Rural Sanitation Supply Chain Gaps & Opportunities:

Bihar Study Report

This report was prepared for Water For People by Ecociate Consultants, www.ecociateconsultants.com

Table of Contents

Executive Summary

Water For People aims to make reliable sanitation services available at the household level via robust and sustainable market system development initiatives. Water For People believes that the sanitation crisis can be solved if there is collaboration among different stakeholders, particularly within the private sector.

In India, Water For People works with partners in the states of Bihar, Odisha, West Bengal, and Maharashtra to increase accessibility to household toilets by encouraging capacity building of local micro-enterprises and creating awareness of the importance of toilets. This includes introducing local sanitation businesses, called Points of Purchase (POPs),[1] into supply chains. POPs manufacture and sell cement rings to line toilet pits, arrange delivery and labor for digging pits and installing the rings, and support construction of the toilet superstructure when required. They also sell various sanitation products used in toilet construction, along other mold-based items like cement pillars, flowerpots, cattle feeder pots, and window frames.

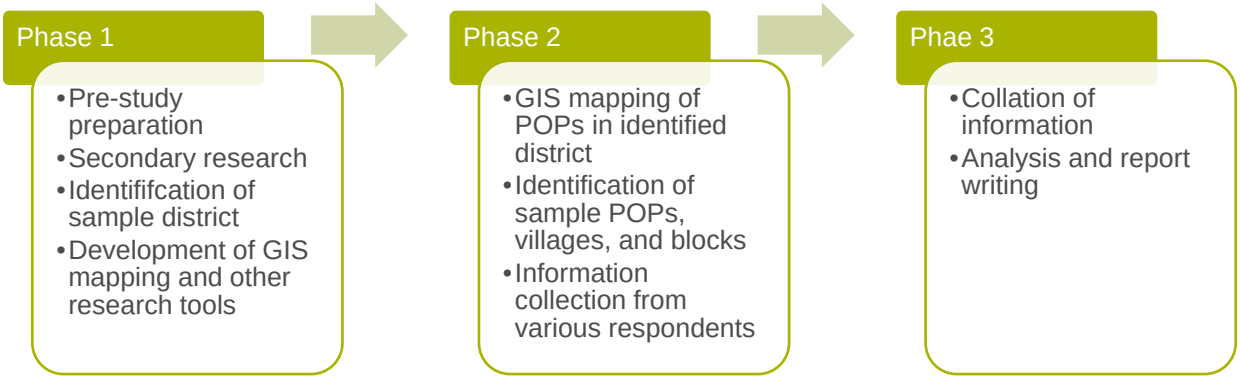
Objectives

Ecociate Consultants (Ecociate) studied the feasibility and level sustainability of POPs supported by Water For People. Specific objectives of the study included:

1. Examine whether there is any association between POP availability (number operating in a region) and toilet coverage (coverage in nearby villages).
2. Analyze gaps in supply chains to understand district-level distribution of POPs and provide insights on distribution at the state level.
3. Understand what prevents a higher concentration of POPs at the village level to help address exclusion.
4. Understand the commercial viability of POPs, including their sustainability, dependent on access to finance.
5. Explore the possibility of geographical expansion of POPs in a self-sustainable manner without any need for donor interventions.

Approach

The study approach included three phases:



[1] For the purpose of this study, the term POP refers to Rural Sanitary Marts, Cement Ring Manufacturers, and any other outlets dealing in supply of toilet materials.

During phase 1, secondary research focused on district level demography such as health, socio-economic, human development , and sanitation indicators. This research informed the selection of a sample district where Water For People has not previously intervened. The district of Saran in Bihar was chosen as a sample because its profile is considered representative of the state of Bihar's average profile.

In phase 2, after a series of discussions with Water For People, research tools and respondent samples were finalized. A diverse group of respondents included representation from various villages, POPs, sanitation promoters, *Gram Panchayat* members, and government representatives.

A GIS mapping exercise used a saturation approach on an open platform to identify and map around 60 POPs in Saran District. The map helped identify the characteristics of POP concentrations across the district; accordingly, villages and blocks were chosen with both high and low concentrations of POPs. Focus group discussions were conducted with villagers and self-help groups. In-depth and key informant interviews with other stakeholders, including POPs, were conducted in the identified villages and blocks.

Findings

As part of the national *Swachh Bharat* Mission, Saran District had a strong impetus to build new household toilets using 'brick-based septic tank technology.' The Mission promoted construction of these toilets across the district through designated vendors, following a common design with *Panchayat*-approved materials. Community members had limited input in the process. There were complaints regarding construction quality because septic tanks were often reported to be punctured by rodents, rendering the entire toilet useless.

The government – through various NGOs and other agencies – carried out household-level awareness generation programs to enhance toilet usage. They used various information communication technology measures to promote toilet construction. Toilet use peaked during the Mission's campaign, and recent floods in Bihar forced communities to continue using toilets, since open defecation in the fields was not possible since they were submerged under water.

Findings related to each objective are as follows.

POP availability and demand for toilet construction

Construction of toilet pits using cement rings was reported to be significantly more durable than pits lined with bricks. Pits lined with cement rings required less space, were faster to build, and were easier to maintain, making them cost effective in the long run. However, the Mission provided no direct impetus for the district to promote POPs or sanitation entrepreneurs. Thanks to the continuous demand for toilets in the rural areas triggered by the Mission, ***POPs developed organically without any significant support from the government or from other ecosystem players like financial institutions.***

The demand for toilets has been universal across rural areas of the district. POPs generally serve customers within a 20-km radius of their respective locations. There is a typical density of 5-10 POPs reported in each block, with a roughly equal distribution across rural areas. The urban areas of the district – primarily comprised of the town of Chappra – have a low penetration of POPs. Toilets in urban areas are often linked to common sewage systems, and households seek services from large hardware stores.

There is a clear correlation between demand for toilets with cement rings and demand for services delivered by POPs. Demand for cement rings is supplemented by the services offered by POPs, including delivery, pit preparation, ring installation, and construction of superstructures.

Supply chain gaps

Supply linkages are haphazard and dependent on the individual capacities of POP entrepreneurs. In interior pockets of the district, inputs such as cement, stone chips, sand, and iron bars are often unavailable, and POPs must arrange for transportation from distant markets. The size, thickness, and quality of cement rings and other mold-based products are not standardized, and prices vary accordingly. As such, the varying quality of inputs is used to optimize costs and cater to customers' needs.

Inadequate financial availability from both formal and informal sources acts as a huge barrier in the growth of POP businesses. The POPs contacted for the study were not aware of various government programs that support Micro, Small and Medium Enterprises (MSMEs), such as MUDRA schemes. Due to low investment in POP enterprises, very few POPs can enter the bathroom and toilet fitting business. Therefore, integration of all products and services required for bathroom construction is not common among POPs.

Many recent POPs were started by former workers who learned the trade while working with other POPs. ***There are large gaps in terms of business and marketing knowledge.*** At times, POP entrepreneurs were not aware of the cost and pricing of their products.

Exclusion at the village level

The government machinery involved in promoting sanitation, such as special cadres of local volunteers (*Swacchagrahi*), has very little linkage with POP enterprises. As such, other ecosystem players, including support service providers and extension departments, show little interest in supporting POPs.

The major barrier to toilet construction was identified as household income level. The financial support available through the *Swacch Bharat* Mission only applied to the government model of toilet construction. Therefore, any toilets constructed through POPs were not recognized by the government or eligible for subsidy, and lower income families faced hurdles in constructing toilets through POPs.

Due to sanitation promotion, the floods, and communities prohibiting people from defecating on their land, there was high demand for household toilet construction and use. ***No major caste barriers were observed for toilet construction among communities. However, an important bottleneck is the absence of adequate space for digging a pit and constructing a toilet.*** For lower income and landless families, it was hard to allot the minimum 4 ft^2 of land. Additionally, some elderly people were found to prefer open defecation.

Commercial viability

The manufacturing cost of one cement ring is Rs. 350 to 500, depending on the quality of the sands, cement, chips, iron rods, and mold, and a typical pit requires 9 to 12 rings. A customer typically pays Rs. 12,000 to 15,000 for a POP to install a toilet pit, including the labor for digging the pit and installing the cement rings. ***A POP earns a profit of approximately Rs. 3,000 for construction of a pit without a superstructure.***

A customer typically pays around Rs 20,000 to construct a toilet with a superstructure, excluding transportation costs. ***When a POP facilitates the construction of the toilet superstructure, they can expect an approximate profit of Rs. 4,500.*** However, very few POPs venture into the construction of superstructure due to constraints in financing.

Capital requirements for a POP vary from Rs. 50,000 to 3 lakhs, with an average of Rs. 1 lakh. A typical POP averages 6-10 orders per month, with few to no sales during the rainy season. ***A typical POP earns Rs. 15,000 to 25,000 per month after recurring expenses.***

The unique selling proposition of POPs, contributing to this commercial viability, includes:

- Varying quality and price of materials offered, including different types of sand, fine chips, and cement.
- Pricing of products in comparison to competitors.
- Integrated solutions provided along with materials, including labor, masonry, and timely delivery.
- Credit facilities provided to customers.

The POPs used low-cost promotion in the form of banners, glow-sign boards, and pamphlets, along with regular participation in various village-level meetings, such as self-help groups and Panchayats, to communicate the benefits of toilet usage to villagers.

Geographic expansion

The independent growth of the POP enterprise model without any support from the government or donors showcases the strength and sustainability of the model. Community members like the POP enterprise model since they can choose the design, location, and depth of pits, materials used in toilet construction, and toilet size. Community members trust POPs, as they believe the entrepreneurs are there to stay and are accessible whenever required.

POP businesses promise to grow both vertically and horizontally, even without any donor funding. Almost all the POPs expressed the desire to venture into additional products like tiles, pans, and tin sheets. Horizontally, some POPs have already initiated branches in other blocks of the district or in nearby districts with the help of partners.

To support POP entrepreneurs, it is important to build their business capacities, enhance their access to financing, and advocate for enabling policies at the government level.

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Background

Water For People aims to make reliable sanitation services available at the household level via robust and sustainable market system development initiatives. Water For People believes that the sanitation crisis can be solved if there is collaboration among different stakeholders, particularly within the private sector. The government, communities, NGOs, researchers, academia, and corporate and private sectors should come together to solve complex sanitation issues. This approach enables each stakeholder to efficiently leverage their core skills, thereby ensuring that effective programs can be scaled with the necessary speed.

In India, Water For People works with partners in the states of Bihar, Odisha, West Bengal, and Maharashtra to increase accessibility to household toilets by encouraging capacity building of local micro-enterprises and creating awareness of the importance of toilets. Water For People acts as an intermediary facilitator between the government and various stakeholders to enable a sustainable ecosystem for improved sanitation services. This includes introducing local sanitation businesses, called Points of Purchase (POPs),[2] into supply chains. POPs manufacture and sell cement rings to line toilet pits, arrange delivery and labor for digging pits and installing the rings, and support construction of the toilet superstructure when required. They also sell various sanitation products used in toilet construction, along other mold-based items like cement pillars, flowerpots, cattle feeder pots, and window frames.

As part of the national *Swachh Bharat* Mission, sanitation partners at the local level are increasing awareness for toilet construction by communicating the needs and benefits for family welfare. The associated increase in toilet building is reducing the cost of the required investment to scale up the POP enterprise model.

Study Objectives

This study conducted by Ecociate Consultants (Ecociate) aimed to assess the feasibility and sustainability of the POP enterprise model. Five objectives guided an exploration of the current POP enterprise model in a new geography via qualitative research and field observation:

1. Examine whether there is any association between POP availability (number operating in a region) and toilet coverage (coverage in nearby villages).
2. Analyze gaps in supply chains to understand district-level distribution of POPs and provide insights on distribution at the state level.
3. Understand what prevents a higher concentration of POPs at the village level to help address exclusion.
4. Understand the commercial viability of POPs, including their sustainability, dependent on access to finance.
5. Explore the possibility of geographical expansion of POPs in a self-sustainable manner without any need for donor interventions.

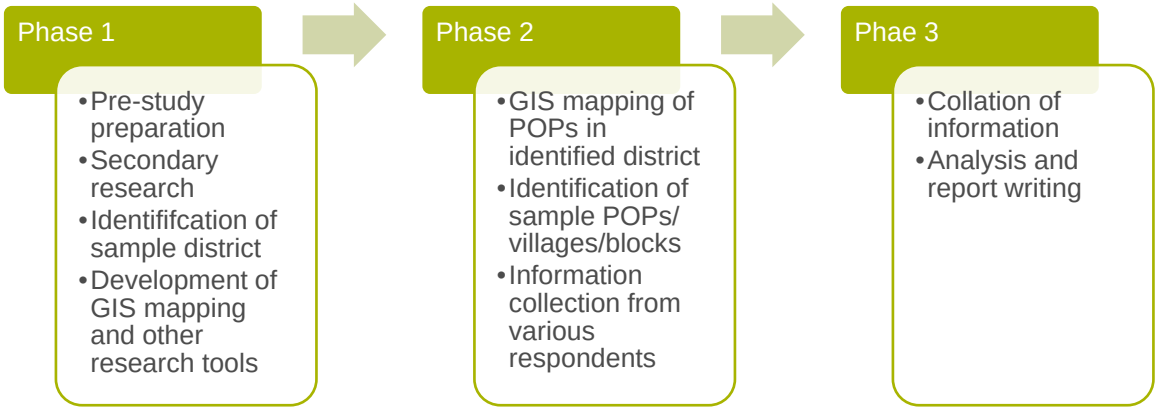
As the POP enterprise model is currently active in seven districts of Bihar, the study also examined potential geographical expansion of the current model.

[2] For the purpose of this study, the term POP refers to Rural Sanitary Marts, Cement Ring Manufacturers, and any other outlets dealing in supply of toilet materials.

Study Approach

Ecociate divided the study into three phases:

- Phase 1 - pre-study preparation
- Phase 2 - field visits and discussions with relevant stakeholders
- Phase 3 - data analysis and report preparation



Phase 1: Study District Selection

In Phase 1, Ecociate conducted secondary research to identify the most suitable district for the study. The research methodology was shared with Water For People to develop the field plan, plan the GIS mapping exercise, and augment the research tools.

As the study aimed to develop a better understanding of the supply chain and assess POP viability and sustainability in Bihar, district selection was based on various indicative parameters to represent target customers for toilet construction in villages. The list of parameters and sources included:

- District demographics (2011 Census)
  - Total population
  - Population density (per km)
  - Literacy rate (%)
  - Scheduled Caste/Scheduled Tribe population (%)
  - Number of households
- Health (Annual Health Survey, Bihar 2011-12)
  - Child mortality rate (under 5 mortality rate per 1,000 live births)
- Socio-economic status (Bihar Economic Survey 2019-20)
  - Per capita Gross State Domestic Product (GSDP)
- Human Development Index (HDI)
  - HDI calculated using District Level Household and Facility Survey (DLHS) 2007-08
  - HDI calculated using Annual Health Survey (AHS) 2010-11
- *Swachh Bharat* Mission - Gramin
  - Families below the poverty line (BPL) without toilets (Bihar *Swachh Bharat* report before 2014)
  - Households identified for toilets (Bihar *Swachh Bharat* report at 2014)
  - Open defecation free (ODF) coverage in 2020 (*Swachh Bharat* Mission Dashboard)

The study methodology considered all districts of Bihar to propose an initial list of five districts that reflected the average profile of Bihar at the state level. In joint consultation with Water For People, a step-by-step process was followed to narrow in on one representative district:

1. Ecociate performed a tabulation of district parameters along with the state's average value for each parameter (12 parameters, 38 districts)
2. Each district was ranked in descending order for each parameter.
3. A parameter rank score was calculated for each district as net difference between the state average value rank and the district parameter rank (state average value rank minus district parameter rank – 1 parameter rank score for 38 districts).
4. All parameters' rank score was calculated for each district (12 parameter rank scores for 38 districts).
5. A net score of all parameters' rank scores was calculated by adding all parameters' rank scores (net score for 38 districts).
6. Selection of sample study district using the district with the closest rank score to the state rank score (state rank score is taken as 0)

Using the district selection criteria explained above, Saran District of Bihar was chosen as the sample. The profile of Saran is similar to Bihar State's average profile on the selected parameters (reference table below), and also represents a district where Water For People had not previously intervened.

Phase 2: GIS Mapping

Phase 2 of the study began with a presentation of Phase 1 results and joint discussion of project objectives and deliverables. Ecociate finalized the study plan after it was considered safe to travel to the shortlisted district of Saran. Research tools were developed for targeted respondents in the form of discussion guides and checklists, and the targeted sample size of respondents was finalized and shared in an inception report.

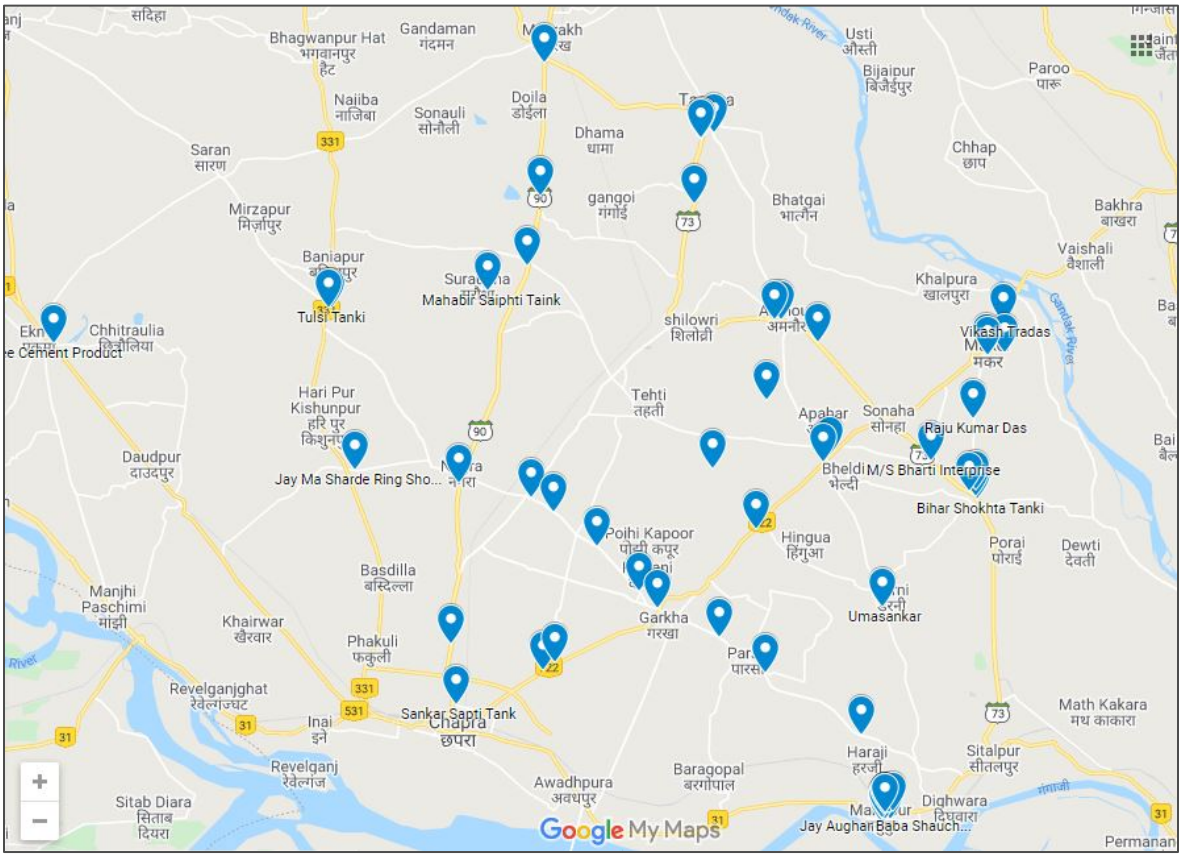
Table 1: Study Stakeholders and Research Tools

Stakeholder	Research tool	No. of samples
Villagers	Focus group discussion	8 groups, each with 4 male & 4 female participants
POPs	In-depth interview	10
Sanitation promoter/motivators	Key informant interview	6
Gram Panchayats	Key informant interview	6
Government representatives (*Gram Sewak*, etc.)	Key informant interview	4

Ecociate developed an IT-based tool to map POPs in Saran District. The GIS-mapping exercise utilized a saturation approach to identify and map 60 POPs across all blocks of the district.

The GIS mapping helped identify geographic clusters with a higher concentration of POPs and thus informed the identification of study respondents such as villagers, key opinion leaders, Panchayats, and other representatives. Information collected from these respondents was then collated and analyzed in Phase 3 of the study.

Figure 1: GIS Mapping of POP Clusters



This map can be viewed at: https://www.google.com/maps/d/viewer?mid=1IZtwNvN4-oqtJ8GGlUIwoMKimrlRJzhS&ll=25.918077631007083%2C84.84413795254522&z=11

Findings and Analysis

The socio-economic situation of Saran District was found to be the most representative of the entire State of Bihar. As part of the national *Swachh Bharat* Mission, Saran District had a strong impetus to build new household toilets using 'brick-based septic tank technology.' The Mission promoted construction of these toilets across the district through designated vendors, following a common design with *Panchayat*-approved materials. Community members had limited input in the process.

Each household received Rs 12,000 in their bank account once the toilets were finished. However, there were complaints about the quality of the toilets constructed under Mission by government contractors. In most cases, the brick-made toilet pits caved in after a year or two, rendering many toilets unusable. Furthermore, septic tanks were often reported to be punctured by rodents. It was reported that only 20% of the originally constructed toilets were still in use.

The government – through various NGOs and other agencies – carried out household-level awareness generation programs to enhance toilet usage. They used various information communication technology measures to promote toilet construction. Toilet use peaked during the Mission's campaign, and recent floods in Bihar forced communities to continue using toilets, as open defecation in the fields was not possible since they were submerged under water.

The information collected from various stakeholders informed the following major findings related to each objective of the study.

POP availability and demand for toilet construction

Construction of toilet pits using cement rings was reported to be significantly more durable than pits lined with bricks. Pits lined with cement rings required less space, were faster to build, and were easier to maintain, making them cost effective in the long run. However, the *Swachh Bharat* Mission provided no direct impetus for the district to promote POPs or sanitation entrepreneurs.

POPs developed organically without any significant support from the government or from other ecosystem players like financial institutions or civil society organizations. Most of the POPs were established in the last 3-4 years when toilet construction opportunities expanded due to the increased demand for toilets triggered by the Mission coupled with the inferior quality toilets built by the government system. The first movers were entrepreneurs from the neighboring Vaishali District who established partners in Saran and elsewhere to set up cement ring manufacturing units locally. Following the example of these entrepreneurs, POPs spread throughout rural areas of the district to meet the continuous demand for toilets with cement rings, enhanced by the severe floods.

The demand for toilets has been universal across rural areas of the district. POPs generally serve customers within a 20-km radius of their respective locations. There is a typical density of 5-10 POPs reported in each block, with a roughly equal distribution across the rural areas. The urban areas of the district – primarily comprised of the town of Chappra – have a low penetration of POPs. Toilets in urban areas are often linked to common sewage systems, and households seek services from large hardware stores that also sell pipes, taps, and bathroom fittings.

There is a clear correlation between demand for toilets with cement rings and demand for services delivered by POPs. Demand for cement rings is supplemented by the services offered by POPs, including doorstep delivery of the rings, labor for pit preparation, ring installation, construction of superstructures, and arrangement of masonry for the customers.

Supply chain gaps

Since the growth of POPs was rather unplanned, ***supply linkages are haphazard and dependent on the individual capacities of POP entrepreneurs.*** POPs mainly rely on local markets within a 20-km radius to source the inputs required to manufacture cement rings. Local sourcing allows for small procurement quantities, the availability of credit facilities, and low logistics expenses which play an important role in the profitability of the POP. However, in interior pockets of the district, inputs such as cement, stone chips, sand, and iron bars are often unavailable, and POPs must arrange and pay for transportation from distant markets.

Major products of POPs consist of cement rings, cement pillars, and other mold-based items like cement flowerpots, cattle feeder pots, and window frames. Around 95% of POP enterprises deal in toilet rings, and around 75% also deal in cement pillars used for construction. The size, thickness, and quality of cement rings and other mold-based products are not standardized, and prices vary accordingly. As such, ***the various quality of inputs is used to optimize costs and cater to customers' needs.*** For other toilet construction inputs like pans, pipes, fittings, and doors, the customer generally arranges their own sourcing.

Inadequate financial availability from both formal and informal sources acts as a huge barrier in the growth of POP businesses. Very few POPs can access formal credit from banks and other financial institutions. Additionally, very few business transactions for the POP occur through banks and formal financial institutions, and as a result, such relationships are weak. The POPs contacted for the study were also not aware of various government programs that support Micro, Small and Medium Enterprises (MSMEs), such as MUDRA schemes.

Due to low investment in POP enterprises, very few POPs can enter the bathroom and toilet fitting business. POP entrepreneurs generally put a lot of effort toward integrating masonry services, skilled labor for digging and installing the rings, and delivery to the customer. However, integration of all products and services required for bathroom construction is not very common among POPs, and this creates issues for customers who need to arrange for delivery of products and services from other businesses.

Many recent POPs were started by former workers who learned the trade while working with other POPs. ***There are large gaps in terms of business and marketing knowledge, including the ability to identify growth opportunities.*** Due to immediate competition and market shortsightedness, many POPs offer cement rings at cheaper rates to allure customers, even when the rates are not sustainable. At times, POP entrepreneurs were not aware of the cost and pricing of their products.

Exclusion at the village level

The government machinery involved in promoting sanitation has very little linkage with POP enterprises. As such, other ecosystem players, including banks, support service providers, and extension departments, show little interest in supporting POPs. The cement ring technology promoted by POPs does not match the brick-based technology promoted by government, and as such, local *panchayats* do not recognize POPs as actors in the sanitation value chain. For example, state government has established special cadres of local volunteers (known as *Swacchagrahi*) responsible for providing toilet construction assistance to beneficiary households. There are few linkages (even informal ones) and major gaps in communication between these local volunteers and the POPs who cater to customer needs.

The major barrier to toilet construction was identified as household income level. The financial support available through the *Swacch Bharat* Mission only applied to the government model of toilet construction. Therefore, any toilets constructed through POPs were not recognized by the government and not eligible for the Rs. 12,000 subsidy. As a result, lower income families faced financial hurdles in constructing toilets through POPs. Additionally, higher income groups were observed to prefer brick-based septic tanks.

Awareness for toilet usage was found to be quite high among various sections of communities. Since the floods became a major factor for toilet use and with vegetable farming communities prohibiting people from defecating on their lands, household priorities changed with more emphasis given to toilet construction. ***No major caste barriers were observed for toilet construction among communities. However, an important bottleneck is the absence of adequate space for digging a pit and constructing a toilet.*** For lower income and landless families, it was hard to allot the minimum 4 ft^2 of land. Additionally, some elderly people were found to prefer open defecation.

Commercial viability

Customer households typically prefer a depth of 8 to 9 feet for toilet pits. While people are aware of the possible contamination of underground aquifers, there are some customers who prefer deeper pits. Toilet ring sizes vary from 3 to 4 feet in diameter and 9 to 12 inches in width. As such, a typical pit requires 9 to 12 rings, and the manufacturing cost of one cement ring is Rs. 350 to 500, depending on the quality of the sands, cement, chips, iron rods, and mold. Two laborers and a skilled mason are required for the construction and installation of the pit. The average cost of transportation of the rings is Rs. 1,000 to 1,200. A customer typically pays Rs. 12,000 to 15,000 for a POP to install a toilet pit, including the labor for digging the pit and installing the cement rings. ***A POP earns a profit of approximately Rs. 3,000 for construction of a pit without a superstructure.***

For a typical brick-made superstructure, a 4 ft^2 room generally requires 800 to 1,000 bricks, costing around Rs. 8,000 to 10,000. Other approximate costs include pipes for Rs. 150, a pan for Rs. 500, sand for Rs. 500, 4 cement bags at Rs. 1,200, and 6 masons and 6 labor days at Rs. 5,000. A customer typically pays around Rs 20,000 to construct a toilet with a superstructure, excluding transportation costs. ***When a POP facilitates the construction of the toilet superstructure, they can expect an approximate profit of Rs. 4,500.*** However, very few POPs venture into the construction of superstructure due to constraints in financing.

Table 2: Costs of POP Toilet Construction without Superstructure

Costs	Quantity	Unit cost (Rs)	Amount (Rs)
Construction materials			
Sanitary accessories (pan, water seal, PVC pipe, cement Jali, etc.)	-	-	1,000
Cement	1	320	320
Toilet rings	10	450	4,500
Transportation	-	-	1,500
Miscellaneous	-	-	500
Construction materials sub-total			**7,820**
Labor charges			
Mason + labor charges for pit construction	-	-	1,000
Labor charges sub-total			**1,000**
Material wastage @ 2%			40
TOTAL COSTS			**8,860**

Table 3: Costs of POP Toilet Construction with Superstructure

Costs	Quantity	Unit cost (Rs)	Amount (Rs)
Construction materials			
Bricks	1,000	4	4,000
Asbestos sheet for roofing	400	2	800
Sand (cft.)	40	24	960
Sanitary accessories (pan, water seal, PVC pipe, cement Jali, etc.)	-	-	1,000
Cement	3	320	960
Gate of iron sheet	1	1500	1,500
Toilet rings	10	350	3,500
Transportation	-	-	1,000
Miscellaneous	-	-	200
Construction materials sub-total			**13,920**
Labor charges			
Mason + labor for pit construction	-	-	1,000
Mason + labor for superstructure construction	-	-	2,000
Labor charges sub-total			**3,000**
Material wastage @ 2%			150
TOTAL COSTS			**17,070**

Capital requirements for a POP vary from Rs. 50,000 to 3 lakhs, with an average of Rs. 1 lakh, excluding the cost of rental space (usually Rs. 600 to 1,000). A typical POP averages 6-10 orders per month, with few to no sales during the rainy season. ***A typical POP earns Rs. 15,000 to 25,000 per month after recurring expenses.*** The average annual gross profit of POPs in the district was reported around Rs 0.97 million from the sale of sanitation items.

Table 4: Sample POP Income Statement

Monthly costs and revenue	Quantity	Rate (Rs)	Amount (Rs)
Monthly revenue			
Construction of toilets without superstructure	5	12,000	60,000
Construction of toilets with superstructure	2	22,000	44,000
Total monthly revenues			**104,000**
Monthly expenses			
Construction materials without superstructure	5	7,820	39,100
Construction materials with superstructure	2	13,920	27,840
Mason and labor for pit construction	7	1,000	7,000
Mason and labor for superstructure construction	2	2,000	4,000
Material waste (2%)	7	190	1,330
Rent of premises			1,000
Administrative and miscellaneous expenses, including marketing and promotion activities			500
Total monthly expenses			**80,770**
MONTHLY PROFIT			**23,230**

Note: POPs can expect additional sales from non-sanitary products (such as flowerpots, pillars, etc.) of approximately Rs. 5,000 per month.

The value proposition of toilet usage strongly emerged during the floods. ***And irrespective of the subsidy amount provided for government-built toilets, community members clearly prefer to build their own toilets using POP services.*** The unique selling proposition of POPs, contributing to this commercial viability, includes:

- Varying quality and price of materials offered, including different types of sand, fine chips, and cement.
- Pricing of products in comparison to competitors.
- Integrated solutions provided along with materials, including labor, masonry, and timely delivery.
- Credit facilities provided to customers.

The POPs used low-cost promotion in the form of banners, glow-sign boards, and pamphlets, along with regular participation in various village-level meetings, such as self-help groups and *Panchayats*, to communicate the benefits of toilet usage and promote their businesses with villagers. Although such marketing efforts are inexpensive, they play an important role, as consumers were found to remember the associated POP and reach out with queries and orders.

Geographic expansion

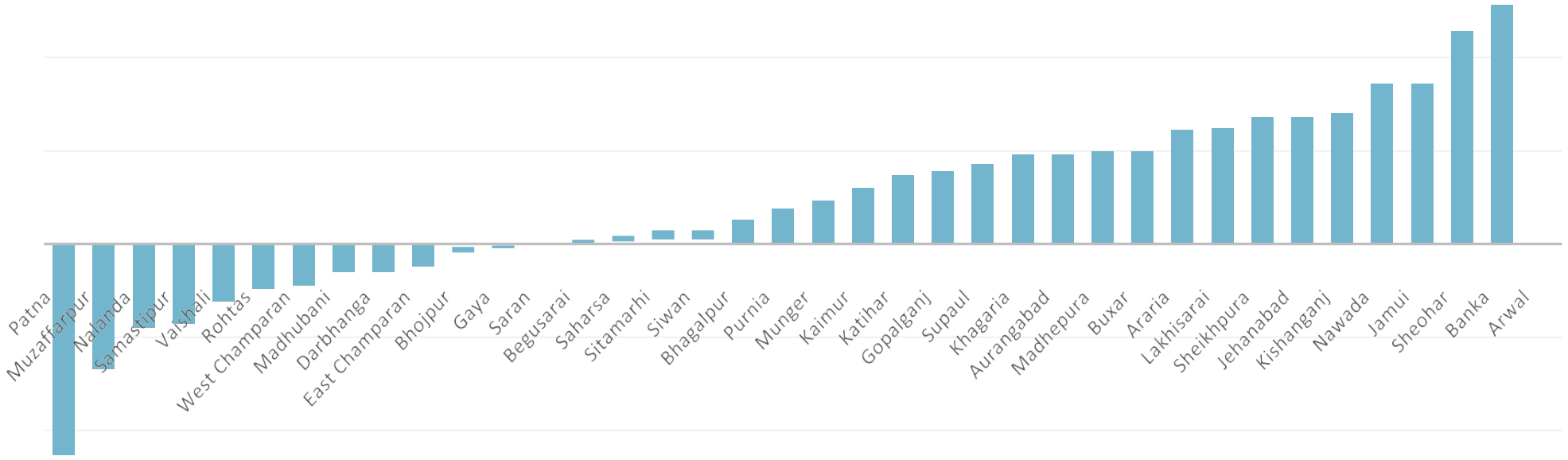
The independent growth of the POP enterprise model without any support from the government or donors showcases the strength and sustainability of the model. The concept of POPs in Saran District, which is representative of the entire state, has seen organic growth primarily fueled by the demand of sanitation services on one hand, and inadequate and low-quality toilet construction by the government on the other hand. Community members like the POP enterprise model since they can choose the design, location, and depth of pits, materials used in toilet construction, and toilet size according to the size of their individual households. Community members trust POPs, as they believe the entrepreneurs are there to stay and are accessible whenever required.

POP businesses promise to grow both vertically and horizontally, even without any donor funding. Almost all the POPs expressed the desire to venture into additional products related to construction. Diversification of the business model is possible in manufacturing cement-based brick, pipes, and other superstructure materials, as well as pans, tiles, and tin sheets, thus providing an entire construction solution. The evident direction of POP expansion is in the range of other construction goods and services, slowly encompassing all kinds of service needs for the customers. Horizontally, some POPs have already initiated branches in other blocks of the district or in nearby districts with the help of partners. Some POPs have opened branches in 2 or 3 locations within the district. Their approach is to enhance the volume of business slowly across different geographies to save on logistics and make operations more cost effective in the long run.

Supply chain gaps are clear and evident in the lack of a systematic approach toward POP businesses, in particular the highly restricted access to capital from formal and informal sources of finance. The key support requirement for diversification and intensification of the business, apart from financial support, is the exposure and knowledge of the supply chain along with appropriate business planning. ***To support POP entrepreneurs, it is important to build their business capacities, enhance their access to financing, and advocate for enabling policies at the government level.***

Annex 1: District Selection Criteria

District	Total population	Density (per km^2)	Literacy rate (%)	Child mortality rate (per 1,000 live births)	Families BPL without toilets (before 2014)	Households identified for toilets (in 2014)	ODF coverage in 2020 (%)	Number of households	HDI (DLHS 2007-08)	HDI (AHS 2010-11)	SC/ST population (%)	Per capita GSDP
Bhojpur	2,720,155	1,136	72.79	57	188,824	275,533	1	416,090	0.48	0.499	0.17081	12,459
Gaya	4,379,383	880	66.35	67	132,679	401,880	1	688,425	0.303	0.4795	0.33257	11,897
Saran	3,943,098	1,493	68.57	66	182,025	265,320	1	631,097	0.326	0.5477	0.13173	10,615
Begusarai	2,954,367	1,540	66.23	64	181,124	258,239	1	589,667	0.378	0.4813	0.15495	17,587
Saharsa	1,897,102	1,125	54.57	86	264,111	445,099	0.9993	368,979	0.239	0.5257	0.17788	12,197
Bihar (state average)	**2,731,701**	**1,142**	**63.77**	**73.48**	**187,798**	**278,976**	**0.9995**	**497,725**	**0.362**	**0.511**	**0.18139**	**12,892**



Annex 1: Business profile and assumptions

Business Profile of Typical POP

Business location	Panchayat HQ or Block HQ
Ownership structure	Proprietorship
Number of owners	1
Major products/services	Cement rings, skilled mason, and additional laborers engaged for preparation of pit and installation of toilets
Major raw materials/ services required	Cement, chips, sand, bricks, iron rods, mason, and labor
Other requirements	Pipes, junction box, cap, and other requirements for the superstructure of the toilet (pan, bricks, asbestos roofing, etc.)
Fixed assets	Land and workshop area, tools, cement ring molds, workshop arrangements, banners, pamphlets, sign boards, etc.
Fixed capital required	Rs. 50,000
Working capital required	Rs. 100,000
Total capital required	**Rs. 150,000**

Specifications and Assumptions

Cement ring size and quantity	Each ring varies from 3, 3.5, or 4 feet in width and 9, 10, or 12 inches in depth. For a 10-foot pit, this typically requires 9 to 12 cement rings.
Cement ring manufacturing cost	Varies from Rs. 350 to 500.
Labor charges	One mason and two laborers take one day to construct a pit, for a total of Rs.1,000 in labor charges per toilet.
Transportation costs for materials	Varies from Rs. 1,000 to 1,500, depending on distance.
Toilet price	A typical customer pays Rs.12,000 to 15,000 per toilet.
Toilet sales and profit	A typical POP sells 6-10 toilets per month. Profit varies and averages approximately Rs. 3,000 per toilet.
Superstructure construction	In 20% of cases, the customer requests construction of the superstructure. This requires one asbestos sheet roof and 800 to 1,000 bricks to build the 4 ft^2 room. The total cost of superstructure construction is around Rs.15,000.
Rent	In cases where the owner does not own the business premises, the POP pays around Rs. 1,000 in rent per month.
Salaries	The POP pays salary and labor charges of Rs. 9,000 per month.
Other expenses	Expenses toward sand, cement, and other necessary items are Rs. 6,000.
Non-sanitary products	The POP sells non-sanitary items for approximately Rs. 5,000 in revenue per month.