Project Resource

Project resources are materials which were originally produced during support from the Business Innovation Facility team to a specific inclusive business project. They include inputs provided as part of technical assistance and summaries of findings and outputs. They are adapted for wider use so that other practitioners can also make use of the material.

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Slum sanitation

Market landscape and options for business design

What is this resource?

Sanitation provision in urban Indian slums has long suffered from poor governance, disputed land and a lack of basic, supporting infrastructure. This document explores sanitation solutions in this market and is based on a research study for Saraplast Private Limited (3S Shramik) a manufacturer and cleaning services enterprise for mobile toilets. Intellecap Advisory Services worked on this Business Innovation Facility project from January to May 2012, providing market entry and strategy consulting to the client.

Why is it interesting?

This report provides an overview of the urban slum toilet market and presents consumer insights from a primary survey conducted across slums in three cities. Based on these, it recommends steps and critical design factors for setting up privately-run toilet facilities in urban slums.

Who is it for?

It will be useful for practitioners, entrepreneurs and other stakeholders working toward improving sanitation provision in urban Indian slums. It is of particular relevance to those designing fee-paying and commercial services for toilets and for other similar basic services for which there in only a nascent market at the base of the pyramid.

Content and structure

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Existing provision and supply

Findings from primary research

Design factors for private toilet provision in slums

Additional resources

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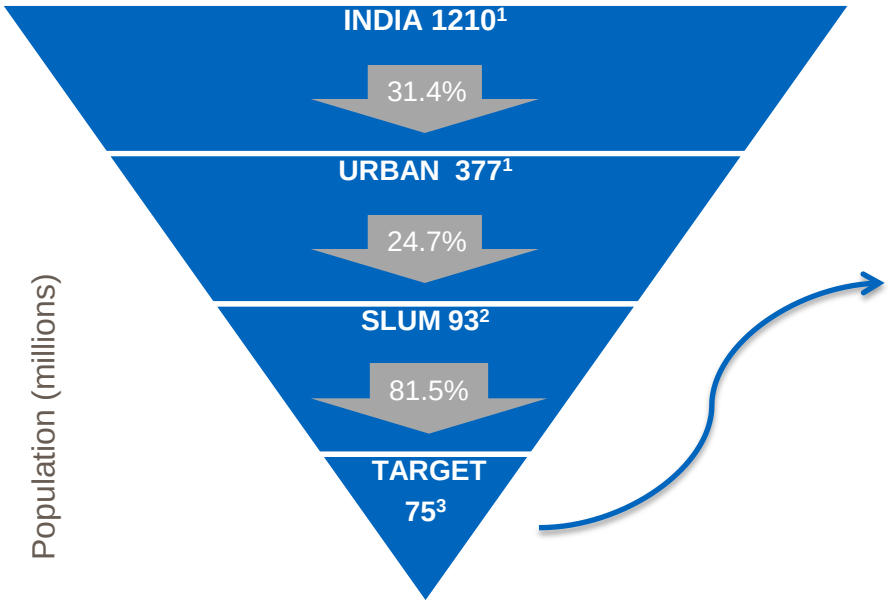
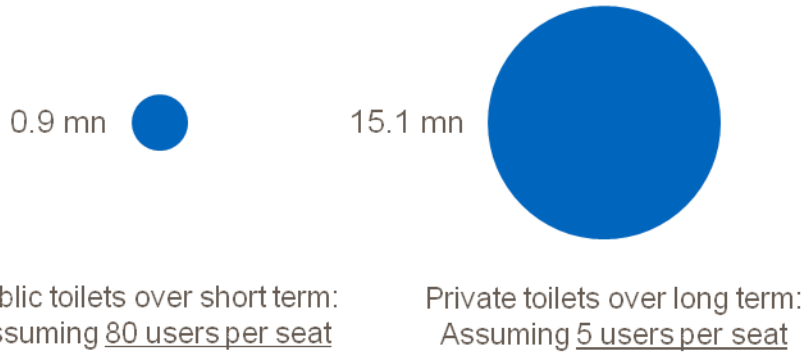
Immediate demand for sanitation in urban slums is estimated to be ~ 1 million seats

Potential target population for sanitation services



Potential target market (75 mn) in terms of number of toilet seats



- Urban slum dwellers who lack access to individual or shared* toilets are the potential target market
- Estimated 75 million (81% of slum population) individuals have no access to individual or shared toilets
  - Of these, an estimated 14 million have no access to any form of sanitation infrastructure
- In the short term, we can assume a population per seat ratio of 80, typically provided through a community toilet block
- In the long term, the ideal situation would be to have one toilet per family i.e. population per seat ratio of 5

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* Note: Shared toilets**:** toilets shared by households in a single building or area e.g. a toilet shared by 20 tenant families each occupying one room in a large building; or a toilet shared by 3 related families living within a compound.

Sources: 1. Census India, 2011; 2. Committee on Slum census and statistics, 2011 using Census 2001 data, among others;.

Two types of urban slums: notified and non-notified. Potential target market is equally split

	Notified slums (48% of urban slums)	Non-notified slums (52% of urban slums)
Definition	**Recognized by the government and granted legal or quasi legal status**	**Not recognized and considered illegal; government not obligated to provide basic amenities**
Characteristics of the slum	○ Slums have right to basic facilities like roads, water, electricity and sanitation; ○ However, advocacy required to motivate municipality ○ Eligible for all government development programs ○ 63% of notified slums on government land ○ Tenure security is high given government recognition ○ Location and type of slum dictates number of government agencies monitoring the land	○ Any facilities provided are on humanitarian grounds ○ Political influence needed since government is not legally obliged to provide facilities ○ Not eligible for government programs in many cases ○ 58% of non notified slums on government land ○ Land tenure uncertain – risk of eviction high unless the land itself is disputed or slum has vintage
Access to sanitation	○ Individual and shared toilets: 23% of slums*	○ Individual and shared toilets: 14% of slums

Slum Infrastructure*		
Sewage	33%	19%
Road in slum	78%	57%
Tapped water	79%	77%
Electricity	76%	53%
Permission process	Permissions need to be taken from relevant departments based on location e.g. flood board, water board, electricity	Permissions to be sought from same departments but politician support (MLA/MP) needed

Huge potential market in both notified and non-notified slums; Operational difficulties tend to be higher in non-notified slums due to low land tenure security, lack of basic supporting infrastructure and challenges in government approval/permission process

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* Note: NSSO counts a slum as having a certain characteristic based on what is available to the majority of the slum residents, but b no means implies that this is the only facility available/characteristic present

Sources: NSSO report, Some Conditions of Urban Slums in India 2008-2009. We have assumed that no. of slums remained constant from 2009 till 2011.

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Current sanitation models found in urban slums

Individual toilets	**Subsidized**	▪ Toilet construction completely/partially subsidized by government/donor agencies
	Credit based	▪ MFIs such as Guardian, BISWA provide credit for individual toilets ▪ NGOs such as SEWA, Waterforpeople, Fodra, VSSU have similar programs
	SHG focused	▪ Women are mobilized in groups and trained in masonry and plumbing in order to construct household toilets and repair water and sanitation facilities
Shared toilets	**Rent based**	▪ Toilets are shared between 2-15 households. Rent is collected by the owner who uses the toilet himself and is responsible for cleaning and repairs
	Joint responsibility	▪ Toilets are shared between 2-5 households. All the households are responsible for cleaning and repairs
Toilet blocks	**Public**	▪ Government toilets: majority are free for use ▪ Build Own Operate: PPP where local body provides land and capital expense to private entity who constructs and operates toilet under a 30 year contract ▪ Build Operate Transfer: PPP where local body provides land to private entity who constructs and operates toilet for 5-7 years post which toilet is transferred to government
	Community	▪ Multiple partnership based: community manages toilet post construction ▪ SHG based: community builds and manages toilet
Other models	**Eco/bio sanitation**	▪ Various organizations are exploring eco sanitation models which generate biogas from solid waste and also reduces the quantity of water necessary
	Portable toilets	▪ Service that rents portable toilets to individual households and charges for collecting waste (Implemented by Unilever and IDEO)

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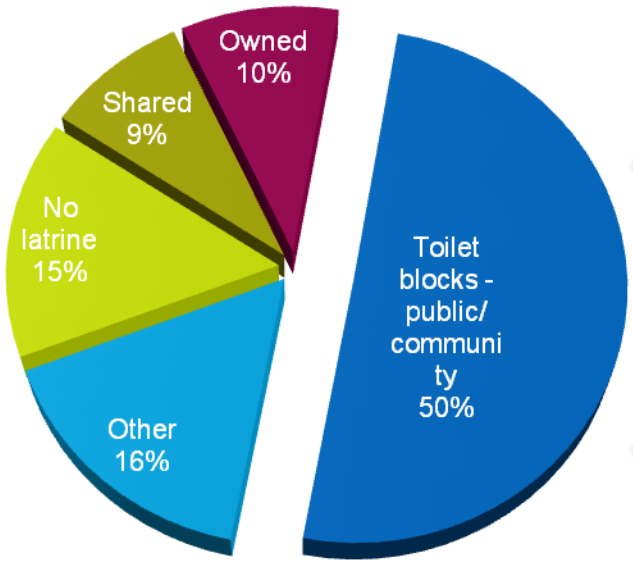
Toilet blocks are most prevalent; various models have had differing success/impact

Distribution of sanitation infrastructure across urban slums[1]



1. NSSO (National Sample Survey Organization), Conditions of Urban Slums in India 2008-2009; Population of slums is assumed to be constant from 2009 to 2011
Table sources: 1. Primary Research 2. Partnering with Slum Communities for Sustainable Sanitation in a Megalopolis (WSP) 3. Public Toilets in Urban India: Doing Business Differently (WSP

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Toilet type	Partnership structure and financial model	Impact on community
Toilet blocks – Public		
Free for use	- Government constructed and maintained - No fee charged to users	- Toilets are not well maintained, - Distorts willingness to pay for private sanitation
Build Own Operate	- Land and capex by government/ donor - Opex by contractor, recovered through user fee	- High usage as they are well maintained by contractors like Sulabh
Build Operate Transfer	- Land by government - Capex by contractor, recovered through advertising fee	- Poorly maintained as contractors focus on exterior for advertisement
Toilet blocks – Community		
Build Own Operate	- Land and capex by government/ donor - Opex by contractor, recovered through user fee	- Absence of buy in from community in location etc. may result in low usage
Multiple partners	- Capex and land by local body - Construction by private contractor - Maintenance by community	- High usage as community involved in planning and maintenance
SHG based	- Capex and land by local body - Construction and maintenance by women's SHG	- High usage as toilet is maintained well by community

Pros and cons of existing toilet block models

		Pros	Cons
Public toilets	Free for use	• Sometimes it is the only sanitation infrastructure available in a slum • Affordable to the poorest income band	• Poorly maintained given government apathy and lack of motivation of toilet operator due to low wages
	Build Own Operate	• Sustainable practice for the private contractor as no capital investment required • Toilet operator incentivized to maintain facilities given dependence on user fee	• User fee based is a high risk model for a private player as revenues are irregular and undependable • Some toilets run on losses and can be managed only by large players who cross subsidize badly performing units by better performing ones
	Build Operate Transfer	• Encourages private sector participation as profits are high • Advertising revenue is regular and reduces risk for the contractor	• No financial incentive to maintain the facilities, since majority of the operators' profits come from advertising revenue
Community toilets	Build Own Operate	• In many cases, limited co-operation from the community as they are not involved in the process	• In many cases, limited co-operation from the community as they are not involved in the process • Restriction to community and lack of more profitable pay per use results in losses
	Multiple partnership based	• Community involvement and hence buy-in at all stages of construction	• Difficult to scale as considerable effort is required to structure the collaborative partnership of NGOs, contractors and CBOs
	SHG based	• Effectively leverages existing groups in the community and makes them internally self sufficient	• Considerable effort required to train the community

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Community involvement and government partnerships are key

What the models teach:

- **Subsidies:** Given inadequate collections, land and capital subsidies have been crucial in making user fee dependent models sustainable
- **Advertising revenues:** Additional revenues such as advertising play an important role if capital costs are not offset by the government
- **Community participation:** Community involvement (including at the planning stage) is found to be crucial for success of PPP projects
- **Multiple stakeholders:** Models with more than two stakeholders are challenging to implement and scale
- **Pricing:**
  - Monthly passes are found mainly in community toilet blocks and generally priced between INR 20-50
  - Pay per use is found mainly in public toilet blocks and priced between INR 1-3 per use

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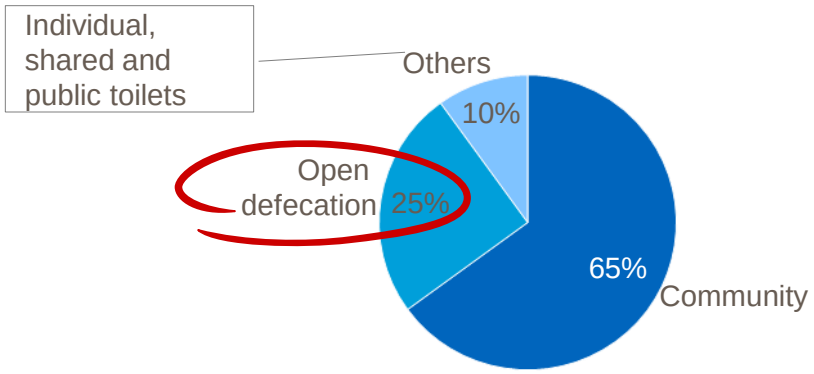
Primary research overview– toilet access, consumer preferences and other insights

Details

- Surveys were conducted across the cities of Pune, Bangalore and Delhi by Intellecap during the tenure of the project
- A questionnaire was taken from door to door and covered 200 slum households per city; total 600 households
- Within each city, efforts were made to cover a variety of slums i.e. geographically, nature of location, nature of land ownership, notified status etc.
- One or two focus group discussions were conducted per city
- Interviews with NGOs, government officials and other stakeholders contributed to the insights

Results: Toilet access



Insights: Consumer preferences

All	HHs prioritize water and cleanliness over other facilities
50%	HHs are willing to pay for bathing and washing facilities
86%	HHs are willing to use mobile toilets if cleaner than traditional brick and mortar toilets, despite being further away
92%	HHs are willing to travel up to 5 min to access toilets

Insights: Key highlights

25%	Men defecate in the open
44%	Children defecate in the open
> 2	Number of uses of toilet per day by children

Observations: Infrastructure

- Pune has better sewage and water access infrastructure when compared to the other two cities
- Although household tap connections are fairly common, water supply is often limited to a few hours a day
- Only 33% of slums have NGOs operating in the community
- 45% of slums have multiple active political parties, which can sometimes lead to a lack of cooperation in the community

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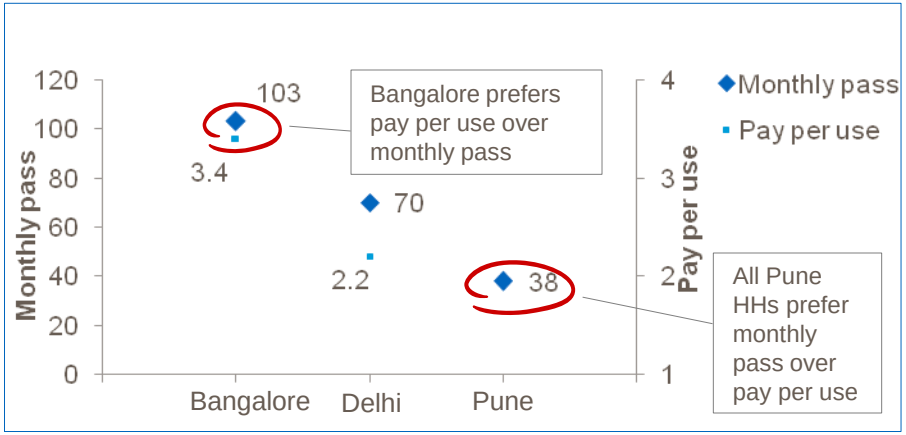
Willingness to pay: more than current spend; not directly correlated to income

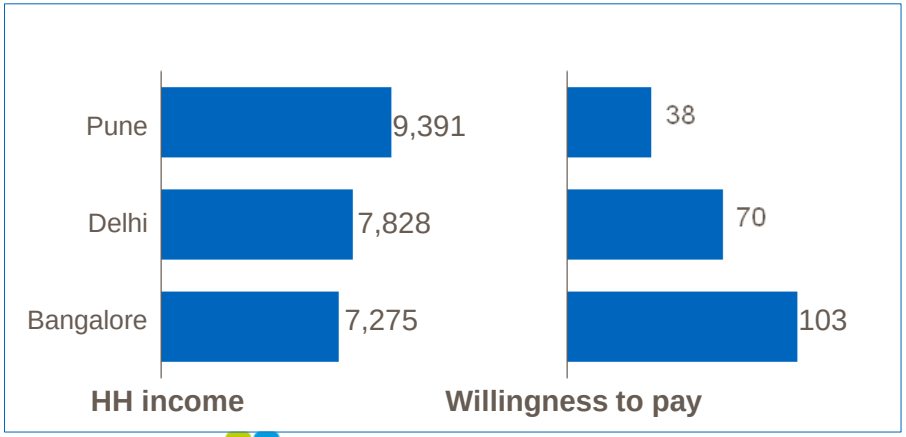
Willingness to pay* across cities (INR)



Willingness to pay: High in Bangalore, average in Delhi, low in Pune

- Willingness to pay for clean mobile toilets is higher than current spend in both monthly and pay per use forms
- However, in cases where HHs are currently paying per use, estimated total monthly spend higher than stated willingness to pay for monthly passes: INR 197 in Bangalore and INR 148 in Delhi
- Monthly passes are not common in Bangalore and Delhi slums, though the norm in Pune slums

Income vs. willingness to pay* (INR)



Willingness and ability to pay are not correlated

- Pune: Willingness to pay distorted by 1) widely available free and/or subsidised toilets, although poorly maintained 2) prevalence of household monthly pass
- Delhi: Willingness to pay distorted by history of political campaigns offering freebies and ad-hoc reductions in usage charges
- Bangalore: Willingness to pay highest due to 1) actual shortage of toilets, resulting in high user per seat ratio
- 2) prevalence of pay per use over monthly pass

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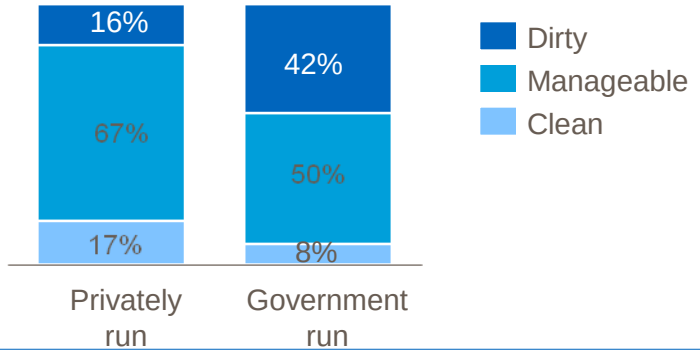
* Note: Willingness to pay is as seen from the survey and may not represent reality.

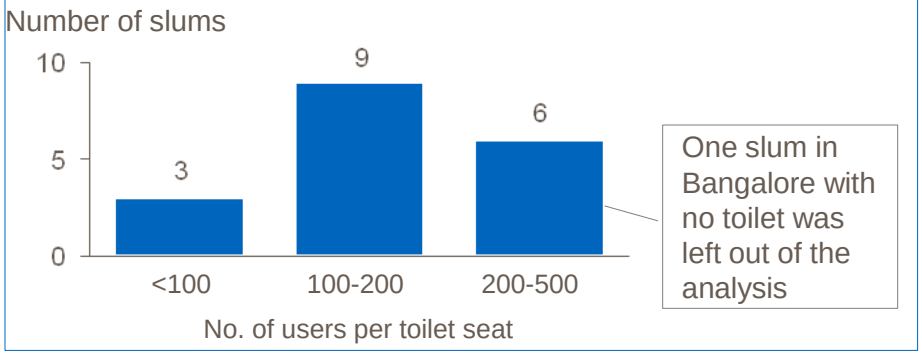
Lack of toilet access, high user per seat ratio and poor maintenance drive interest in mobile toilets

Toilet quality based on management



84% of privately managed toilets are clean or manageable compared to 58% of government operated toilets

User/seat ratio across slums



Extremely high toilet to seat ratio across a majority of the slums surveyed over three cities

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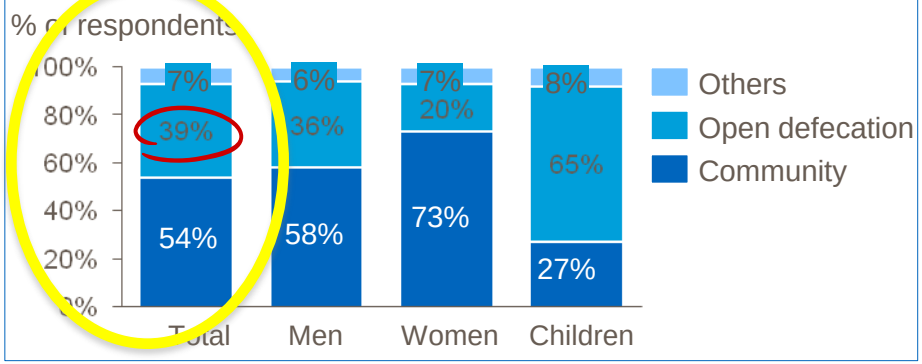
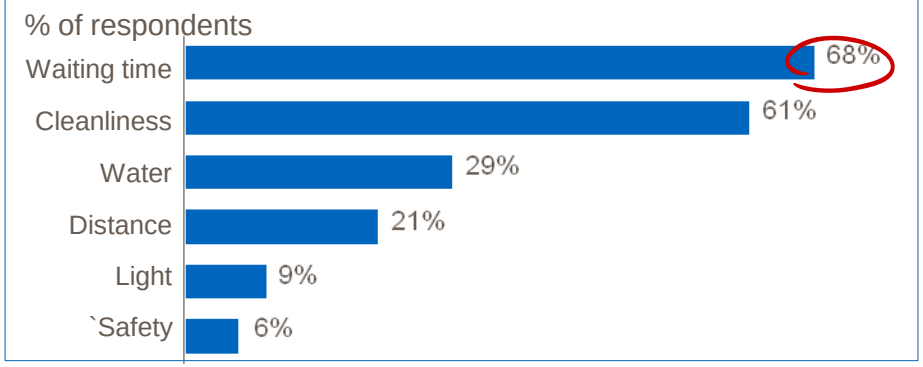
Bangalore: expensive public and community toilets, limited access and high awareness create demand for mobile solutions

Access to sanitation



Highest percentage of open defecation relative to other cities

Facilities lacking at the toilet



Unlike other cities, Bangalore has high % of HHs complaining about wait time

"Since our only option is pay per use, we spend **INR 300- 500 per month per family** on sanitation. For mobile toilets we would initially prefer pay per use until we are assured of good service and then would like to shift to monthly pass as it is cheaper."

– Resident, Gandhinagar slum

Key insights

- Largely prevalent pay per use mechanism and lack of monthly pass option results in high HH expenditure on sanitation
- In instances where there is no toilet at all or access restricted to women, residents are willing to pay >INR 100 per month
- Even in cases where community toilets are free slum dwellers are willing to pay for well maintained mobile toilets
- Despite slums having functioning pay per use community toilets the high person to seat ratio (~200), results in long waiting time

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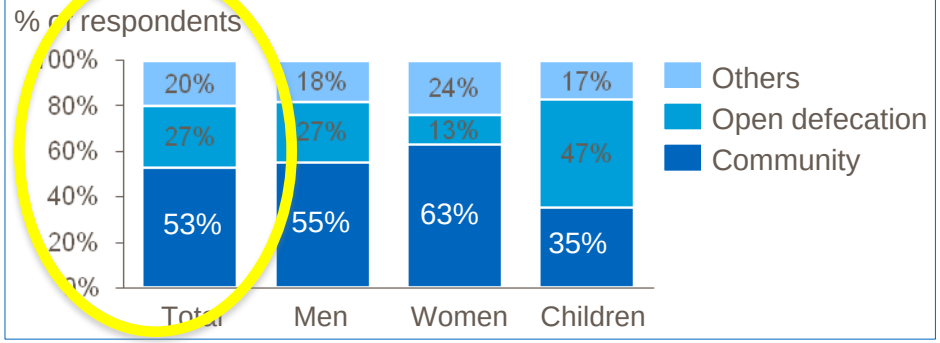
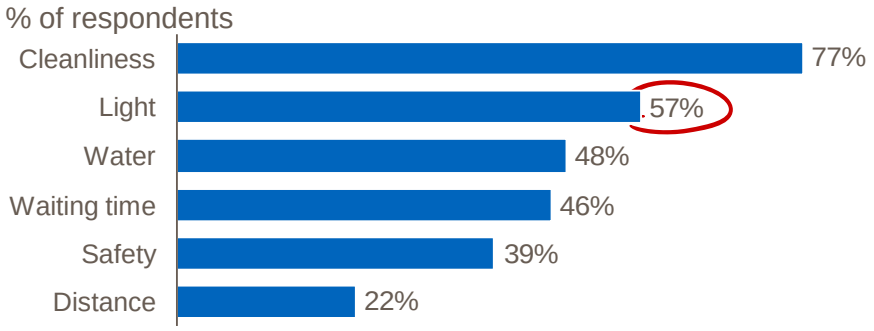
Delhi: poor community toilet access and lack of maintenance drive demand, willingness to pay limited by low awareness

Access to sanitation



Within 'others', a large proportion consists of public toilet usage

Facilities lacking at the toilet



Apart from cleanliness, a sizeable % of respondents were troubled by poor lighting

"**Need is high in** both notified and non-notified slums and also across the city (outskirts, old city etc.). However **willingness to pay is marred** by frequent promotional gimmicks carried out by campaigning political parties."

– Delhi Urban Shelter Improvement Board (DUSIB)

Key insights

- Willingness to pay is driven by lack of toilet access in/near the community, overcrowding of public and community toilets (150 people per seat) , long queues, security and maintenance issues
- Those unwilling to pay often have an open defecation space nearby
- Users' preference equally split between pay per use and monthly
- 38% of HHs currently on pay per use are interested in switching to more economical monthly option. The few who pay monthly are charged a subsidised rate of ~INR 36 on average
- 63% of respondents willing to pay for bathing facilities

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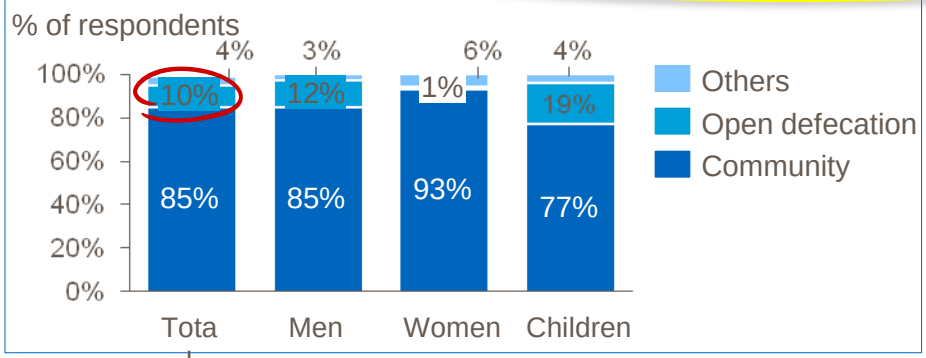
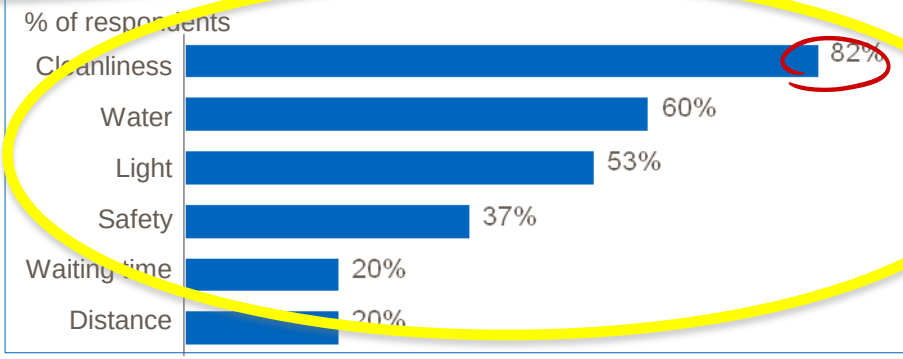
Pune: high access to community toilets and low current spend limits willingness to pay for mobile solutions

Access to sanitation



Lowest percentage of open defecation relative to other cities

Facilities lacking at the toilet



Despite good toilet access, a high % of households found the latrines to be dirty

"We are not willing to pay a rupee more than INR 30 per month."

– Resident, Kashevadi slum

Key insights

- **~90% of users prefer monthly pass** given familiarity with the model; most HHs pay INR 30 per month
- Cleaners receive salary from the municipal govt., and HH collections (INR 30 per month) is over and above his/her salary
- HHs have low service expectations, limiting willingness to pay as they are used to in their current toilet
- Some Muslim women are unwilling to use community toilets owing to privacy and modesty concerns
- Government has provided good infrastructure to most slums (toilets, water taps , sewerage), though maintenance is poor

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Step 1: 5 key metrics for defining location of operation

1	**Willingness to pay**	Influenced by various parameters like shortage of options, distrust of private service providers, prevalence of subsidised alternatives etc.; conduct survey to gauge this
2	**Ease of permissions**	Varies significantly from city to city and is dependent on the set up and attitude of the local municipality; important to have preliminary conversations with officials to assess this
3	**Limited alternatives**	Some cities have a high incidence of toilets provided by the government and NGOs, while others suffer from a scarcity of seats; pick a city with less competition
4	**Market size and individual slum size**	Only few Indian cities have a sizeable slum population *as well as* a good number of slums actually large enough to be economically viable (e.g.. >250 households); acquire secondary or primary data to ascertain this
5	**Consumer attitude***	Target population's attitude can vary from city to city on parameters like trust of privately offered facilities, influence of political activities, respect for property etc.; this should also be covered in the initial survey and understood from conversations with local sector stakeholders

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* For e.g. Delhi had a higher incidence of vandalism and politically motivated disruptions, in Pune slum dwellers had an inherent mistrust of private enterprise and their ability to provide improved service while Bangalore had the most positive attitude toward paid, private run facilities

Step 2 and 3: Survey each slum before deciding to enter

Step 2 : Check against minimum criteria

- Current usage
  - Lack of usable toilets in the community
  - Limited households with individual toilets
- Water
  - 2-3 hours of water supply at most households
  - Access to a public tap close to the toilets
- Space near/within the slum
  - Should have adequate space for 10 - 15 toilets in one location except in the case of shared toilets
- Sewerage or road access
  - Presence of either sewerage connectivity or road access for an evacuation truck
- Willingness to pay
  - INR 120/HH/month* for community facility
  - INR 400/HH/month* for shared toilet
- Critical mass
  - Slum has at least 250 households
  - Demand from 50% or more households for toilets

Step 3 : Review other considerations

- Political/community issues
  - Slums with multiple active political parties and those with a history of communal violence could divide the community, especially in cases where water, land or sewerage permissions are an issue
- Organization of the community
  - Presence of community leader and/or Residents' Welfare Association (RWA) and/or NGO could ease entry into the community
- Land ownership:
  - Local government owned land tends to make procuring operating permissions easier
  - Central government and privately owned land not preferable
- Other seasonal issues:
  - Flooding during the rainy season
  - Agriculture linked migration of the community
- Notification status, potential threat of eviction
- Demand for cassette toilets, other sanitary products
- Interest from local entrepreneurs; ease of exit
- Willingness of local corporator in collaborating

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Step 4: Consider demand and supply side issues in model design

DEMAND

Ability to pay

Willingness to pay

Ability and willingness to pay are not directly related; willingness is also a function of current spend, access to alternatives and their condition.

- Explore various payment mechanisms such as a pass for women & children only, HH monthly pass, pay per use, subsidised pass (PPP)
- Explore partnership with user reward schemes, awareness campaigns

Distance from home

Culture/ Demographics

Distance of toilets from households has a direct impact on the security of women and children using them, and thus ability to convert demand. Privacy needs are also a factor of culture, for eg. some Muslim women unwilling to use even community toilets.

- Explore offering shared toilets to a few HHs; into small groups of 5 and shared among restricted no. of HHs

SUPPLY

Permissions

Requisite permissions to operate vary across slums based on land ownership, etc., constraining scale of the model.

- Explore PPPs with government schools, Shelter Board

Cash collections

Cash management in slum s is a challenge; collections are pocket money for attendant s, rarely flow back to service providers.

- Explore technology to restrict usage to payees

Toilet maintenance

Community buy-in

There is little trust that toilets can be well maintained in slums and also, level of ownership amongst users in community toilets is low.

- Explore the introduction of a QA team to drive attendant accountability
- Explore franchise model to increase community and attendant ownership levels within the slum, develop *"Sanipreneurs"* concept started by 3S SHRAMIK to raise profile and respectability

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Step 5: Design around the seven key tenets of slum sanitation

1	**Water**	Access for cleaning is crucial; foot the bill and facilitate water access for toilet use where needed
2	**Demand Generation**	Market entry must go hand-in-hand with awareness building through schools, NGOs and entrepreneur's own efforts
3	**Collections**	Translating willingness to pay into revenue will require measures against pilferage and free loaders
4	**Aspiration**	Key to creating customer stickiness, to develop pride in users and potential *"sanipreneurs"* – a 3S SHRAMIK concept providing high hygiene standards, machinery to clean toilets, uniformed attendants, other marketing
5	**Women**	Are early adopters, can influence community's uptake of toilets, are future "*sanipreneur*" candidates
6	**Sanitation Spectrum**	Needs vary across individual, shared and community toilets; must be able to cater to all
7	**Local Partners**	Will be key to smooth entry, scale and exit in a given slum and across the city

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Overall: Customise the model to target infrastructure, size and need

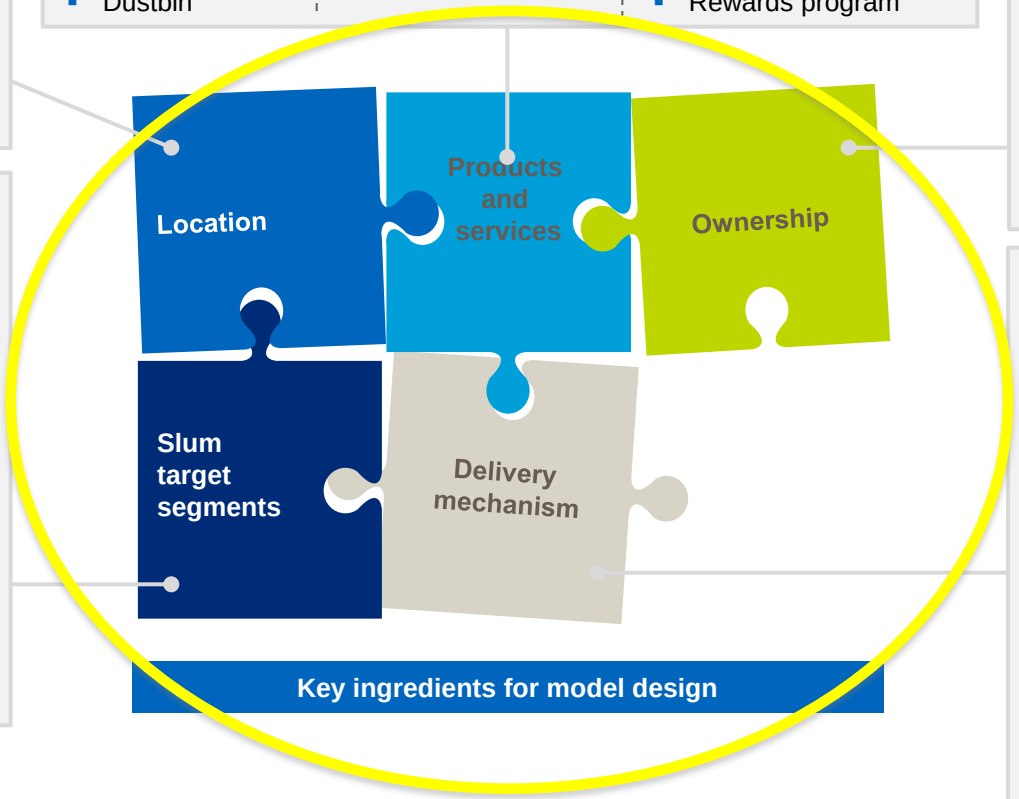
- Public spaces: bus stops, railway stations, metro stations, parks, gardens, beaches, promenades
- Private/ semi private spaces: construction sites, events, schools, petrol pumps within city, parking lots
- Railway crossings : for staff
- On mobile vans/trucks: mainly for promotional purposes

- Individual households: affordable modular fittings, whole bathroom or just toilet
- Community: toilet blocks
- Groups of households: shared toilets restricted to a few families who pay a premium
- Shared–community hybrid
- Public–community hybrid
- School +community: restricted to women and children from the community, usable only outside school hours

Services
- Toilets
- Urinals
- Bathing space
- Handwash, soap
- Dustbin

Products
- Porta spray/faucet
- FMCG items
- Sanitary napkins

Service bundle/ Alliance
- Medical insurance
- Health products
- Nutrition supplements
- Drinking water
- Rewards program



- Saraplast owned and operated
- PPP: Government pays capital cost and/or subsidises operations
- Franchisee/ entrepreneur model: entrepreneur buys the toilet(s):
  - At the start
  - At a depreciated price after 2-3 years
- Maintenance: of dilapidated public /government run toilets

- Awareness generation: panchayat, women's group, local NGOs, government or company's own program
- Revenue model/pricing strategy: Pay per use, weekly pass, monthly pass - toilet block and/or shared toilet, household and/or women & children only
- Payment method: smart card, coupons, cash, punch card, Airtel money, collector
- Sewage disposal : truck + toilets, truck + septic tank+toilets, mains connected

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Additional Resources

You will find more ideas, information and resources on innovation and inclusive business on the **Practitioner Hub: www.businessinnovationfacility.org.**

To read more about the Saraplast Pvt. Ltd (3S SHRAMIK) initiative and project, visit: http://businessinnovationfacility.org/page/saraplast-3s-shramik-portable-sanitation-and-waste-management-in-

Further interesting resources on this topic include:
A website detailing sanitation consumer behaviour and user interface research: http://www.pottyproject.in/

3S SHRAMIK is a sanitation service brand for SaraPlast Pvt. Ltd.: SaraPlast Pvt Ltd is a maverick and innovative company which came into being with the collaboration of two vital reasons -social impact and large scale growth for a completely neglected and disorganized sector in India- Sanitation and waste management.

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This report was written by Ratna Sinroja and Pramod Majetyof Intellectual Capital Advisory Services Ltd. Intellecap works at the intersection of the private sector and development. It provides consulting and investment banking services driven by innovative thought processes, to Business and Development communities globally, helping them bring entrepreneurship solutions to development challenges at the Base of the Pyramid and beyond. Intellecap provides India Country Management for the Business Innovation Facility

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