Non- Ideal Toilets in India: The Solution to Sanitation Woes Or The Source of New Problems?

It seems an unavoidable feature of moral experience that men should be torn between moral claims entailed by effectiveness in action, and particularly in politics,
and the moral claims derived from the ideals of scrupulous honesty and integrity.
— Stuart Hampshire

Although we take it for granted, sanitation is a physical measure that has probably done more to increase human life span than any kind of drug or surgery.
— Deepak Chopra




Source: MHT 2011, Field Data Source

This case was written by Aprajita Singh, Ekroop Kaur and Kashyap Shah under the guidance of Professor M Ramesh, Lee Kuan Yew School of Public Policy (LKY School), National University of Singapore and was funded by the LKY School. The case does not reflect the views of the sponsoring organisation nor is it intended to suggest correct or incorrect handling of the situation depicted. The case is not intended to serve as a primary source of data and is meant solely for class discussion. This case is based largely on publicly available sources and actual events, but some characters and events have been altered for the purposes of this case study.
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Introduction

Anushka is the Project Director of a women-led urban sanitation project, “Change”, led by Urban Shelter Trust (UST), a non governmental organisation (NGO). The project site, Katihar, is a small urban town in Bihar. Like most in India, it does not have a state scheme in urban sanitation. Open defecation is a pervasive problem.

Project Change aimed to provide sanitation solutions to about 1200 low income households through a credit based financing model (micro loans).[1] UST had chosen soak pit type (see *Exhibit 1*) toilet model for multiple reasons and in the absence of a city level sewage system, the soak pit model was also the only affordable choice that could be conveniently connected to the sewage system once it was laid.

The Project was funded by The Will Door Foundation (WDF). Both the Foundation and UST aimed to get insights on the sustainability and scalability of the current model, in their pursuit to devise a larger strategy to address the water and sanitation deficits in the State of Bihar. Hence, this project had an action research component for which a team from the Indian Management Institute (IMI) was hired.

The research team recently completed a reconnaissance visit. It then raised serious concerns about the nature of sanitation solutions (soak pit) being constructed. They observed that most of the toilets constructed so far did not adhere to the safety norms to ensure non-contamination of ground water. For instance, they did not maintain adequate distance between the source of drinking water and the soak pit. Further, the households, in order to ensure a life lasting soak pit, had dug much deeper soak pits. The soak pit depth, which should have been restricted to 7 feet, had been stretched to 15 to 20 feet. This posed potential threats to contaminating ground water. The majority of the households used hand pumps to access drinking water. With no purification system in place, the local community ran the risk of being exposed to potential health hazards. The research team felt that UST should immediately stop the Project. They argued that the project was creating a solution likely to be unsustainable.

As the pressure to stop the project mounted, Anushka's thoughts wandered to her rendezvous

[1] The micro loan of USD 200 covered the costs of a concrete super structure and a soak pit type sub structure of a toilet.

with Basanti ben. One of the beneficiaries, Basanti ben visited and thanked Anushka profusely for the difference the toilet had made to her and her daughters. Not having access to a toilet had made them face the brunt of slangs, threats, stares, eve-teasing every day. She was grateful that UST had helped give them dignity. UST had saved their lives.

There were many Basanti ben's that Anushka and her team had met while working for two years on the field understanding needs. These women had their hopes pinned on these soak pit toilets.

As Anushka grappled with these conflicting emotions, her phone rang. The call was from the Director of UST. The Board of Trustees entrusted Anushka with the final say in deciding the fate of the Project.

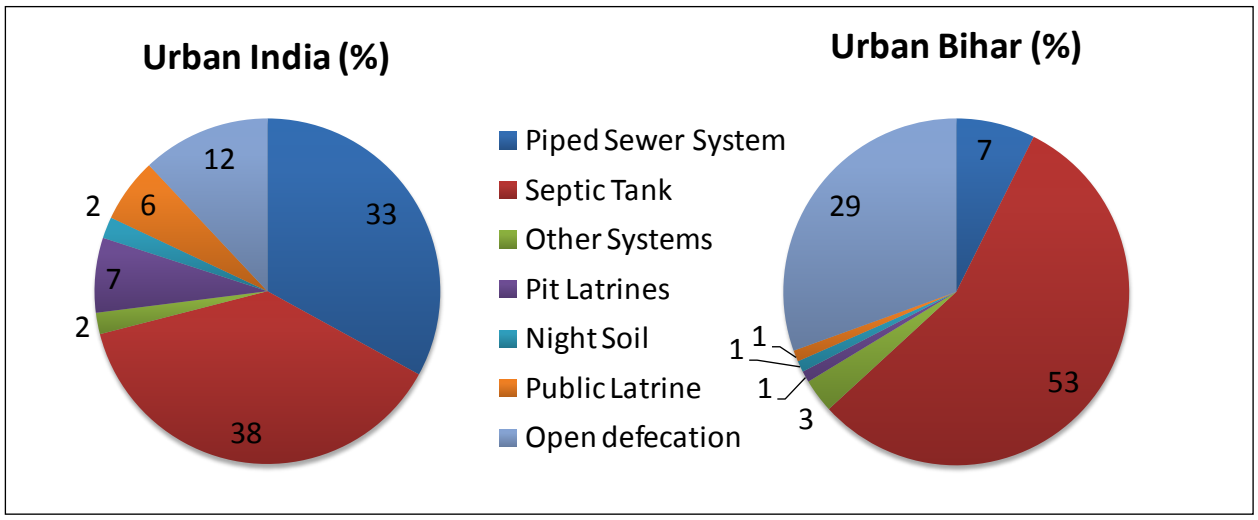
Background

Safe water and sanitation are basic requirements for a dignified and healthy life for all women and men and should be entitlements that every citizen can enjoy. In the Indian context, they are an extension of the fundamental right to life. These entitlements contribute directly and indirectly to the achievements of the Millennium Development Goals (MDGs) by 2015 and also to the goals of the 11th Five Year Plan by 2012 based on the approach of "Inclusive Growth".

It is not without reason that India is often referred to as the world leader in open defecation. Home to 64 percent of all open defecation, India is clearly a concern for the world in its achievement of the MDGs.[2]

[2] Nair Binu (2008), UNICEF and WHO Report, (2012), Progress on Drinking Water and Sanitation- Update Institute of Development Studies, 2012 CLTS website http://www.communityledtotalsanitation.org/country/india

Figure 1: Distribution of Households by Access to Sanitation Facilities



Source: Census of India, 2011

The figures for open defecation for urban Bihar (29 percent) were two folds that for India (12 percent). However, such a macro picture did not reveal figures about usability, number of users per unit, or sanitation practices. Hence, it was inadequate to gauge the practical situation. The break up into various types of sanitation reveals that onsite sanitation systems remained the most prevalent form of solutions.

Sewerage system access also appeared abysmally low in India. The National Institute of Urban Affairs,(NIUA) 1998[3] survey revealed that only 100 out of 300 cities surveyed had sewerage access. The cities covered also reported limited presence. Sewerage system networks was still a feature of elite localities within the city.

The poor quality of habitat often tilted the disease burden scales towards the poor slum dwellers or low income colonies.[4,5] This was worse in the urban settlement where space was constrained and environment burdened with a heavy population density. Public health becomes more linked with health of environment.[6] An inadequate sanitation resulted in increasing disease burdens of those such as diarrheoa. The lack of sanitation was responsible

[3]NIUA (1998). Status of Water Supply, Sanitation and Solid Waste Management in Urban Areas. Natio nal Institute of Urban Affairs, New Delhi
[4] CSDH (2008). Closing the gap in a generation: health equity through action on the social determinants of healt h. Final Report of the Commission on Social Determinants of Health. World Health Organization, Gene va.
[5] MHT 2014, Baseline Report on Sanitation Intervention in Katihar
[6]Satterthwaite, D. (2011). Why is urban health so poor even in many successful cities? Environment and Urbani zation, 23, pp. 5-11.

for other diseases like ascariasis, hookworm infection, schistosomiasis and trachoma. The WHO reports[7] inadequate access to potable water and sanitation as the underlying causes for diarrheoa which was one of the key causes for infant deaths. Spears (2013) also found empirical evidence linking inadequate sanitation facilities to stunting amongst children in India.[8]

The WSP estimates suggested economic losses owing to inadequate sanitation made up about 7 percent of India's gross domestic product (GDP). Disease burdens comprised three quarter of the losses. This further suggested that those in the lowest income groups residing in low income, slum and squatter settlements bore the brunt by suffering the highest loss per capita.[9]

The Katihar's sanitation woes

Like most small urban towns in India, Katihar does not have a state scheme in urban sanitation. The problem of open defecation is pervasive. According to Census 2001, around one third of the population defecates in the open.[10]

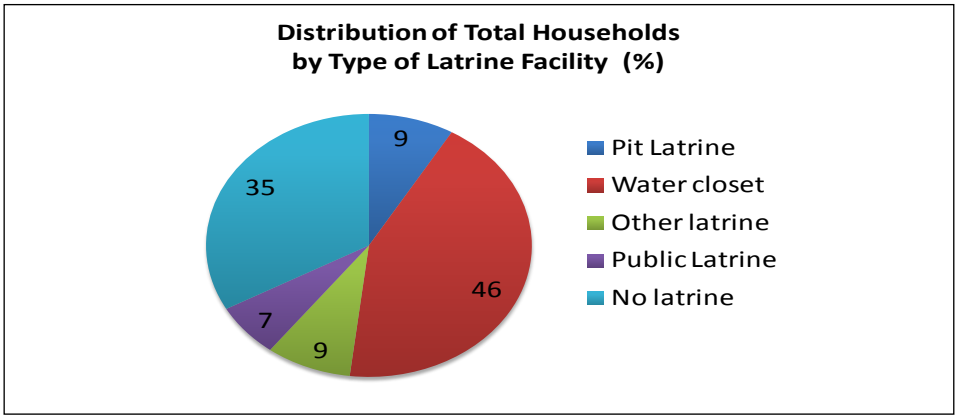
Like the majority of urban India, urban Katihar was also dependant on onsite sanitation solutions due to the absence of a city level sewage system. Also, public toilets were negligible in number, poorly maintained and often dysfunctional. Data on the various types of onsite sanitation systems was unavailable.

However, preliminary results from field suggested:[11]

"The choice between soak-pit and septic tank was a function of financial capacity of the household; economically weaker households built soak-pits while those with higher spending capacity opted for septic tanks. The sludge and night soil from the septic tanks and pit latrines was either removed by the cleaners from KMC or by private cleaners. In both cases, the waste was dumped in an area without any further treatment."

[7]WHO/UNICEF. (2008). Progress on Drinking Water and Sanitation: Special Focus on Sanitation. World Healh Organisation/UNICEF Joint Monitoring Programme for Water Supply and Sanitation, New York and Geneva.
[8]Spears, D. (2013). How much international variation in child height can sanitation explain? Policy resea rch working paper series. World Bank, Washington.
[9] WSP 2012, The economic impacts of inadequate sanitation in India
[10] Census of India (2001). Primary Census Abstract. Office of the Registrar General and Census Com missioner, Ministry of Home Affairs, Government of India, New Delhi.
[11] MHT 2014, Baseline Report on Sanitation Intervention in Katihar

Figure 2



Source: Census 2011

Fig 4. Private Pit Latrine in Rehman Colony	**Fig 5. Community Toilet in Shitlasthan**	**Fig 6: Open Defecation Site near Bhatta Tola**
		

Source: Baseline Report on Sanitation Intervention in Katihar , Mahila Housing SEWA Trust, 2014

UST's field study[12] clearly showed that lack of toilet access were a grave concern to women, who, unlike men, could not go out into the fields at any time of the day and night. The field interactions echoed safety, privacy, dignity, convenience and impact to health in context of repercussions of holding on to the excretory activity as the demand drivers.

1. *Safety*. With the population explosion and infrastructural pressures on land, open spaces were on a regular decline. This made the situation of unsanitary defecation worse. With no place to relieve themselves, people ended up using public land: railway lines, roads, etc. In various slums, one would see excreta lined up, almost in a

[12] Singh Aprajita 2012, 'Access to toilets and its impact on women' for a state level commission ('the State Task Force') on the 'social determinants of health' of self employed women (unorganized sector) in Bihar, SEWA Bharat initiative funded by the David and Lucille Packard Foundation, Los Almos, USA.

pattern, on both sides of the main road. This not only led to a deterioration of the cleanliness standards of these public spaces, but also posed risks for the communities defecating there. Apart from having to live with the brunt of daily reprimands by the authorities causing much social embarrassment and shame, accidents also increased.

In Purnea, a highly dense cluster of basket weavers, both men and women used the railway line as the defecating area. Unfortunately, more than the daily risk of being run down by the train, the community feared that the railway authorities might construct a wall to prevent their access. “What would we do then?”. This was a thought that scared the people every day.

2. *Health*. The field interactions brought out the daily discomforts and health issues that women faced due to the unavailability of a toilet. The situation deteriorated further where space constraints prevented even open defecation. Women avoiding or limiting the consumption of water or fluids because they did not have access to privacy or safe environment to relieve themselves were voiced at almost all the visited settlements. Women mentioned how the situation worsened in the menstrual period resulting in acute dysmenorrhoea.

3. *Dignity*. “A toilet is much more than just a sanitation unit,” said Savita ben from Garedi tola settlement. Communities saw it as a prized possession that reflected their care for the loved ones, women, elderly and children.[13] Not having a toilet led to insults and threats that hurt their self respect and pride.

   This sentiment had been echoed in the interaction with women in the Rupali village in Purnea. They had revealed that “there is no toilet here, no government scheme has reached us. We walk every day to a far off land to defecate. We cannot dare to defecate or urinate in the land close by”. When somebody trespassed, a big fight broke out and subsequently, a legal case had to be filed. Verbal threats by landowners such as “if you step on my land, I will cut your legs” were statements heard everyday. Not having access to a toilet made them face the brunt of slangs, threats, stares, teasing every day. They didn't want their daughters to go through daily ordeal. They

[13] The Voices of Women in Bihar, 2012. SEWA Bharat Study document

wanted to afford them dignity that they themselves were deprived of.

UST Project: What it brought for Katihar?

The UST-WDF Project aimed to a) deliver user-sensitive sanitation solutions to at least 1,200 households (7,200 individuals)[14] with extensive women participation. b) Create a local resource pool by training and providing livelihood generation opportunities to at least 250 informal sector members – predominantly women identified from the target community and surrounding areas – in the execution of these projects. In the process, it aimed to set the foundation for the formal creation of a grassroot-driven local management of sanitation systems to poor households. c) Organise women members from the community as Community Based Organizations (CBO) and train and orient them in the maintenance of the delivered sanitation systems and the general hygiene of the community. In addition to this, the intervention intended to build their capacities to liaise with the government: a) to influence pro poor governance processes towards access to sanitation in Katihar and other cities b) to ensure graduation to better levels of service, within and beyond the project period.

UST's Technical model

UST had chosen this particular (soak pit type) toilet model for multiple reasons.

1. The demand for such toilets had been strongly voiced during several Focused Group Discussions (FGDs) and other community interactions which UST conducted over a year, to understand needs and preferences of the target community.
2. In the absence of a city level sewage system, the soak pit model was also the only affordable choice that could be conveniently connected to the sewage system once it was laid.
3. This was the technical model that had been chosen by the Central Government for its nationwide rural sanitation programme, Total Sanitation Campaign (TSC).
4. The soak pit type toilet cost about USD 200 whereas a septic tank toilet was USD 1400-1500.[15]

[14] As per the 2001 Census of India, the average house hold size for Katihar is 6. Since the house hold toilet would be used by all members of the house hold, we have considered them direct beneficiaries of the provided sanitation solution.
[15] MHT 2014, Baseline Report on Sanitation Intervention in Katihar

The choice between a soak-pit and a septic tank was thus also a function of the household financial capacity; economically weaker households built soak-pits while those with higher spending capacity could opt for septic tanks.[16]

Pit Latrines and Contamination

The Research team's arguments were based on the two principal violations in the construction of the soak pit toilets by beneficiary households of the Project Change. First, they had failed to maintain an adequate distance between the source of drinking water and the soak pit. Second, the households had exceeded the soak pit depth beyond the permissible limits of 7 feet.

To get a city-wide picture, Anushka studied the other sanitation units in the city (those not provided through the Project). In a random sample of about 100 toilets, she discovered that most toilets (more than 50 percent) violated the safety norms. In the absence of government guidelines or awareness for such norms, people had opted for the most convenient, albeit non ideal, solutions.

She also recalled that the choice of the technical model (soak pit toilet) adopted by UST was anchored in the Government of India's Total Sanitation Campaign (TSC) for rural landscape (*Nirmal Bharat Abhiyan*). The government funding and focus on sanitation so far had been limited to providing subsidies, sewage network expansion and treatment. Technical efficiency and on-site sanitation systems had been largely ignored. For instance, the National Urban Sanitation Policy (NUSP) specifically stated that “sanitation interventions must be technology agnostic”.

The government figures for TSC achievements in 2013-2014 claimed 51,177,621 soak pit toilets had been constructed so far. On average, an expected 3,936,740 were added to this pool every year. Assuming 50 percent of these violated the safety norms, there was a likelihood of 25,000,000 non ideal toilets delivered through this government initiative already, with a whopping 1,000,000 added every year. [17]

[16] MHT 2014, Baseline Report on Sanitation Intervention in Katihar

[17] http://tsc.gov.in/tsc/Report/Physical/RptYearWiseCountryLevelAch.aspx?id=PHY

What is the 'ideal toilet'?

However, Anushka acknowledged the potential risk of ground water contamination, especially in high water table areas such as Bihar. In the absence of any local on national guidelines, she reviewed international research papers to determine "the travel distances of pathogens especially coliform till they come inert." This would help understand the ideal distance between the soak pit and drinking water source. These findings have been summarised below:

Table 1. Travel Distances of Coliform from Pit Latrines

Soil Type	Geographic Location	Season	Travel distance of coliform from pits	Source
Wet and sandy soil			5.5 m	Kligler (1921)
			3 – 25 m	Caldwell and Parr (1937)
Alkaline alluvium soil			< 7 m	Dyer (1941)
	South Africa		1 m	Still and Nash, 200
			< 5 m	Dzwairo et al. 2006
Sandy soil		Monsoon	10 m	Banerjee (2011)
	Zimbabwe	Dry season	20 m	Chidavaenzi et al. (1997)
			10 m	Ahmed et al. (2002)

Source: Cited in: Graham and Polizzotto, 2013 taken from Baseline Report on Sanitation Intervention in Katihar , Mahila Housing SEWA Trust, 2012

Table 2. Recommended Distances between Pit Latrines and Source of Water		
Vertical Distance (from the water table)	**Horizontal Distance (from the source of water)**	**Source**
3 – 4.5 m		Kligler, 1921
	15 m	Lewis et al. 1982
	20 m (less than 1 decade) 36 m (1 – 2 decade) 48 m (More than 2 decades)	Tandia et al. 1999
1.5 – 2 m	15 – 30 m	Banks et al. 2002
	10 m	Banerjee, 2011
	12 m	Vinger et al. 2012
1.5 m	30 m	Haiti Standards (Reed, 2010)
	75 m	South Africa guidelines (Still and Nash, 2002)
2 m	15 m	WHO (Franceys et al. 1992)
	50 m	Water Aid, 2011
	30 m	Sphere Project, 2011
Source: Cited in: Graham and Polizzotto, 2013 taken from Baseline Report on Sanitation Intervention in Katihar , Mahila Housing SEWA Trust, 2013		

The recommendations, apparent from the tables, show great variations. The vertical distance varies from a minimum of 1.5 m to a maximum of 4.5m, while horizontal distances vary from 10 m to 75 m.

The review also reveals variations owing to differences in soil type and region. In the absence of water quality test studies, it appeared difficult to determine accurately what technical guidelines (appropriate distance, depth, etc.) would make an 'ideal soak pit toilet' for Katihar.

Multiple Dilemmas

Basanti ben’s young daughters avoided consuming water or fluids because they did not have access to privacy or a safe environment to relieve themselves. Anushka recalled how Basanti

was in tears at how helpless she felt as a mother seeing them suffer dysmenorrhoea. She thought they would be better off falling sick rather than to die of shame relieving themselves in front of strangers in broad daylight. Basantiben's story was not an isolated one; there were many such voices who were gratified with UST's support.

Anushka wondered if it was morally acceptable to stop the project and make such women already crippled with multiple vulnerabilities pay for these norms flouted across households in Katihar, in fact, in the entire country. Katihar was merely a microcosm of the sanitation landscape and its related complexities in India.

If she decided to continue, whatlong term risks would she be overlooking for immediate benefits? Could there be a better project design to address potential risks?

What decision should Anushka make and why?

Epilogue

12 October 2012: Anushka asked the research team to conduct a water quality test to substantiate their water contamination argument. They declined to do so and insisted to stop the project immediately.

25 October 2012: Anushka informed The Will Door Foundation (WDF) about the stalemate with Indian Management Institute (IMI).

November 2012: IMI was replaced by Institute of Human Shelter (IHS) as the research partner.

December 2013: IHS conducted water quality testing in Project Change beneficiary households. The results were inconclusive. The causal relationship between technical violations and ground water contamination could not be established (Exhibit 1).

As of January 2014: The Project has benefited 700 households.

Exhibit 1

"A soak pit, or soak away, is simply an excavation in the ground which facilitates the percolation of wastewater into the surrounding soil. A soak pit can also be used to dispose of the effluent from a septic tank. By spreading the effluent over a sufficiently large soil area the water is treated and absorbed efficiently. Depending on the wastewater quality, a film of organic slime may develop on the walls of the soak pit and just inside the soil"[18]

Graphical Representation of a Soak pit[19]

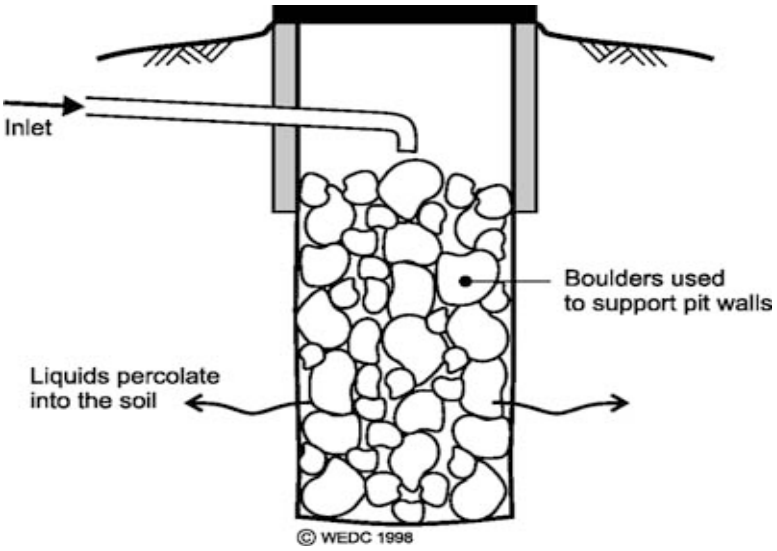


Exhibit 2[20]

Mixed evidence from Project Change

As can be seen from the table above, 6 out of 26, nearly 23 percent of samples contained iron. However, 0.3 mg/l is within permissible limits, so only two samples show presence of excess iron. This finding is contrary to the common perception that there is excess iron in the water.

Table 3 : Results of Coliform Testing Done for 21 Water Sample from Government Hand-pumps in UST Settlements

S. No.	Settlement Name	Result	Distance Category
1	Shitlasthan	Yes	2-4 m
2	Hawai Adda	Yes	4-6 m
3	Balu Tola Sharifganj	No	4-6 m
4	Bhaurabari	No	4-6 m

[18] Soakpit definition as per 'Emergency Sanitation: Assessment and Program Design' authored by The Water, Engineering and Development Centre (WEDC) – Loughborough University (London); 2002; 358 pages.
[19] Photo courtesy WEDC
[20] Taken from Baseline Report on Sanitation Intervention in Katihar , Mahila Housing SEWA Trust, 2012

5	Sitaram Chamariya Colony	No	4-6 m
6	Naya Tola	Yes	10-15 m
7	Bhatta Tola	Yes	10-15 m
8	Hridyaganj	No	10-15 m
9	Officer's Colony	No	10-15 m
10	Nayi Masjid Sharif Ganj	No	15+ m
11	Gachi Tola	No	15+ m
12	Garedi Tola	No	15+ m
13	Shanti Tola Fasiya	No	15+ m
14	Shivaji Colony	Yes	Distance unknown
15	Ramsabha Gaushala	Yes	Distance unknown
16	Chowdhary Mohalla	Yes	Distance unknown
17	Baigna	No	Distance unknown
18	Lalu Nagar	No	Distance unknown
19	Rehman Colony	No	Distance unknown
20	Laxman Tola	No	Distance unknown
21	Harishankar Nayak	No	Distance unknown
Source: IIHS-MHT Katihar Sanitation Baseline Study 2014			

As can be seen from Table 3, 7 of 21 households had coliform contamination. This is nearly one-third of the sample. However, the percentage of contaminated water went up to 50 percent in the case of household samples; 14 out of 31 samples were contaminated.

Table 4 : Results of Coliform Testing Done for 31 Water Samples from Select Households in UST Settlements

S. No.	Settlement Name	Result	Distance Category
1	Shanti Tola Fasiya	No	< 1m
2	Sharifganj Balu Tola	No	< 1m
3	Rehman Colony	No	1-2 m
4	Sitaram Chamariya Colony	No	1-2 m
5	Lalu Nagar	Yes	1-2 m
6	Sharifganj	Yes	1-2 m

7	Chowdary Mohalla	Yes	1-2 m
8	Ramsabha Gaushala	Yes	1-2 m
9	Gaushala	Yes	1-2 m
10	Officer's Colony	Yes	1-2 m
11	Shivaji Colony	Yes	2-4 m
12	Bhaurabari	Yes	2-4 m
13	Chowdary Mohalla	Yes	2-4 m
14	Baigna	Yes	2-4 m
15	Bhatta Tola	No	4-6 m
16	Shivaji Colony	No	4-6 m
17	Gachi Tola	Yes	6-10 m
18	Sharifganj Balu Tola	No	6-10 m
19	Sharifganj	No	6-10 m
20	Rehman Colony	Yes	6-10 m
21	Sitaram Chamariya Colony	No	6-10 m
22	Hawai Adda	No	6-10 m
23	Bhaurabari	Yes	6-10 m
24	Harishankar Nayak Colony	No	6-10 m
25	Hawai Adda	No	6-10 m
26	Ramsabha Gaushala	No	10-15 m
27	Kosi Colony	No	15+ m
28	Shivaji Colony	No	15+ m
29	Hridyaganj	Yes	Distance unknown
30	Hridyaganj	No	Distance unknown
31	Bhaurabari	No	Distance unknown
Source: IIHS-MHT Katihar Sanitation Baseline Study 2014			