community leaders with 36%. In West Bengal there is a difference, where 55% of the respondents from West Bengal, wants politician or local representatives to share information.

7. District Snapshots

We will now look at the districts and try to find where the districts differ from each other. The areas where some of the districts behave in an entirely different way from the others have been explored here. Please note that, since West Bengal had only one district, so state data will be equivalent to the district data.

Table 46- Type of toilets

Figures in %	All	States		Districts		
		Bihar	WB	Patna	Begusari	Samistipur
Base (n)	802	597	205	198	199	200
Single Pit	49	35	91	20	48	38
Septic Tank	51	65	9	80	52	62

There is a big difference between the type of toilets in Patna and that of Begusarai and Samistipur. In Patna district there is only 20% of the households who have single pits in their house as compared to 48% in Begusarai and 38% in Samistipur.

Table 47– Awareness of sludge disposal

Figures in %	All	States		Districts		
		Bihar	WB	Patna	Begusari	Samistipur
Base (n)	802	597	205	198	199	200
Yes	69	73	55	65	59	96
No	30	25	43	34	38	3

In Samistipur the awareness of sludge disposal is very high, at 96%, as compared to 65% in Patna and 59% in Begusarai. The Patna and Begusarai data are almost consistent with the overall data, but Samistipur is an exception.

Table 48– What happens to the sludge?

Figures in %	All	States		Districts		
		Bihar	WB	Patna	Begusarai	Samistipur
Base (n)	802	597	205	198	199	200
It is taken to sewage disposal plant	31	39	2	19	57	40
It is dumped in nearby pit	61	54	84	47	30	74
Some farmer buys it and stores it for using it as manure	6	6	6	9	9	1
It is dumped in nearby water body	10	12	4	21	9	7

There is a big difference in the awareness of the households when it comes to what happens to the sludge. In Patna, only 19% of the households said, that sludge is taken to sewage disposal unit, whereas the value is much higher for Begusarai and Samistipur, where 57% and 40% mentioned sewage disposal plant respectively. In Samistipur 74% of the respondents said, that the sludge is dumped in the nearby pit which is quite high compared to Patna and Begusarai.

Table 49– Who clear the sludge?

Figures in %	All	States		Districts		
		Bihar	WB	Patna	Begusarai	Samistipur
Base (<n)	168	83	85	26	23	34
Private Operators	13	13	13	8	4	24
Government Agency	1	1	0	0	4	0
Manual Scavengers	55	48	62	54	52	41
No Response	15	28	4	19	35	29

Samistipur is an exception when it comes to clearing of sludge by private operators. While Patna and Begusari have very less percentage of households employing private operators to clear sludge, with percentages of only 8% and 4% respectively, Samistipur have 24% households employing private operators to clear sludge.

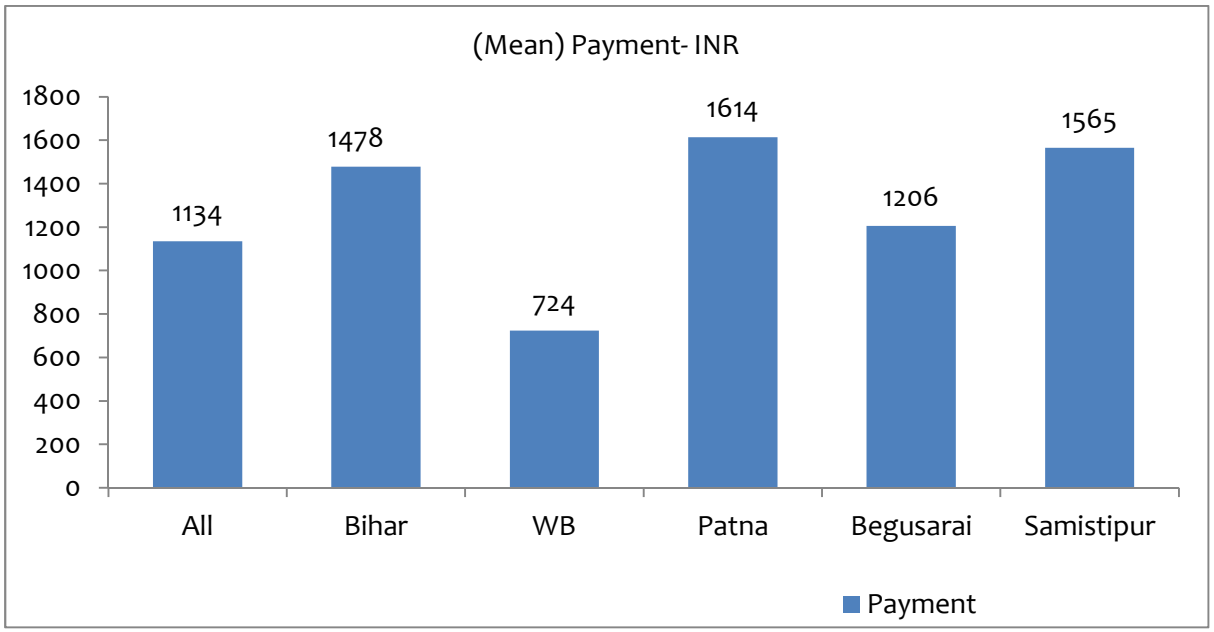


Chart 11– Last Payment Made for clearing sludge (By Districts)

All the districts have made more average payment for the last time sludge clearance was done than the overall of average. Patna has the highest amongst the three districts in Bihar with RS 1614, as compared to RS 1206 in Begusarai and RS 1565 in Samistipur.

Table 50– Is Toilet effective?

Figures in %	All	States		Districts		
		Bihar	WB	Patna	Begusari	Samistipur
Base (n)	802	597	205	198	199	200
Yes	79	85	63	90	91	74
No	20	15	37	19	8	27

Majority of the households in Bihar and Begusari said that the toilet in their house is effective with 90% and 91% respectively. But in case of Samistipur, only 74% of the households feel that their toilet is effective.

Table 51– Have the requirements for proper sanitation been met?

Figures in %	All	States		Districts		
		Bihar	WB	Patna	Begusari	Samistipur
Base (n)	802	597	205	198	199	200
Yes	34	42	8	59	33	36
No	66	57	92	41	65	65

Around 59% of the households in Patna feel that their requirements for proper sanitation have been met. But the percentage drops to 33% and 36% in Begusarai and Samistipur respectively.

Table 52– Have the requirements for proper FSM been met?

Figures in %	All	States		Districts		
		Bihar	WB	Patna	Begusari	Samistipur
Base (n)	802	597	205	198	199	200
Yes	25	30	9	42	32	18
No	75	69	91	57	67	83

Only 18% of the respondents belonging to Samistipur says that the requirement for fecal sludge management have been met. The story is very different when it comes to Patna, where 42% of the households saying that the requirements for proper FSM have been met.

Table 53– Best service provider for FSM?

Figures in %	All	States		Districts		
		Bihar	WB	Patna	Begusarai	Samistipur
Base (n)	802	597	205	198	199	200
Government Agency	58	53	73	52	77	32

Figures in %	All	States		Districts		
		Bihar	WB	Patna	Begusarai	Samistipur
NGO	23	17	40	23	22	7
Private Company	37	39	31	43	23	52
Community driven initiatives	9	10	7	15	14	1
Don't Know	6	6	4	7	1	11

There is a high preference for government agency in Begusarai when it comes to the best provider for FSM. Around 77% of the respondents think that government will be able be the best service provider. There is a much higher preference for private operators in Samistipur and Patna with percentage of 52% and 43% respectively.

Table 54– Problems facing current toilets

Figures in %	All	States		Districts		
		Bihar	WB	Patna	Begusarai	Samistipur
Base (n)	802	597	205	198	199	200
Very poor quality and hence can't be used	5	3	10	3	4	3
Technology Problems	18	14	31	17	24	2
The current practice is very unhygienic	28	26	31	30	16	34
Proper service not available	57	53	71	60	55	43
Very infrequent services	35	35	37	35	32	38
Sludge Left behind	30	37	10	38	29	43
Leakages in the tanker itself	8	10	0	12	18	1

As per households in Patna, the biggest problem facing current toilets are proper service not available with 60% of respondents mentioning this point. In Samistipur only 2% of the households think technology is the problem as compared to higher percentages in Patna and Begusarai. In Begusarai, only 16% think that the current practice is very unhygienic as compared to Patna and Samistipur where the values are 30% and 34% respectively.

Table 55– Things to improve in FSM

Figures in %	All	States		Districts		
		Bihar	WB	Patna	Begusarai	Samistipur
Base (n)	802	597	205	198	199	200
Better Toilet infrastructure	48	52	38	41	56	58
Proper services in sludge	35	32	45	42	32	22

Figures in %	All	States		Districts		
		Bihar	WB	Patna	Begusarai	Samistipur
disposal						
Frequent sludge disposal	54	63	30	59	48	81
Proper maintenance	26	22	36	26	36	5

In Samistipur an overwhelming majority of the households feel that the frequent sludge disposal is the best way to improve FSM, with 81% of the respondents mentioning this point. A very few percentage, 5%, believe that proper maintenance can improve FSM, as compared to the higher percentages in Patna and Begusarai, where the percentages are 26% and 36% respectively.

8. Supply

The supply side of the landscape of the fecal sludge management is dominated mostly by the manual scavengers and the private operators. The two of the biggest barriers for the rural households are directly link to the supply of the service and they are following:

1) Financial Constraints – Majority of the rural households have very less income to spend on proper fecal sludge disposal. Many of the poor rural households just cover the existing pit and dig another pit alongside it. If they do not have enough space for it, they revert to open defecation.
   The private operators are too expensive for majority of the households. For the private operators too, the costs increases the distance increases, as all of them are based out of the city, and they have to travel the extra distance once a rural customer asks for their service. So they pass on the extra costs to the customers.
   So majority of the rural households use manual labourers, who belongs to the village or nearby village, can provide prompt service and most importantly they are much cheaper than the private operators.
2) Lack of proper vendor/ operators – There is a lack of proper service provider/ operator in rural Bihar. There is hardly any player dedicated to the rural sector. Mostly the need arises when there is an emergency, and the pit or tank is filled to the brim, so the service is needed immediately. The manual labourers are immediately available as they are local to the area.

The existing private operators or any entrepreneur who wants to enter the business and wants to cater to the rural sector as well needs to keep the above barriers in mind. The pricing is the key, and if they can offer lower pricing, comparable to the manual scavengers, then the demand for their service will increase. The private operators are perceived to offer higher quality service in the villages. They are considered better than the government service. If some innovative pricing options like EMI be provided then the demand will be high. The villagers consider that it is easier to pay smaller amount each year than a large amount in one go.

The private operators have their base in the city, and most of their business is concentrated in and around it. The cost increases, as the distance increases, and hence the extra cost has to be paid by the end customer themselves. So a village which is far from the village has to pay more to avail the same service as compared to a household in the city.

When it comes to sludge disposal, safe disposal is not practised by the private operators. Most of them dispose the sludge at some barren land or nearby water bodies. There is an example where the operator used his own land to convert it into a dumping ground. It is cheaper for them to dispose the sludge like this, as wherever the sewage treatment plant is present, it becomes expensive for them to transport the sludge to that place and also, they have to pay the sewage treatment plant to dispose the sludge for each trip.

The current practices and business of the private operators are shown below:

Collection and Transportation

The private operators get the order from the customer. The operator sends trucks/ tractors to clear the sludge from the tanks or pits. The actual clearing is done by labourers with help of suction machine. Some of the figures related to transportation are as follows:

Clearing Process	Mechanical
Type of vehicle used for transportation	Mostly Tractors, in some cases trucks
Type of ownership	Owned
No of cleaning per day	Usually 2 clearing per day on average; but nothing is fixed, there are days where there are no clearing also.
Number of trucks	3-4
Size of the business	Medium (2 – 5 trucks) on average
Capacity of Tanks	Mostly 4000 litres
Type of trucks purchased	New
Typical age of truck	10 years
Typical number of trips per day	On average 2; but depends on the distance.
Where is sludge dumped	Mostly in nearby land or small water body; one operator has his own storage place in rural area which was his own land
Reuse for sludge	Gas and Fertilizer
Quantity of fecal sludge received per day	Depends on the number of trips and the operator, but it ranges from roughly 15000 litres to 20000 litres
Is the technology found to be suitable for the users	The operators are happy with the existing technology
Highest demand for sludge clearing	During the rainy season, the demand is the maximum

So the collection and emptying is done mechanically using suction machines by labourers. Most of the private operators have trucks and tractors for carrying the tanker and the machines. On an average, the numbers of trucks owned by the operators are 3-4, and they have mostly bought new. The capacity of the tank is roughly 4000 litres, and so if the sludge from a household is more, then more than one trip is required, which will increase the cost. The typical number of trips for an operator is 2 per day. But there are times when there is not a single trip also. After emptying, the sludge is mostly disposed in nearby empty land or water body. One operator uses his own ancestral land for dumping. But by and large, safe disposal is not practised by majority of the operators.

Cost and Revenue

The following are few of the facts regarding costs and earnings of the private operators.

Labour costs for Operations and maintenance	On average RS 300 daily
Land Costs	RS 10 to 15 lakhs per Katha
Ownership of land	Private
Fund Assistance from government	No assistance is received from the government
Investment required to start the business	As per the private operators an initial investment of RS 15 lakhs will be required
Main expenses in running the business	Labour, Machinery, Diesel
Price of new truck/ tractor	Approximately RS 6 lakhs
Charge for Pit clearing	RS 800 – RS 1500 per trip, depending on the operator and the distance needed to be travelled. The more the distance, the rate increases accordingly. So a rural household has to pay more, as the operator has to travel a longer distance. So with around 2 trips on average and an average rate of RS 1200, the private operators earns around RS 2400 per day.

For the customers the clearing costs is around RS 1200 on average. For the rural customers it will be more, as the price increases as the distance increases, and since all the private operators are based out of the city, the cost will be much higher as the trucks have to travel a longer distance which will increase the cost.

When it comes to costs, an approximate cost of new tractor is roughly RS 6 lakhs and main expenses in running the operation is mostly in paying for the labour, machinery and the fuel costs. If land is not owned, then cost of land comes out to be around RS 10 to 15 lakhs per Katha. But the cost of land will vary depending on the area.

As per the private operator, an initial investment of minimum RS 10 to RS 15 lakhs will be required to start this business.

9. An Example to follow

In a latest move, Tamil Nadu government has taken its cue from the Union Urban Development advisory and has come up with guidelines for management of septage (sewage stored in septic tank)

- Local bodies will evaluate existing septic tank designs
- Notices to be given to owners of septic tanks that do not meet standards for converting insanitary latrines to sanitary ones
- Only licensed transporters to be allowed to remove sewage
- Fee of Rs. 150-Rs. 200 for treatment of 9000 litres of waste collected
- Under-utilised sewage treatment plants (STP) to absorb sewage from septic tanks.
- Municipal staff to be trained in safe septage management

It has also been stated that the government must attach more importance to the reuse of treated sewage, requiring industrial units to use sewage water instead of tapping into the groundwater.

10. Conclusion

Summing up, one can see that fecal sludge management has very less demand and the supply to rural areas very less and expensive. There is lot of dependency on manual scavengers as of now, with no other private operator in that price range and within immediate reach.

The demand will not increase if the major barriers of financial constraint, lack of knowledge and no major vendors in the rural areas are not overcome. If a new player is to setup a new business in this area, then the pricing along with timeliness of the service will be the key.

In the supply side, the rural areas are generally ignored by the private operators from the nearby town. Though they do go the villages to clear sludge, but the rate increases with the distance, so the rural households have to pay more in comparison to their urban counterparts. The government agencies are considered lethargic, and the process too complicated. The demand arises only in case of emergencies, and when the pit or the tank is absolutely full, and the government agency services are considered to be very slow to address their immediate needs. Hence in most of the cases, manual labourers are used as they are cheaper, present in the locality and hence can provide the immediately. The households are also not aware of the new law which has made manual scavenging illegal.

The practise of safe disposal is almost nil in most of the cases, as the sludge is mostly disposed of in the nearby barren land or nearby water bodies. Even with sewage treatment plant being present in the city, the sludge is not disposed there, as it is considered expensive by the operators.

In conclusion, the demand right now is too less to be considered lucrative for private operators or new players to give it much thought. The demand has to be increased by overcoming the barriers and meeting the requirements, which will lead to more business from the rural area and improve the state of sanitation and the issues related improper fecal sludge management to be eradicated.