



# **BUILDING A SUSTAINABLE MARKET FOR TOILETS**

## LESSONS LEARNED FROM RURAL BIHAR, INDIA



# THIS WHITE PAPER

This white paper shares the implementation experience and key lessons learned during the Supporting Sustainable Sanitation Improvements (3SI) project in Bihar, India. It seeks to synthesize the project's learning from the approaches and strategies tested in rural Bihar, and the insights and recommendations that emerged from the experience. We expect the ideas shared in this document to stimulate thought and discussion on the strategies for unlocking the full potential of the market development approach to rural sanitation. We hope the lessons shared in this document will be used by national and international policymakers, funders, and implementers to advance and accelerate their efforts in the sanitation sector.

We begin the white paper with an executive summary that captures the major interventions and lessons from the project. The next chapter introduces the 3SI project, detailing its background and context and providing a summary of the critical market failures that a landscape study at the start of the project identified as key inhibitors for the growth of a thriving sanitation marketplace in rural Bihar. Each of the ensuing chapters then lays out 3SI's strategic approach, implementation experience, and lessons as it systematically tackled these market failures.

# ACKNOWLEDGEMENTS

This whitepaper has been thoughtfully prepared by Sanjay Singh, Aprajita Singh, and Bikas Sinha. It has benefited from comments and edits by Marcie Cook, Pritpal Marjara, Jennifer Marcy, and Fareha Ahmed. This project would not have been possible without the financial support of the Bill & Melinda Gates Foundation and Unilever, and the collaboration of Friends of the Women's World Banking, PATH, Water for the People.

# TABLE OF CONTENTS

About this White Paper .....	ii
Acknowledgements .....	iii
Table of Contents .....	iv
Abbreviations .....	v
Executive Summary .....	vi
<b>1</b> The 3SI Project; Creating a Sustainable Market for Rural Sanitation .....	1
<b>2</b> Selling Quality Toilets at an Affordable Price .....	5
<b>3</b> Repairing a Broken Supply Chain .....	9
<b>4</b> Recurring Finance for Consumers and Enterprises .....	14
<b>5</b> Converting Latent Demand into Purchase .....	19
<b>6</b> Pursuing Convergence with Government Program .....	26
<b>7</b> Planning for a Sustainable Sanitation Marketplace .....	30
Annexure: Program Tools .....	34

# ABBREVIATIONS

<b>3SI</b>	Supporting Sustainable Sanitation Improvements	<b>PSI</b>	Population Services International
<b>APL</b>	Above the Poverty line	<b>SBA</b>	Swachha Bharat Abhiyan
<b>BPL</b>	Below the Poverty Line	<b>SBCC</b>	Social and Behavior Change Communication
<b>CDOT</b>	Center for Development Orientation & Training	<b>SBM</b>	Swachha Bharat Mission
<b>CRM</b>	Cement Ring Manufacturer	<b>SDS</b>	Sahyog Development Services
<b>DIY</b>	Do It Yourself	<b>SSP</b>	Sanitation Solution Provider
<b>ECAT</b>	Enterprise capacity Assessment Tool	<b>STP</b>	Sewage Treatment Plant
<b>FSM</b>	Fecal Sludge Management	<b>TM</b>	Toilet Motivator
<b>FWWB</b>	Friends of Women's World Banking	<b>TSP</b>	Turnkey Solution Provider
<b>NBA</b>	Nirmal Bharat Abhiyan	<b>WASH</b>	Water, Sanitation, and Hygiene
<b>ODF</b>	Open Defecation Free		





# EXECUTIVE SUMMARY

Pervasive lack of toilets and widespread prevalence of open defecation makes sanitation among the biggest public health challenges India faces. The situation is particularly dismal in rural areas, where, as per Census 2011, almost 67 percent of the households do not have toilets. Over the last three decades India's national and state governments have sought to support, largely through subsidy/incentive, construction of toilets across the country. While these efforts have had an impact—sanitation coverage in India rose from 1 percent in 1981 to around 47 percent in 2011—India is still far short of ensuring sanitation for all. The drive for toilet construction recently received a renewed push with the Swachh Bharat Abhiyan (SBA; Clean India Mission), the central government's flagship campaign to eradicate open defecation in India by the year 2019. Like previous programs, SBA has also adopted a financing-focused strategy, envisaging the construction of 12 million toilets in rural India through incentives to poor households for toilet construction.

The financing-focused strategy addresses a critical need by providing money for toilet construction to resource-constrained households. However, previous implementation of the strategy has shown limited impact on the ground, due in part to incentive/subsidy schemes' poor execution, difficulties in accessing subsidy by beneficiaries, and variable quality of constructed toilets and their usage. Financing is good but not sufficient, the implementation of financing schemes themselves have challenges. Most importantly, there is limited availability of quality toilets that meet consumer needs, and therefore lower than expected uptake even with a subsidy. Hence there is a need to explore alternative, and perhaps complementary, approaches that can build a vibrant, self-sustaining sanitation

marketplace at the local level to provide households easy access to a quality, affordable toilet they can purchase and use.

The Supporting Sustainable Sanitation Improvements (3SI) project, funded by the Bill & Melinda Gates Foundation, tested a market development approach to rural sanitation to address low toilet coverage in rural Bihar. Launched in August 2012 in the state of Bihar, where a staggering 81 percent of the rural households practice open defecation, 3SI systematically tackled multiple barriers that hinder the rural sanitation market from taking off. The \$8.7 million, five-year project was initiated in eight select districts of Bihar with the target of raising toilet sales in project districts by 10 percent (~450,000 toilets sold). Population Services International (PSI) led the project, supported by Monitor Group and Water for People.

Basing its strategy and interventions on hard evidence, 3SI started out with a landscape study of Bihar's sanitation ecosystem, comprising households in need of toilets, sanitation value chain players, and influencers who impact the toilet purchase decision. The study found that demand for toilets existed: 84 percent of the households without toilets expressed a desire to own a toilet but owning a toilet was low in their hierarchy of need. It also found that the different supply-side actors who could enable a household to meet this demand were already present. The research identified constraints that were limiting the sanitation market from thriving despite the presence of these crucial ingredients. Four major market failures came to light: 1) unavailability of affordable, quality toilets that people aspired to own; 2) a fragmented supply chain that was difficult for households to maneuver; 3) lack of

financing for both consumers and enterprises; and 4) normative acceptance of open defecation.

During its five-year duration, 3SI worked on multiple fronts to address the different market failures, developing product prototypes and business models and testing them using an iterative, evidence-based approach. 3SI's quest for functional, scalable, and sustainable solutions and their implementation on the ground has provided valuable insights and lessons that could, specific as they may be to the context of rural Bihar, prove useful to similar efforts elsewhere to address rural sanitation deficit.

The first set of learnings came from the effort to design and sell quality, affordable, and desirable toilets. In doing so, the project was **addressing the unavailability of affordable, quality toilets, that people aspired to own**. Working with its consortium partner PATH, PSI designed products that met consumer preferences, as illustrated by the landscape study, for affordable, long lasting, environmentally safe toilets that met quality standards and were convenient to use. 3SI designed and launched three toilet variants (standard, deluxe, and super-deluxe) across various price points, with differing pit sizes<sup>1</sup> and cosmetic super-structure features. PSI did not see the uptick in sales as expected. Further experience /data from field indicated that upon seeing the options, households desired the high-end super-deluxe model they could not afford, and, therefore, did not purchase the lower end models, stalling sales.

The **need for reducing complexity of choice** was clear and in turn 3SI designed and launched a **standard base model toilet that could be customized** based on customer budget. The project sold 219,494 of these base model toilets as of June 2017; 53 percent of the sales were to below poverty line (BPL) households. 3SI's rigorous **emphasis on product quality** through **regular checks, including low-touch interventions** like the Schmidt hammer test, and **capacity building of providers** has also emerged as a best practice, resulting in 90 percent of the sold toilets meeting quality standards and 92 percent of the toilets being used consistently.

The second market failure 3SI tackled emanated from a **fragmented sanitation supply chain that was difficult for customers to maneuver**. Absence of coordination between different service providers and suppliers of input materials made toilet purchase a cumbersome, tedious, and costly process for the customer, thus discouraging purchase. The solution lay in identifying a **one-stop private sector sanitation solution provider to play the role of aggregator and bring together the different players**. The project developed and tested business models, and finally landed on **centering the business model around a core sanitation market player**: the cement ring manufactures (CRMs). CRMs were at the core of this business model as they were the only market players to be completely linked with the sanitation market and reliant on toilet sales for their profit margins.

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<sup>1</sup> The Standard a pit with a three-foot diameter; Deluxe had twin pit with a three-foot diameter and Super Deluxe has twin pit with a diameter of four and half feet.

In this model—called CRM+—CRMs played the role of aggregator and enabler for the customer, who purchased the cement rings and toilet pan from the CRM and received guidance and help in identifying the other materials and their suppliers needed for constructing the toilet; hence why we called this CRM plus (CRM+). To further strengthen the supply chain, 3SI worked to **aggregate demand for quality construction inputs and secure them at a lower cost for CRMs**. 3SI secured excellent quality, affordable PVC doors from an out of state manufacturer and a national level cement company. The CRM+ model proved to be a durable, productive, and agile framework, scaled to 19 out of the Bihar's 38 districts. Through this model, 3SI was able to reduce time to delivery from over 90 days to an average of 13 days.

Lack of financing or limited access to credit was the third major barrier 3SI tackled toward building a vibrant sanitation market in rural Bihar. **Financing for sanitation, a critical need for households and enterprises** in poverty-stricken Bihar, was almost non-existent. There was a government incentive but could only be claimed by the household **after** constructing the toilet. After submitting a claim for the incentive, the time for reimbursement varied.

None of the limited number of micro-finance institutions (MFIs) operating in Bihar had any experience or interest in sanitation financing. 3SI **motivated and engaged MFIs in the sanitation finance supply chain by demonstrating sanitation loans as a profitable business for MFIs and connecting them to funds**. The project partnered with MFIs and a fund manager (Friends of Women's World Banking; FWWB) to pilot sanitation loans and demonstrate their viability. Recognizing the need for **capital infusion to trigger sanitation financing**, 3SI infused a soft grant of about INR 37,00,000 (USD 60,000) through FWWB to Sahyog Development Services

(SDS), a Bihar-based MFI. The **MFI was provided funds at a subsidized rate** and distributed the entire tranche as 264 consumer loans and 16 enterprise loans within 45 days of receiving the loan from FWWB, with 100 percent repayment rate. The encouraging result not only brought more MFIs and banks on board, but also secured additional grant of about INR 7,80,00,000 (USD 1.2 million) from donors the foundation and Unilever. 3SI expects the funds to revolve for about 3–5 loan cycles in Bihar, that is, disbursed to households as sanitation loans, eventually repaid to MFIs, and then disbursed again to other households, and then remain in the ecosystem for utilization in other underserved states. The project successfully disbursed 30,000 consumer loans for sanitation. Sanitation financing under this project helped both the consumer and sanitation enterprise(s) to get financial support for toilet construction as well as establishing toilet enterprises respectively.

**Enterprise financing for CRM+ entrepreneurs and other input material suppliers** was addressed by 3SI through the MFI route. 3SI not only designed, together with four MFIs, a specialized enterprise-financing product for CRM+ entrepreneurs, but also developed **a credit-worthiness assessment tool for evaluation of CRMs' performance and financing needs**. At the end of the project, 250 enterprise loans, amounting to INR 2,50,00,000 (USD 0.39 million) had been disbursed, with repayment rate of over 95 percent.

The fourth market failure 3SI addressed came from the demand side: households desired toilet ownership but did not consider it a necessity due to normative acceptance of open defecation. Although demand generation was initially not a core component of 3SI's supply-side focused strategy, it became imperative, primarily to support the newly formed CRM+ actors with sales and



marketing activities. The project designed a **communication strategy to educate and mobilize communities and households to make toilets at home an immediate priority, promoting toilets as a solution for families, not just women**, and focusing on the family rather than an individual for toilet sale. 3SI deployed an incentivized sales force to motivate and connect interested households with supply chain actors. Two major lessons emerged from the implementation of this sales strategy: **sales people require the certainty of a regular salary**, instead of a high commission per sale, to remain motivated and the **role must be restricted to that of a facilitator** of toilet purchase, and not an active participant in the sale, which arouses suspicion in the community. As a vital complement to the sales cadre, the project also established a **network of commissioned community-based toilet champions** who closely and consistently worked within the community to spread awareness and facilitate toilet sales. 3SI's sales strategy succeeded in generating 220,145 toilets; 48 percent of the sales were to BPL households. **Targeting not just higher toilet ownership but also toilet usage**, the project ran a behavior change communication pilot, with preliminary but promising results, to end existing social norms around open defecation. As per the project Household survey done in 2017, **93 percent** of households having 3Si toilets reported to use it consistently.

Besides systematically tackling each of the identified market failures, 3SI also pursued **convergence with the government program** for toilet construction under the national SBA campaign. The effort is geared at supporting the Government of Bihar meet its target, under SBA, of making rural Bihar open defecation free (ODF). In support of this objective, 3SI has worked with gram panchayats (local self-government

organizations at the village/small town level) and government functionaries to **mobilize demand for toilets, create awareness about quality parameters, and establish linkages with local sanitation enterprises (CRMs) to ensure supply of quality inputs** for toilet construction. 3SI's contribution to the government's ODF campaign was instrumental in three panchayats of Bihar's Begusarai district being declared ODF in the year 2016.

**Ensuring sustainability of the intervention** beyond the term of the project has been another major area of focus. The key sustainability objective for was to ensure the supply chain actors continue to use the improved coordination and management structures, access to financing, and know-how created by the project to meet households' demand for quality, affordable toilets. The project has thus focused its sustainability **effort on strengthening and scaling up the linking sanitation enterprises with Toilet Motivators (TMs)** and promoting their ownership by natural market actors. It has also undertaken small **pilot demonstrations to explore innovative mechanisms for smooth transition** and sustainability of some of its key functions.

The 3SI project has demonstrated an evidence-based, iterative approach to addressing the market failures that stymie the growth of a thriving rural sanitation marketplace. It developed and tested multiple business models, financing mechanisms, and demand generation strategies to enhance the market's capacity to deliver quality toilets to low-income consumers. The project's implementation experience and iterative approach hold valuable insights and lessons, for similar efforts elsewhere, to use a market development approach to increase rural access to basic sanitations.





# 1

## THE 3SI PROJECT; CREATING A SUSTAINABLE MARKET FOR RURAL SANITATION

A third of the world's population — 2.4 billion people — live without sanitation facilities (World Health Organization 2015). Not having access to even a basic toilet exposes millions of men, women, and children to risk of death and illness daily. Every year an estimated 801,000 children under five—or 2,200 children each day—are lost to diarrheal disease globally (Liu L et al. 2012). The burden of poor sanitation and incumbent disease is largely shouldered by the poor in developing countries. In India, where almost 600 million people (World Bank 2013) defecate in the open, lack of toilets represents a grave sanitation and public health challenge. Access to toilets is particularly limited in India's rural areas, where almost 67 percent of households lack toilets, resorting to unsafe defecation practices (Census 2011).

Tackling the persistent problem of open defecation has emerged as a key priority for the country's policymakers over the last three

decades. In a bid to promote access to sanitation, national and state governments in India have supported, mostly through subsidy/incentive, construction of toilets across the country. There has been progress: sanitation coverage in India increased from 1 percent in 1981 to around 47 percent in 2011. However, access to toilets continues to remain dismal in rural areas, which report sanitation coverage of only about 30 percent. Clearly, the financing-focused strategy of government subsidy/incentive for toilet construction, essential as it is, has not yielded adequate results. The poor progress is in part due to the difficulties beneficiaries face in accessing the subsidy, poor execution by civil society organizations on the ground, and variable quality of constructed toilets and their usage. The need, thus, is to explore alternative, and perhaps complementary, approaches that foster a viable sanitation market at the local level to enthuse and enable more people to easily purchase an affordable, quality toilet that they want to use.



The **Supporting Sustainable Sanitation Improvements (3SI)** project takes a market development approach to the problem, with focus on identifying market failures and determining the most appropriate interventions to improve demand and supply as well as create an enabling environment for a sustainable and equitable sanitation market. The project was launched in August 2012 through funding from the Bill & Melinda Gates Foundation in Bihar, which reports among the weakest poverty and sanitation indicators in the country. About 34 percent of the state's 100 million+ population lives below poverty line (BPL) and 81 percent of its rural households practice open defecation (Census 2011).

Aimed at addressing the sanitation deficit in rural Bihar, the 3SI project was initiated in 138 Blocks across eight select districts of Bihar with the target of raising toilet sales in project districts by 10 percent (~450,000 toilets sold). The \$8.7 million project aimed to meet this target by catalyzing the private sector to invest in developing profitable businesses that offer consumers high quality products and services at an affordable price. Population Services International (PSI) led the project, supported by Monitor Group and Water for People.

The five-year project was structured into three distinct phases — a landscape study to inform strategy and aid the formulation of product and business models; piloting and refinement of product prototypes and business models; and full-scale implementation of the most effective models — to ensure that the adopted solution was functional, scalable, and sustainable. The landscape study examined the sanitation value chain, customer behavior and sanitation ecosystem in Bihar. This included households in need of a toilet, service providers, suppliers of input materials like cement, executors like masons, financiers, and key influencers, who are the entities involved in or influencing toilet construction. The study revealed, crucially,

the presence of strong demand for toilets — 84 percent of the households without toilets wanted to own one but is not considered as an urgent need. It also found presence of multiple supply-side actors who could provide toilets to customers.

However, the presence of these market conditions was not resulting in widespread toilet purchase and improved sanitation coverage, due to several market constraints. The landscape study identified four critical market failures that were inhibiting the growth of a thriving sanitation market: 1) unavailability of affordable, quality toilets that people aspire to own; 2) a fragmented supply chain that is difficult for households to maneuver; 3) lack of financing for both consumers and enterprises, primarily due to a lack of access credit across the state of Bihar; and 4) normative acceptance of open defecation. The 3SI project worked toward fixing these market failures by developing innovative and sustainable business models, financing mechanisms, and demand generation strategies to rapidly increase the number of toilets purchased in target districts. Figure 2 presents the project's major achievements resulting from those efforts. The other key focus of the 3SI project was on pursuing alignment with the government program, particularly to support the goals of the recently launched Swachh Bharat Abhiyan (Clean India Mission), and sustainability of the intervention beyond the term of the project.

The chapters ahead lay out the 3SI project's strategic approach, implementation experience, and lessons along the way as it systematically tackled each of the identified market failures. The project addressed the different market failures at the same time, developing models and testing them using an iterative, evidence-based approach. Figure 1 summarizes the timeline and trajectory of the project as it worked to establish a sustainable sanitation marketplace with enhanced capacity to deliver quality toilets to low-income consumers.

FIGURE  
**01** Evolution and Progress of the 3SI Project

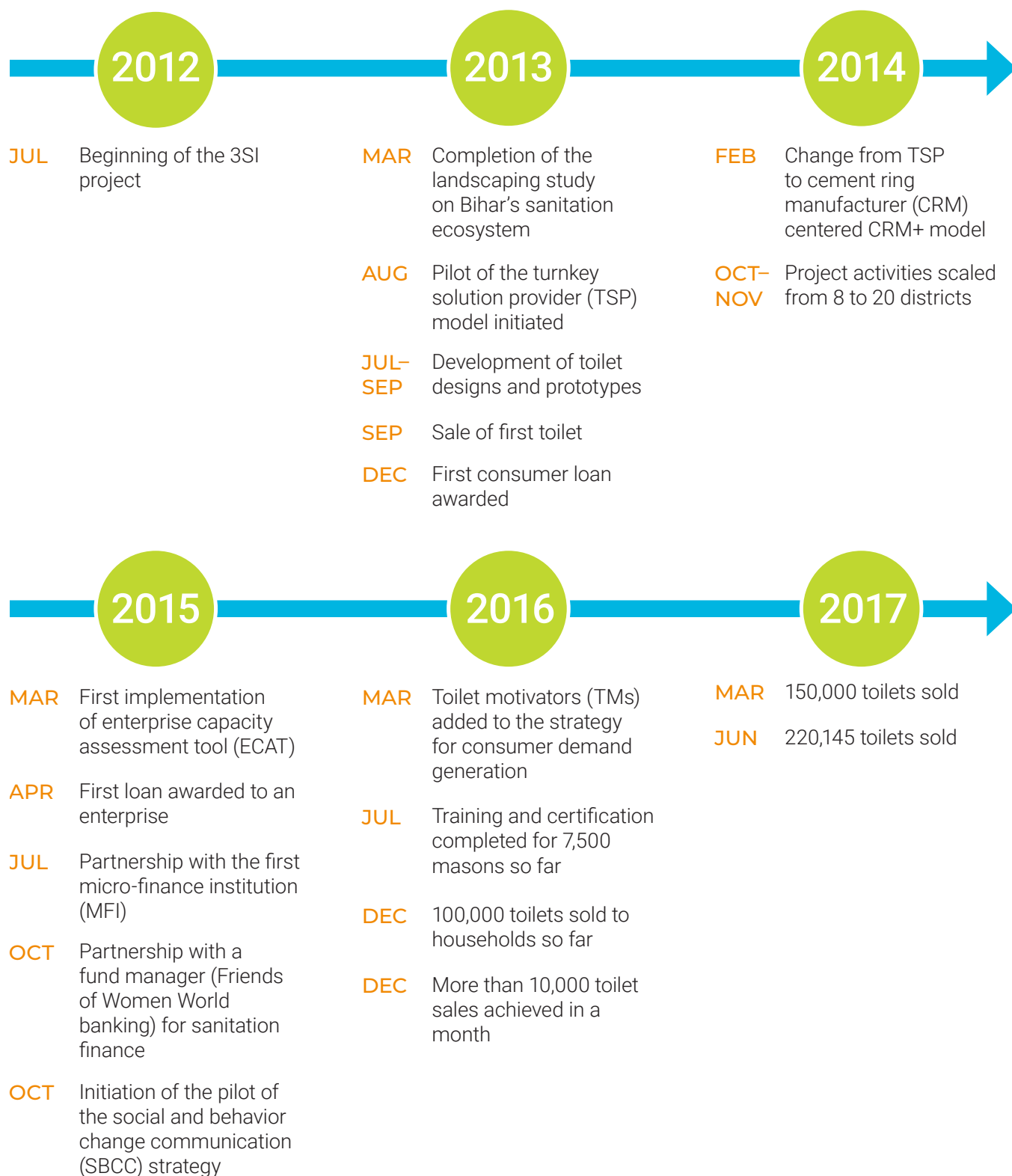




FIGURE  
**02**

Key Successes of the 3SI Project (As of June 2017)

- 220,145** Toilets sold
- 37,175** Households received loans for toilets
- 251** Enterprise loans provided
- 759** Sanitation enterprises trained
- 6,408** Masons trained
- 53%** Of the toilets sold to below poverty line households
- 92%** Of the toilets used consistently

FIGURE  
**03**

Scale of the 3SI Intervention in Bihar

- 5,000** Villages (Each Block has an average of 35 Villages)
- 250** Panchayat (Each Block has an average of 15 Panchayats)
- 155** Blocks (Each Block has an average of 35,000 HH)
- 19 of 38** Districts (Each District has an average of 14 Blocks)

# 2

## SELLING QUALITY TOILETS AT AN AFFORDABLE PRICE

### THE PROBLEM

#### The Desired Product is Not Affordable.

3SI's research found the lack of acceptable product options to be a major barrier inhibiting the growth of the local sanitation market. The market did not offer lower income populations affordable quality toilets that they wanted to own. Realistically, there were only two toilet options available. The first, the more affordable option, was the 3-feet deep, brick-lined single leach pit toilet that could be built with the help of government subsidy (of INR 4,600 or USD 71) and cost between INR 5,000–8,000 (USD 77–124). While this toilet was nearly free, its poor

execution by implementation agencies and poor construction quality resulted in it being perceived as a “poor solution for poor people”, rendering it unattractive to potential buyers. The second option was at the other end of the cost spectrum, unaffordable to most. The construction of this toilet cost anywhere between INR 20,000–50,000 (USD 310–775), making it well beyond most households' reach. No quality products were available in the local market within the price range of INR 8,000 to 20,000 (USD 124–310).<sup>1</sup>

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<sup>1</sup> This was our target price based on willingness to pay data collected during the landscape study.

# PSI's Response: Make a Product Available to Consumers that they Desire and Can Afford.



FIGURE  
**04**

What We Learned About Consumer Preferences



3SI worked with consortium partner PATH to design products that met consumer preferences, as expressed by consumers during the landscape study at the beginning of the project. The designs accounted for both consumer desires and aspirations and the existing value chain capabilities with a clear value-quality tradeoff. Based on these considerations, PSI designed toilets that were:

- 1. Affordable:** The project designed three toilet variants — basic, middle, and premium (named Standard, Deluxe, and Super-deluxe) — across price points. The three variants were priced at INR 19,000, 25,000, and 29,000 (USD 294, 387, and 449), respectively. The sub-structure was slightly different across the three variants; the Standard had a pit with a three-foot diameter; Deluxe had twin pit with a three-foot diameter and Super Deluxe has twin pit with a diameter of four and half feet. In addition, the price was due to differing cosmetic super-

structure features, that is, the toilet's look and feel for example if it was plaster or tiled, etc. PSI introduced pre-casted components such as the roof slab which alone reduced the cost of the roof by ~1000INR. Further, PSI developed standard operating procedures (SOPs) for toilet construction that clearly outlined the expected outcomes daily. PSI was able to identify efficiencies that significantly reduced the cost of the toilet.

- 2. Long lasting:** There was strong desire for a toilet with a permanent super-structure and a deep pit that would not fill up soon and require frequent cleaning. People wanted to delay pit cleaning for as long as possible, as it was an expensive and arduous exercise entailing the use of manual labor; less expensive, mechanized pit cleaning options were not available in rural areas.

- 1. Environmentally safe:** In keeping with consumer wishes, the top two toilet variants that 3SI designed came with long-lasting 5-feet deep twin leach pits; PSI worked with its technical partner WASH Institute to study the local topography and determined 5 feet as the depth at which the pit would not contaminate groundwater.
- 2. Responsive to the needs of women and men:** The project sought to also address other expressed concerns of consumers by designing toilets that were well-ventilated, spacious, sturdy, and provided women with a discreet cubby shelf they could use to store sanitary napkins. The designs satisfied government mandates and were cleared with key stakeholders.



**WE LEARNED: WE HAD TO REDUCE COMPLEXITY OF CHOICE THROUGH BY PRESENTING CUSTOMERS WITH ONE STANDARD PRODUCT AND OPTIONS FOR CUSTOMIZATION**

PSI launched the three toilet variants in the market in September 2013. Demonstration toilets and a corresponding marketing catalog were produced. However, soon after their launch it became clear that presenting the customer with three choices was hurting sales. Upon seeing options in product catalogs, every household wanted the luxury offering, regardless of their income bracket. Customers' desire for the high-end super-deluxe model, with its tiles and Re-in forced Cement Concrete roof, quickly became a chokepoint, as prices and time to delivery were forbiddingly high for both consumers and enterprises. Sales did not pick up, with customers preferring to defer their purchase rather than

buy the affordable, basic model, although it was still excellent quality and would meet the basic needs of the consumer. The three toilet variants were discontinued by February 2014, just a few months after their launch.

The poor sales of multiple toilet variants necessitated a change of strategy. Learning from this experience, 3SI shifted to promoting an unbranded basic model that could be upgraded to high end. A 5-feet deep, twin leach pit toilet with standardized features for super- and sub-structure was offered to customers at a base price of INR 15,000 (USD 232), to which a customer could custom add-ons such as tiling, based on her/his budget. The project also started using cement rings of the specifications already being produced by cement ring manufacturers (CRMs), instead of prescribing a standard size and thickness of cement ring. This was done as the CRMs producing these rings were already too far in their manufacturing processes and changing their practices would entail cost and time implications without having any effect on quality.



**WE LEARNED: QUALITY IS IMPORTANT!**

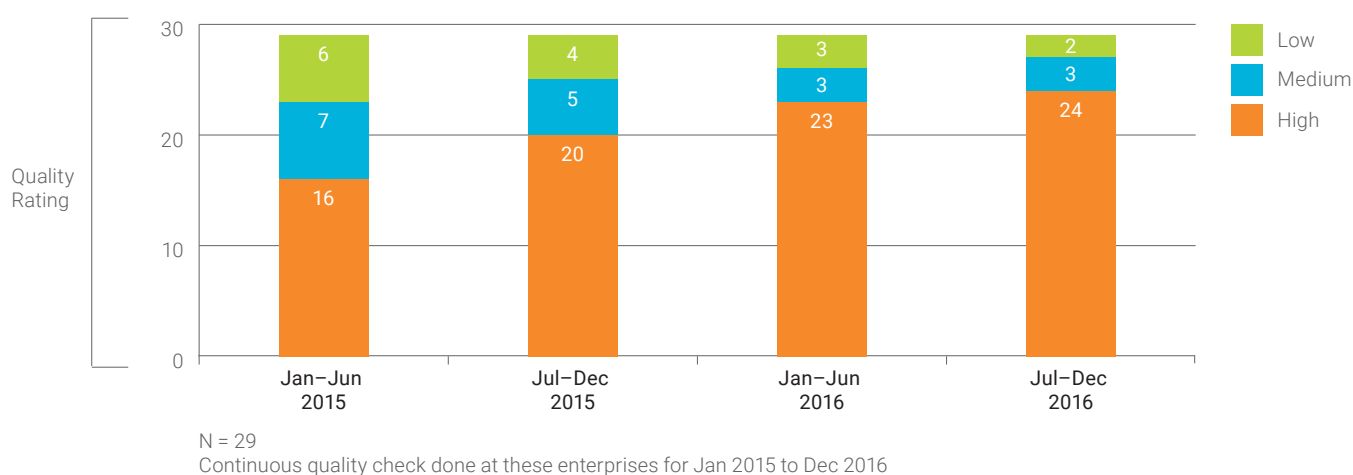
The project placed rigorous emphasis on quality assurance, especially of the cement ring, which was one of the key components being manufactured locally along with roof panel, cubby shelf, and soap shelf. CRMs were trained on the process of casting, based on standard operating procedures, to ensure a minimum standard. Another measure of quality assurance entailed the use of a Schmidt hammer to test the quality of cement rings; Schmidt hammer measures the resonance of the cement product and can tell how much cement has been used. The project's technical associate conducted this test once every three months at the CRM's manufacturing

site; low reading invited review of processes and guidance for correction. 3SI also provided CRMs guidance on the key parameters to check when procuring input materials, such as cement, and linked them to players providing these inputs.

The CRMs were also linked with masons who had been trained by the project on constructing quality toilets. The training curriculum for masons

was reduced from three days to one day during project implementation, after identifying the most relevant skills based on toilet quality, such as the placing of squat pan and fixing of squat pan with the cement ring. This training of masons was important to standardize and ensure quality of construction.

**FIGURE 05** | Quality of Cement Ring improved over a period at Production Center



## Key Takeaways

- Ascertain consumer preference through research to design a toilet that is considered affordable and desirable
- Reduce complexity of choice by providing a standard product that can be customized.
- Ensure product quality through regular checks and capacity building of providers.
- Minimize training by focusing only on skills critical for toilet construction
- Reduce cost by understanding the time associated with installing different components of the toilet. The project brought in product modifications like prefabrication that reduced dependency on masons and expedited the time to delivery.



# 3

## REPAIRING A BROKEN SUPPLY CHAIN

### THE PROBLEM

#### Fragmented Sanitation Supply Chain is Tough for Consumers to Navigate.

3SI mapped the entire sanitation ecosystem of Bihar and found presence of more than 30 different direct and indirect sanitation value chain actors. These included suppliers of input materials like cement and bricks; implementers, such as masons; financiers; service providers, such as for waste removal; and influencers, like civil society organizations and government entities. However, the mere presence of different value chain actors did not ensure growth of the local market for toilets, largely due to lack of coordination between different actors in the supply chain. Each actor worked in their own specialized sphere, without engaging related businesses necessary for providing a customer with a complete product. As a result, it took the average customer 90 days to get a toilet and

required engaging 12-14 of service providers for the job. A one-stop private sector sanitation solution provider, who could aggregate these different market players for a customer, was nonexistent.

Maneuvering this fragmented supply chain meant a customer interested in getting a toilet was required to separately transact with multiple players to secure the various inputs and services that go into building a toilet. This made toilet construction a difficult and cumbersome process, increased the time to delivery (the average time it took for a toilet to be ready was 90 days), and increased the cost of a toilet (as high as INR 50,000 or USD 775), all of which discouraged consumers from purchasing a toilet.

# PSI's Response: Design and Test Business Models to Make the Supply Chain Efficient for Consumers.

## WE ASSUMED: WE NEED A 'LOCAL' AGGREGATOR FOR THE SUPPLY CHAIN

Strengthening the fragmented supply chain emerged as a critical imperative. The solution to this supply-side market failure lies in identifying local entrepreneurs who could play the role of aggregators and bring together the existing suppliers to establish a more organized supply chain. The willingness of a private player to take on this role and invest her/his time and resources in the sanitation market depends on many factors, such as profit margins, capital required, risks, and the opportunity for repeat business. Entrepreneurs either need to see demand or a significant potential return on investment to engage or invest in the relatively new sanitation sector. With these observations in mind, and building on the findings of the landscape research, the project prototyped business models and zeroed in on the Turnkey Solution Provider (TSP) model, commonly referred to as the “one stop shop” model, to pilot.

Under the TSP model, 3SI considered long-standing enterprises<sup>1</sup> in the area to play the role of market aggregators, overseeing both construction and installation. A single entrepreneur (TSP) was required to stock all the products and services related to toilet construction and supply these to customers at a specified quality and price. Small local businesses expressed enthusiasm

and alacrity to play the role of a TSP to benefit from the increase in the toilet sales the 3SI project would facilitate.

In August 2013, PSI began recruiting businesses in three districts to participate in the TSP model as part of a 5-month pilot. PSI supported the TSPs through capacity building, access to credit, and demand generation. Within the first three months, six TSPs were identified, recruited, trained, and linked to different value chain actors. However, problems soon became evident. The initial cohort of TSPs did not have strong business plans and had limited or no commercial relationship with the targeted households. The model required substantial up-front investments by the entrepreneur and a long start-up period.

The enterprises also faced slow recovery of money from customers, who only paid a small sum upfront and made the full payment only after construction of the toilet, coupled with sluggish sales, left the TSPs unable to reinvest in their business for growth, leading to high attrition among the initial cohort. The model required the TSP entrepreneurs to work as service providers, in

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<sup>1</sup> These enterprises included hardware store, an organization manufacturing liquified petroleum gas cylinders, an MFI willing to invest in starting up this new business also invested almost 500,000 INR to start the TSP center, a contractor who was linked to the government's “Total Sanitation Campaign” and have delivered toilets to HH, and three CRMs willing to upgrade their business as TSP.

which they had neither expertise nor experience. Also, unlike their former trading business, the model brought them lower margins from selling affordable toilets but required more intensive engagement, for example, in managing labor and keeping checks on quality.

On the consumer end of things, there was a trust deficit between the customers and enterprises, customers were reluctant to purchase everything from one enterprise, preferring to purchase from supply chain actors they already knew and trusted. Additionally, customers were unwilling to pay for TSP service fees that were embedded in the price. During the five-month run, the TSP model managed to sell only 35 toilets with the average time of delivery as high as 67 days, and 5 out of the six TSPs were no longer selling toilets by the end of the pilot.



### WE LEARNED: WE NEED TO CENTER THE BUSINESS MODEL AROUND A CORE SANITATION MARKET PLAYER

The slow toilet sales through the TSP model sent the 3SI team back to the drawing board. Seeking to accelerate toilet uptake, the team decided to evaluate and test another model. The preference began to veer toward a do-it-yourself (DIY) model, which would allow customers to build in accordance with their current cash flow, reuse materials already on hand, and directly negotiate with trusted supply chain actors. It became obvious that consumers wanted to follow the same process as they would for any other construction process and so after some ideation and consumer feedback it was clear that a DIY model would be worth testing. Even in this model though, the need for an aggregator was clear. The team decided to work with smaller enterprises that were working with cement: the

cement ring manufactures (CRMs). In the CRM+ model, the entrepreneur plays the crucial role of aggregator and enabler for customer, who can secure the supplies and services and project manage the toilet construction. To this extent, the CRM+ model represents a mix of the DIY and TSP models.

CRMs are at the core of this business model as they are the only market players to be **completely linked to the sanitation market and reliant primarily on toilet sales for their profit margins**.

To pilot this model, PSI trained interested CRMs to manufacture quality rings and other precast components of toilets, and facilitated linkages with other value chain players, such as cement distributors and brick kilns. Piloting began in February 2014, with PSI supporting CRM+ with technical and demand generation support. PSI also trained masons on constructing quality toilets and linked them to CRM+. CRMs would hold a list of trained masons and share that list with HH that were constructing a toilet. Prior to the project intervention, such a list did not exist. The customer purchased the cement rings and a toilet pan, the core components of a toilet, from the CRM. In addition, the CRM provided guidance and help to the customer in identifying the additional materials needed to construct the rest of the toilet and where they could be acquired; this explains why the model is called CRM-plus.

Over time, CRM+ were able to cultivate trust in households, who were willing to buy additional supplies and services from the enterprise. The CRM+ model has proved to be a durable, productive, and flexible framework over the past 3.5 years and was scaled up to 19 out of the state's 38 districts. The CRM+ entrepreneurs now form the last mile delivery point of the sanitation supply chain. Figures 6 and 7 show the increase in toilet sales and the decrease in time to delivery over time.



## WE LEARNED: WE NEED TO ESTABLISH LINKAGES TO SECURE QUALITY INPUTS AT LOW COST

To further strengthen the supply chain, standardize quality of toilets, and bring down cost of construction, 3SI developed mechanisms to secure a supply of good quality doors and cement, two major components in toilet construction, at a better price. The project partnered with an out-of-state manufacturer of good quality, affordable PVC doors; the manufacturer was linked to a super-stockist in Bihar, from where the doors were delivered to CRM+ and then to households. Similarly, 3SI tied up with a national level cement company to provide cement to CRM+ at a 20 percent lower rate than the market. This initiative has enabled CRM+ to access quality inputs at low cost.



## WE LEARNED: WE NEED TO BUILD SYSTEMS FOR ROBUST MONITORING

A robust monitoring and evaluation (M&E) system was established early in the project's implementation throughout. Data for the management information system (MIS) was rigorously collected from CRM+ by the project's Sanitation Solution Providers (SSPs), who were 3SI's toilet sales facilitators on the ground. The data included the contact details of the customers who purchased the toilet, their socio-economic statuses, the stage of toilet construction, and the kind of toilet superstructure they had constructed. This data was validated by the SSPs themselves as well as through a central helpline that 3SI set up; the helpline randomly called 621 customers each month to validate details. All the customers who reported having completed toilet construction were visited by a technical associate, who physically went to the site to validate information and check quality.

FIGURE  
**06** Increase in Sale of Toilets Over Time

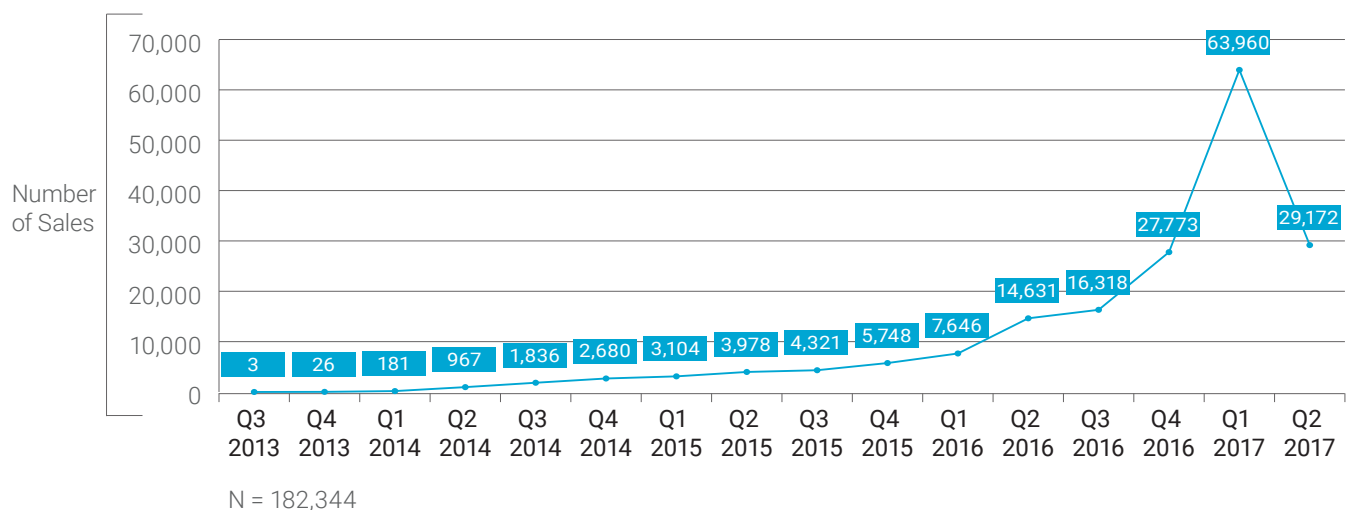
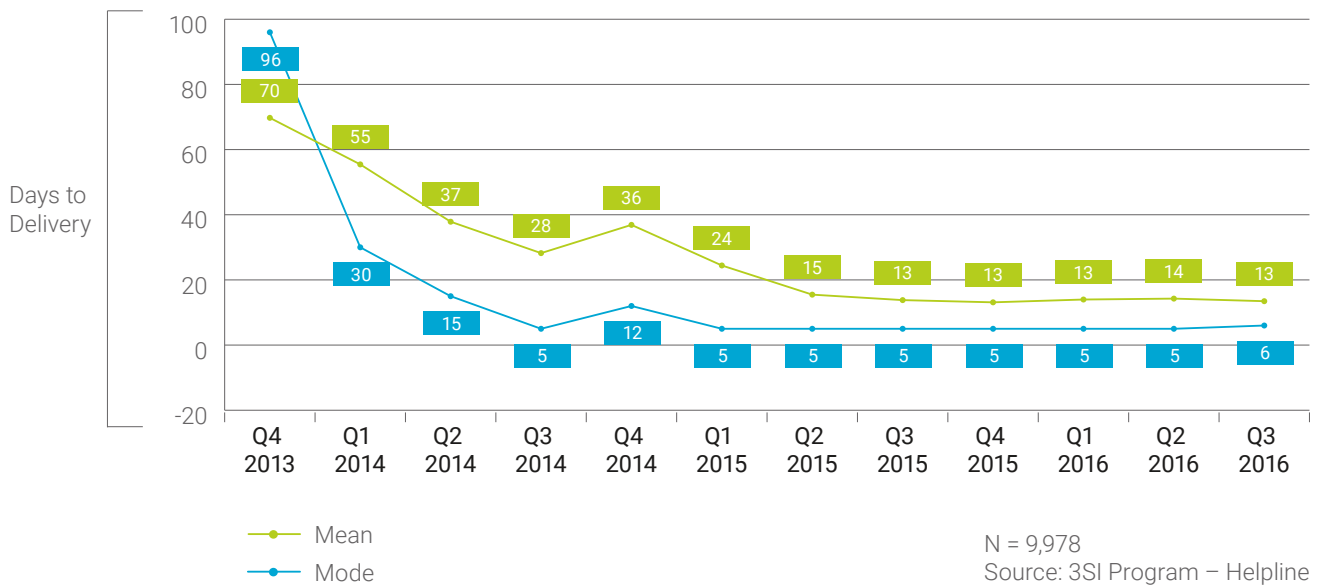


FIGURE  
**07**

## Decrease in Time to Delivery of Toilets Over Time



## Key Takeaways

- Build in time and resources for iterations in the business model and strategy.
- The TSP was the wrong model as the enterprise wasn't motivated enough by toilets, however, an aggregator that already had 'skin in the game' in sanitation market helped grow the business
- Ensure consumer is guided but continues to exercise control over the toilet construction process.
- Build the capacity of supply chain actors to run businesses and deliver quality toilets.
- Technical and business training are essential to running an effective toilet business, 3SI held trainings
- Aggregate supply-side demand and link it to wholesalers and stockists to keep input costs low.
- An attractive market – defined by volume of business, physical access, and availability of technical information and enabling environment – is required to draw entrepreneurs. 42,00,00,000 INR market (80% of 35000 HH not having toilets; each toilet costs 15,000 INR) with limited/no service providers. Toilet construction high on the political agenda, hence market sure to grow with high pace. The revised policy promotes toilet to be purchased by the HH rather than given through the contractors to the HH. And the entire gamut of support that the project has – Quality, demand generation, linking to financing institutions etc.



# 4

## RECURRING FINANCE FOR CONSUMERS AND ENTERPRISES

### THE PROBLEM

#### Sanitation Financing is Missing for Both Households and Businesses.

3SI's initial research identified poor liquidity, coupled with limited access to credit, as a major demand-side barrier thwarting the development of a vibrant sanitation market in rural Bihar. Most households lacked cash on hand to pay the upfront costs of purchasing a toilet. As few as 6–8 percent of the rural Bihar households without toilets were able to afford, without external help, an investment of INR 7,000–10,000 (USD 108–155) for purchasing a toilet. Almost 88 percent of the households required financial facilitation (loans and/or subsidy) to construct a basic toilet. Even for households that could already afford toilets, financing was a decision driver. In other words, people had a hard time prioritizing toilet purchase with the upfront costs. Lack of working capital also posed a critical barrier for actors across the sanitation value chain, like providers

of cement rings and other building materials, who needed capital to expand their businesses to meet the growing demand for toilets.

Notwithstanding its critical need, financing for sanitation was almost non-existent for both households and businesses in Bihar. Micro-finance institutions (MFIs), a key vehicle of financial inclusion, had an overall low presence in poverty-stricken Bihar; fewer than 3 percent households in the state had ever accessed any type of loan from an MFI. Most importantly, the MFIs in Bihar did not have any experience in sanitation financing, and none were interested in getting into the field due to lack of exclusive funding for sanitation. In other words, no one was giving them capital for sanitation loans. Further, sanitation loans were considered consumption loans, or non-income generating loans, with a higher risk of default, making sanitation financing an unattractive realm for MFIs. Consequently, the top 15 MFIs in Bihar did not have a sanitation loan portfolio. In this scenario, any households or businesses accessing credit were compelled to take it from village lenders, who provided loans at predatory interest rates of 22–24 percent, a charge too prohibitive for most.

# PSI's Response: Motivate and Engage Local MFIs in Sanitation Finance and Link Them to Capital.



## WE ASSUMED: WE HAD TO DEMONSTRATE THE OPERATIONAL SUCCESS OF SANITATION LOANS TO LOCAL MFIS

Sanitation financing emerged as a pivotal component of 3SI's strategy to surmount key demand- and supply-side barriers. MFIs were at the core of 3SI's strategy for sanitation financing. The strategy was one of rapid testing and scale up, that is, providing a proof of concept to MFIs with a small sample, co-creating a sanitation loan product, testing it with a larger group, demonstrating its viability, and supporting scale up.

The project began by signing a partnership agreement, in October 2013, with the Center for Development Orientation & Training (CDOT), a Bihar-based MFI, to pilot a sanitation loan product in one block of Patna through the traditional MFI model, where the loan amount is directly paid to customers to construct a toilet. To convince CDOT to enter the supposedly "risky" sanitation loans business, 3SI signed a guarantee to cover the expected 20 percent delinquency. CDOT began to offer the toilet loan, but only to its tested clients who had already taken and repaid two or three loans. This severely limited the potential client base, and only 5–10 toilet loans were disbursed per month in the initial months.

To demonstrate the viability of sanitation loans, 3SI soon tied up with another Bihar-based MFI, the Sahyog Development Services (SDS), to disburse 200 toilet loans to new clients to determine the non-repayment risk. The result was more than encouraging: 100 percent of the loans were repaid. SDS was willing to learn alongside PSI, this required significant hand-holding with SDS. PSI spent a significant level of effort bringing SDS along in the process. In addition, PSI provided a risk guarantee to cover up to five (5) percent of defaults. With SDS, 3SI also demonstrated the utility of a strategic tweak in the loan arrangement, whereby half of a client's loan went directly to a CRM+ enterprise for the sub-structure and the other half went to the client to buy the other components; this ensured loan utilization and prompt initiation of toilet construction.



## WE LEARNED: WE HAD TO MAKE CAPITAL AVAILABLE WITH MFIS FOR SANITATION LOANS

PSI identified capital infusion as a critical need for catalyzing sanitation loans in Bihar. It decided to infuse a soft grant to make capital available with MFIs for toilet loans. To this end, PSI signed a partnership contract with fund manager, Friends of Women's World Banking (FWWB), to create a fund exclusively for MFIs giving sanitation loans in Bihar. In January 2015, PSI infused INR 37,00,000 (USD 60,000 at the time) into the FWWB fund, to be disbursed through SDS. SDS disbursed the entire tranche as 264 consumer loans and 16 enterprise loans within 45 days of receiving the loan from FWWB, with 100 percent repayment rate over one year. The repayment

would come to FWWB and then be disbursed again, to SDS or other MFIs, thereby demonstrating the entire finance cycle. The encouraging SDS data was shared with other MFIs, and, over time, six MFIs and a bank have come on board with giving 3SI access to their well-established client base in Bihar. Besides increasing the availability of financing, 3SI also attended to the demand side by proactively reaching out to households with information about the availability of loans.

With the PSI-FWWB deal proving to be an effective catalyst for toilet loans, the project secured, in September 2015, a grant of about INR 7,80,00,000 (USD 1.2 million at the time) from the Bill & Melinda Gates Foundation and Unilever to infuse as capital at the fund manager level. Working with five MFIs, FWWB disbursed the entire fund within 1.5 years, disbursing 20,000 loans with a 100 percent repayment rate. To incentivize MFIs, FWWB provided the debt capital at 6 percent, compared to the 12 percent MFIs would pay if they were to receive commercial funds from a bank, making it attractive for MFIs to draw on these funds. Based on existing market norms, 3SI expects the fund to be revolved at least 3–5 times within its client base. That is, the money will be disbursed to households, eventually repaid to MFIs, and then disbursed again to other households, for a total of 3–5 loan cycles in Bihar and remain in the ecosystem for utilization in other underserved states. Figure 8 illustrates 3SI's success in catalyzing investment for sanitation financing.

The project also helped MFIs raise additional private capital from other investors and commercial banks, an effort that would get a fillip from a recent change in banking regulation that approves sanitation loans under the mandatory 40 percent priority sector portfolio all banks must have.<sup>4</sup>



## **WE LEARNED: WE HAD TO ADDRESS MFIS' CONCERNS ABOUT CREDIT WORTHINESS OF SMALL SANITATION ENTERPRISES**

Value chain financing for CRM+ entrepreneurs and other input material suppliers was also a key component of 3SI's strategy for scaling toilet construction in rural Bihar. PSI engaged four MFIs to design a specialized enterprise-financing product that could be offered to CRM+ entrepreneurs. However, MFIs were faced with the problem of assessing the business performance of sanitation enterprises, as most CRM+ lacked proper documents and proof for any financial transaction at the enterprise level. To address this roadblock, 3SI developed a credit-worthiness assessment tool – Enterprise Capacity Assessment Tool (ECAT) – to evaluate the performance of CRM+ and to assess their financing needs. The ECAT-based assessments were shared with MFIs, who used these, together with their own mechanisms, to assess the financial risk of lending to an enterprise and to ascertain how much to lend. Through the sanitation finance model that was established, 250 enterprise loans had been disbursed as of May 2017, amounting to almost INR 2,50,00,000 (USD 390,000). Much like consumer loans, this segment has also shown a healthy portfolio record, with repayment rate of over 95 percent. Figure 9 shows the increase in consumer and enterprise sanitation loans over time.

FIGURE  
**08** Catalyzing Investment for Sanitation Financing

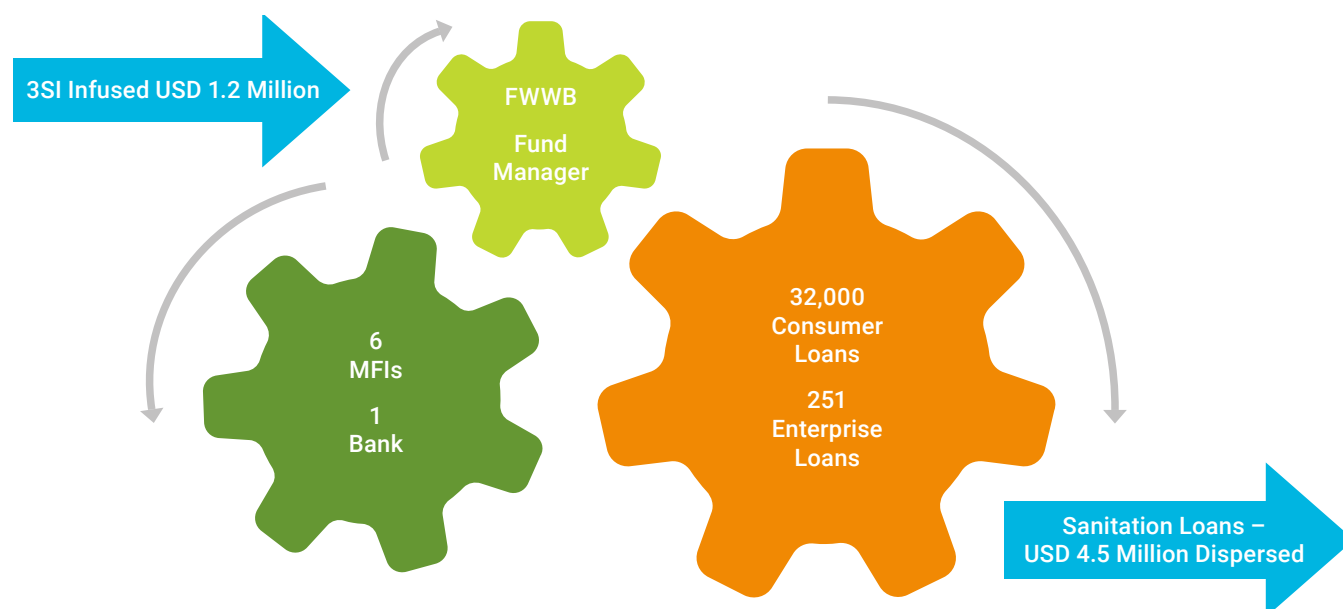
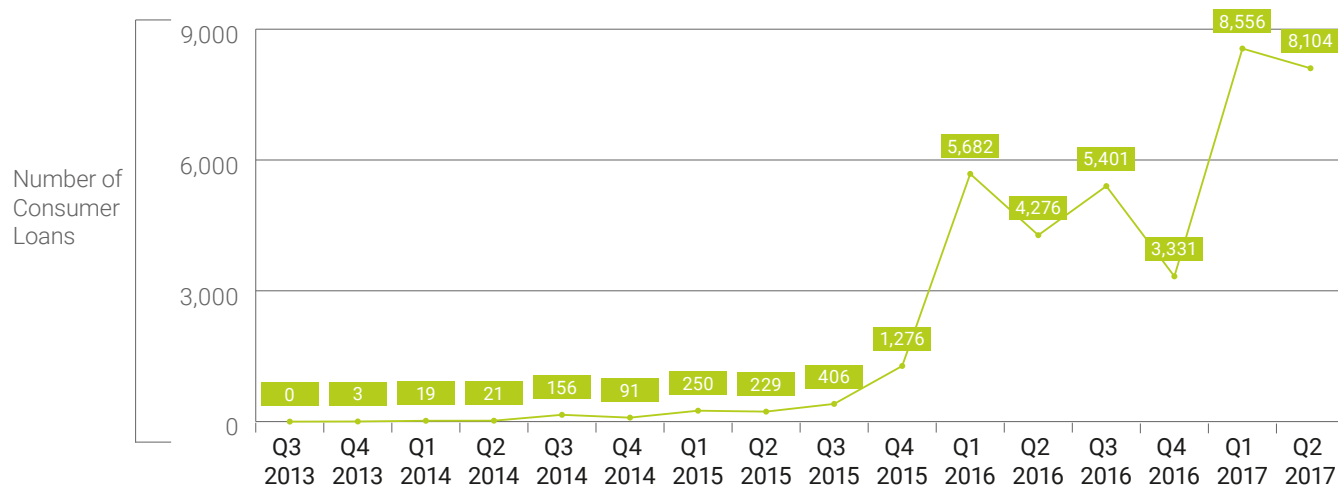
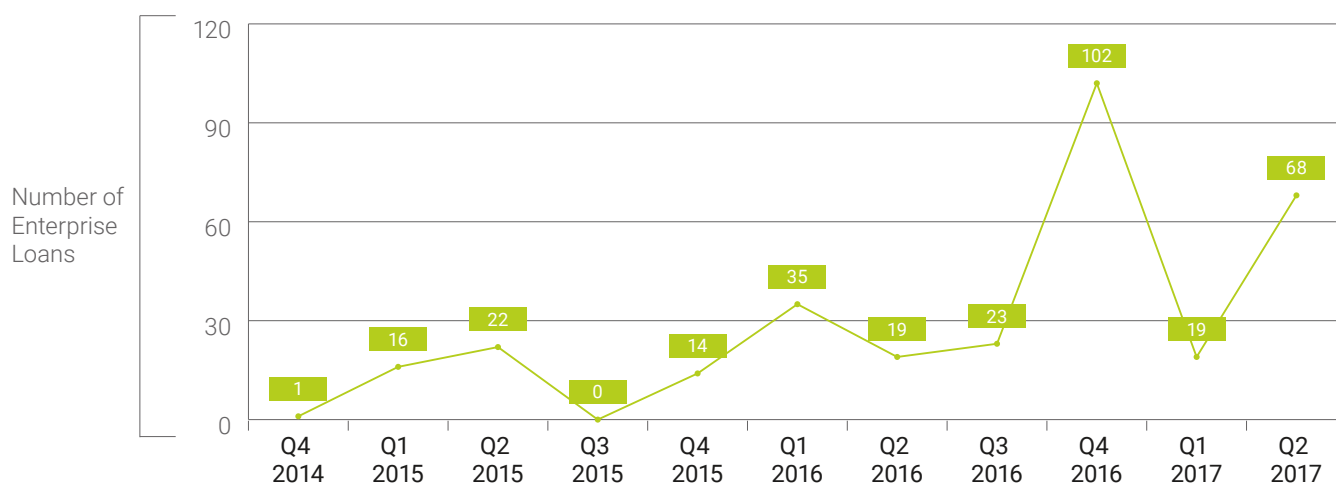


FIGURE  
**09** Increase in Consumer and Enterprise Sanitation Loans Over Time





## Key Takeaways

- Motivate and engage local MFIs as the vehicles for sanitation financing to households and enterprises.
- Co-create a sanitation loan product with MFIs and pilot it with a small sample to demonstrate sanitation financing as a profitable business line.
- Mobilize sanitation financing through infusion of a soft grant for loans.
- Attracting MFIs to sanitation lending requires them having access to subsidized sanitation funds and resources. The MFIs ended up raising additional capital, but this initial investment was necessary for them to see the benefit.
- Design innovative loan arrangements to ensure successful and prompt utilization of loan for toilet construction.
- Initial capital infusion may be necessary to kick-start the sanitation financing.
- Risk averse guidelines for due diligence and credit worthiness hinder sanitation financing to small enterprises but can be overcome with relatively simple enterprise training and assessment tools that MFIs can use.
- Address concerns about credit worthiness of small sanitation enterprises by providing MFIs with assessment tools they can use, along with their own mechanisms.
- Ensuring steady demand for toilet loans and demonstrating strong repayment rates provides the needed incentive to sanitation lenders.
- There is a long ramp up period to convert MFIs into sanitation lenders.



# 5

## CONVERTING LATENT DEMAND INTO PURCHASE

### THE PROBLEM

**Households Desire Toilet Ownership but Do Not Consider It Necessary Due to Normative Acceptance of Open Defecation.**

An encouraging finding of 3SI's study on rural Bihar's sanitation landscape was that demand for toilets existed — more than 85 percent of the households without toilets expressed a desire to own one. However, multiple barriers obstructed this latent demand from converting into purchase. The landscape study identified four key barriers. First, although households desired toilets for the privacy, safety, social status, and convenience they offered, toilet construction featured quite low in the hierarchy of needs and fell further with a household's socio-economic status and ability to afford; health was not considered a compelling

enough reason for toilet ownership. Second, as open defecation was an accepted social norm and there was little stigma associated with the practice, households did not consider it necessary to own a toilet. Third, the population was by and large in a beneficiary mode, preferring to wait for the government to build them a toilet as a free handout rather than paying for one themselves. Lastly, and importantly, most households in poverty-stricken rural Bihar simply did not have cash on hand or access to loans to buy a toilet.

# PSI's Response: Educate and Mobilize Communities and Households to Make Toilets at Home an Immediate Priority.



## WE ASSUMED: WE NEED TO MAKE DEMAND GENERATION A COMPONENT OF THE MARKET DEVELOPMENT STRATEGY

Although demand generation was initially not a core component of 3SI's supply-side focused strategy, the project soon recognized that demand-side activities would have to be a part of its efforts to ensure a growing, self-sustaining sanitation marketplace. This recognition was primarily born from the fact that the newly formed CRM+ actors were too new and unstable to take on sales and marketing activities. In attending to the need for converting latent demand into purchase, the project designed a communication strategy to address the multiple barriers to toilet ownership, focusing not only on ensuring sustained demand for toilets in the community but also usage of toilets after purchase.

The project's communication and marketing strategy evolved over time, changing in response to the implementation experience. Overall, the key elements of 3SI's communication strategy included: engaging the community to help households make the decision about toilet purchase; driving demand through key influencers, including family members; motivating and connecting the interested households with supply chain actors through an incentivized sales force; and running behavior change communication campaigns to target existing social norms around open defecation and promote toilets as a means for improved social status, health, safety, privacy, and dignity.



## WE LEARNED: WE NEED TO TARGET THE WHOLE FAMILY AND NOT AN INDIVIDUAL

The messaging for toilet sales was done to target the whole family and not an individual, an approach that was informed by the findings of 3SI research into the household buying process; the research had shown that both men (typical decision makers) and women (typical influencers) had a role to play in purchase decisions, indicating the need to hook both. Another reason for purposely positioning toilets as a solution for 'families' and not just for 'women' was to promote toilet usage among men, who often continued to defecate in the open despite having a toilet at home. The pitch and visual aids for the communication campaign were developed to target the barriers and incorrect beliefs toward toilet construction and open defecation, while communicating the benefits of safety, privacy, convenience, and social status.



## WE LEARNED: WE HAD TO DEPLOY A SALARIED SALES FORCE ON THE GROUND

The implementers of 3SI's communication strategy on the ground were its team of sales agents, and later sales facilitators, who interacted with households in one-to-one or one-to-group meetings to build awareness, create interest, and facilitate purchase. During these interactions, the trained sales cadres would begin by talking about the importance of a toilet, going on to discuss the different barriers/reasons why people do not have a toilet in their house, and finally providing information on the available toilet construction facilities and motivating households to avail these services. The project equipped these cadres with different kinds of leaflets, flashcards, and other visual aids to communicate the message in a story format.

The project rolled out its communication strategy in September 2013 with a cadre of sales agents called Sales Executives. These Sales Executives were primarily paid on a per sale commission basis, with a small salary component (75 percent commission: 25 percent base salary). In using this incentive structure, 3SI was seeking to replicate an earlier successful demonstration of the payment model by PATH elsewhere. However, the approach did not take off in Bihar, with the low salary failing to draw talented staff. Weak sales and high attrition of sales cadre quickly made the need for change evident. In December 2013, the project changed the payment structure, nearly tripling the amount paid out as salary (75 percent base salary: 25 percent commission). The title of the sales cadre was also changed to Sales Officers. These Sales Officers conducted one-to-group meetings in communities to motivate toilet purchase and took a sum of money as advance from interested persons to seal the toilet sale during the meeting itself.



## WE LEARNED: WE HAD TO FACILITATE TOILET PURCHASE RATHER THAN ACTIVELY PARTICIPATE IN ITS SALE

Deployment of salaried Sales Officers helped the sales of toilets pick up initially. However, it soon became evident that the practice of the Sales Officers taking advances during group meetings was inviting suspicion from the community and stalling sales. In response, 3SI made a significant change in its marketing strategy, completely pulling back from the active sales role by April 2014. The project now assumed the role of a facilitator that would enable people to purchase a toilet rather than sell them one. Suitably, the project's toilet sales facilitators on the ground were now named Sanitation Solution Providers (SSPs). The SSPs were trained and instructed to create awareness about the need for toilets and the available solutions during group meetings, identify people who exhibited interest during these group meetings, visit them at their house to interact with the entire family to enable a decision on toilet purchase, and link the interested households with CRM+ actors. The facilitator model — where 3SI restricts itself only to facilitation and each sale becomes an individual contract between a willing household (buyer) and a willing contractor (seller) — has since continued and is in line with the project's aim of creating a self-sustaining sanitation marketplace. The project currently has a team of 70 SSPs working as salaried staff with a commission component.



## WE LEARNED: WE HAD TO ESTABLISH A NETWORK OF COMMISSIONED COMMUNITY-BASED TOILET CHAMPIONS

Seeking to bolster community engagement and customer interface, in March 2016 the project added a new community-based cadre of toilet champions to work alongside SSPs in facilitating toilet sales. Called Toilet Motivators (TMs), the toilet champions are volunteers from the community itself and contracted to promote toilets within the community for a small commission on each toilet sold. The ask from the TMs is to closely and consistently interact with the community through group or one-to-one meetings to spread awareness about why a toilet must be purchased and used, and how the purchase can be made. The SSPs secure their leads on interested households through the TM network. As of May 2017, the project has a network of about 900 TMs.

3SI's sales and marketing engine has shown its effectiveness on the ground: a total of 182,869 toilets out of a total 220,297 were sold through our sales team with 45 percent of the sales being to BPL households.



## WE LEARNED: TARGET NOT JUST TOILET PURCHASE BUT ALSO TOILET USAGE

Beyond boosting toilet purchase in rural Bihar's communities, 3SI's communication strategy also demonstrated its post-purchase impact, that is, improving toilet usage by changing the existing norms around open defecation. The mode of this demonstration was a social and behavior change communication (SBCC) pilot the project conducted in 9 blocks (36 villages) during October 2015–March 2016. The SBCC pilot targeted strategic communication at an inter-personal

and community level to: engage the community in deliberation and action; use peer modeling to inspire other households; and motivate households to make a public commitment to own and use a toilet.

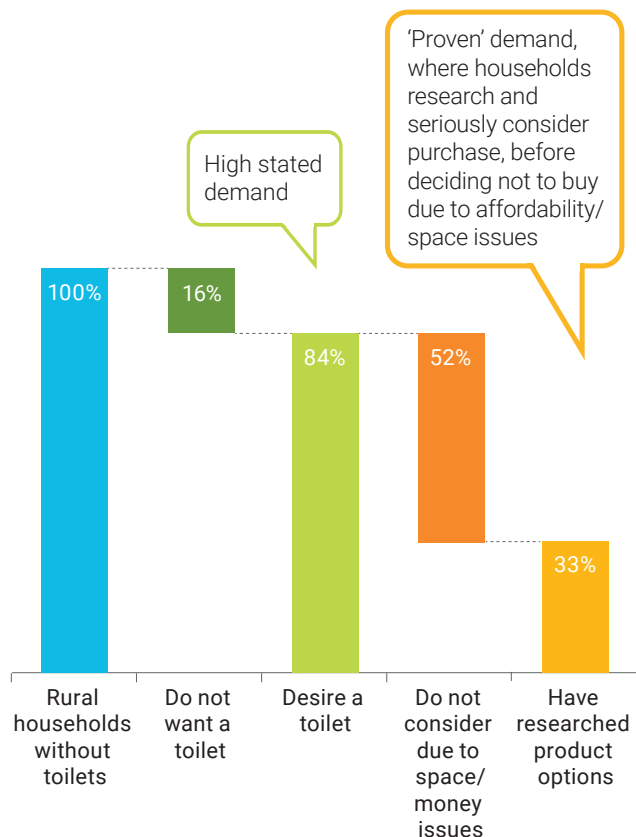
The pilot drew on the audience insight about families with toilets being considered superior families to devise its campaign theme: "*Shaandaar Soch, Shaandaar Parivaar*" (literally, "*Splendid Thinking, Splendid Family*"). Community events, led by community volunteers (TMs), were the pilot's main channel of communication. The '*Shaandaar*' households who owned and used toilets gave testimonials and were facilitated at these community events, a strategy aimed at inspiring other households to buy and use a toilet and make a social commitment to this end. A total of 18,192 people were reached through these events, with 5,922 of them making a pledge for toilet use. Although response to the SBCC pilot was encouraging and conversion rate in pilot blocks was higher (45%) than elsewhere (20%), the pilot could not be scaled due to limited 3SI project funding for demand generation activities. It did, however, establish the potential that strategic SBCC campaigns have for tackling entrenched attitudes and social norms.

Usage was defined as at least two members report having used the improved sanitation facility consistently, defined as used every time in the last three occasions. The project conducted a household survey in June 2017. One of the indicators that was checked in this survey was consistent use of toilet. The result of this survey was used to report on the toilet usage indicator. As per the Household survey that was completed in 2017, **93 percent** of households reported using 3SI toilets consistently.

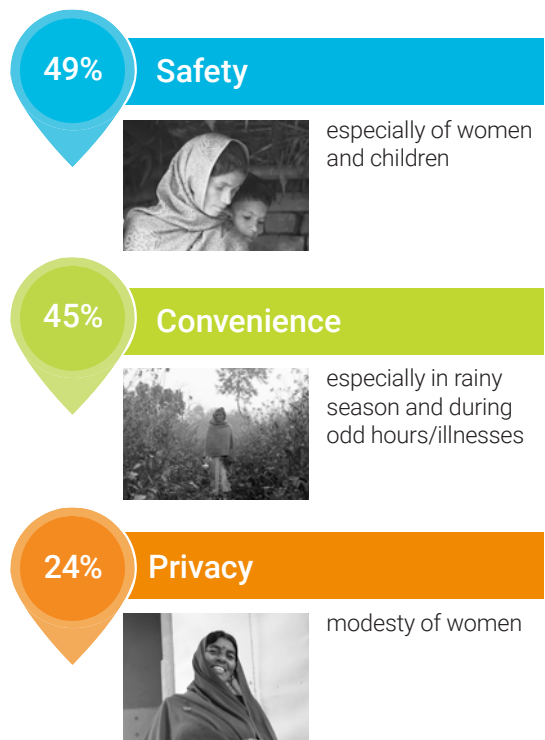
FIGURE  
**10**

## Landscape Study Findings on Consumer Demand: Why People Want a Toilet?

### Demand for Toilets in Rural Areas



### Why Do Customers Want a Toilet?



Health is not the primary driver for customers desiring a toilet. While over 60% of respondents in the research recognized the fact that open defecation causes health problems, only 1% indicated that as one of their main motivators for wanting a toilet.

Findings in Bihar resonate with feedback from experts and organizations working in other parts of India, indicating their validity in a larger context.

FIGURE  
11

Collaterals Used in the Social and Behavior Change Communication Pilot

### Campaign Logo



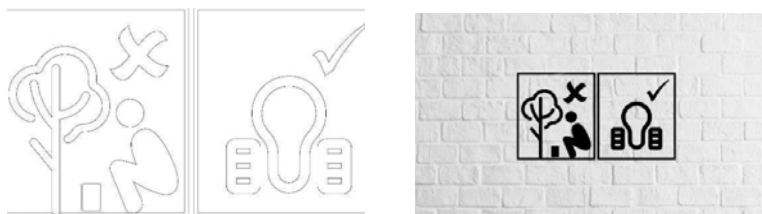
### Team Uniform



### Post Pledge – Stamp



### Stencil Painting – Reminder



### Free Gifts





# Key Takeaways

- Complement supply-side effort with demand generation activities.
- Focus not only on ensuring toilet sales but also usage of toilets after purchase.
- Promote toilets as a solution for families, not just women.
- Sharing of testimonials by owners and users of toilets can help motivate and inspire others.
- A family that purchases and uses a toilet is considered a more cultured family, a tag that can be harnessed for SBCC campaigns.
- Drive demand through key influencers, including both men and women in the family.
- Limit the role to facilitation of toilet purchase, as opposed to active selling.
- Provide the sales staff the certainty of a regular salary, with a small incentive component.
- Deploy incentivized community-based toilet champions to strengthen community engagement.
- Facilitating households to purchase a toilet themselves, as opposed to selling them one, can help build trust in the community.
- For sales agents, the certainty of a guaranteed salary exceeds the draw of a bigger commission.
- Participation of community members (toilet motivators) in demand generation activities can help further the campaign.

# 6

## PURSuing CONVERGENCE WITH GOVERNMENT PROGRAM

### The Context

Launched in October 2014, the Government of India's *Swachha Bharat Abhiyan* (SBA; Clean India Mission) campaign has set in place an ambitious target: making India open defecation free (ODF) by 2019. The program aims to deliver on this target through a massive national drive for toilet construction to eliminate open defecation across the country. It envisages construction of 12 million toilets in rural India, supported through an incentive of INR 12,000 (about USD 185) for each toilet constructed by households that live below poverty line (BPL) and some that live above the poverty line (APL).

The government of the state of Bihar has adopted the SBA program with the vision of ensuring 'sanitation for all' to make rural Bihar ODF by 2019. Tackling open defecation is an urgent priority for

Bihar, where, as per the 2011 Census, over 75 percent of the population defecates in the open. The state is undertaking multiple initiatives to enhance sanitation coverage under SBA. These include, among others, initiatives to mobilize and involve the community; strategizing selection of *gram panchayats* (local self-government organizations at the village/small town level) to achieve ODF; and running a sanitation expansion campaign in convergence with JEEViKA, a government-supported initiative for social and economic empowerment of the state's rural poor. The strong central and state governmental thrust on toilet construction presents an opportunity for convergence of intent and action to expand sanitation coverage in rural areas.

# The Approach

While 3SI's market development approach pivots around the establishment of a robust sanitation marketplace with a self-sustaining demand-supply equilibrium, it well recognizes the crucial role the government can play as an enabler, particularly for the ultra-poor, a group unlikely to be catered to by the market. Beyond providing the short-term stimulus, the government's role would also, of course, extend to addressing the need for sustained behavior change and tackling the larger challenges of physical infrastructure and safe disposal of waste to ensure that, once attained, the ODF status lasts.

Seeking to leverage the synergies of its market development work and the government's push against open defecation, PSI has worked at establishing some ground-level linkages with the government program. The collaborative effort is geared at supporting the state government in meeting its target of making rural Bihar ODF and clean by 2019. The 3SI project's linkages with the government program have primarily focused on: 1) working with JEEVIKA to make quality supply chain inputs available to fulfill the demand for toilets generated among the rural, poor households in select overlapping geographies and 2) supporting gram panchayats during community meetings and thereafter to advocate for toilets and provide linkages to the established sanitation enterprises in the vicinity to ensure supply of quality inputs for toilet construction. The collaborative approach is shaped as a joint effort between the government and PSI, where the government ensures incentive payout and PSI ensures quality supplies through the sanitation enterprises linked to the project in and around the region.

## The Progress

Engagement with panchayats has been part of 3SI's community mobilization strategy from the start, with the project team regularly attending group meetings at the village/panchayat level to disseminate information on why, how, and where

to secure resources for quality toilet construction. Responding to the need for targeted action in support of SBA, the project changed its strategy to one of intensive engagement in December 2016. The project has since been working more proactively with the *mukhiya*, the panchayat head, in the villages and block headquarters identified to achieve ODF status and systematically linking the households with the sanitation enterprises (CRM+) supported by the project. As part of the *Swachhata Samvaad* (Conversation on Cleanliness) initiative, PSI, along with village and panchayat authorities, organized a total of 258 meetings in the month of March 2017 itself, covering 220 village wards/panchayats and 71 blocks in 17 districts of the state. Besides mobilizing demand and establishing linkages with supply chain players, the community meetings .

## What makes a village ODF?

Villages are considered open defecation free (ODF) when no visible feces is found in the environment/village and every household and public/community institution uses a safe technology option for disposal of feces. Safe technology option implies there is no contamination of surface soil, groundwater, or surface water; excreta is inaccessible to flies or animals; there is no handling of fresh excreta; and there is freedom from odor and unsightly conditions.

*Source: Ministry of Drinking Water and Sanitation, Government of India; 2015*

also served as a platform to educate people on quality toilets so that even if the masons and enterprises trained by PSI are not used, the households are able to ensure a basic minimum quality.

Building the capacity of government officials has also been a key component of 3SI's effort to create sustainable sanitation markets. The project team has regularly, since June 2014, been part of the District Water and Sanitation Committee (DWSC) meetings in several Bihar districts. DWSC and other forums like meetings with departmental/program heads, and even political leadership, have not only lent PSI an opportunity to advocate for the right policy support but also to equip government functionaries with technical information on quality parameters, best practices,

and selection of panchayats for ODF. The project has also supported the government program with communication material for consumer education; the different IEC/SBCC materials developed by 3SI have been used during government drives and festivals to promote sanitation.

The SBA program is witnessing slow but certain progress in Bihar, with a total of 1437 Villages, 255 Gram Panchayats and 2 blocks becoming ODF by June 2017. 3SI's contribution to the government's ODF campaign has been particularly instrumental in three panchayats of Begusarai district being declared ODF in the year 2016. The box below presents a brief case study, detailing how 3SI's support enabled Amarpur village/gram panchayat in Begusarai to achieve ODF status.

## Case in Point

### AMARPUR EARNS ODF STATUS

Located in the Barauni block of Bihar's Begusarai district, Amarpur village is home to over 2,500 families. Much like other villages in the district, Amarpur has also been struggling with rampant open defecation. The identification of Amarpur in early 2015 as a candidate for achieving ODF set into motion a rigorous drive to improve the availability of sanitation facilities at the household level. The target for toilets to be constructed in Amarpur was set at around 2,300, not a small figure for the poorly equipped, remotely located village.

The daunting task of making Amarpur ODF was led by Heera Devi, the village mukhiya, who worked closely with district authorities and the 3SI project team to leverage, respectively, the government's resources and PSI's technical expertise and sanitation enterprise network. PSI's support was especially crucial given the absence of a local sanitation enterprise that could build and supply cement rings and lids

on a large scale to serve the village households. To solve this problem, 3SI linked the Amarpur households with five CRM+ enterprises located in the nearby blocks of Barauni, Teghra, and Birpur, who supplied cement rings and other inputs in bulk to Amarpur. PSI also assisted the village Panchayat in community mobilization and demand generation by educating and persuading the community members to stop defecating in the open and to avail the benefits of owning and using a toilet.

Amarpur was able to rapidly transform its sanitation landscape, with almost 1,200 new toilets constructed completely by the sanitation enterprises linked to the 3SI project. Convergent action by village/government authorities and 3SI team, together with participation of the village's inhabitants, enabled the village to dramatically expand its sanitation coverage. The Amarpur panchayat assessed and declared itself ODF in September 2015.



# Key Takeaways

- Government at all levels is an important stakeholder in the sanitation value chain.
- Strong partnership with government is a critical factor in successful implementation and scalability of interventions.
- Establishing a supply chain and helping gram panchayats leverage it was important to increase toilet uptake and improve the quality of construction.





# 7

## PLANNING FOR A SUSTAINABLE SANITATION MARKETPLACE

### The Context

Sustainability is at the core of PSI's aims and strategies, particularly to the market development approach it takes to establish robust marketplace ecosystems. From the outset, the 3SI project envisaged for itself the role of a facilitator that would help develop sanitation market structures that are able to maintain or expand beyond the project term in rural Bihar. However, as the project rolled out on the ground, the absence of key market building roles required that 3SI play a more active role, much like that of a market player's — for example, infusing capital into sanitation financing; creating demand through paid field staff; and ensuring quality through trainings and quality checks, and aggregating demand at a higher level to source quality products at reduced price. Ensuring a self-sustaining sanitation marketplace would require PSI to gradually withdraw from this active role to that of a facilitator, which too would need to phase out over time.

### The Approach

The key sustainability objective for 3SI is that the supply chain actors continue to use the improved coordination and management structures along with access to financing and know-how to meet households' demand for quality, affordable toilets. The project worked to strengthen and scale up the infrastructure around the value chain to ensure it continues beyond the project. We have also undertaken small pilot demonstrations to explore innovative mechanisms for smooth transition and sustainability of some of the key functions (see box).

### The Plan and Progress

Effort toward meeting the sustainability objective has focused on each area the project intervened in: supply side, demand side, and financial inclusion. On the supply side, the project has successfully

demonstrated how identifying and training smaller enterprises (CRMs), who can aggregate all the input materials/have linkages with other value chain players, can provide the community a single point of coordination for their sanitation needs. Assured demand for toilets would be a key motivator for sustaining these sanitation entrepreneurs. For this, the project maintained a force of about of 900 commission-based Toilet Motivators (TMs) who worked at the community level to catalyze demand for toilets. Thus far, the incentive payment for the TMs was being made by 3SI. As part of its sustainability plan, the project is working to gradually shift the onus of TMs' commission payment to CRM+ players for whom the TMs generate demand (see box). Besides transitioning the TMs to CRM+, the TMs may also be adopted by the government as part of the new cadre of *Swachhagrahis* introduced under the SBM program for community engagement.

A major initiative to trigger scale up and bolster sustainability on the supply side has been the linkages the project established between CRM+ players and a super-stockist, who aggregated demand for inputs and enabled CRM+ to access quality inputs at low cost. 3SI has linked the super-stockist with an out-of-state manufacturer of good quality but affordable PVC doors. The demand for standardized doors has also activated the local market, which is seeing the entry of local mid-sized fabricators and manufacturers of galvanized iron doors. During the project, 3SI also liaised with a national level cement company and linked it with the super-stockist to secure non-trade cement, which is sold for much lower than the retail rate; a cement bag selling for INR 350 in the open market is made available to CRM+ enterprises at the rate of INR 280. So far, the project was aggregating demand for cement from CRM+ at the regional level and giving it to the super-stockist. Going forward, 3SI is looking to establish a market-owned system—perhaps

an association of entrepreneurs at the district level—to take on the responsibility of aggregating demand from CRM+ players.

Safeguarding the quality of toilets has been a key thrust of the project. 3SI trained masons and CRM+ on quality and conducted quality checks at the household level. Ensuring the market self-regulates quality would require consumers to be quality sensitive and aware of what to expect from a quality product. To this end, the project has, by supporting the construction of quality toilets, worked toward establishing a quality benchmark in the community, providing consumers examples in their community of what a quality toilet looks like. The other imperative for sustained focus on quality would be effort toward consumer education, a role the CRM+ entrepreneurs and TMs must continue playing.

On the sanitation financing side, the project has already provided a proof of concept to MFIs that sanitation loans are viable and provided them access to subsidized capital. The INR 7,80,00,000 (USD 1.2 million) funded project, infused at the fund manager (FM) level, was disbursed by June 2017 as 37,801 consumer loans and 319 enterprise loans, with 100 percent repayment rate. Based on existing market norms, this money is expected to revolve at least 3–5 times within the client base in rural Bihar. The project is also helping MFIs raise funds from other investors and commercial banks. The effort has already succeeded in securing a commitment to leverage USD 2 million from banks, taking the total capital expected to be available for sanitation loans in rural Bihar to USD 3.2 million (true market rate). With continued focus on strengthening the supply side and bolstering demand, the project hopes that there will be a tipping point where MFIs' high demand for capital for sanitation loans will result in the FM itself scouting for more funds.

# Devising Sustainable Incentive Mechanisms for Toilet Promotion and Sales: Two Pilots

## THE BEGUSARAI PILOT

Seeking to facilitate sustainable linkages between CRM+ entrepreneurs and TMs, the project initiated, in June 2017, a pilot in the Chhourahi block of Begusarai district in Bihar. Ten sanitation enterprises and 13 TMs were part of the pilot. These TMs were initially linked with the 3SI project and paid incentives directly by PSI. As per the sustainability plan, PSI discontinued its contract agreement with these TMs and linked them directly with their respective CRM+ enterprises.

The pilot tested an incentive payment mechanism to shift the responsibility for TMs' commission payment from PSI to CRM+ enterprises. The change is being introduced in a phased manner, with PSI currently reimbursing the CRM+ players for the incentive payout. Once the payment is made to the TMs, the enterprises raise a bill to PSI to get it reimbursed on a monthly basis. Over time, the sanitation enterprises will assume sole responsibility for paying the incentive amount upfront to the TMs' linked to their business. As the sanitation enterprises are still good at documentation, PSI is providing them on-ground documentation support to capture sales of toilets and calculate the incentive amount for each TM.

The pilot was implemented for one month, during which seven toilets were sold by a TM under the new payment mechanism. The TM was paid the incentive directly by the linked CRM, who was then reimbursed later by PSI.

## THE SAMASTIPUR PILOT

In pursuance of its sustainability plan, 3SI is piloting a technology platform in the Kalyanpur block of Samastipur district. Implemented for one month in June 2017, the pilot tested a software (Movercado) to streamline the system for incentivizing different stakeholders for toilet promotion and sales. The software will provide all registered stakeholders with redeemable points (Tiko) they earn based on the pre-decided rate for the function they perform. The Tiko points are earned and redeemed through short messaging service (SMS), requiring all the stakeholders to have mobile phones to access the technology platform.


The technology-based system appears to be a marked improvement from the current system, where the incentive earned by each TM is manually calculated from the report generated by the project MIS. In the current system, the TMs continue performing their functions without any information about their accrued incentives; the incentive amount is known only after it is transferred to their account. Movercado enables sharing of real-time information with all the stakeholders linked to a particular function. All the concerned stakeholders can view the incentive earned for each specific function performed as well as the overall incentives earned (as Tiko points). The platform also provides flexibility to redeem the earned amount at any time. As per the plan, a TM can redeem his/her Tiko points from the respective sanitation enterprises by transferring the earned Tiko points to them (through SMS) and getting paid in cash. The enterprise will transfer the entire Tiko points to PSI and get it reimbursed during the pilot phase.

The system will also provide some Tiko points to every household for registering themselves with the system; this will ensure that correct details (mobile number) of all the households purchasing a toilet are registered with the system.

During the pilot, two CRMs sold 115 toilets under this mechanism through two TMs, who earned the incentive as Tiko points.

FIGURE  
**A1**

# Asset Register

SAADHAN SANITARY MART							
		ASSET REGISTER					
Sl No	Asset ID	Item Name / Descriptions	Quantity	Company / Brand	Model / Serial No	Date of Purchase/Delevered	Purchase Value
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							



## Stock Register

35


## Sales Register

36

FIGURE

A3.1

Sales Invoice

 <b>SAADHAN SANITARY MART</b>											
<b><u>INVOICE</u></b>											
<b>Name of the Household Chief :</b> _____	<b>Invoice No :</b> _____										
<b>Name of the Father / Husband :</b> _____	<b>Date :</b> _____										
<b>Address :</b>											
Location / Landmark : _____											
Village : _____											
Panchayat : _____											
Block : _____											
District : _____											
Pin Code :	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> </tr> </table>										
Mobile No :	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> </tr> </table>										
Telephone No :	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> </tr> </table>										
<b>Toilet Model : Standard / Deluxe / Super Deluxe</b>											
<b>Total Amount : Rs.</b> _____											
<b>Advance Given : Rs.</b> _____											
<b>Amount Due : Rs.</b> _____											
Authorized Signatory (Name / Sign / Date)	Signature of Household Chief										

FIGURE

A3.2

## Sales Closing Form



### Sales Closing Form

Name of the SR : \_\_\_\_\_ Date : \_\_\_\_\_

Name of the TSP : \_\_\_\_\_

#### Household Details :

A. Name of the Household Chief : \_\_\_\_\_

B. Name of the Father/Husband : \_\_\_\_\_

C. Type of Card : BPL Card / APL Card / Voter Card / Job Card / Ration Card / Adhar Card / Antyodaya Card / Others( \_\_\_\_\_ ) (Collect Photo Copy of the Card)

D. Card No : \_\_\_\_\_ (Name of the Card: \_\_\_\_\_)

E. Postal Address: Street/Tola : \_\_\_\_\_ Village : \_\_\_\_\_

Panchayat : \_\_\_\_\_ Block : \_\_\_\_\_

District : \_\_\_\_\_

Pin Code : 

--	--	--	--	--	--	--	--	--	--

Mobile No : 

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Phone No : 

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

#### Family Details :

A. No of Family Members : Total: \_\_\_\_\_, Male: \_\_\_\_\_, Female: \_\_\_\_\_

B. Type of Family : APL / BPL

a. If BPL : General / ST / SC

b. If APL : General / ST / SC / Small & Marginal Farmers / Landless with homestead / Physically handicapped / Women Headed Households / Other ( \_\_\_\_\_ )

#### Status of Toilet :

A. Availability of Toilet within the premises: Yes / No

B. If Yes, Is the Toilet Functional / Not Functional condition : Functional / Not Functional

#### Toilet Sales Detail :

A. Toilet Model : 1. Standard / 2. Deluxe / 3. Super Deluxe / 4. Customization (Annex-I)

B. Total Amount : Rs: \_\_\_\_\_

C. Advance Given : Rs: \_\_\_\_\_

D. Amount Due : Rs: \_\_\_\_\_

E. Due Cleared on : Date : \_\_\_\_\_ Amount Rs: \_\_\_\_\_

Remarks :

--

Submitted By

Approved By

Verified By

## Sales Closing Form

---

### Customization of the Toilet

#### Annexure – I

Structures	Sl No	Items	Descriptions
Supper Structure	1	Wall – 1	
	2	Wall – 2	
	3	Wall – 3	
	4	Door	
	5	Roof	
	6	Plastering of walls (Inside/Outside)	
	7	Tiles (Skirting/Full)	
	8	Ventilators - 3	
	9		
	10		
Sub - Structure	1	Number of Pits	
	2	Pit ( 3.5ft / 4ft)	
	3		
	4		
	5		



FIGURE  
**A4**

Construction Register


<div style="display: flex; justify-content: space-between; align-items: center;">  <div> <b>SAADHAN SANITARY MART</b>  <hr/> <b>CONSTRUCTION REGISTER</b> </div> </div>										
Sl No	Name of the HH Chief	Contact No	Invoice No	01-10-2013	02-10-2013	03-10-2013	04-10-2013	05-10-2013	06-10-2013	07-10-2013
1										
2										
3										
4										
5										

FIGURE  
**A5**

Attendance Register

Attendance Register						
Sl No	Date	Name	Disignation	Contact No	Signature	Remarks
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

FIGURE  
**A6**

Walk-In Register

Walk-in Register						
Sl No	Date	Name	Contact No	Village Name	Signature	Remarks
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

# FIGURE A6.1

## Construction Quality Checklist

### Construction Quality Checklist

Name of the Customer :

Date :

Name of the Franchisee :

Block :

District:

Please tick (✓) or cross (X)

A	Site selection	✓/x
1	Distance between the toilet and the drinking ground water source (In Feet) (If above 30 feet then write only 30 feet, if below 30 feet then write exact distance in feet)	.....feet
2	Toilet/Pit is placed at higher level compared to the general ground level to protect it from flooding.	<input type="checkbox"/>
B	Leach Pit	
3	The depth of the Pit (In Feet)	.....feet
4	The bottom of the pit is not covered with cement concrete or any other impermeable material	<input type="checkbox"/>
5	The top of the pits are covered with a removable reinforced cement concrete lid	<input type="checkbox"/>
7	Space between the consecutive ring is not plastered	<input type="checkbox"/>
8	The top of the pit is above the ground level	<input type="checkbox"/>
9	Outer to outer space between two pits (in feet)	.....feet
C	Pan and Junction	
10	Squat pan and P trap and is connected properly and water seal is maintained	<input type="checkbox"/>
11	Distance between the back wall and the pan (in inch)	.....Inch
12	PVC 'T' junction is used in between the two pits and placed properly for the uninterrupted flow into the pit	<input type="checkbox"/>
13	The connecting drain pipe extended towards the centre of the pit from the inner surface of the pit (In Inches)	.....Inch
14	End of pipe in one pit is to be capped through PVC cap	<input type="checkbox"/>
D	Toilet superstructure	
15	Height of Plinth from the ground level (In Inch)	.....Inch
16	Internal Length (In Inch)	.....Inch
17	Internal Width (In Inch)	.....Inch
18	Height of the toilet (In Feet)	.....Feet
19	Height of the door (In Feet)	.....Inch
20	Door is opened outwards	<input type="checkbox"/>
21	Door has inner side latch	<input type="checkbox"/>
22	Number of Walls with Ventilators	.....
23	Cubby shelf ?	<input type="checkbox"/>
24	Cubby Shelf is fixed properly on the side wall	<input type="checkbox"/>
25	Precast roof slab is installed and the space between the panels is properly filled with cement mortar (if applicable)	<input type="checkbox"/>
26	Corrugated Cement Roof is fixed properly (if applicable)	<input type="checkbox"/>

\_\_\_\_\_  
Name & Signature of the Technical Associate

# FIGURE A7

## Ring Testing Reporting Form

### Ring Testing Reporting Form

Name of the Technical Associate : \_\_\_\_\_

District : \_\_\_\_\_

Sl No	Enterprise Name	Block	Ring Manufacturing Date	Ring Testing Date	Days Old of Ring	Test 1 (A)	Test 2 (B)	Test 3 (C)	Test 4 (D)	Avg. (A+B+C+D)
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
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31										
32										
33										
34										
35										







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