

Gopal Krishna Gokhale

# An Impact Assessment of Shelter Associates



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An Impact Assessment of  
Shelter Associates'  
'One Home One Toilet' Program

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Impact Assessment of Shelter Associates' One Home One Toilet Program aims to assess the impact of household toilets by taking a 'comparison approach' in urban slums within four corporations, Pune, Pimpri-Chinchwad, Sangli-Miraj, and Kolhapur.

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# List of Abbreviations

|        |   |  |
|--------|---|--|
| CTB    | : | Community Toilet Block                                 |
| CSR    | : | Corporate Social Responsibility                        |
| CLRA   | : | Centre for Legislative Research and Advocacy           |
| FGD    | : | Focus Group Discussion                                 |
| GIPE   | : | Gokhale Institute of Politics and Economics            |
| GIS    | : | Geographical Information Systems                       |
| GOI    | : | Government of India                                    |
| IILS   | : | Indian Institute of Local Self Government              |
| JNNURM | : | Jawaharlal Nehru National Urban Renewal Mission        |
| KII    | : | Key Informant Interview                                |
| KMC    | : | Kolhapur Municipal Corporation                         |
| LPG    | : | Liquid Petroleum Gas                                   |
| NFHS   | : | National Family Health Survey                          |
| NGO    | : | Non Government Organizations                           |
| NSSO   | : | National Sample Survey Office                          |
| OD     | : | Open Defecation  |
| OHOT   | : | One Home One Toilet                                    |
| PCMC   | : | Pimpri Chinchwad Municipal Corporation                 |
| PIC    | : | Pune International Centre                              |
| PMC    | : | Pune Municipal Corporation                             |
| PPP    | : | Purchasing Power Parity                                |
| SA     | : | Shelter Associates                                     |
| SBM    | : | Swachh Bharat Mission                                  |
| SHG    | : | Self Help Group  |
| SLI    | : | Standard of Living Index                               |
| SMKMC  | : | Sangli Miraj Kupwada Municipal Corporation             |
| SSP    | : | Slum Sanitation Programme                              |
| ULB    | : | Urban Local Body                                       |
| UN     | : | United Nations   |
| UNICEF | : | United Nations International Children's Emergency Fund |
| UTI    | : | Urinary Tract Infections                               |
| WHO    | : | World Health Organization                              |
| WSP    | : | Water and Sanitation Programme                         |
| WSS    | : | Water Supply and Sanitation Services                   |

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# Executive Summary

Inadequate sanitation is much more than just an inconvenience - it costs lives, dignity and productivity. Poor sanitation means dying children, uneducated girls, vulnerable women, unhealthy living conditions and ultimately unproductive and poor populations.

The central government guidelines on India's Swachh Bharat Mission (SBM) state that "close to eight million households do not have access to toilets and defecate in the open. Weak sanitation has significant health costs and untreated sewage from cities is the single biggest source of water resource pollution in India. This indicates both the scale of the challenge ahead of the Indian cities and the huge costs incurred from not addressing them" (GOI, 2014). Low sanitation coverage poses a challenge in improving community hygiene and sanitation. Despite economic growth, government latrine construction, and increasing recognition among policy-makers that it constitutes a health and human capital crisis, open defecation remains stubbornly widespread in India. Study by Coffey, et al. shows that amongst the households who have access to working latrines 40% have at least one member from the household who defecates in the open. The findings suggest that intensifying latrine construction alone is not likely to cause any substantial reduction in open defecation, the policy makers must roll out large-scale campaign to promote latrine use.

Ever since the re-branding and re-launch of the Indian government's flagship sanitation campaign, the SBM, the country's sanitation sector has been galvanized to debate and take action with a sense of urgency. Their goal is ambitious: make India open defecation-free by 2nd October 2019 – the 150th anniversary of the birth of Mahatma Gandhi.

SA began its work in 1993 with an initial focus on Community Toilet Blocks (CTBs). 5200 toilets across 15 administrative wards of Pune Municipal Corporation (PMC) and several more in other municipalities have been facilitated by SA since its shift towards individual toilets through its One Home One Toilet (OHOT) program in 2005.

This study assesses the impact of OHOT by taking a comparison approach. The intervention group received toilets through the SA OHOT model, while the control group consists of a comparable set of households who did not

receive toilets. A pre- and a post- intervention analysis was carried out to trace the change in sanitation and hygiene attitudes, the impact on health status, cleanliness and maintenance of individual toilets, and to document problems involved in construction and use. Results indicate that the OHOT Model has proven to be replicable, scalable and sustainable especially when done in partnership with the Municipal Corporation, also called the Urban Local Body (ULB).

## Methodology

The study was conducted during the period from October 2015 to March 2017 within four Municipal Corporation areas in Maharashtra, namely Pune, Pimpri–Chinchwad, Kolhapur, and Sangli-Miraj. A comparison was made pre- and post- intervention, where the only intervention was the construction of toilet.

**The key outcome in this study concerned the relation of sanitation to women's health. Lack of proper hygiene leads to health issues, such as Urinary Tract Infections (UTIs), prolapsed bladder, and involuntary urine release. Thus, the sample size was constructed to detect a reduction in prevalence of UTI among women between pre- and post- intervention. A sample size of 400 at a significance level of 0.05 was calculated to provide a power of 90. The entire sample was selected from 16 slums that satisfied certain inclusion criteria.**

**Other outcome areas were focused on access to toilet (with regard to time, cost, convenience), health (UTI in women, digestive disorders), personal hygiene (use of soap, cleanliness during menstruation), gender and social issues (safety, privacy, physical abuse, teasing, animal attacks, human attacks), and community cleanliness (flies and presence of faeces around house).**

A household survey was conducted to gather data on the outcomes above as well as basic socio-demographic information. In addition to the survey, in-depth interviews, key informant interviews, and Focus Group Discussions (FGD) were conducted to learn about toilet issues in the community.

All the tools prepared for data collection were pre-tested for the content, flow, and phrasing in the slums of Pune, which was not included in this study. On the basis of the pre-testing tools were modified and finalized. After the selection and training of field staff, questionnaires were administered in different slums, during baseline and endline periods<sup>1</sup>. Key informants such as a long-time resident of the slum, community leader, or member of a Self-Help Group (SHG) were identified who presented detailed descriptions of various issues pertinent to the toilet construction. Qualitative information was also collected from SA officials at different levels and SBM officials from respective Municipal Corporations. FGD of women in four cities were conducted to capture the information on use, satisfaction, and problems of individual household toilets.

<sup>1</sup>Baseline survey- survey conducted before any intervention.

Endline survey- survey conducted after a period of one year from baseline survey.

Ethical clearance for the study was obtained from Institutional Ethics Committee of Gokhale Institute of Politics and Economics (GIPE), Pune.

The final sample size included 199 households for the intervention group and 187 households for the control group.

## Impact of OHOT Model

There is a myth, that after building toilet people don't use it but data from this study revealed that 93% people use the toilet. In some cases, once the toilet is built, not everyone uses it, though the share of such persons is just 7%.

### **On open defecation and usage of CTB:**

A 29 point percentage reduction is reported in open defecation in the intervention group.

- During pre-intervention survey, a majority (75.8%) of this population reported using CTBs (with or without payment) while 30.4% reported practicing open defecation (including defecation in /chamber/ manhole/ open gutter). The total exceeds 100 as some of them use both. As a result of the OHOT intervention, out of 870 respondents 92.5% (n=805) reported using their individual toilets while 7.5% (n=65) reported continued usage of other places (CTBs/open areas) for defecation.
- Post construction of OHOT open defecation dropped by 29.6 point percentage in intervention group where as a drop by 0.6 point percentage was observed in the control group.
- 100% shift was observed amongst the 86.1% adolescent girls who shifted from using CTBs to household toilets.
- Shift in defecation practices was observed amongst children up to 5 years where open defecation reduced from 80% to 6.5% (a drop by 73.5 point percentage).
- Beneficiaries had reported spending approximately half an hour walking to or waiting at the place of defecation. Considerable time and effort is saved for each visit since the construction of the toilet in the house.
- All respondents reported higher privacy, safety, self-respect and dignity during defecation, especially in comparison to public spaces in the presence or vicinity of other community members. It was encouraging to see that all adolescent girls in the study area were using the individual toilets constructed in their household.

### **On women and adolescent girls:**

Having sufficient safety and privacy enhances the dignity and self-respect of slum dweller women while responding to a basic need like defecation. An overall improvement by 61.1 point percentage is reported on safety and 64.5 point percentage on privacy in the intervention group.

- During the baseline 35.1% women had reported feeling unsafe while approaching and/or using a toilet and 67.3% had reported feeling lack of privacy, with access to an individual toilet the reporting dropped to 0.0%

(35.1 point percentage improvement) and 2.2% (65.1 point percentage improvement).

- Number of women and adolescent girls reporting feeling unsafe in control group increased by 26.0 point percentage by endline. A marginal improvement (0.6 point percentage) is reported in privacy.
- Toilet blocks or open spaces are also not very close to each house so residents need to walk some distance. On an average a woman was spending 35 minutes to access a CTB. With the construction of the toilet in the house members of the household did not have to wait or avoid going to toilet and thus need to regulate their water and food intake.
- Proportion of women restricting food intake at night has come down from 27.0% to 5.0% (22 point percentage improvement) in the OHOT intervention group.
- Restriction on liquid consumption has reduced from 12.1% to merely 1% (11.1 point percentage improvement)
- Menstruation can entail specific challenges among poor communities, household toilet impacts privacy and hygiene during menstruation. All women and adolescent girls, across intervention as well as control group, were aware of the importance of maintaining cleanliness during menstruation during baseline. Despite that, only 31.7% reported changing cloth/sanitary napkin more than twice a day during their last periods. This increased to 36.5% during endline. Whereas the same, among control group, dropped by 7.8 point percentage.

#### **On individual health:**

Public places of defecation are often unhygienic and lead to avoidance of defecation. Both these factors lead to health problems depending upon prevailing conditions. 63.5% respondents shared that they perceived improvement in the overall health status of their family which they attributed to OHOT.

Limited access to hygienic sanitation facility along with restricted intake of liquids increases the likelihood of developing a UTI, especially among young women. Respondents (women) were asked if they were currently experiencing symptoms (of UTI) such as burning sensations/pain during urination, frequent urination, and itching around the vagina. Reporting at least one symptom is how we have defined prevalence of UTI. Overall, 20.6% of women reported at least one symptom of UTI.

A significant reduction in at least one symptom is seen in the intervention group (beneficiaries of OHOT) – 23.4% to 13.1% whereas the control group reported a slight increase from 21.1% to 23.5 %. Furthermore, quantitative analysis of the data indicated that women having access to an individual toilet have one-third the chances of developing UTI as compare to control group.

- All beneficiaries reported using of soap for hand washing after defecation.
- Beneficiary households perceive themselves to be healthier since the

construction of the individual toilet and reported lower incidence of illness in the past one month.

## Other benefits and satisfaction

The benefits of an individual toilet apart from safety, privacy, and saving time are feeling lack of stress, the freedom to go any time, not needing to go out in the dark or and in rains, and being able to defecate in a clean environment. It is also perceived to be more convenient to people with limited mobility such as children and elderly as well as pregnant and lactating women. Women and girls reported feeling secure being able to access a household toilet compared to CTBs or open defecation where they needed to wait for company for fear of -animal attack, dog bites and insect bites, abuse, teasing, or voyeurism.

- Defecation in a clean environment is a need and individual toilet fulfils this need of slum dwellers in urban areas.
- Presence of faeces around the house was observed to be negligible.

**More than 80% are satisfied with the decision of getting an individual toilet and 75% are satisfied even with the reduced space in their house.**

## Recommendations

Any construction program needs to monitor both the quality and quantity of the material supplied for the toilet construction. If quality of the part of the material is not up to the mark, then slum dwellers have to purchase it from the market; because they are purchasing the material in small quantities, they end up paying more than anticipated.

- Material for a roof is not provided in SA model, but most of the toilet takers are interested in having a roof on the toilet even though it is inside the house. They have expressed this need to be able to control the foul smell inside the house and sounds from the toilet. Moreover, the roof develops some extra space which they can use for storage or for fitting a water tank.
- By facilitating doorstep delivery of all construction material, SA eliminates households' need to purchase individual components to build a functional toilet. However, as it's operations scale, SA will need to implement systematic quality checks and vendor management systems to ensure the consistency of it's construction material.
- Currently, SA is mapping the community using GIS and providing toilets to the households that can be connected to the drainage line quickly. Thus, households without a nearby drainage line are deprived of toilet access, even if they were interested. Further, non-functioning of toilets is largely because of drainage problems. Considering the importance of drainage in the entire organization of the toilet, SA can initiate policy advocacy to improve sanitation facilities, essentially the drainage system. The advocacy can complement the activities conducted under SBM to greater extent.

## CHAPTER 1

# Introduction

**D**emographic projections by the Gokhale Institute of Politics and Economics (GIPE) for Pune in 2008 confirm that migration to the city is on the rise due to increased economic opportunities. The growth of slum populations alongside overall population growth in the city, like in other cities across India, is a pressing reality. According to the 2011 Census, the population of the city governed by the Pune Municipal Corporation (PMC) is 31.15 lakh; combined with Pimpri-Chinchwad Municipal Corporation (PCMC), this number is 48.44 lakh. Approximately 11.89 lakh persons reside in slums, which is about 25% of the city's total population. Approximately 8.5%, or 3.4 lakh people, correspond to a transient population. The 2012-2013 Environment Status Report for PMC shows 564 slums in the city, of which 353 (64%) are declared, meaning their existence is officially recognized and they are provided basic services, like internal roads, water, and electricity while 211 (36%) are undeclared and so are not eligible for basic services from the Municipal Corporation. Attenuation of open space limits access to open defecation, and demand for toilets becomes an overriding issue for the local government authorities. Families start looking for the best solution to the issue. When demand is generated, people will go all out to receive – and pay for – services.

**In this context, SA's 'One Home One Toilet' (OHOT) programme aims to provide individual household toilets to slum-dwellers. The Non-Governmental Organization (NGO) has been facilitating the construction of toilets in the slums of urban areas in Maharashtra over a decade. It is a premiere organization working in the area of sanitation. Their initiative of the construction of toilets began in 2000. Since 2013 they have supported the construction of 4000 toilets across 15 administrative wards of PMC.**

### **Background of the Study**

Ending open defecation in urban areas is an important and complex endeavour because India's population is huge, densely settled, and growing rapidly. It is a daunting task in urban areas to keep human faeces away from people's day to day life. Contact with human faeces can lead to ingestion of bacteria, viruses, and worms. This can cause enteropathy, a chronic illness that prevents the body from absorbing calories and nutrients. That may help to explain why, in spite of rising incomes and better diets; rates of child malnourishment in India do not improve faster, especially in urban slum areas. Conversely, there is an evidence that investments in sanitation and sewerage can yield reduction in child diarrhoea which promotes child health and immunity (Bose, 2009,

Barreto et al., 2007).

As far as urban sanitation in India is concerned, one of the commonly used approaches by government agencies is building CTBs. Moreover, ever since the re-branding and re-launch of the Indian government's flagship sanitation campaign, the Swachh Bharat Mission (SBM), the country's sanitation sector has been galvanized to debate and take action with a sense of urgency. Their goal is ambitious: make India open defecation-free by 2nd October 2019 – the 150th anniversary of the birth of Mahatma Gandhi. This cannot happen without sustained efforts at both macro- and micro- levels. It actually points to the need for large numbers of toilets to be built in both rural as well as in urban areas, mainly in urban slums. Being a large-scale project the SBM demands involvement of various stakeholders like NGOs and other Civil Society Organizations to achieve the target. As a result, there has been a surge in the number of household toilets built since the Mission was launched. As per the quick survey of National Sample Survey Office (NSSO), between November 2014 and October 2015, more than 98 lakh toilets were built.

**The aspects of sanitation revolve around two major approaches: the community level and the individual level. The feasibility of both approaches rests primarily on the spatial characteristics of the area where it is being implemented, for example, land area, status of drainage, and availability of running water. These determining factors vary in different states, districts, cities, and at the end, different slums. Due to significant culturally engrained behavioural barriers to use latrines, merely providing infrastructure does not ensure its use.**

Future sanitation programmes in rural and urban India need to focus on understanding and addressing these behavioral barriers and spatial characteristics of rural and urban in general and a specific village or slum in particular. Habits, socializing, sanitation rituals and daily routines varying with caste, gender, marital status, age and lifestyle, also hinder the adoption of latrines (Routray et al., 2015). In fact, a survey conducted by the NSSO in 2015 has revealed that not even half the toilets built as part of the SBM are being used. This obviously needs exploration because many more are on the way and effective use of toilets is a dire need.

A report by the sub-group of chief ministers on SBM published by the NITI Aayog in October 2015, tells another story. The report cites a 'SQUAT' (Sanitation Quality, Use, Access and Trends) survey conducted in five states of north India and finds a 'revealed preference' for open defecation, but the notion of 'preference' must be viewed in the context of viable options. In the light of reports of shoddy toilet projects with unfinished construction or no drainage system for sewage to go, defecating in a field away from the home might be quite a reasonable decision to make. Lessons learned from the failures and successes of family planning and polio campaigns are worth reconsidering, especially as the SBM moves into its most critical end phase. It is vital to emphasize a need to move away from its top-down method to a community-led approach like Community-Led Total Sanitation (CLTS).

Endorsed by the United Nations, it encourages communities to confront the consequences of their sanitation practices and take ownership to improve their situation collectively (DASRA, 2015)<sup>2</sup>. Such an experience proves the fact that constructing toilet blocks only solves one problem, rather it is necessary to support non-coercive behaviour change in policy action, which includes training, field facilitation, monitoring the use of toilets, hygiene behaviour, as the final decision to change remains with the individual. Finally, a campaign with a sole emphasis on toilet construction cannot be successful without attention to the entire sanitation pipeline, including drainage, sewage processing, and solid waste management.

## Shelter Associates and the OHOT Project

SA's OHOT model provides a holistic sanitation solution that is data and technology driven, community centric, and integrates Urban Local Bodies (ULB) and other stakeholders to ensure sustainability and scalability.

This model promotes household sanitation by adopting 3 key steps.

**S**A pioneered the use of Geographic Information Systems (GIS) technology and Google Earth for poverty mapping in the late 90's. Spatial Data mapping with GIS and Google Earth, combined with mobile technology, determines the gaps in delivery of sanitation and becomes an effective planning tool for ULBs to address the problem. Data is collected at the slum level, including the infrastructure present in the slums such as water supply, drainage coverage, waste management systems, road networks, and electricity, and at the household level which includes the family, demographics, and amenities. Wherever possible, the youth in the community are trained to conduct survey on their smartphones which engages the community right from the beginning. This spatial data is validated by the ULB, it is then used to plan strategic and focused interventions.

### 1 Creating Spatial Data

### 2 Mobilizing Communities

### 3 Delivering Toilets

**T**he second step is to create awareness, bring about behavioural change, and generate demand for household toilets in the community by conducting a series of workshops and FGDs to target children, women, youth, and the men.

**T**he last step is the construction of the household toilet on a cost sharing basis, where the construction material is provided for free at the doorstep of the household and the cost of construction is borne by the beneficiaries, bringing in a sense of ownership & pride. This also enables construction of customized toilets tailored to their needs. This stage also involves close monitoring and the collection of data on households at various stages of construction.

<sup>2</sup>This report has also identified few key focus areas to provide universal urban sanitation in India , such as; develop a gendered approach, improve hygiene, foster champions within government, nurture community ownership and customize solutions and create standards. For details, see: <https://www.dasra.org/cause/improving-urban-sanitation>.



SA has been successfully implementing its OHOT programme since 2005 in various slums in Pune, Sangli-Miraj, Pimpri-Chinchwad, and Kolhapur, and more recently in Navi Mumbai and Thane Municipal Corporation areas. SA has proven that construction on its own is not enough; in order to achieve health gains from sanitation, it is essential to expand on strategies that ensure that the toilets will be used, correctly and consistently. SA has also made landmarks in sanitation by using modern technologies like GIS to map slums in Pune and Sangli-Miraj. Executive Director, Pratima Joshi and colleagues describe how SA and an organization of women and men slum dwellers worked together to collect information on each household in slum settlements in Pune and Sangli-Miraj and to map this, along with infrastructure and service provision, within the city. This permitted data on slums to be superimposed on these cities' development plans using GIS. This endeavour has successfully closed the information gap on slums in these municipalities and has provided an important information base for improving infrastructure services within slums and for integrating slums into city-wide planning (Joshi et al., 2002).

Earlier, "in the absence of information about and understanding of slums, these settlements were typically considered to be chaotic masses rather

than coherent urban areas. They were easily ignored or else planned for programmes aimed specifically at slums, and not with slums understood as an integral part of the city” (Joshi et al., 2002).

SA was founded in 1993 to facilitate basic services and secure housing to slum dwellers. Initial projects included relocation and sanitation schemes for slum-dwellers whose homes were set to be demolished or which were destroyed in weather events. These projects aimed to be responsive to the needs of residents, resettle in areas close by to avoid disruption of their communities, and to construct sustainable housing which could be used and maintained. They paved the way for SA’s role as an intermediary between local slum communities and the Municipal Corporation, and as an advocate for effective slum rehabilitation policy. In 1999, alongside an effort of the PMC to begin a city-wide CTB project, SA began laying out methods that would become foundations of the organization, such as systematic mapping of housing to guide projects, and designing in a way that was technically sound but also sensitive to local needs. This approach included a CTB caretaker system, the installation of baby channels for child usage, mechanized cleaning of septic tanks to avoid manual scavenging, and even developing biogas from waste to use as cooking fuel.

Around 2005, SA began its OHOT approach to shift from CTBs to individual pour-flush in-home toilets. This method not only aligns with existing policy in India such as the Total Sanitation Campaign, the National Urban Sanitation Policy, and SBM, but based on SA’s experience, it seemed a worthwhile goal given that personal toilets offered more convenience, safety, and dignity. While SA initially attempted a model in which households contributed a small share of the funds for the cost of the toilet, eventually a model shift seemed required based on survey data responses and general reactions from communities. Now SA covers the cost of the materials for the toilet which are delivered for free to the household in two instalments; the household then agrees to take on the expense and effort for construction. Most of the time, a great deal of technical knowledge is available from masons and labourers in slum communities but if needed, SA connects householders with people who could construct the toilet for them. This not only promotes business for local people within the community, but it ensures that the toilet will be built in the preferred location for the family and that it will be maintained in the long run. The cost comparison also indicates that when maintained by the household, individual household toilets are viable from a financial standpoint. Currently 5200 toilets have been built in Pune and Sangli-Miraj alone.

OHOT has proven to be replicable, scalable, and sustainable – especially when done in partnership with the ULB. In 2015, SA created a unique partnership with the PMC, which has allocated a budget of Rs. 2 crores towards individual sanitation during the financial year 2014-2015 and places SA in the role of monitoring the implementation of the plan.

## Review of Literature

### SLUMS, HOUSING, AND INFRASTRUCTURE

The United Nations (UN) State of the World's Cities Report of 2012-2013 focuses on the notion of prosperity and its realization in urban areas. More specifically, this report advocates a shift in attention around the world in favour of a more robust notion of development—one that looks beyond the narrow domain of economic growth that has dominated ill-balanced policy agendas over the last decades (UN HABITAT, 2013). Another UN report on human settlements elucidates the challenges of the urban poor with regards to shelter and housing conditions of slums. It is about how the poor struggle to survive within urban areas, mainly through informal shelter and informal income-generation strategies, and about the inadequacy of both public and market responses to their plight. But the report is also about hope, about building on the foundations of the urban poor's survival strategies and about what needs to be done by both the public and non-governmental sectors, as well as by the international community, if the goal of adequate shelter for all is to have any relevance (UN, 2003).

These issues are just as pressing in the Indian context. The day-to-day reality in slums of Mumbai and Pune have also been brought to light through interviews with women slum-dwellers, which provide insights that rarely emerge in quantitative studies. These women live in a variety of circumstances—on pavements, beside railway tracks, in swampy areas, on steep slopes—and this affects the particular problems they face. But in all cases, dealing with their need for water and sanitation is a stressful and time-consuming challenge (Bapat and Agarwal, 2003). A committee under the Ministry of Housing and Urban Poverty Alleviation's National Buildings Organization forecasted in 2010 that “as urbanization grows, and the projected share of urban households rises in the next two decades from the current 28% to 50% of the country's population, we may expect that slums will tend to grow even faster” (GOI, 2010). Meanwhile, the 69th National Sample Survey Organization (NSSO) survey pointed out that in Maharashtra, 75% of the slums have not been declared, meaning that they are not eligible for certain key services. Around 39% of Maharashtra's households are living in these slums (NSSO, 2013). Another report prepared by the PMC indicating the rapid expansion of slums in Pune municipal area states that, “the migrant population is likely to increase the demand for housing, particularly for Low Income Groups (LIG), if housing for these groups is not planned, slums are likely to proliferate” (PMC, 2011). Working with the urban poor, cities need to invest in housing, water, sanitation, energy, and urban services, such as garbage disposal. These services and infrastructure must reach the poor living in informal settlements (Bandyopadhyay and Agarwal, 2010).

### Sanitation, Sewerage, and Open Defecation

A massive disease burden is associated with deficient hygiene, sanitation, and water supply and is largely preventable with proven, cost-effective interventions (Bartram and Cairncross, 2010). The WHO/UNICEF update on progress in sanitation and drinking water shows that in 2012, 89% of the global population used an improved source of drinking water, and 64% used an improved sanitation facility, but these global averages mask significant

variation. Further investigation reveals disparities in access based on nationally representative household surveys which allow for disaggregation by certain strata. The examples in this report include geographic inequalities, such as disparities at the subnational level as well as between and within urban and rural areas. It also highlights group-related inequalities, such as those based on wealth quintiles, ethnicity, language or religion, and individual-related inequalities, such as those based on gender and education level of the head of the household (UNICEF and WHO, 2014). Researcher Sandy Cairncross states that “four in five of these un-served people are in Asia, with approximately one in five in both India and China, respectively. Even in large Asian cities, less than half of those served are using sewerage systems; the others use on-site systems, from pit latrines to septic tanks. Most have been installed by householders or builders employed by them, rather than by government or municipal agencies.”

**The central government guidelines on India’s SBM state that “close to eight million households do not have access to toilets and defecate in the open. Weak sanitation has significant health costs and untreated sewage from cities is the single biggest source of water resource pollution in India. This indicates both the scale of the challenge ahead of the Indian cities and the huge costs incurred from not addressing them” (GOI, 2014). Indeed, a study by DASRA shows that inadequate sanitation is much more than just an inconvenience - it costs lives, dignity and productivity. Poor sanitation means dying children, uneducated girls, vulnerable women, unhealthy living conditions and ultimately unproductive and poor populations.**

In India, 1,600 children die every day before reaching their fifth birthday, 24% of girls drop out of school and more than 30% of marginalized women are violently assaulted every year as the lack of basic sanitation forces them to travel long distances to meet their needs. Above all, lack of sanitation is not a symptom of poverty but a major contributing factor (DASRA, 2012). In one study, diarrhoea incidence and the associated illness costs fell during the evaluation period in both intervention and control villages presumably because of overall socioeconomic development in rural Maharashtra and routine water and health programmes (e.g. activities in control villages).

**Pattanayak et al. (2010) present possibilities for improvements through certain environmental programmes and policies in the sanitation sector. The average household in programme communities could save roughly 5% of monthly expenditures. These coping cost reductions are largely due to improved access to better water and sanitation services, which shortens the time household members spend travelling to and waiting at the service source. Improved access leads to greater use of better services and to better public health outcomes as long as households also adopt complementary hygienic practices, such as hand washing, in response to effective hygiene promotion.**

A few authors have pointed out the importance of menstrual hygiene practices. Researchers have also explored why menstrual hygiene management is not generally included in WASH initiatives, social and health impacts of this neglect on women and girls, and examples of successful approaches that address menstrual hygiene in the South Asia region (Therese and Fernanes, 2010).

Further challenges are made clear with regards to open defecation. Despite economic growth, government latrine construction, and increasing recognition among policy-makers that it constitutes a health and human capital crisis, open defecation remains stubbornly widespread in India. Many survey respondents' behavior reveals a preference for open defecation: over 40% of households with a working latrine have at least one member who defecates in the open. The findings suggest that intensifying existing policies of latrine construction will not be enough to substantially reduce open defecation. "Policy-makers in India must lead a large-scale campaign to promote latrine use" (Coffey, et al. 2014). However, the persistence of this practice points to the need for appropriate infrastructure as much as behavior changes. Jha (2003) elucidates the Indian experience of health and social benefits from improving community hygiene and sanitation. He argues that the low sanitation coverage could be due to lack of affordable sanitation technology and awareness or motivation. Although the sewerage system was introduced in India long ago, high operational and maintenance costs have prohibited it from being implemented in most towns and cities. Similarly, the cost of a septic tank is beyond most people, and disposal of sludge from septic tanks remains a problem.

The economic impacts of inadequate sanitation in India have been extensively discussed in a flagship report published by the Water and Sanitation Programme (WSP) in 2011. The report estimates that the total annual economic impact of inadequate sanitation in India amounted to a loss of 2.4 trillion (USD 53.8 billion) in 2006. This implies a per capita annual loss of Rs. 2,180 (USD 48). In Purchasing Power Parity (PPP) terms, the adverse economic impact of inadequate sanitation in India was \$161 billion, or \$144 per person. These economic impacts were the equivalent of about 6.4% of India's GDP in 2006. The health-related economic impact of inadequate sanitation was 1.75 trillion (USD 38.5 billion), which was 72% of the total impact. Access time and water-related impacts made up the other two main losses (WSP, 2011).

### **Challenges for Governments in Urban Sanitation Infrastructure: National and Local**

Governments, international agencies and municipalities can never hope to meet the immense gap in provision unless they promote sanitation in a way that meets demand. It is often said that the constraint to increasing sanitation coverage is a lack of demand, but there is also a lack of supply of appropriate products, and latrine designs are often too expensive for the poor, requiring subsidies which are captured by the better-off (Cairncross, 2003). A World Bank (2012) study on improving urban Water Supply and Sanitation Services (WSS) pointed out seven priority areas for immediate concern. These include steps such as establishing better customer-oriented service providers, decentralizing service delivery responsibilities, recovering operations and maintenance costs, preparing reform implementation plans, and implementing incentive-based financing program. Another study looks

into urban water supply and sanitation services in selected states in India. This study has distilled lessons for improving WSS services in India, through the recent WSS Business Plans prepared for parts of India by the World Bank on best practices in urban water service delivery (MUDGI and WB, 2012).

Some local initiatives to address these have had some success, such as the Slum Sanitation Programme (SSP) undertaken by the Bombay Municipal Corporation (BMC) (Sharma and Bhide, 2005). A report prepared by All India Institute of Local Self Government (IILS), Mumbai in 2011 pointed out the responsibilities of municipal and state machinery in sanitation and solid waste management. It also emphasizes that the 12th Schedule of 74th Constitutional Amendment Act, 1992 states 'public health, sanitation, conservancy and solid waste management' as one of the main civic functions to be performed by the municipal body (IILS, 2011). When it comes to studies on slums in Pune, both government and non-government agencies have played a substantial role. PMC published its city sanitation plan in 2011. This plan was based on the baseline data collected by the PMC in 2010. Awareness campaigns for citizens regarding sanitation plan were carried out before collecting data, involving banners, posters, pamphlets, calendars, and press releases as well as social mapping exercises (PMC, 2011).

However, these must also be examined in the context of progress in other governmental urban improvement missions, such as the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) and its functioning in cities like Pune (Kulkarni, 2008). Some issues concerning JNNURM in Pune naturally leave doubts about the management and allocation of funds and resources. Irrespective of the PMC score card, projects undertaken have not been delivered and money amassed has not been spent. In June 2008, a national newspaper's local edition reported that out of one crore of rupees budgeted, no money had yet been spent on at least five road sub-projects under the 2008 project since October 2007. The impression this has left on the citizens is that the municipal body is swindling their money (Kulkarni, 2008).

These factors illustrate that while progress has been made toward the standard of living in slums, stronger governance is needed to address the problem fully. The Centre for Legislative Research and Advocacy (CLRA) published startling facts about the slums in Pune. It is found that "103 open defecation spots are used by approximately 8,500-9,000 people daily. A total of 24,153 properties do not have access to toilets within walking distance. In Pimpri-Chinchwad area out of the current number of 72 slums, 7 slums are reported to have no toilets and 54 have less than one toilet seat for every 35 people" (CLRA, 2014). A 2004 report by Water and Sanitation Programme (WSP) has published a report on sanitation in Pune after conducting a two-day workshop titled, "Provision of City-wide Universal Sanitation: Challenges and Strategies in Pune" in 2004. This report identified key issues such as information and awareness building needs, fragmented city base systems, lack of political

will, supply-side versus demand initiatives, and community mobilization (WSP, 2004). A separate paper published by Pune International Centre (PIC) provided its own recommendation, including construction of temporary toilets with off-site disposal for schools, migratory population in semi-urban or urban areas, places of pilgrimage, and temporary bazaars in the countryside. The report also emphasizes the fact that the government is primarily responsible for implementing projects to provide clean toilets to citizens on the strength of appropriate legislation. Other authors have pointed out the importance of Corporate Social Responsibility (CSR) to the welfare of slum dwellers, especially with regards to the role of heavy industries in expanding slums in Pune. Paranjpe has written, “it is necessary for companies like TELCO and its business friends to spell out in what manner they would tackle this issue. In places like Pune, those who have established industrial complexes have done little to provide housings to their increasing number of employees” (Paranjpe, 1983).

### **The Role of Third-Party Institutions**

It has been recommended that governments should seek the participation of NGOs, local communities, and as well as entrepreneurs. This literature review has touched on a few instances of engagement with third-party groups (PIC, Policy Paper, 6). International funding agencies like the World Bank have recently insisted on beneficiary participation in infrastructure provision programmes funded by them. The rationale behind this insistence is to put a check on corrupt, inefficient, non-accountable and manipulative state machinery. Thus, a participatory approach is the new ‘*mantra*’, though what constitutes “participatory” is somewhat variable. Local governments are by and large hostile to NGOs but have allowed space to NGOs in implementing programmes under pressure from financial organizations. For instance, the World Bank-funded Slum Sanitation Programme by the BMC, as mentioned previously, resulted in useful lessons with its participatory approaches (Sharma and Bhide, 2005). The experiences of other organizations which have connected between governmental services and the needs of certain communities are summarized here.

Another initiative which has garnered a great deal of attention is the Orangi Pilot Project (OPP) in Karachi, Pakistan. This was collaboration between trained professionals, local activists, and community members, which aimed to provide internal sanitation – referring to in-home sanitary latrines, underground sewers inside lanes, and collector sewers – and external sanitation infrastructure – referring to trunk sewers and treatment plants. The goal was for the former to be constructed and financed solely within the community through community mapping, training, and utilization of existing resources, whereas the latter was to be provided through advocacy with the local municipality. This project began in the 1980’s, and in communities that built sanitation systems through the OPP, infant mortality has fallen from 128/1,000 to 37/1,000 from 1983 to 1993.

In order to assist other NGOs, government officials, and communities with this model, the OPP has also led to the formation of the OPP Research and Training Institute.

Another useful comparison is the Slum Networking Project, which involved upgrades to slum infrastructure using existing community resources. An assessment of this project's implementation in Sanjaynagar, Ahmedabad (Gujarat state) in 1997, exhibited a large reduction in reported household medical expenses and monthly work days lost to illness. However, a primary difference here is that the project included sewerage/drainage connections, road paving, street light construction, and other upgrades but not toilet construction (Parikh and Robie 2009).

Finally, Sulabh International is an organization which has put existing technology to use to minimize the persistence of unsafe scavenging occupations. The pour-flush two-pit toilet (known as Sulabh Shauchalaya) is a low cost, socially acceptable, and appropriate technology that does not require scavengers to clean the pits. Sulabh has converted and constructed over 1.2 million such toilets throughout India, making 240 towns scavenger-free.

These examples highlight initiatives in and near India which have taken a similar approach to that of SA and make it clear that 1) provision of toilets alongside appropriate sewer and drainage options can make important impacts on health and the practice of open defecation, and 2) that sustained engagement directly with local beneficiaries ensures sustainability of the intervention. With this context in mind, we can now turn to the assessment of SA's OHOT project.



## Objectives of the study



This assessment explores SA's OHOT initiative based on changes before and after toilet construction in 16 slums across four municipalities: Pune, Pimpri-Chinchwad, Sangli-Miraj, and Kolhapur. The intervention group consisted of households who received toilets through the SA model. Controls consisted of households in the similar area who did not receive toilets. Data collection for the baseline study was carried out from October 2015 - December 2015, a three-month period. Immediately after that toilets were facilitated. Endline study data was collected from November 2016 - December 2016. The aim is to understand the cost and benefits of the individual household toilet for the larger community as well as each beneficiary household in particular. In conclusion it aims to highlight the sustainability of this Model.

## CHAPTER 2

# Methodology

### Study settings

The present research study aims to assess the impact of the OHOT scheme implemented by SA. The impact assessment study was carried out during October 2015 to March 2017 by the research team at the GIPE.

SA has been facilitating individual household toilets and implementing its OHOT program in urban slums within the jurisdiction of four Municipal Corporations: Pune Municipal Corporation (PMC), Pimpri-Chinchwad Municipal Corporation (PCMC), Kolhapur Municipal Corporation (KMC), and Sangli-Miraj-Kupwad Municipal Corporation (SMKMC).

### Study design

To assess the impact, the study design used is a baseline-endline and case-control approach. It is a comparison between the SA OHOT group, that is, people having access to an individual household toilet, and the control group, people without access to any household toilets. Comparisons in these two groups before and after being facilitated with household toilets provide a sense of the impact of the individual household toilet. Therefore, the sample consists of the households under the categories.

1. SA OHOT Group - Households having toilet facilitated by SA
2. Control Group - Households without individual household toilet

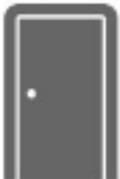
Both groups were surveyed during both baseline and endline.

### Intervention

In this study, the intervention is the construction of an individual household toilet. SA facilitates the construction of toilets among slum dwellers. Their OHOT scheme employs a cost-sharing model, whereby SA delivers required construction materials at the doorstep to construct a toilet, while beneficiaries provide their own funds to cover the costs of construction.

Construction material supplied by SA includes following:

**Table 2.1- Description and quantity of material provided by SA for construction of the toilet**

|   |  |   |  |
|---|--|---|--|
| <p><b>CEMENT</b></p>  <p><b>4 Bags</b></p>                         | <p><b>RIVER SAND</b></p>  <p><b>2Piaggio (Tempo)</b></p>                  | <p><b>2nd CLASS BRICKS6"</b></p>  <p><b>230 Bricks</b></p>              | <p><b>SUNLA</b></p>  <p><b>1 Packet</b></p>     |
| <p><b>ORISSA PAN 20"</b></p>  <p><b>1 NO.</b></p>                  | <p><b>P-TRAP</b></p>  <p><b>1 NO.</b></p>                                 | <p><b>PVC PIPE 4"</b></p>  <p><b>1 NO.</b></p>                          | <p><b>PVC PLUG TEE</b></p>  <p><b>1 NO.</b></p> |
| <p><b>PVC PLUG BEND 4"</b></p>  <p><b>1 NO.</b></p>              | <p><b>CEMENT JAIL<br/>(VENTILATION WINDOW)</b></p>  <p><b>1 NO.</b></p> | <p><b>CEMENT CHAMBER<br/>COVER 16" X 22"</b></p>  <p><b>1 NO.</b></p> | <p><b>PVC COWL</b></p>  <p><b>1 NO.</b></p>   |
| <p><b>TILES 8" X 12"</b></p>  <p><b>4 boxes ( 60 Pieces)</b></p> | <p><b>BIRLA WHITE CEMENT</b></p>  <p><b>1 KG</b></p>                    | <p><b>ADHESIVE SOLUTION<br/>100 ml</b></p>  <p><b>1 NO.</b></p>       | <p><b>FIBRE DOOR</b></p>  <p><b>1 NO.</b></p> |

| Description             | Quantity          | Description                      | Quantity            |
|-------------------------|-------------------|----------------------------------|---------------------|
| Cement                  | 4 bags            | PVC plug bend 4"                 | 1                   |
| River sand              | 2 piaggio (tempo) | Cement jail (Ventilating window) | 1                   |
| 2nd class bricks -6"    | 230               | Cement chamber cover 16" x 22"   | 1                   |
| Sunla                   | 1 packet          | PVC Cowl                         | 1                   |
| Orissa pan 20"          | 1                 | Tiles of size 8" x 12"           | 5 boxes (60 pieces) |
| P-trap                  | 1                 | Birla white cement               | 1 kg                |
| PVC pipe 4" -10 ft long | 1                 | Adhesive solution 100ml          | 1                   |
| PVC plug TEE            | 1                 | Fibre door                       | 1                   |

## Sampling design

### Sample size

The present study had multiple outcomes related to personal hygiene, gender, health, and social status of women. In particular, among women lack of a proper toilet facility can be a major cause for many diseases including UTI. Lack of toilet also leads to security and safety issues whereby chances of being prone to gender and social abuse are high. Further, to avoid using the dirty toilets, many women do not consume their daily requirement of water. Such insufficient water intake can impact health, leading to increase in chances of UTIs, prolapsed bladder, and incontinence. Use of bad toilets is associated with higher UTI in females (Vyas et al. 2015). As a result, a large focus among the outcomes was related to risk of UTIs and health issues, as well as safety risks perceived by women associated with common toilet spaces. Prior estimate of prevalence of UTI was available from the National Family Health Survey 2, conducted in 1998-99. Therefore, for sample size calculations, a reduction in prevalence of UTI among women between baseline and endline periods was considered as the outcome parameter. UTI prevalence is reported as 29.9% among women from urban slums of Mumbai as per the National Family Health Survey 2. The sample size was calculated to detect a small effect size of 0.25, when the women were enrolled into two groups i.e. intervention and control in 1:1 proportions. A sample size of 400 was calculated at a significance level of 0.05 to provide a power of 90. The GPower 3.1 software was used to estimate sample size.

After considering 25% attrition, the sample size required to be enrolled is 500; 250 for intervention group and 250 for control.

### Sample design

The entire sample for the study was enrolled from 16 slums across four Municipal Corporations. Those who got toilets under the OHOT scheme form the intervention group and those who did not form the control group.

**Intervention group:** 248 households which were enrolled in SA's OHOT scheme were recruited for the study, as an intervention group. 258 were enrolled as controls.

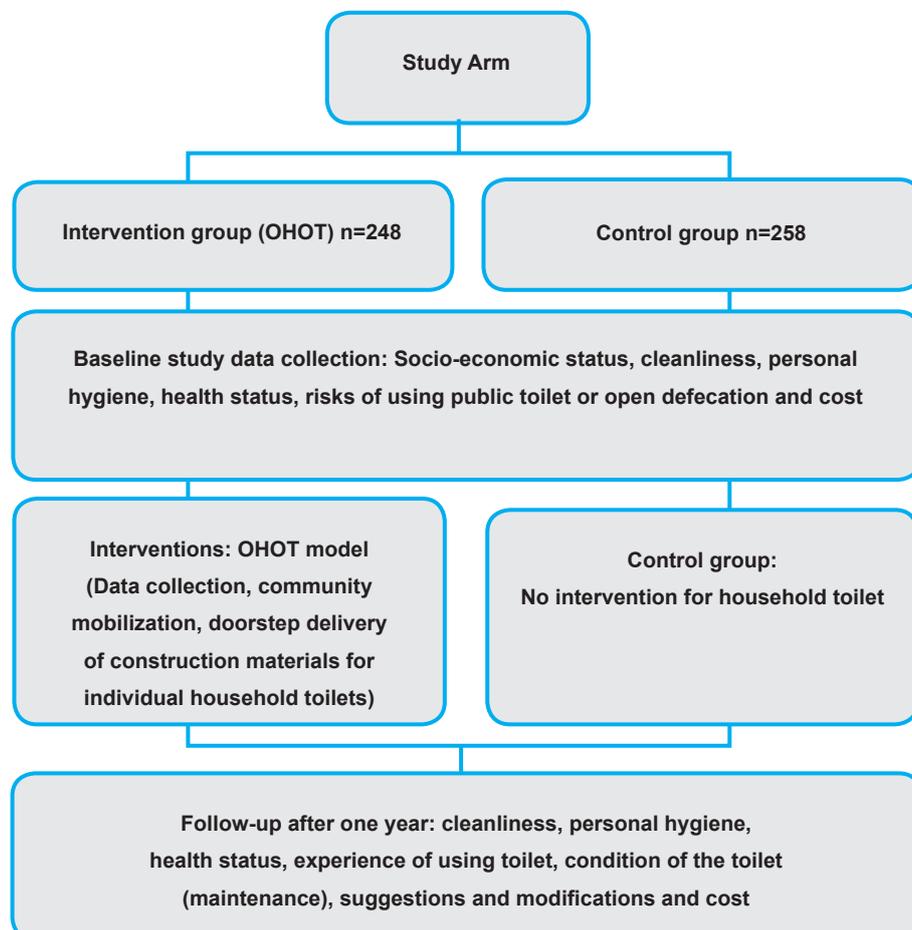
**Control group:** Considering the issue of contamination, the control households were selected from slums outside the project area of SA. The control slums were matched for characteristics related to conditions of common toilet blocks, areas for open defecation, drainage facility, and type of housing. A complete list of 20 characteristics was prepared for matching. The slums that matched on more than 15 out of 20 possible characteristics were considered as control slums. These characteristics include:

1) Year of establishment, 2) Legal status, 3) Approximate area in sq. m., 4) Approximate population, 5) Location, 6) Type of house structure, 7) Availability of electricity, 8) Individual water connections, 9) Presence of drainage system, 10) Condition of drainage system, 11) Number of CTBs, 12) Number of seats for female, 13) Number of seats for male, 14) Toilet seat to person ratio, 15) Condition of the toilets, 16) Cleanliness of toilets, 17) Facility for children (baby channel), 18) Sewage disposal system, 19) Cleanliness of the area around the house and 20) Cleanliness of the area around the slum.

Specific criteria were involved for study households. The inclusion criteria for study households were as follows:

1. Married females aged 18 years and above were the respondents for this study. Households were excluded where eligible women were not available for interview for various reasons (died, living separately, gone for delivery etc.).
2. Houses given on rent or families already using individual household toilets were excluded from the study.
3. Control households did not have any household toilet in both baseline and endline surveys. Intervention households were exclusively those enrolled in SA's OHOT scheme. For instance, households that chose to take a common or shared toilet between two or more households were excluded from the study.

### Study protocol

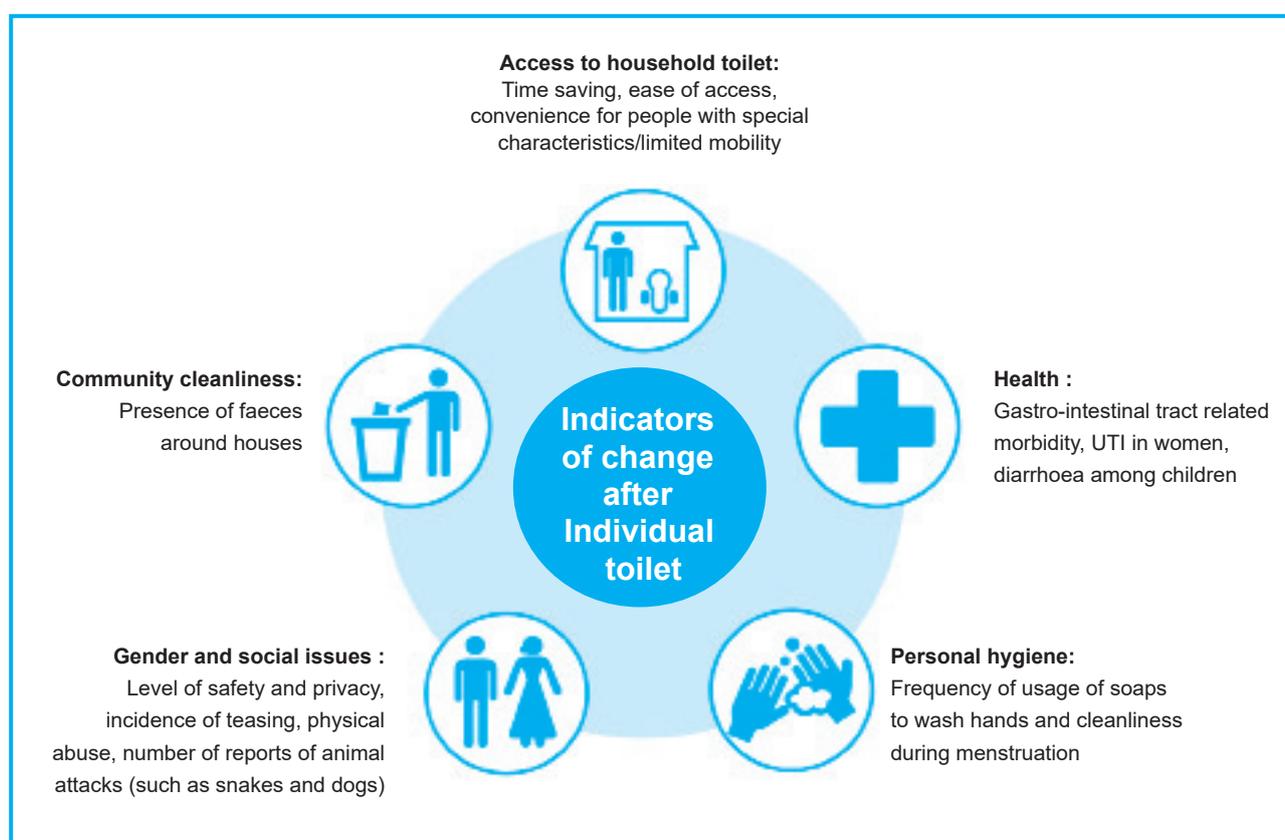


## Outcome variables

The hypothesis of this study is that having access to an improved sanitation facility, meaning a facility where human excreta is separated hygienically from human contact, within the home will: (1) reduce the risk of verbal and physical abuse associated with CTB and open defecation, (2) improve personal hygiene, (3) improve menstrual hygiene, (4) reduce hygiene related morbidity and (5) reduce gastro-intestinal related morbidity.

Key indicators used to assess impact of the intervention were as follows:

**Table 2.2- Indicators of change after facilitation of individual household toilet**



## Data collection tools

The study used a mixed method approach that included household surveys, in-depth interviews, and FGDs.

### Household Survey:

A structured and pre-tested interview schedule was administered during baseline and endline survey to respondents by visiting their houses. Information on background characteristics about the household, access, availability, adequacy of water and toilet facilities, and user experiences were collected. The survey questionnaire also included questions on perceptions of respondent regarding OHOT for the SA intervention group, along with advantages and disadvantages of individual household toilet.

The survey questionnaire was prepared at baseline to collect data on:

1. Socio-demographic characteristics: profile of the residents of the selected households, housing condition and living standards.
2. Toilet practices: place of defecation, status of CTBs, open defecation, issues related to place of defecation.
3. Personal hygiene: Frequency of usage of soaps to wash hands, cleanliness during menstruation.
4. OHOT: Need to have toilet at home, perceptions of the OHOT model, advantages and disadvantages of OHOT model.
5. Health status: Digestive system related morbidity, symptoms of UTI in women.
6. Gender and social issues: Level of safety, privacy level, incidence of teasing and physical abuse, number of reports of animal attacks (such as snakes or dogs).
7. Community cleanliness: presence of faeces around houses, control of flies.

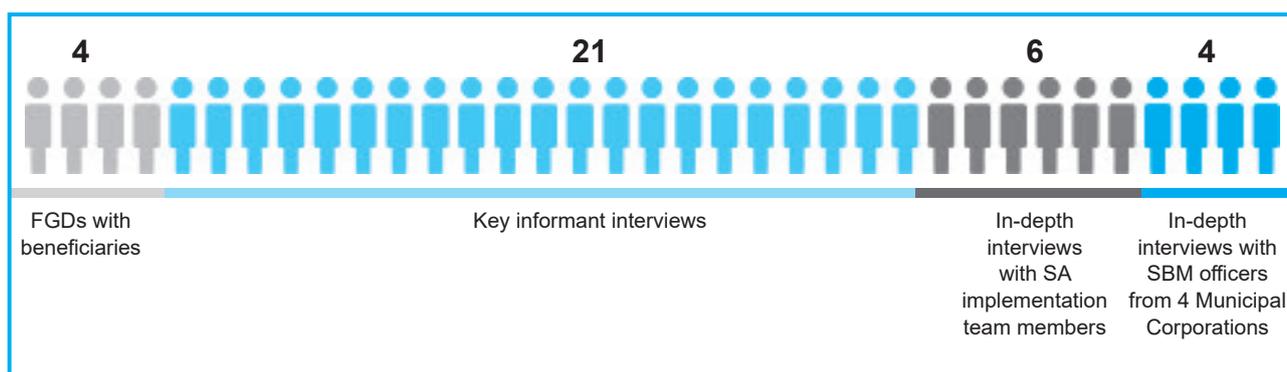
The baseline study tool was modified according to the requirements of the endline study. Extra questions related to household toilets, such as the construction of the toilet, quality of the material, use of individual household toilet, issues associated with individual household toilets, behaviour change, and health problems were incorporated.

To substantiate the findings of the survey and to understand the process of toilet construction, various viewpoints regarding toilet use and changes seen after having built individual household toilet, additional information was collected qualitatively, as described below.

**Key informant interviews:**

An interview guide was formulated consisting of open-ended questions to conduct in-depth interviews of people considered key informants. Key informants can be individuals who are well-positioned to provide information about the key issues of the project. The key informant could be a resident of the slum for more than ten years, community leader or member of a SHG, anganwadi (pre-school) worker, or a person who could narrate a descriptive

**Figure 2.1- Sample for Qualitative data**



account of issues related to defecation, management of CTB, water, drainage and waste management in the slum. Their interviews were conducted during both baseline and endline. All the interviews were audio-recorded with prior written consent of the respondents. The interviews were transcribed in Marathi. Selected quotes were translated to English and used in report to support the findings of household survey.

For in-depth interviews and FGDs, guides were prepared to understand the community views and scenario about the individual household toilets. Information was collected on the process of opting for individual household toilets.

Household surveys and FGDs were carried out during the endline period as well. In addition to this, in-depth interviews of SA implementation members and SBM officers from four Municipal Corporations were conducted. The same woman respondent was interviewed at both baseline and endline study.

### **Slum Profile:**

A research officer appointed on the project visited the slums before conducting household surveys. Slum level information was documented during this visit using a semi-structured observation schedule and through informal interactions with the residents. A total of 16 slums were visited during data collection. Information collected as part of the slum profile included year of settlement, approximate number of households and population, availability of water, drainage and waste management system, most common place of defecation, availability and condition of public toilets. The data were entered and analyzed in Microsoft Excel 2007. Slum profiles generated by SA were also referred during analysis.

### **Pretesting**

Study instruments were created in English and were translated into Marathi language. They were pre-tested in slum areas of Pune. The time required for a survey interview was around 20 minutes. During pre-testing the instrument was mainly checked for the flow and order of questions, skip patterns, etc. A few changes were made in the order of questions after pre-testing. Some of the questions were revised for clarity. The modified instrument was again tested in the field. All the questions included in the final version were clearly understood by the respondents and were sufficient to provide data required for this study.

## Sample covered for the study

The sample covered for household survey is described in the tables below.

**Table 2.3– Distribution of households within the selected slums across 4 cities by study groups**

| Area         | Intervention Group |            |           |
|--------------|--------------------|------------|-----------|
|              | Baseline           | Endline    | Dropouts  |
| PMC          | 97                 | 76         | 21        |
| PCMC         | 55                 | 47         | 8         |
| SMMC         | 36                 | 22         | 14        |
| KMC          | 60                 | 54         | 6         |
| <b>Total</b> | <b>248</b>         | <b>199</b> | <b>49</b> |

| Area         | Control Group |            |           |
|--------------|---------------|------------|-----------|
|              | Baseline      | Endline    | Dropouts  |
| PMC          | 112           | 72         | 40        |
| PCMC         | 56            | 36         | 20        |
| SMMC         | 37            | 35         | 2         |
| KMC          | 53            | 44         | 9         |
| <b>Total</b> | <b>258</b>    | <b>187</b> | <b>71</b> |

Out of 506 (248 + 258) households enrolled at baseline study, and 120 (49 + 71) families dropped out from the study at endline. The rate of dropout was 19.8% and 27.5% in SA OHOT group and control group, respectively.

The major reason for dropout in control group was that toilets got constructed in these areas. It was anticipated at the beginning of the study that people from the control group might construct their own toilet as a result of the government policy and self-motivation. Other important reasons for dropping out included; migration (18) and not available for the interview or sold house (4).

In the intervention group, 21 households out of 49, did not have the toilet at time of endline study and migration is reported in case of 15 households. Other reasons include death (2), refusal (3), and locked houses (8).

## Data management

Questionnaires were maintained separately as intervention group and control group households and were given an identification number. The research officer kept a record of additional comments and information noted on each questionnaire during data collection, if any. A track sheet was used to follow the timeline of data collection. Reasons of non-response, details of exclusion criteria, or refusals were recorded.

## Quality control

Continuous supervision was carried out by the research officer and other research team members during the data collection period to provide consistent and high quality data. Spot and back checks were carried out during supervision. Twenty key questions where under-reporting (e.g UTI) or over-reporting (e.g. practices related to hygiene) were identified for spot checking. 5% of the households were randomly selected for quality checks.

## Data entry

Data from household surveys was entered into Microsoft Excel 2007 and exported to IBM SPSS 20 for statistical analysis. The data entry of 5% of randomly selected schedules was carried out by the research officer as quality check for data entry. The complete data was checked by the research officer during data cleaning and corrected wherever required.

## Selection and training of the field staff

The survey team consisted of five members: one research officer and four field research officers. Selection and recruitment of the team members was carried out by the selection committee of GIPE after personal interviews. Candidates with post-graduate level education and prior experience of field work and data collection were recruited for the study.

Two days of training was conducted at GIPE for the field team. The field research officers were given an orientation to SA and it's projects. Each question from the interview schedule was explained in detail. Demonstrations and mock interviews were conducted to train staff in ways of asking questions and recording information. The field team was sent to the slums in Pune, outside the sample, on the second day of the training for practice interviews. The final revision of the instrument was carried out considering the feedback of the field team.

## Ethical clearance

The project proposal was reviewed for ethical considerations, and clearance was granted by Institutional Ethics Committee of GIPE. Before conducting the interview, written consent was taken from each respondent. They were assured about confidentiality, and were requested to impart complete and true information. They were informed that they could refuse to answer one or more questions which they found insulting, offensive, or sensitive. It was not obligatory on their part to answer all the questions. Of the total respondents approached for household survey, 36 (3.2%) respondents refused to participate in the study. Those who participated in the study imparted complete information.

## Limitations and challenges

The real challenge was actually designing the impact assessment study. Studies related to the impact of receiving an individual household toilet are scarcely reported in literature. Further, the study has multiple outcomes and there is limited knowledge regarding community level variables which can be correlated with these outcomes. In a given situation, selection of control households was equally important. Ideally, control households would be enrolled from same slum as they would have the same exposure to the same environment as intervention households, so that differentials, if any, would be reduced. However, considering the issue of contamination in the form of receiving services from SA, the control households were selected from slums other than the project area but which matched certain characteristics, as listed earlier.

Considering government policy regarding toilet construction, the risk was predicted at the baseline phase that controls may get individual household toilets before the endline assessment. Indeed, out of 258 households, 45 households from the control group who constructed individual household toilets were excluded from the analysis.

## Profile: Slums, Households, Residents

Information for this study was collected from 6 slums in Pune, 1 in Pimpri-Chinchwad, 4 in Kolhapur and 5 in Sangli-Miraj, as listed below. While in almost all cases the intervention and control households were from separate slums, in the case of PCMC both groups were enrolled from one large slum.

**Table 2.4- Selected Slums across 4 cities**

| Intervention Group             | Control Group                   |
|--------------------------------|---------------------------------|
| <b>Pune (PMC)</b>              |                                 |
| Rajiv Gandhi Nagar, Sangamwadi | Sanjay Gandhi Nagar, Karvenagar |
| Bhadakwadi, Sangamwadi         | Pandit Jawaharlal Neharu Nagar  |
| Premnagar                      | PatryachiChawl, Tadiwala Road   |
| <b>Pimpri-Chinchwad (PCMC)</b> |                                 |
| Balaji Nagar, Bhosari          | Balaji Nagar, Bhosari           |
| <b>Kolhapur (KMC)</b>          |                                 |
| Rajendra Nagar, Kolhapur       | Timber Market, Kolhapur         |
| Bondre Nagar, Kolhapur         | Sadar Bazar, Kolhapur           |
| <b>Sangli-Miraj (SMKMC)</b>    |                                 |
| Vajan Kata, Sangli             | Ambaji Mali, Miraj              |
| IdgahVasti, Miraj              | Balaji Nagar, Yerwada           |
| GhisadiVasti, Miraj            |                                 |

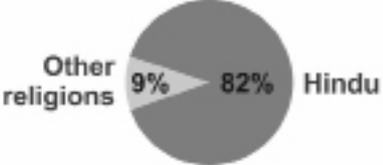
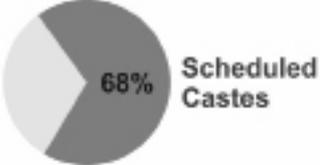
As shown in Table 2.3, for the baseline phase, 506 households were selected. This included 248 intervention group and 258 control group households, with populations of 1268 and 1260 respectively. For the endline phase, data was collected from 199 and 187 households with populations 870 and 951 respectively for intervention and control groups.

Water supply and drainage systems are essential facilities for the success of toilet construction and use. All the slums were provided with piped water supply by the local Municipal Corporation, and the respondents confirmed that they have access to sufficient water for their family to use. As the toilets were to be constructed inside the house, the housing condition of these households was studied at both time periods. At baseline, the average area of the house was 187 ft<sup>2</sup>. The average size of the house was 1.8 rooms with average family size 5.1 persons, which indicates crowding in the house. The majority of the houses had an individual (64%) or shared water connection (36%).

The majority of houses (93%) were connected to a sewerage line. However, 40% of respondents reported problems associated with their drainage lines such as choked line (maybe because of garbage accumulation) and insufficient carrying capacity caused by flooding during the monsoons.

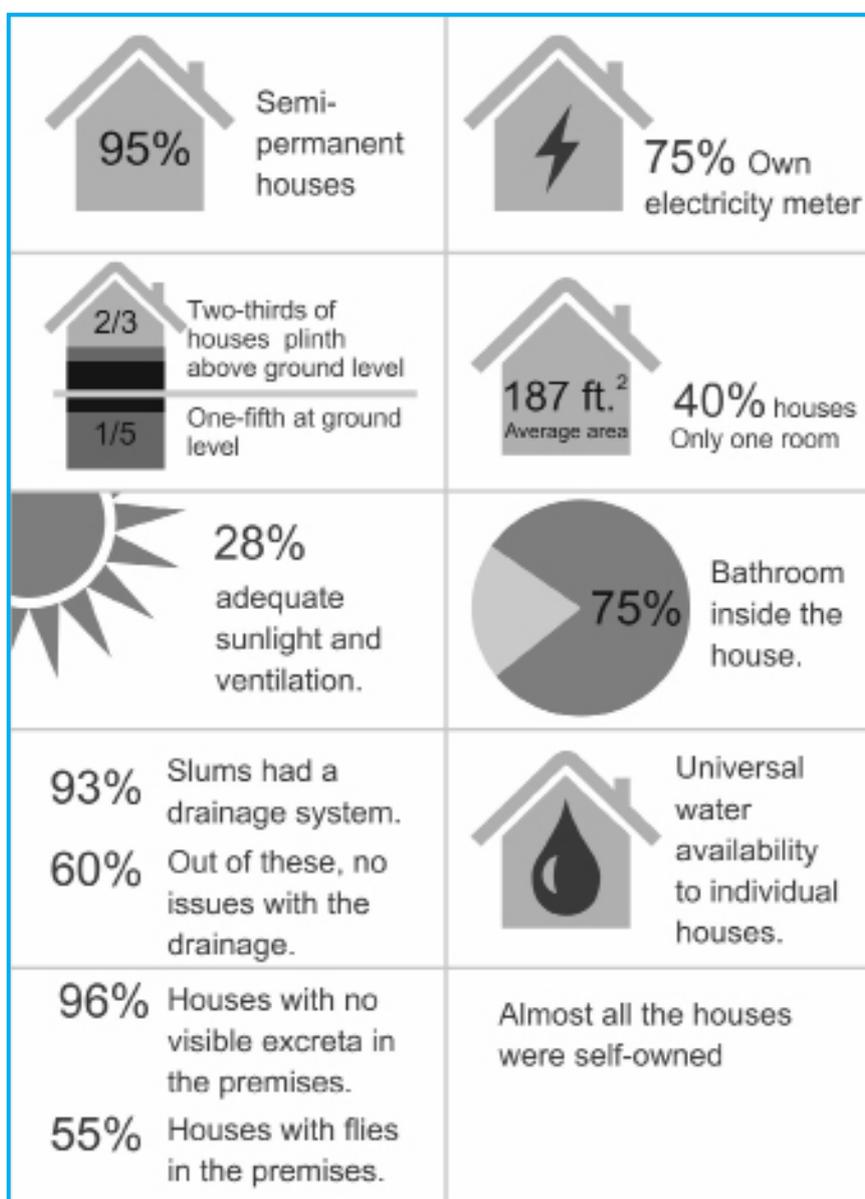
The connectivity of the household to a main road or internal road relates to the means of accessing the house, ventilation, and thus indirectly the economic condition, or poverty of the residents. Those with difficult approach roads and no streetlights indicate a vulnerable section. As well, several houses are on a very narrow road which poses a problem for laying of drainage lines. About 36% are on the internal road with streetlight and with a width less than 1.5 m.

During endline, it was found that the toilet and bathroom is combined in 40.8% households and the availability of a tap is in 76.7%.

|   |  |
|---|--|
|  <p>Other religions 9% 82% Hindu</p>   |  <p>68% Scheduled Castes</p> |
| <p>LPG (Liquified Petroleum Gas)</p>  <p>87%</p> <p>Common fuel used for cooking</p> | <p>Selected households had a similar average score for standard of living.</p>                                 |
| <p><b>14%</b> Selected population Above 50 years of age.</p>  | <p><b>Profile of the population in the study slums</b></p>   |
| <p><b>24%</b> Education between 10 and 12 years</p> <p><b>5%</b> Studied beyond 12 years.</p>   |  |
| <p>Almost all the residents of the selected slums were engaged in lower economic level of occupations.</p>  | <p>A typical respondent of the study is a 36-year-old married illiterate woman.</p>                            |

**The following points summarize the profile of the population in the study slums:**

- 82% of the population was Hindu and 9% from other religions.
- 68% belonged to scheduled castes.
- Liquified Petroleum Gas (LPG) was a common fuel used for cooking (87%).
- Selected households had a similar average score for standard of living.
- 14% of the selected population was above 50 years of age.
- 24% had an education between 10 and 12 years and 5% have studied beyond 12 years.
- Different types of disabilities were reported by a small section of population.
- Almost all the residents of the selected slums were engaged in lower economic level of occupations.
- A typical respondent of the study is a 36-year-old married illiterate woman.



**Structural characteristics of selected households include:**

- Almost all the houses were self-owned.
- 95% were semi-permanent.
- 75% of the houses had their own electricity meter.
- Over two-thirds of the houses had a plinth above ground level and one-fifth at ground level.
- Average area of the house was 187 ft<sup>2</sup> and 40% houses had only one room.
- 28% of houses had adequate sunlight and ventilation.
- 75% of the houses had their bathroom inside the house<sup>3</sup>.
- 93% slums had a drainage system out of which 60% had no issues with the drainage.
- Water availability to individual houses was universal.
- Though human excreta was not visible in 96% of houses, flies were a problem in 55% houses.

**With regards to CTBs in the slums:**

- One slum under the intervention group and one slum under the control group did not have a CTB.
- There are 29 CTBs in 9 slums, where SA model has been implemented and 20 CTBs in 8 control group slums.

<sup>3</sup>In this paper, the word bathroom refers to the Indian word *mori* – a small space used for any water-related activities like bathing and washing. At times it can also be used for urination.

## CHAPTER 3

# Intervention Process

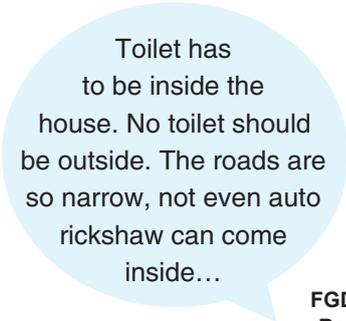
In this project, a baseline and endline survey was conducted where the behaviour of household members was studied with regard to the place of defecation and its related issues. The section elucidates the process of constructing toilets under the cost-sharing model of OHOT designed by SA. Selected households sought household toilets through this Model in urban slums of Pune, Pimpri-Chinchwad, Sangli–Miraj and Kolhapur.

When the baseline survey was conducted, none of the selected households had access to an individual household toilet. Immediately after data collection SA began facilitating toilet construction through its OHOT scheme. This section discusses the factors that play an important role in the utilisation of the toilet space.

### Key features of OHOT

**Location:** When we look at the physical conditions of an individual household toilet, one of the important aspects is the ‘location’ of the toilet, that is, whether it is inside the house or outside. SA recommends construction of toilets inside the house, in order to prevent encroachment of common spaces. Despite the fact that most houses are small, a majority of the beneficiaries (71.4% of 199) have opted to construct the toilet inside the house. Whereas 28.6% of beneficiaries have constructed toilets outside their house. Refer table 3.1.

Residents of Balaji Nagar support SA’s recommendation on construction of indoor toilets:



Toilet has to be inside the house. No toilet should be outside. The roads are so narrow, not even auto rickshaw can come inside...

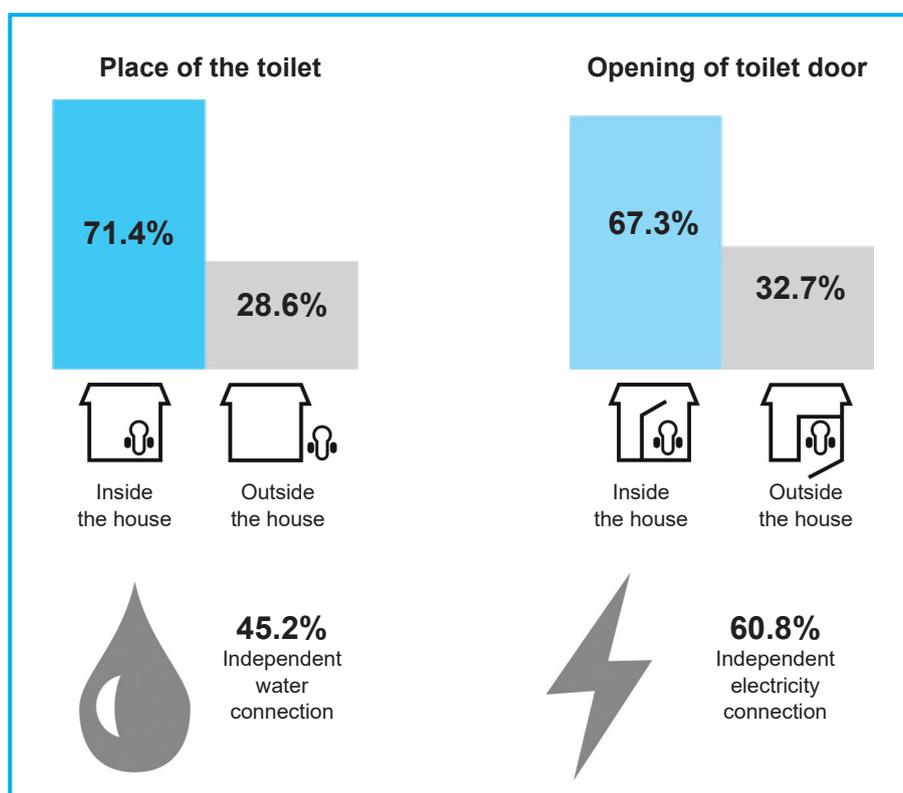
FGD, Women,  
Balaji Nagar

It must be noted that SA does not provide electricity connection or water supply, however, use of the toilets can be gauged by the fact that 45.2% of respondents reported that their toilet had a separate water connection and 60.8% of respondents reported an electricity connection, whereas 68

toilets (34.2%) were reported to have both. SA does not provide supplies for electricity connection or water supply, but this data indicates that many users were motivated to install these supplies themselves. A combined toilet and bathroom was reported by 63.8% of households, indicating the economical use of the available space. In addition, 33.8% (48 out of 142) of beneficiaries reported having built a roof even though the toilets were built indoor. A majority of them (56.3%) were using the roof top for storage while 12.5% had fitted a water tank on the roof top.

Qualitative assessment explored the need for the roof on indoor toilets. Women shared that a roof was useful in reducing sound and spreading of smell within the house and the space on the top of the roof could be used for storage, which is a major requirement for slum dwellers in the absence of sufficient space.

**Table 3.1- Percentage distribution of individual household toilets by place and physical condition for intervention group, endline study**



| Physical condition of the toilet (n=199)             | Percentage |
|--|------------|
| <b>Place of the toilet</b>                           |            |
| Inside the house                                     | 71.4       |
| Outside the house                                    | 28.6       |
| <b>Opening of toilet door</b>                        |            |
| Inside the house                                     | 67.3       |
| Outside the house                                    | 32.7       |
| <b>Independent water connection for toilet</b>       | 45.2       |
| <b>Independent electricity connection for toilet</b> | 60.8       |

**Drainage connection:** A functional drainage network is a major factor that contributes to functionality of a toilet. As a part of its OHOT model, SA collects spatial data on existing drainage networks, maps the location and size of new drainage lines that could be extended from the network, and provides this information to the local municipality. Thus, not only does SA ensure safe and responsible toilet construction by operating only where there is drainage, but also they take efforts to hold municipalities accountable by advocating for new drainage lines which would allow even more people to enroll in the OHOT program. Among OHOT intervention households, 87.2% of toilets are connected to a drainage line, whereas the remaining toilets are connect to a septic tank or a biogas unit.

### **Effectiveness of intervention**

After having taken care of the construction of the toilet including water supply and drainage, keeping them functional on an on-going basis requires effort. This is especially true in case of impediments like water scarcity, choked drainage connection and other construction related issues.

88% of respondents reported the toilets to be functional and under use. 12% (n=15) reported not using the toilets. In addition, the respondents reported 28 prior instances where SA had supported them to put pressure on the municipality to resolve drainage issues for their toilets.

Among the 12% of respondents who reported the toilets not being used, 4.5% reported that the toilets were dysfunctional. This lack of functionality revolved around foul smell and/or improper drainage due to a poor gradient, choked line, or insufficient drainage during monsoons. The remaining 7.5% reported that the toilets were functional but are not being used by owing to cultural issues (such as women not preferring to use the toilet when men were around or when guests/relatives visit) or proximity to a CTB.

## CHAPTER 4

# Impact of OHOT on defecation practices and cleanliness

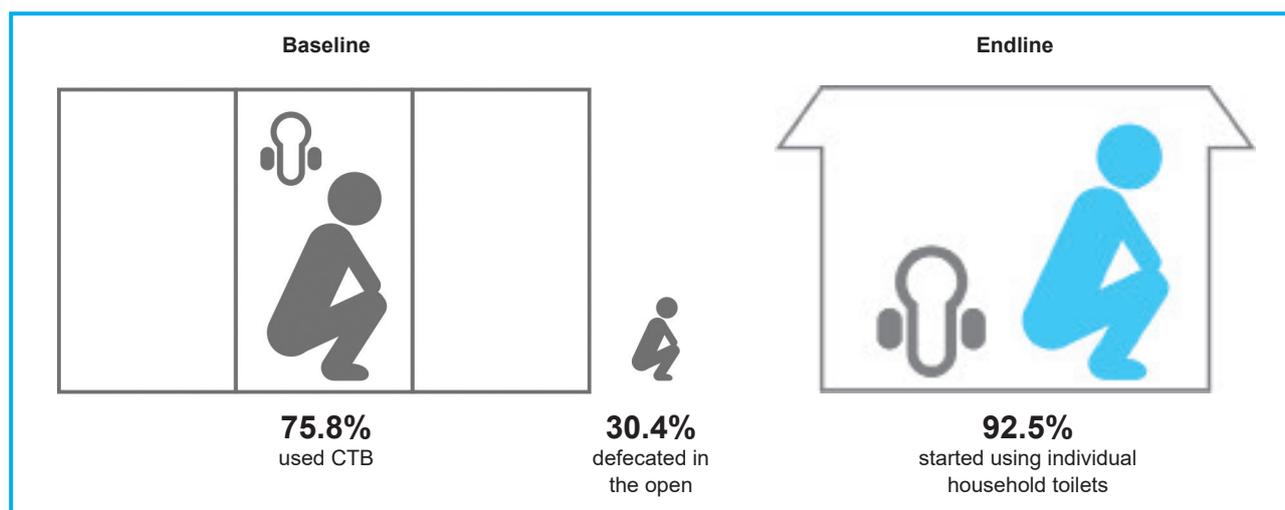
In the absence of individual household toilets, the entire study population was using public facilities for defecation or practicing open defecation, which entails several issues. These issues include cleanliness, safety, privacy, and time. This section highlights how hygiene and defecation practices have changed due to construction of individual household toilets through OHOT.

Information about the place of defecation was collected from all members above 1 year of age from the selected households. Baseline data was collected from a total of 2,528 respondents (1,268 intervention group and 1,260 control group) while the endline was collected from 1,821 respondents (870 in the intervention group and 951 in the control group).



## PLACE OF DEFECACTION

A majority (75.8%) of this population reported using CTBs (with or without payment) while 30.4% reported practicing open defecation (including defecation in chamber/ manhole/open gutter) (Table 4.1). The total exceeds 100 as some of them use CTBs as well as practice open defecation. As a result of the OHOT intervention out of 870 respondents reported constructing individual household toilets. 92.5% (n=805) of this population reported using the individual household toilets while 7.5% (n=65) reported continued usage of other places (CTBs/open areas) for defecation.



In the case of the control group no major shifts were observed in use of CTBs. However, 43.7% shift was observed towards using CTBs.

**Open defecation dropped by 29.6 point percentage in intervention group whereas a drop by 0.6 point percentage was observed in the control group. Overall an improvement by 29 point percentage is reported in the intervention group.**

**Table 4.1- Place of defecation**

| Place of defecation                         | Intervention (%) |         |
|---|------------------|---------|
|   | Baseline         | Endline |
|   | (n=1268)         | (n=870) |
| CTB without payment/with payment            | 75.8             | 6.7     |
| Open defecation/chamber/manhole/open gutter | 30.4             | 0.8     |
| Individual household toilet                 | 0.0              | 92.5    |
| Place of defecation                         | Control (%)      |         |
|   | Baseline         | Endline |
|   | (n= 1260)        | (n=951) |
| CTB without payment/with payment            | 82.6             | 82.1    |
| Open defecation/chamber/manhole/open gutter | 18.5             | 17.9    |
| Individual household toilet                 | 0.0              | 0.0     |

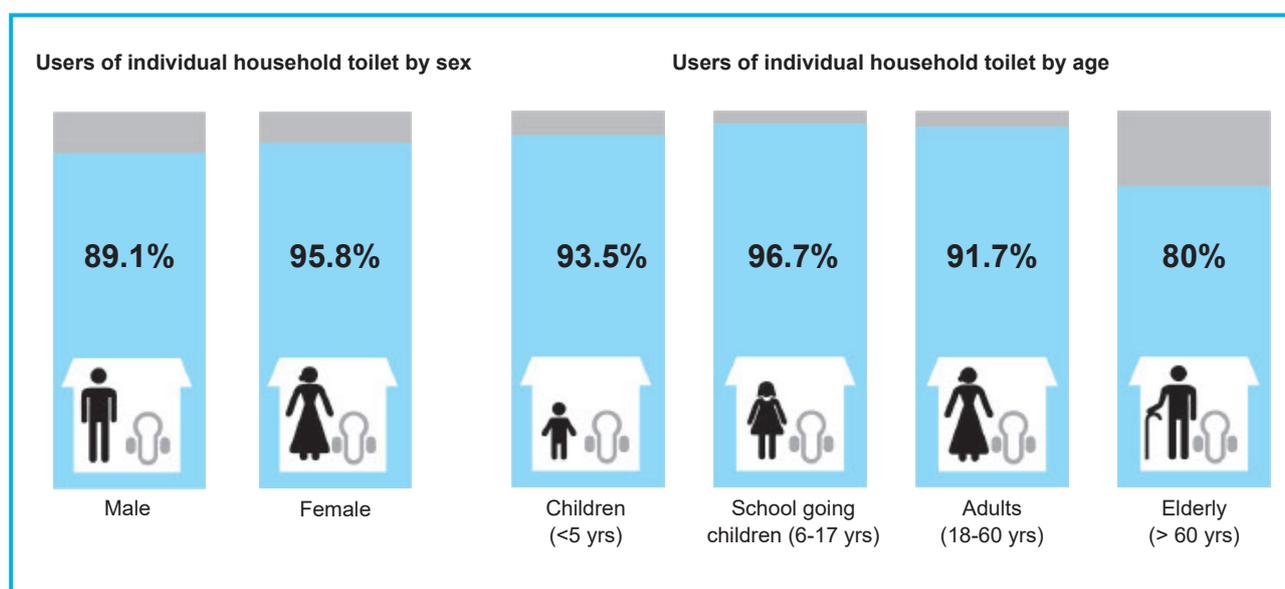
## Use of individual household toilet by age and sex during endline

Reported use of individual household toilets is higher among women (95.8%) as compared to men (89.1%).

During baseline around 80% of children up to 5 years of the age were practicing open defecation around the house in chambers/manholes/open gutters, and only 20% children reported using a CTB. During endline, 93.5% children reported using an individual household toilet, showing a huge shift in defecation practices.

However, only 80% respondents above 60 years of age reported to using individual household toilets during endline, possibly out of long-held habits. This is illustrated in Table 4.2 below.

**Table 4.2- Use of individual household toilet by age and sex, endline**



| Characteristics |                                  | Users of individual household toilet (%) | Non-users of individual household toilet (%) |
|-----------------|----------------------------------|--|--|
| Sex             | Male                             | 89.1                                     | 10.9   |
|                 | Female                           | 95.8                                     | 4.2  |
| Age             | Children (<5 yrs)                | 93.5                                     | 6.5  |
|                 | School going children (6-17 yrs) | 96.7                                     | 3.3  |
|                 | Adults (18-60 yrs)               | 91.7                                     | 8.3  |
|                 | Elderly (> 60 yrs)               | 80.0                                     | 20.0   |
| <b>Total</b>    |                                  | <b>(805) 92.5</b>                        | <b>(65) 7.5</b>                              |

## Place of defecation among adolescent girls

During the baseline, 86.1% of adolescent girls were using CTBs and 13.9% were practicing open defecation in the intervention group.

**However, once they had access to individual household toilets, all of them reported to be using the facility.**

Shift in open defecation is reported in the control group where 2.9 point percentage drop is observed in adolescent girls. Overall an 11 point percentage improvement in open defecation is reported in the intervention group. However, the shift in open defecation in the control group is negligible. Of the 65 non-users of individual household toilet reported use of multiple places for defecation, majority i.e. 56 (85.7%) of them continued using CTB. Eleven individuals (16.9%) were using facility at work place. Around 5 (7.7%) persons were practicing open defecation even after the accessibility of individual household toilet.

During baseline some respondents thought that, the need and use of individual household toilet is mainly the concern of women; however, it was observed that at the time of building toilets, men not only extend their support but also started using them once the toilets were functional.

**Table 4.3- Place of defecation among adolescent girls**

| Place of defecation                               | Intervention (%) |                 |            | Control (%)       |                |            | DiD   |
|---|------------------|-----------------|------------|-------------------|----------------|------------|-------|
|   | Baseline (n=194) | Endline (n=105) | Difference | Baseline (n= 177) | Endline (n=90) | Difference |       |
| CTBs  | 86.1             | 0               |            | 92.7              | 95.6           |            |       |
| Open defecation / chamber / manhole / open gutter | 13.9             | 0               | -13.9      | 7.3               | 4.4            | -2.9       | 11.0  |
| Individual household toilet                       | 0.0              | 100.0           | 100.0      | 0.0               | 0.0            | 0.0        | 100.0 |

Endline



**Among the study population, the use of the individual household toilet is highest (100%) among the adolescent girls. A response voices the relief aptly:**

Now that we have a toilet in our house, our daughter feels safe and is free from stress related to eve-teasing, physical abuse, insect/animal bite etc.

**FGD, Women,  
Rajendra Nagar**

Earlier, when the scheme was introduced, he (husband) filled the application because women in the house had to go out and to avoid the same, he got the toilet constructed very fast just for us. But now, he and other men in the house use the toilet. So initially, it was not for him but just for us that he got the toilet constructed very fast.

**FGD, Women  
Rajiv Gandhi Nagar**

## Reason for non-usage of toilets facilitated under OHOT scheme

The study further explored why beneficiaries were not using individual household toilets. Of the 65 non-users, 46 were men and 19 were women. The most common reason for non-use was 'habit', as stated by 43.1% respondents that they have not developed the habit to use an individual household toilet. Around 12.3% of non-users reported that they could not use the individual household toilet because of the large number of family members using the toilet.

Qualitative research brought forth cultural issues where men were more hesitant to use the toilet since it was near the kitchen, and women felt awkward to use the toilet when male members or guests were at home. SA regularly conducts extensive community mobilization to tackle some of these cultural issues. However, the challenges still exist.

Structural issues such as drainage problems leading to non-usage of toilet were reported by 7 (10.8%) respondents.

**Table 4.4- Reason for non-usage of toilets facilitated under OHOT scheme**

| Reasons for non-usage                           | Number (%) n=65 |
|---|-----------------|
| Habit   | 28 (43.1)       |
| Discomfort                                      | 6 (9.2)         |
| Choke up/ Drainage problem                      | 7 (10.8)        |
| Cultural issues                                 | 6 (9.2)         |
| Large family size                               | 8 (12.3)        |
| Accessibility of other sources                  | 10 (15.4)       |
| Small children (though the age is above 1 year) | 7 (10.8)        |

## Visibility of human excreta around the house

During the baseline, it was noticed that small children used to defecate around the house. Hence human excreta was visible for around the 8.5% of households, which has now dropped to 3% during endline in the intervention groups. However, marginal increase by 0.4 point percentage (Baseline - 1.2%, Endline - 1.6%) is reported in the control group. An overall improvement by 5.9 point percentage is reported in intervention group.

## Benefits of individual household toilet

Refusal to construct the toilet was almost non-existent. Only two households had family members who were not in favour of constructing a toilet in the house. Surprisingly, the two individuals who disagreed were women: in one case, it was mother-in-law of the respondent and in the other, the respondent herself. Both the households finally agreed to construct the toilets.

**Table 4.5- Benefits of the use of toilet**

| Perceived benefits of individual household toilet* (for household) | Percentage |
|--|------------|
| More cleanliness   | 56.3       |
| No long waiting time   | 32.7       |
| Can go anytime / don't have to go out                              | 30.6       |
| Not required to go out in the dark                                 | 29.1       |
| Feel stress free   | 15.1       |
| Other  | 10.6       |
| <b>No. of observations</b>   | <b>199</b> |

*\* Percentages may not add to 100 because of multiple responses*

**Irrespective of the hesitation to use the toilet by women, all of them see the benefits of having one. The most reported perceived benefit is more cleanliness (56.3%), followed by no waiting time (32.7%), not having to hold their bowels for long hours (30.6%), not having to go out in the dark (29.1%) and feel stress-free (15.1%).**

Having an individual household toilet is a need of the entire household though it is reflected more as a need of women in the house. Beneficiaries of OHOT reported the benefits of the individual household toilet such as being able to use the toilet at night (28.1%), saving time (27.9%), and convenient for old/ children and women (10.8%). Safety for the women is reported by 9.5% of the population under study.

**Gender disaggregation of data showed that men were relieved that they were able to save time while women were relieved that they were no longer worried about safety and could use the toilet at night and also saved time.**

The list of the benefits is exhaustive which includes 1) defecation in a clean environment (not having to relieve themselves in an unhygienic CTB), and 2) using it in the rainy season, 3) Health benefits included fewer ailments, and 4) fewer health expenses, 5) Social benefits included improved social status, and value of the house, and 6) being able to invite guests without hesitation.

## Experience of Individual household toilet

Before constructing an individual household toilet, many women respondents had experienced inadequate privacy and safety. Significant time was spent to reach the place of defecation and/or waiting for their turn to use the toilet. In contrast, the reported benefits of the toilet are provided below.

**Table 4.6- Benefits of individual toilet by sex within households**

| Benefits  |   | SA Model - Perceived Benefits (%) |              |                |
|---|---|-----------------------------------|--------------|----------------|
|   |   | Male (620)                        | Female (841) | Overall (1461) |
|  | Convenience to all family member / saves time | 76                                | 62           | 68             |
|  | To get clean environment                      | 12                                | 12           | 12             |
|  | To improve health and hygiene                 | 6                                 | 6            | 6              |
|  | Safer for women                               | 2                                 | 15           | 10             |
|  | Used to feel ashamed                          | 2                                 | 2            | 2              |
|  | Improved privacy                              | 0                                 | 0            | 0              |
|  | Other   | 2                                 | 2            | 2              |
|  | No benefits                                   | 1                                 | 0            | 0              |

### Disadvantages

In the case of respondents who got the toilets under the SA Model, 82.4% did not report any disadvantages. Distribution of disadvantages includes: reduces usable space in the house (12.6%), close to kitchen (1.0%), and foul smell inside the house (3.0%) whereas 2.5% expressed concerned about expenses because of the toilet.

### Visibility of human excreta around the house

During the baseline it was noticed that small children used to defecate around the house and human excreta was visible around 8.5% of households, which dropped to 3% during endline in the intervention group. However, an increase by 0.4 point percentage is seen in the control group. An overall improvement by 5.9 point percentage is reported in intervention group.

## CHAPTER 5

# Impact of OHOT among women and adolescent girls



**W**omen are particularly vulnerable to poor sanitation as it exposes them to ill health as well as social risks. Women who have to walk a distance to use the toilet or to defecate in the open are more susceptible to sexual harassment and violence. In densely populated areas like slums, it is challenging for women to find privacy. This can lead them to refrain from urinating and defecating for many hours, which can cause UTI. Further, women don't feel safe going whenever they want as they don't want to go when there are male members around or when their relatives visit. The existence of individual household toilets has resolved these issues to some extent.

## Safety and privacy

In the absence of a toilet, slum dwellers need to walk up to the place of defecation which sometimes becomes embarrassing, especially for women. A very personal issue like visit to the toilet then becomes public. In addition it exposes women to the risk of teasing, abuse and embarrassment.

Safety and privacy issues were reported by respondents while approaching as well as using the place of defecation. Around 56.3% reported that they need company during the night to go to the place of defecation. The need for accompaniment was expressed more by young women below 30 years of age (61.6%) compared to older women (52.8%).

**During the baseline 35.1% of women had reported feeling unsafe while approaching and/or using a toilet and 67.3% had reported feeling lack of privacy. With access to an individual household toilet the reporting dropped to 0.0% (35.1 point percentage improvement) and 2.2% (65.1 point percentage improvement). Whereas further deterioration by 26.0 point percentage is reported among the control group on safety and a marginal improvement by 0.6% is reported on privacy. An overall improvement by 61.1 point percentage is reported on safety and 64.5 point percentage on privacy in the intervention group.**

Having sufficient safety and privacy enhances the dignity and self-respect of slum dweller women while responding to a basic need like defecation. This very strongly underlines the need for individual household toilet.

**Table 5.1- Safety and privacy**

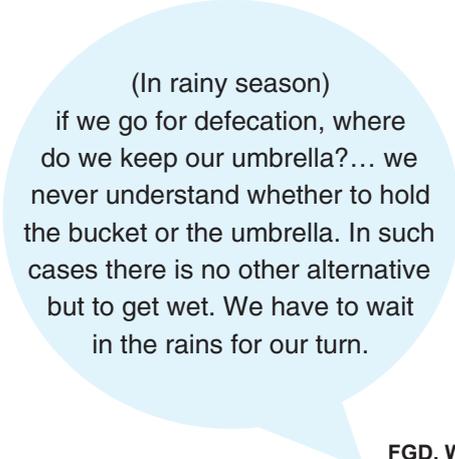
| Perceived lack of safety and privacy | Intervention (%)    |                    |            |
|--------------------------------------|---------------------|--------------------|------------|
|                                      | Baseline<br>(n=248) | Endline<br>(n=175) | Difference |
| Feel Unsafe                          | 35.1                | 0.0                | 35.1       |
| Feel lack of privacy                 | 67.3                | 2.2                | 65.1       |

| Perceived lack of safety and privacy | Control (%)          |                    |            | DiD   |
|--------------------------------------|----------------------|--------------------|------------|-------|
|                                      | Baseline<br>(n= 258) | Endline<br>(n=187) | Difference |       |
| Feel Unsafe                          | 21.3                 | 47.3               | -26.0      | +61.1 |
| Feel lack of privacy                 | 57.4                 | 56.8               | 0.6        | +64.5 |

## Distance and Time

Using a public toilet facility is time consuming. Toilet blocks or open spaces are also not very close to each house so residents need to walk some distance. Women thus need to spend time walking to the CTB and waiting for their turn. Average time to reach the toilet block was reported to be 9 minutes while the average waiting time was 26 minutes. Thus, on an average, the respondents were spending 35 minutes to visit the toilet each time.

Apart from the safety and privacy, other issues also make a difference. It is very difficult for women to go out when it's raining.



(In rainy season)  
if we go for defecation, where do we keep our umbrella?... we never understand whether to hold the bucket or the umbrella. In such cases there is no other alternative but to get wet. We have to wait in the rains for our turn.

**FGD, Women,  
Rajendra Nagar**

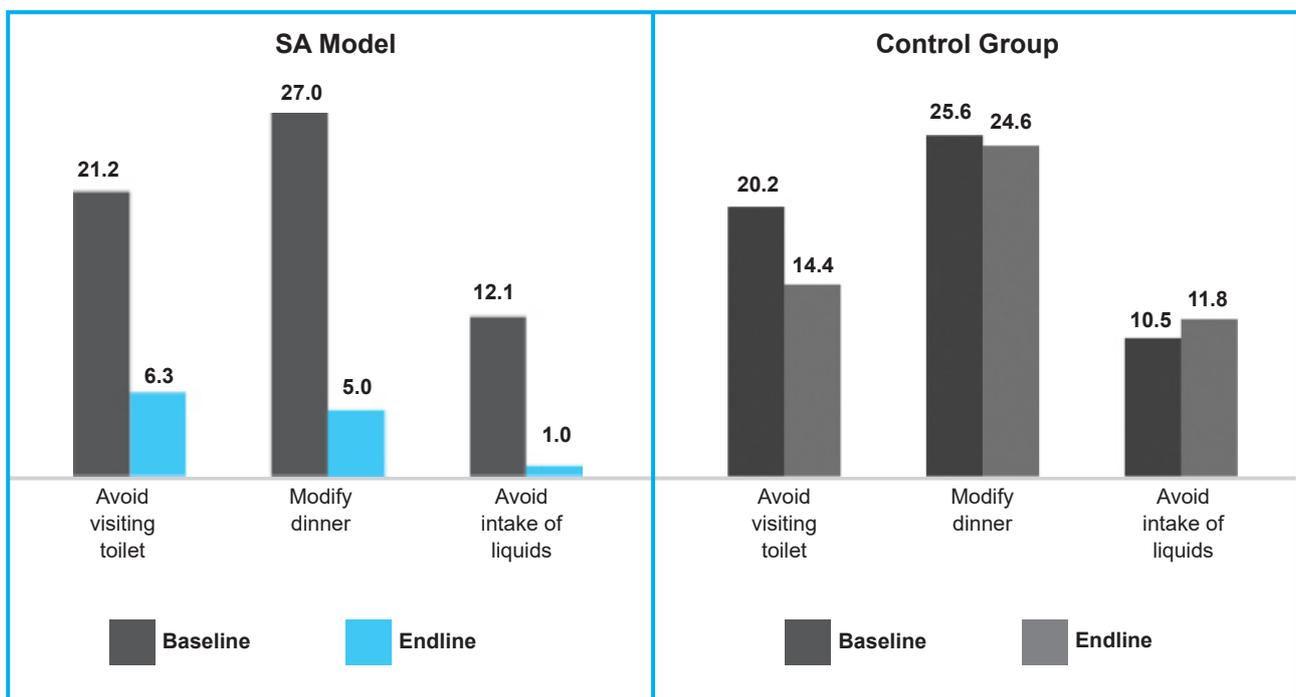
## Toilet practices and dietary behaviour of women

Women have reported various challenges while using CTBs such as lack of safety and privacy, distance from home, and the need for company which have led to women avoiding toilet use. Dietary modification is a common practice among women who desire to avoid visiting toilets.

During the baseline 21.1% of women had reported sometimes avoiding going to the toilet. With the access to an individual household toilet, it has dropped to 6.3% (14.8 point percentage improvement). Whereas an improvement by 6.8 point percentage is reported in the control group. An overall improvement by 8 point percentage is reported in the intervention group.

Similarly, the proportion of women restricting food intake at night has come down from 27.0% to 5.0% (22 point percentage improvement) in the OHOT intervention group. The restriction on liquid consumption has also reduced from 12.1% to merely 1% (11.1 point percentage improvement). Whereas women from the control group have reported, very minimal changes in such behaviors (1point percentage improvement in women not restricting food intake at night but further deterioration by 1.3 point percentage in women restricting liquid consumption) were reported by women from the control group.

Figure 5.1- Change in dietary behaviour



## Menstrual hygiene

Menstruation can entail specific challenges among poor communities, so it is essential to test whether a household toilet impacts the issue of privacy and hygiene during menstruation.

No differences were observed between intervention and control group respondents in the understanding that maintaining cleanliness during menstruation was necessary (almost 100%). During the baseline, 31.7% of women and adolescent girls across the intervention group reported changing cloth/sanitary napkin more than twice a day during their last periods. During the endline the proportion of respondents that reported doing the same increased to 36.5%. On the contrary, a 7.8 point percentage drop was reported by the respondents in the control group. Overall a difference-in-difference of 12.5 point percentage in recommended number of times one should change cloth/sanitary napkin is reported in the intervention group.

**Table 5.2- Frequency of changing cloth/sanitary napkins during last menstrual period**

| Changing cloth / sanitary napkins      | Intervention (%)    |                    |            |
|--|---------------------|--------------------|------------|
|  | Baseline<br>(n=189) | Endline<br>(n=137) | Difference |
| Once in a day                          | 21.2                | 18.2               | -3.0       |
| Twice in a day                         | 47.1                | 45.3               | -1.8       |
| More than twice in a day (recommended) | 31.7                | 36.5               | +4.8       |

| Changing cloth / sanitary napkins      | Control (%)          |                    |            | DiD   |
|--|----------------------|--------------------|------------|-------|
|  | Baseline<br>(n= 178) | Endline<br>(n=130) | Difference |       |
| Once in a day                          | 18.5                 | 20.0               | +1.5       |       |
| Twice in a day                         | 39.9                 | 46.2               | +6.3       |       |
| More than twice in a day (recommended) | 41.6                 | 33.8               | -7.8       | +12.5 |

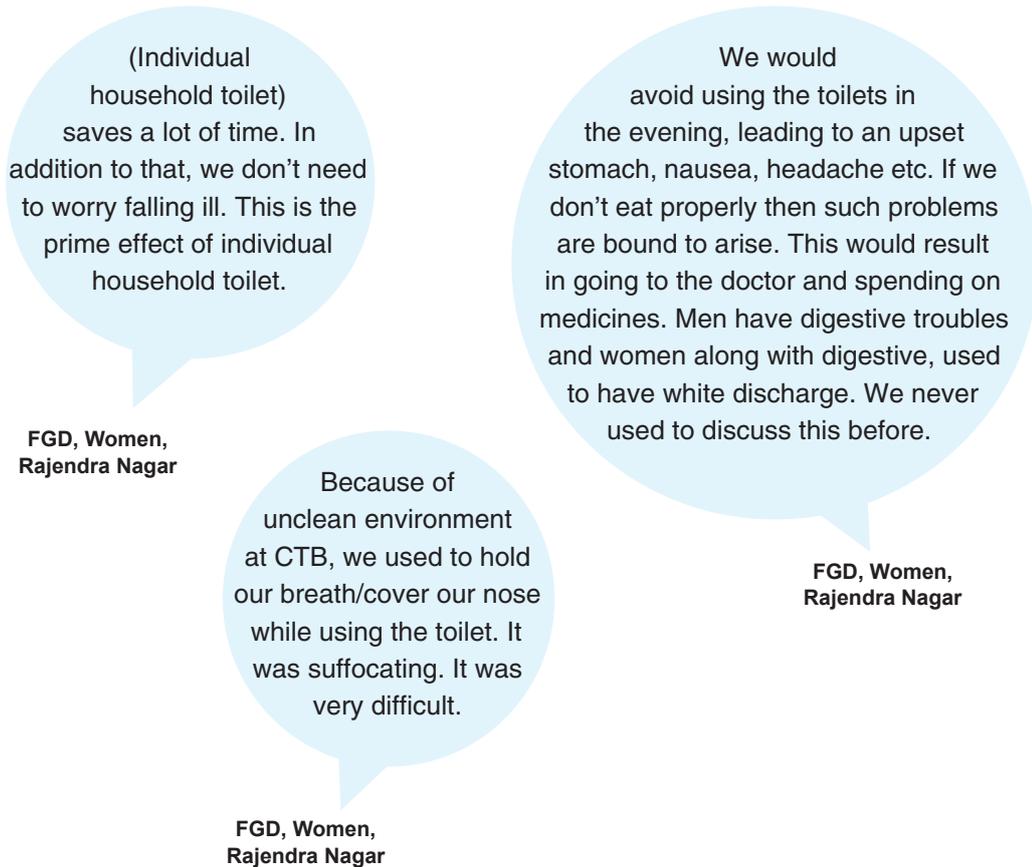
Around 88.9% of respondents in the intervention group reported that having an individual household toilet was an added advantage for maintaining menstrual hygiene.

To maintain cleanliness during menstruation, women need to wash the vaginal area with soap and water, which requires a safe environment and privacy. No differences are seen among respondents under the OHOT group and the control group. About 47% of women wash twice compared to 17% who wash once and 36% who wash three or more times. Personal cleanliness is maintained irrespective of availability of household toilet.

## Perceived Impact of Individual household toilets on overall Health

As we have discussed so far, public places of defecation are often unhygienic and lead to avoidance of defecation. Both these factors lead to health problems depending upon prevailing conditions. 63.5% of respondents shared that they perceived improvement in the overall health status of their family which they attributed to OHOT while 32.2% did not perceive any difference and 4.2% were unsure.

### Women shared:



## Morbidity experienced and Treatment Seeking

Data was also collected from the study group on morbidity patterns (episodes) in the last one month

Data presented in Table 5.3 compares the reporting by individuals suffering from ailments during baseline and endline. A reduction in morbidity by 4.5 point percentage (from 18.2% to 13.7%) was reported by the intervention group while the control group reported an increase in morbidity by 6.4 point percentage (from 11.8 % to 18.2 %).An overall difference in difference by 11.1 point percentage is reported in experience of morbidity in the last one month in the intervention group.

**Table 5.3- Morbidity experienced in last one month**

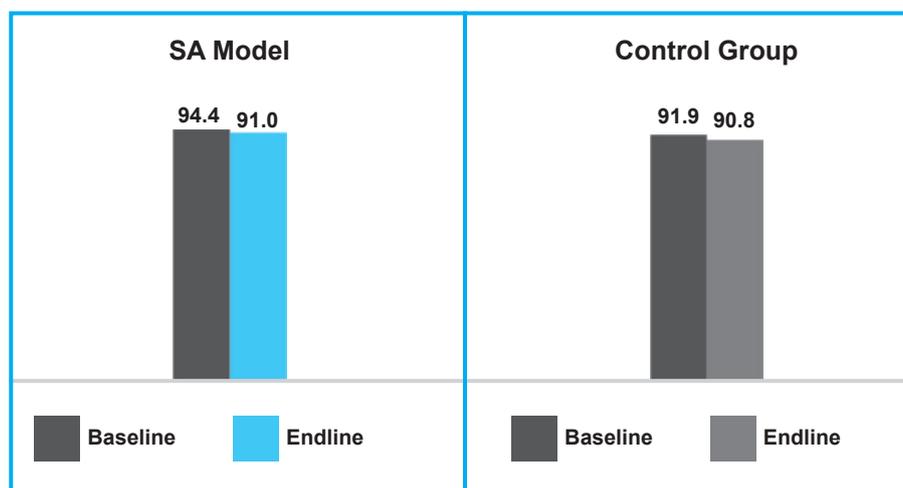
| Morbidity  | Intervention (%)     |                     |            |
|------------|----------------------|---------------------|------------|
|            | Baseline<br>(n=1268) | Endline<br>(n=1030) | Difference |
| Yes (in %) | 18.2                 | 13.7                | -4.5       |

| Morbidity  | Control (%)           |                     |            | DiD  |
|------------|-----------------------|---------------------|------------|------|
|            | Baseline<br>(n= 1260) | Endline<br>(n=1039) | Difference |      |
| Yes (in %) | 11.8                  | 18.2                | +6.4       | 11.1 |

During the baseline, a majority (94.4%) of the persons across the intervention group sought treatment for their health problems. During endline the proportion of persons seeking treatment reduced by 3.4 percentage points (from 94.4% to 91.0%) in the intervention group. However, a small reduction (1.1 percentage point) from 91.9% to 90.8% was reported by the control group. Overall a difference in difference of 2.3 point percentage is observed in the intervention group.

**Figure 5.2- Treatment for health ailments**

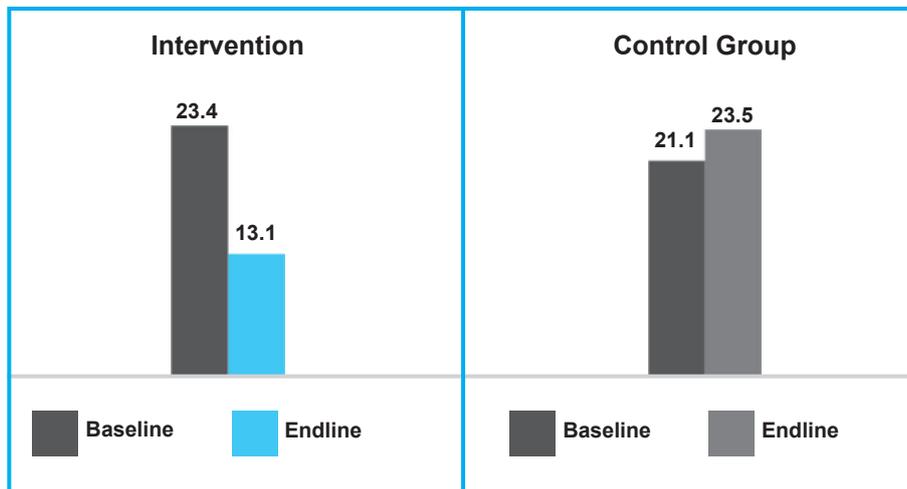


## Prevalence of symptoms of UTI in women

Limited access to a hygienic sanitation facility along with restricted intake of liquids increases the likelihood of developing a UTI, especially among young women. Information was collected on three symptoms of UTI. Respondents were asked if they were currently experiencing symptoms of UTI such as burning sensations/pain during urination, frequent urination, and itching around the vagina. Reporting at least one symptom is how we have defined prevalence of UTI. Overall, 20.6% of women reported at least one symptom of UTI.

A significant reduction in at least one symptom is seen in the intervention group (beneficiaries of OHOT) – 23.4% to 13.1% whereas the control group reported a slight increase from 21.1% to 23.5 %.

**Figure 5.3- Prevalence of UTI among women and access to individual household toilets**



Furthermore, quantitative analysis of the data indicated that women having access to an individual household toilet have one-third the chances of developing UTI as compare to control group (Table 5.4).

Bivariate logistic analysis was carried out to assess the independent effect of access to a household toilet on prevalence of UTI at endline. In the analysis, the prevalence of UTI during the endline phase was entered as the dependent variable and access to an individual household toilet as the independent variable. To control the effect of differences in UTI prevalence at baseline across the groups, the prevalence of UTI at baseline was added as a co-variate in the analysis.

**The analysis indicates that women having no access to an individual household toilet have 3 times more likelihood to develop UTI as compared to the women with access to a household toilet ( $R^2= 0.173$ ,  $p<0.001$ ).**

**Table 5.4- Logistic regression to assess impact of intervention on prevalence of UTI among women**

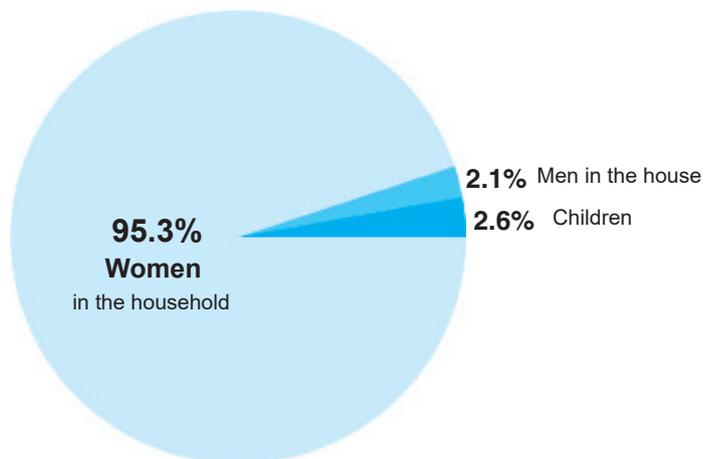
| Factors                       | B      | S.E. | Wald   | df | Sig. | Exp(B) | 95% C.I. for EXP(B) |       |
|-------------------------------|--------|------|--------|----|------|--------|---------------------|-------|
|                               |        |      |        |    |      |        | Lower               | Upper |
| No access to toilet           | 1.127  | .269 | 17.616 | 1  | .000 | 3.086  | 1.823               | 5.224 |
| Prevalence of UTI at baseline | 1.675  | .276 | 36.923 | 1  | .000 | 5.339  | 3.110               | 9.165 |
| Constant                      | -3.879 | .458 | 71.771 | 1  | .000 | .021   |                     |       |

$R^2=0.173$ ,  $p<0.001$  Dependent variable- Prevalence of UIT at endline

## Toilet maintenance

Having an individual household toilet takes care of many aforementioned issues among women, but adds to existing tasks, which is cleaning. A toilet within the house – especially in a small house – needs to be cleaned at frequent intervals to be functional and used efficiently by all the family members. Maintaining the individual household toilet has become mostly the responsibility of women as reported by 95.3% respondents (183 women out of 192). Men and children found a rare mention in taking on the responsibility to clean the toilets.

**Table 5.5- Person responsible for cleaning the toilet**



| Person responsible for cleaning the toilet (n=192)* | Percentage |
|---|------------|
| Women in the household                              | 95.3       |
| Men in the house                                    | 2.1        |
| Children  | 2.6        |

\* Percentages may not add to 100 because of multiple responses

## CHAPTER 6

# Awareness, satisfaction and suggestions

**S**A had a unique scheme under which construction of individual household toilets was being facilitated far before the advent of SBM.

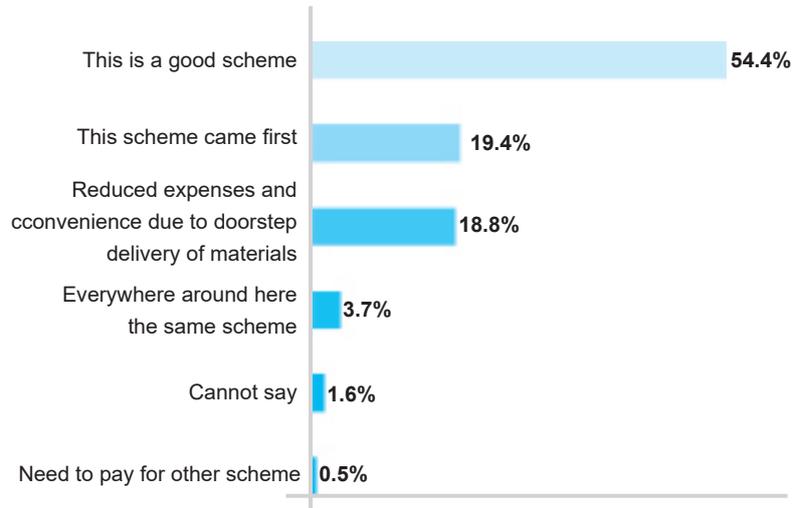
### Awareness about the scheme

SA mobilizes slum dwellers and builds their awareness on the importance of toilets. 75.9% (n=191) of the OHOT beneficiaries reported being informed about the SA scheme by the volunteers from SA.

**54.4% beneficiaries reported opting for the scheme because they feel that this scheme is good. The need for the individual household toilet was always in the background, so when SA approached the community with this particular scheme, many jumped at the opportunity. They hadn't heard of any other such scheme previously. 18.8% of respondents reported that since they received the construction material at the doorstep, their expenses were reduced. The other reason is that nearby people had signed up for the same scheme (3.7%), reflecting the importance of social influence in the spread of such initiatives. Among the beneficiaries of OHOT, 82.4% respondents reported being satisfied with the SA scheme.**

Out of 142 who have the toilet inside the house, 129 responded to the question related to reduction of usable space in the house due to construction of toilet. 74.6% respondents reported being satisfied, 16.9% felt indifferent and 8.5% reported being dissatisfied (largely due to reduction of floor area in the house, followed by a few who cited expenses and foul smell and other social problems).

**Table 6.1- Reason for choosing the SA scheme**



| Reason for choosing the SA scheme (n=191)                              | Percentage |
|--|------------|
| This is a good scheme  | 54.4       |
| This scheme came first   | 19.4       |
| Reduced expenses and convenience due to doorstep delivery of materials | 18.8       |
| Everywhere around here the same scheme                                 | 3.7        |
| Cannot say   | 1.6        |
| Need to pay for other scheme   | 0.5        |

## Beneficiary Suggestions to Shelter Associates

SA has devised their plan of facilitation of construction of toilets which includes a financial contribution and meaningful engagement with local beneficiaries. They have finalized the design of the toilet and accepted the responsibility of providing each required aspect for the construction of the toilet. They also liaise with respective municipal bodies and ensure that the toilet is connected to drainage lines. In spite of their sustained efforts to provide all the necessary support regarding toilet by SA, occasionally people wish to get something more.

It should be stated here that 99 respondents (30.6%) did not have any suggestion to give. The remaining 70% had something to add. As expected most of the suggestions were expenses-related followed by material-related aspects – quantity, quality and something extra that SA doesn't provide in their standardized design. The other concerns were about the need for more reliable drainage connection and constructing a roof on the toilet. As per their wishes and demands they report what they think is missing in the current design and procedure. About 17.4% were so satisfied by the current toilets and the scheme that they are looking forward to something like a housing scheme in the future by SA.

One can look at these suggestions and see if it is possible to incorporate them in the further constructions.



## Awareness about Swachh Bharat Mission

SBM is one of the most publicized initiatives of the Government that promotes sanitation and waste management issues. SBM goes hand in hand with SA's OHOT program which is being studied. It would thus be worthwhile to explore whether people are aware of SBM.

**Table 6.2- Percentage distribution of respondents who have heard about SBM by study groups, Baseline and Endline study**

| Heard about SBM | Intervention Group |                 |            | Control Group     |                 |            | DiD |
|-----------------|--------------------|-----------------|------------|-------------------|-----------------|------------|-----|
|                 | Baseline (n=248)   | Endline (n=199) | Difference | Baseline (n= 258) | Endline (n=187) | Difference |     |
| Yes (in %)      | 23.8               | 47.7            | 23.9       | 31.4              | 47.6            | 16.2       | 7.7 |
| Yes (in no.)    | 59                 | 94              |            | 81                | 89              |            |     |

Awareness of SBM has increased during endline survey for both groups. Increase in awareness by 23.9 point percentage is reported in intervention group and 16.2 point percentage in control group. The increase in awareness is higher by 7.7 point percentage in the intervention group. It is also explored, though, how precisely people know about SBM. The most known aspect is environmental cleanliness (66.8%) followed by the need for an individual household toilet (35.3%). Other known parameters are personal cleanliness (27.8%), waste management (25.3%) and avoiding open defecation (22.4%).

**Table 6.3- Knowledge about Swachh Bharat Mission**

| Knowledge about mission*    | Intervention Group |                | Control Group    |                |
|-----------------------------|--------------------|----------------|------------------|----------------|
|                             | Baseline (n=59)    | Endline (n=95) | Baseline (n= 81) | Endline (n=89) |
| Individual household toilet | 15.2               | 40.0           | 21.0             | 34.8           |
| Personal cleanliness        | 50.8               | 29.5           | 25.9             | 32.6           |
| Environmental cleanliness   | 72.8               | 65.3           | 74.1             | 69.7           |
| Avoid open defecation       | 13.5               | 21.0           | 16.0             | 24.7           |
| Toilet facility in schools  | 16.9               | -              | 3.7              | 4.5            |
| Waste management            | 10.2               | 31.6           | 6.1              | 15.7           |

\* Percentages may not add to 100 because of multiple responses

## CHAPTER 7

# Summary of Impact

**T**he existence of a toilet is of utmost importance when it comes to hygiene. Urban areas are densely populated and those who do not have access to individual household toilets have to use either common toilet blocks or resort to open defecation. CTBs – as well as seating capacity in CTBs – are limited, and the population utilizing it is increasing, which puts strain on existing infrastructure and compromises cleanliness. More households having an individual household toilet, will reduce the strain on existing infrastructure. Individual household toilet irrespective of the space reduction that may occur in the house has its benefits over other common/public places of defecation.

**SBM has also become increasingly widespread, which facilitates the process of receiving individual household toilets. SA's OHOT model provides a compelling example of a successful method of facilitating toilet construction in urban slums that has concrete and measurable benefits.**

### Areas of Impact

#### 1. Access to toilet

- Beneficiaries had reported spending approximately half an hour walking to or waiting at the place of defecation. Considerable time and effort is saved for each visit since the construction of the toilet in the house.
- All respondents reported higher privacy, safety, self-respect and dignity during defecation, especially in comparison to public spaces in the presence or vicinity of other community members. It was encouraging to see that all adolescent girls in the study area were using the individual household toilets constructed in their household.
- Beneficiaries reported a sense of freedom to access the toilet any time they wish to.
- Beneficiaries reported convenience of using individual household toilets especially during the rainy season.
- Beneficiaries emphasized on convenience of accessing toilets anytime for people with limited mobility, including children and the elderly along with disabled persons, as well as for pregnant and lactating women.

#### 2. Health

- Beneficiaries reported that they didn't need to avoid defecation or controlling intake of food and liquids anymore as a result of construction of a household toilet.

- All beneficiaries reported using of soap for hand washing after defecation.
- A significant decline in symptoms of UTI was reported by the women in the intervention group.
- Beneficiary households perceive their health to be improved since the construction of the individual household toilet and reported lower incidence of illness in the past one month.

### **3. Personal hygiene**

- Women and adolescent girls reported benefits such as sufficient privacy and convenience to maintain menstrual hygiene.
- Improved menstrual hygiene through washing the vaginal area using soap and frequent change of napkins was reported by women and adolescent girls.

### **4. Gender and Social issues**

- Women and girls reported feeling secure being able to access a household toilet compared to CTBs or open defecation where they needed to wait for company for the fear of:
  - animal attack, dog bites and insect bites.
  - abuse, teasing, or voyeurism.

### **5. Cleanliness of surrounding**

- Presence of feces around the house was observed to be negligible.

Apart from all these factors highlighting the impact of the individual household toilet, respondents also reported enhanced social status as well as the worth of the house. They also report improved socializing since they did not feel embarrassed of inviting guests to their place any more.

The study also highlighted a few concerns such as reduction in usable area in the house, proximity to the kitchen, and women having an additional responsibility of maintaining cleanliness of the toilet.

## Recommendations

SA has been facilitating toilet construction for more than 12 years now. Under the cost-sharing model SA provides the construction material required for building a toilet at the doorstep of the beneficiary household and the beneficiary takes on the responsibility of the labour payment towards construction. In case the beneficiary is unable to arrange a mason, SA recommends one to them. SA follows up with ULBs to ensure drainage connection to the toilets, making them functional. This study illustrates that SA's OHOT Model has significant benefits in health and quality of life for the beneficiary households.

### **Recommendations based on the data collected in this study include:**

- Material for the roof is not provided in the OHOT model, but most of the beneficiary households are interested in having a roof on the toilet even though it is inside the house. They have expressed this preference to be able to control foul smell and sound from the toilet. Moreover, the roof provides for extra space for storage or fitting a water tank. SA can contemplate providing material for the roof.
- By facilitating doorstep delivery of all construction material, SA eliminates households' need to purchase individual components to build a functional toilet. However, as its operations scale, SA will need to implement systematic quality checks and vendor management systems to ensure the consistency of its construction material.
- Currently, SA maps the community using GIS and provides toilets to households that can be immediately connected to the existing drainage line. SA simultaneously proposes feasibility of additional lines to ULB which then lays additional drainage network. The remaining households get covered in phase 2. In this study, non-functioning toilets existed largely because of drainage problems. Considering the importance of drainage to the functionality of the toilet, maintaining drainage network data and ensuring functional drainage networks is crucial for the municipality. SA can further develop a policy advocacy to improve sanitation facilities, essentially the drainage system. The advocacy can complement the activities conducted under SBM to a greater extent.

# Annexure

## Standard of living index

This is a summary of household measure called Standard of Living Index (SLI). It is a composite index based on the household amenities and material possessions. SLI scores are computed using the weights assigned to individual amenity or possession, as per National Family Health Survey -3.

| Variable   | Score   |
|--|---|
| <b>Type of house</b>   | Pucca - 4<br>Semi-pucca - 2<br>Kachcha - 0  |
| <b>Source of lighting</b>  | Electricity - 2<br>Otherwise - 0  |
| <b>Main fuel for cooking</b>   | Electricity, LPG, Biogas – 2<br>Coal, Charcoal, Kerosene – 1<br>Other – 0                       |
| <b>Source of drinking water</b>  | Pipe, Hand pump, Well in residence – 2<br>Public tap, hand pump or well – 1<br>Other source – 0 |
| <b>Ownership of house</b>  | Yes - 2<br>No - 0   |
| <b>Car</b><br><b>Taxi</b><br><b>Rickshaw</b>   | Yes - 4<br>No - 0   |
| <b>Moped / Scooter / Motorcycle</b><br><b>Telephone</b><br><b>Refrigerator</b><br><b>Colour television</b>   | Yes - 3<br>No - 0   |
| <b>Bicycle</b><br><b>Electric fan</b><br><b>Radio / Transistor / Music system</b><br><b>Sewing machine</b><br><b>Black and white television</b><br><b>Pushcart</b> | Yes - 2<br>No - 0   |
| <b>Mattress</b><br><b>Pressure cooker</b><br><b>Chair</b><br><b>Cot / Bed</b><br><b>Table</b><br><b>Clock / Watch</b>  | Yes - 1<br>No - 0   |

Composite scores are computed for each household.

This is a study of slum households and the study group is homogenous in most of its background characteristics. However, to get the summary measure for standard of living, the scores are further classified into three equal groups to capture the variation within this homogeneous group.

# Informed Consent

My name is \_\_\_\_\_ and I am working with Gokhale Institute of Politics and Economics, Pune as a Field Research Officer. First of all thank you very much for giving your valuable time for this discussion.

We are conducting a study in your slum area where we are collecting information about toilet facilities here and how to improve the toilet situation.

This discussion tries to understand more about current place of defecation and your awareness about the hygiene, your concerns about the safety and security, health hazards and cost you incur.

We want to assure that the information that you provide will be kept strictly confidential. No one, including those at home, will ever know that you in particular have given these answers since we do not disclose any identifying information. Your name or other information that could identify you will not appear anywhere in study, record or report. Your participation is voluntary and information provided by you is very valuable to us. You have the right to say 'no' or 'yes' to participate, and also to answer or refuse any question(s). Nothing will happen if you decide to say no to us and nobody in your family will know that you have refused. Even after the discussion has started, you have the right to change your mind about participating and leave any time.

In this discussion, there is no right or wrong answers. We just need to understand your views on toilet use. We think you have important ideas regarding sanitation, particularly in your area. We are pleased that you have agreed to be a part of this discussion

In case you want more information about the study or you have questions, you can contact our lead researchers: Dr. Anjali Radkar (09422009758) and / or Dr. T Abhilash (9405005956) from Gokhale Institute of Politics and Economics.

Do you have any questions that I could clarify? May I begin the discussion now?

Respondent's Signature:

Date

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