RESEARCH REPORT

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SWACHH BHARAT:
INDUSTRY ENGAGEMENT – SCOPE & EXAMPLES

CENTRE FOR POLICY RESEARCH

Confederation of Indian Industry

SWACHH BHARAT:
INDUSTRY ENGAGEMENT – SCOPE & EXAMPLES

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SWACHH BHARAT:
INDUSTRY ENGAGEMENT – SCOPE & EXAMPLES

MESSAGE

The Hon'ble Prime Minister, in his Independence Day speech on 15 August 2014, espoused the need for a clean India. He called for Swachh Bharat, a massive mass movement that seeks to engage everyone in the task of cleaning homes, work places, villages, cities and surroundings, in a collective quest. He especially called upon the corporate sector to give priority to the provision of toilets in schools as part of their corporate social responsibility.

Indian Industry and the Confederation of Indian Industry (CII) have always responded to the needs of the nation, accorded priority to issues of national concern, and taken concrete steps to address the same.

CII has taken the lead in sensitising industry on this critical agenda and creating necessary enablers for promoting and realising the objectives of the Swachh Bharat Campaign. CII launched Mission SoS (Sanitation of Schools) towards accomplishing this goal with the focus of converging CSR endeavors of industry towards sanitation in government schools as part of the Swachh Vidyalaya Programme. Additionally, we in CII have created enablers in facilitating the delivery of the Swachh Bharat Mission by providing advisory services, promoting technologies and undertaking projects on waste management.

CII is delighted to partner with the Centre for Policy Research (CPR) in developing this Report. I am confident that all stakeholders including the industry will benefit immensely from this document and also replicate the models presented here.

Building a society which provides equal access to opportunities and basic amenities is a collective responsibility. This call for action presents a unique opportunity to stand up to the challenge. CII appreciates this need and commit whole-heartedly to support and strengthen the momentum created towards delivery of the Swachh Bharat Mission.

Chandrajit Banerjee
Director General
Confederation of Indian Industry (CII)

PREFACE

The Centre for Policy Research (CPR), is undertaking the Scaling City Institutions for India (SCI-FI) programme, which aims to build a stronger evidence base for developing policies, programmes and implementation plans for achieving sanitized cities. Through research, SCI-FI: Sanitation aims to inform and support the formulation and implementation of the Government of India's urban sanitation programs and investments. The research programme is studying cities in two different states to understand the reasons for poor sanitation and inform and support the state and city governments to pursue their goals of increasing access to safe and sustainable sanitation in urban areas.

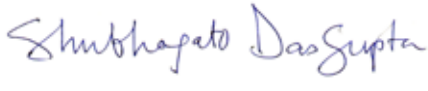
Since the announcement almost, a year ago of the Swachh Bharat Mission, there has been an increased emphasis on both, the current and future possible involvement of the private sector and industry as a key partner. Achieving the vision of Swachh Bharat requires that we, as citizens of this nation and members of communities, adopt behaviour which is consistent to improving the cleanliness of our surroundings, which would lead to improved public health. It also requires the development of new facilities, and ensuring operations and maintenance of facilities for sanitation services. The private and corporate sector will have to play a significant role to catalyze and embed this societal change. This is also held up by history, with the significant role the private sector played in improving sanitation in western Europe, starting from the mid 19th century. At this historic moment in India too, the private sector would need to play an important role, be it in financing, development of new ways for communication for behavior change, construction, implementation, technology development, or innovating new service delivery models.

The Confederation of Indian Industry (CII) and many of its members have responded strongly to the call for the private sector to act, and have undertaken effective interventions towards SBM. The CII Foundation (CIIF) launched Mission Sanitation of School (SoS)-Phase I last year with the focus of converging CSR endeavors of industry especially towards creating sanitation facilities in Government schools as part of the Swachh Vidyalaya Programme. Having addressed the Swachh Vidyalaya challenge, CII Foundation, in the next phase, will focus on addressing sanitation challenges of urban communities through industry engagement. Additionally, CII, through its various verticals and Centers of Excellence have been facilitating the delivery of the SBM in the form of evangelizing sanitation among members across the country, providing advisory services, promoting waste management technologies and undertaking projects, especially through the CII – Andhra Pradesh Government partnered Andhra Pradesh Technology Development and Promotion Centre (APTDC). CII–APTDC has been a pioneer in the country for establishing Public Private Partnership for Technology Intellectual Property Services in the area of Technology Commercialization of Waste management.

We at CPR, and especially the SCI-FI team are delighted to have partnered with the leading industry association, CII and the CII Foundation in producing this report and in supporting in deepening a dialogue on the scope, opportunities and limitations of a government – industry partnership in implementing the vision of a Swachh Bharat.

This report is aimed at being an early attempt to comprehend scope and scale of the sanitation sector from the private sector industry perspective. The report is organized into two parts. Part A on is the Scope for Industry participation in Sanitation and Part B documents innovative profiles of firms and non-governmental organizations who have been developing new products or implementing unique and new models for improved sanitation. The sector analysis focuses on financing requirements for a Swachh and Clean India, and also aims at understanding the current and possible future role of the private sector and industry engagement in sanitation service delivery in India, with a view to scaling-up the engagement of the private sector and industry.

This report which was conceived off after a number of discussions between Shefali Chaturvedi, K. Jawaharlal, and Sarbani Chakarvarty, and the CPR SCI-FI team, would not have been possible without the active support of a number of contributors. We are thankful to the firms that supported this exercise by providing us with information and allowing a team to visit the locations of their work. This exercise could not have been possible without their support. Kimberly Noronha led the finalization of the report, and she along with Nikhil George at CPR spearheaded the implementation and production of this report. Jawaharlal and Shivani from CII also provided comments and connected the research team to particular firms for which we are very thankful. Amandeep Singh, Aditya Bhol, Tripti Singh and Swati Diman also contributed in refining the profiled initiatives. The profiles for the sixteen private sector and non-governmental agencies that have been documented were first developed by a team at ForthLion Technologies Private Limited, lead by Ankur Bansal The sector overview exercise was lead by Raghu RamaSwamy, Director, RICS School of Built Environment, Amity University and was strongly supported by Smita Rao and Seetharaman Ramakrishnan. Technical resource people including Shrinivas Anerao, Pushpa Chowdhury, Pearl Tiwari, Sampath Kumar, Anand Jalakam, and Bibhas Mohapatra were consulted for inputs and to the modeling exercise. We are also thankful to Oroon Das for designing the report in a short period of time.



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LIST OF ACRONYMS

CBO	Community-based Organization
CSC	Community Sanitary Complex
CSR	Corporate Social Responsibility
FSM	Faecal Sludge Management
FY	Financial Year
GDP	Gross Domestic Product
GoI	Government of India
HH	Household
HPEC	High Powered Expert Committee
IEC	Information, Education-communication and Communication
LPCD	Litres per capita per day
MLD	Million liters per day
MSW	Municipal Solid Waste
NGO	Non Government Organization
OD	Open Defecation
O&M	Operation and Maintenance
SBM	Swachh Bharat Mission
SWM	Solid Waste Management
TPD	Tonnes per Day
UGD	Underground Drainage
ULB	Urban Local Body/Urban Local Bodies
WASH	Water, Sanitation and Hygiene
WHO	World Health Organization
WSP	Water and Sanitation Programme (World Bank)
WTE	Waste to Energy

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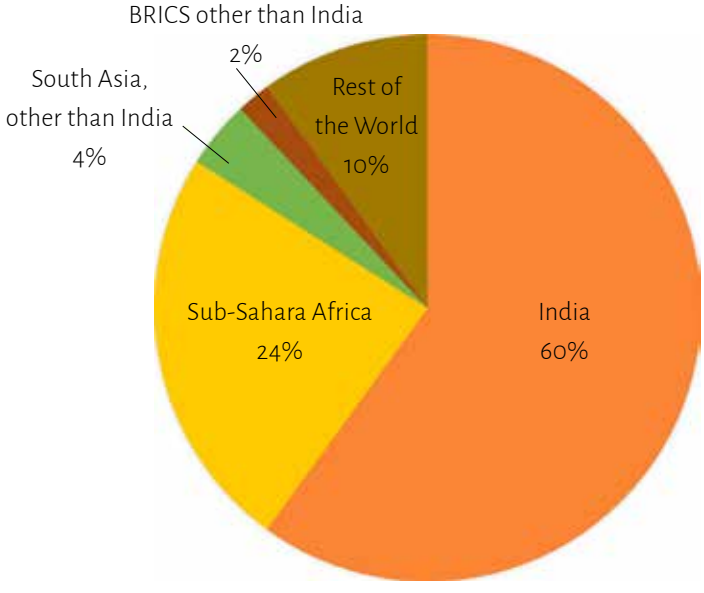
1.1 BRIEF INTRODUCTION TO THE SCALE AND NATURE OF THE SANITATION CHALLENGE

These are historic times for the field of sanitation in India. **"Swachh Bharat"**, described by the Prime Minister as *"a massive mass movement that seeks to create a Clean India"*, has captured the imagination of a large section of the population. This is being pursued as a primary development goal. India is well known to be the location housing the largest number of people without access to improved sanitation. While India is home to 17.5 percent of the world's population, close to 60 percent of the number of people globally who do not have toilets and defecate in the open, live in India (see chart 1 and table 1). The scale of the problem is reflected within India too, where more than fifty percent of the population do not have access to toilets or do not use them. Solving India's sanitation problem therefore is both a national, and a global priority. These massive numbers of people not gaining access or using adequate sanitation has led to both India, as well as the world as a whole, not meeting the sanitation targets it had set itself, as part of the Millennium Development Goals (MDGs).

Chart 1: Open Defecation in India compared to other regions of the World (%)



Source: WHO-UNICEF, 2015. Joint Monitoring Program

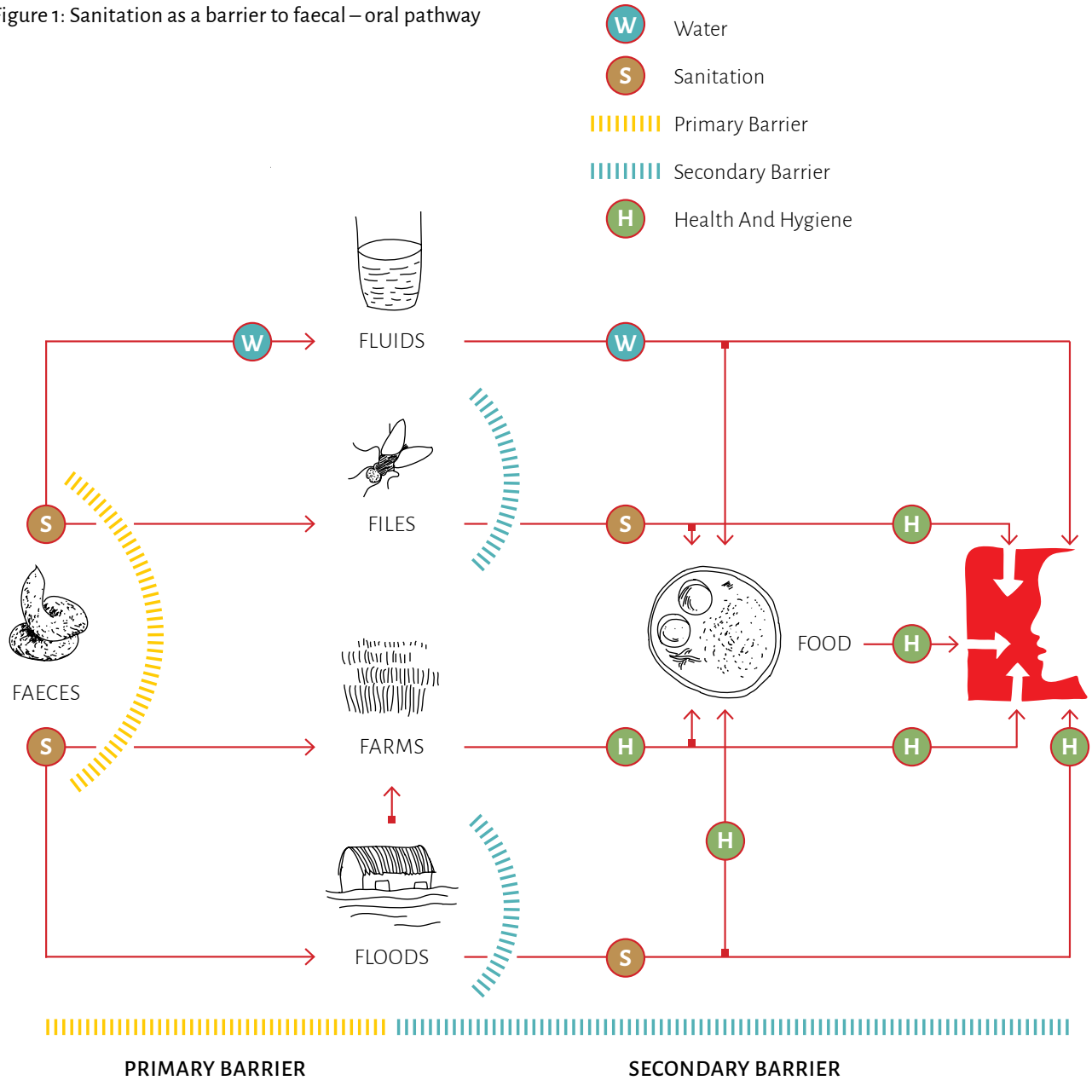
Table 1 : India's performance on Millennium Development Goals (MDGs) : drinking water and sanitation

(%)

		Year 1990 Actual/ Est. value	Latest status (2012)	MDG target 2015	Likely achievement 2015
Households with sustainable access to an improved water source	Urban	87	95	94	98
	Rural	59	89	79	96
Households without access to sanitation	Urban	24	9	14	11
	Rural	87	59	47	61

Source :MOSPI 2015

Figure 1: Sanitation as a barrier to faecal – oral pathway



Source: Adopted from WEDC 1982

Poor sanitation continues to have a significant impact on the country as a whole. The faecal – oral chain, as expressed in Figure 1 continues to contribute to significant morbidity and mortality in India. Sanitation as a barrier for the faecal – oral chain has an important human development role. Various researchers and field studies continue to produce evidence of the linkages between poor sanitation and adverse health through diseases such as diarrhoea, typhoid and malaria. In 2014 alone, there were 600 million adult cases, and 300 million cases of diarrhoea in children under 5 years of age in India; Of the latter, 300,000 deaths were reported in2014 alone (RGI, 2014). The correlation between open defecation and stunting in children, implying the prevalence of malnutrition caused by the inability to absorb and retain nutrients (with its permanent adverse impact on the mental development of children), is being increasingly emphasised in research and literature.

A number of sanitation studies have tried to broadly establish and estimate the linkages between sanitation and economic indicators at the household, community and national levels. A widely quoted study estimating the economic impact of inadequate sanitation in India (WSP 2008), had found that the total economic impacts of inadequate sanitation in India amounted to Rs. 2.44 trillion in 2006, which was the equivalent of 6.4 percent of India's GDP at the time. This set out the per person annual impact at Rs. 2,180 due to poor sanitation.

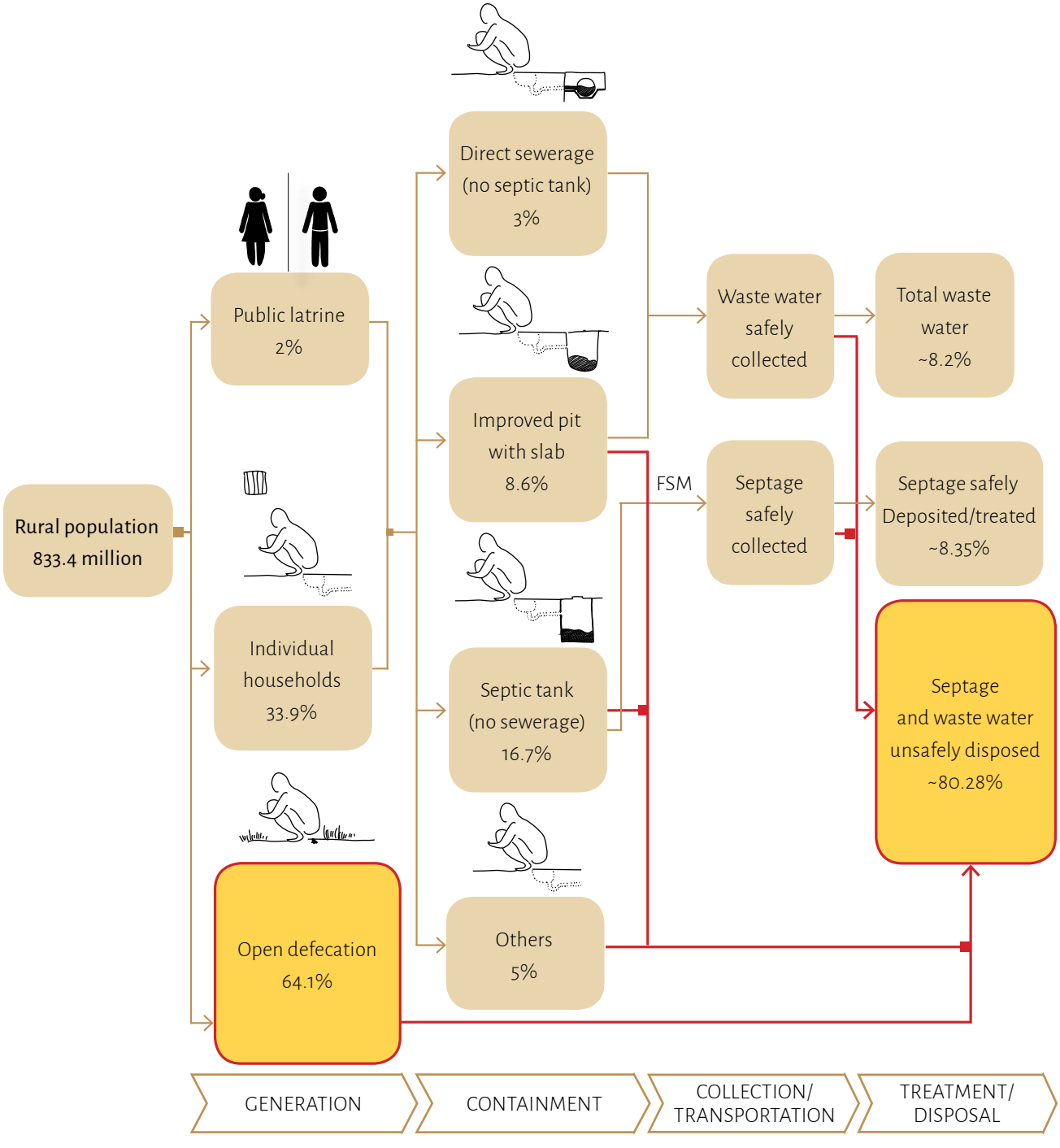
1.1.1 *Sanitation in rural areas in India*

As per the Census of India, 2011, the rural population was 833.4 million (up from 743 million in 2001), making the rural population of India 68.9 percent of its total population. In 2011, there were 167.82 million households (HHs) living in rural areas. In 2011, as per the Census 113 million rural households did not have access to toilets and were defecating in the open, and 3.25 million rural households used public or community latrines. However, even in the households which had access to toilets, only some were using improved pits or septic tanks for storage and treatment of the waste. While in some areas composting takes place, there is increasing evidence that a majority of these improved on-site systems are not backed up by, and nor do they have access to improved pit or septic tank evacuation and conveyance systems, which could lead to environmental contamination. There is no data from the Census on waste management facilities and arrangements and the sector relies on anecdotal and often dated information. This needs to be corrected so that planning for the solid and liquid waste management sector can be improved. Please see Figure 2 for graphical explaination.

1.1.2 *Urban Sanitation*

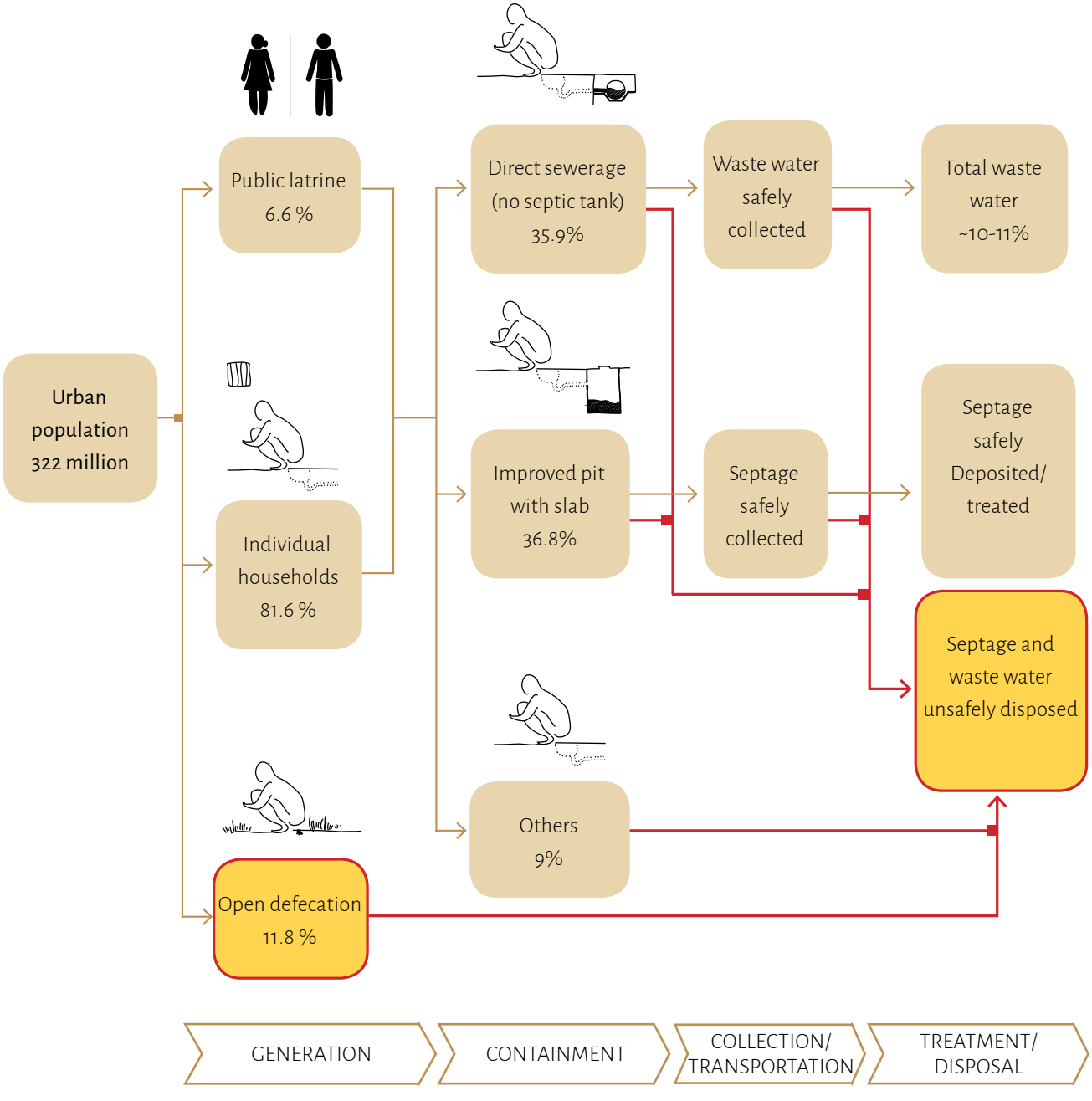
As per the Census of India, 2011, the urban population was 377 million (up from 286 million in 2001). However if the population of statutory towns alone was to be considered, and the census towns which are governed as rural areas are excluded, then the urban population in 2011 was 322 million. The statutory town's urban population of India was 31.1 percent of its total population. In 2011, there were 78.8 million households living in urban areas. In 2011, Census figures show that 9.96 million (including census towns) urban households defecated in the open, and 4.74 million urban households used public or community latrines. The status in respect to the urban poor, especially those living in slums was recorded to be even weaker.

Figure 2: Flow of human waste through the sanitation chain: Rural India 2011



Source : Author's representation, based on data from Census 2011

Figure 3: Flow of human waste through the sanitation chain: Urban India 2011



Source : Author's representation, based on data from Census 2011

In urban areas too, even in the households which had access to toilets, only 35.9 percent of the households were connected to a sewerage system, and as reported by the Central Pollution Control Board (CPCB) in 2010, the total installed capacity on Class I and Class II cities represented only 10 to 11 percent of the overall waste water generated in urban India. This implies that close to 90 percent of the waste water being discharged, is untreated and causes environment pollution thereby creating health hazards for the population. While the urban population has also been relying significantly on "on-site" septic tanks, (i.e. approximately 36.8 percent of the population), other than at waste water treatment plants there are no stand alone Faecal Sludge Treatment plants. As in the case of rural India, there is limited, and at best anecdotal data on Solid and Liquid Waste Management (SLWM) facilities which needs to be connected for better long-term planning. A number of treatment options for Municipal Solid Waste Management (MSWM) at the decentralised and the centralised level are available but many plants set up across the country do not function at the desired levels. Please see Figure 3 for graphical explaination.

1.2 THE NEW POLICY AND PROGRAMME CONTEXT

India's focus on sanitation policy has followed the trajectory of international emphasis on sanitation policy. During the International Water and Sanitation Decade (1980-90), India launched the Integrated Low-Cost Sanitation (ILCS) Scheme (1980) and the Central Rural Sanitation Programme (CRSP) (1986). Central Rural Sanitation Programme was restructured in 1996, following which, a community-led Total Sanitation Campaign (TSC) was introduced with a focus on Information, Education and Communication (IEC), human resource development, and capacity development activities to increase awareness and demand generation for sanitary facilities. The Nirmal Bharat Abhiyan (NBA) was launched in 1999 to replace the TSC. The focus here was on the principles of community-led total sanitation (CLTS) in rural areas.

Urban sanitation started receiving attention only after the Pune Declaration titled "Provision of Universal Sanitation in Urban India" in 2004. The Declaration was followed by the Water for Life Decade (2005-2015) and the International year of Sanitation in 2008. During the same decade, Jawaharlal Nehru National Urban Renewal Scheme (JNNURM) was launched in 2005 and the National Urban Sanitation Policy (NUSP) in 2008. NUSP sets out a vision where: "All Indian cities and towns become totally sanitised, healthy and livable and ensure and sustain good public health and environmental outcomes for all their citizens with a special focus on hygienic and affordable sanitation facilities for the urban poor and women" (MoUD, 2008:7).

The present central government has refocused sanitation as a national development priority. It launched Swachh Bharat Mission (SBM) with two sub-missions, the Swachh Bharat Mission (Gramin) - (SBM (G)) and

the Swachh Bharat Mission (Urban) - (SBM (U)) in October 2014, with the vision of ensuring a 'Clean India' by October 2019. Some elements of sanitation are also included in the Atal Mission for Rejuvenation and Urban Transformation (AMRUT) 2015-2019 meant for 500 larger cities. Apart from the nodal ministries of Urban Development (MoUD), Drinking Water and Sanitation (MoDWS); Health and Family Welfare (MoHFW); Human Resources Development (MoHRD); and Water Resources, River Development and Ganga Rejuvenation(MoWR) have also geared up their efforts to help improve sanitation. This strong focus has repeatedly been emphasised, prioritised, and driven by the Prime Minister in a number of important public speeches.

It must however be kept in mind that the Swachh Bharat Mission, is only one of the instruments being used to improve sanitation. The articulation that sanitation should be connected to public health is an important and powerful one, as it also connects directly to all citizens and brings the health outcome to the fore. This emphasis is also important as it articulates the fact that if toilets and sanitation infrastructure alone are provided, it will not be enough to reach the desired outcome. The outcome of improved public health through sanitation, will require that all build, use and maintain these facilities consistently. The Prime Minister's emphasis on SBM as a people's movement, and the fact that it's outcome can not be achieved by government functionaries alone, also point to the role of stakeholders beyond government alone, especially the residents at large to meet this vision.

1.2.1 *Swachh Bharat Mission (Urban) - SBM (U)*

SBM (U) covers 4,041 statutory towns. At present 26.6 percent of the population lives in Statutory towns (STs); out of this close to 8 million households (HH) do not have access to toilets (Census, 2011). The overall target of the mission is to construct 1.04 crore units of individual household toilets, 5.08 lakh units of community and public toilets in urban areas (MoUD, 2014 and MoDWS, 2014).

To improve citizen's access to sanitation, seven key mission objectives have been identified. They are: (1) elimination of open defecation; (2) eradication of manual scavenging; (3) modern and scientific municipal solid waste management; (4) to effect behavioural change regarding healthy sanitation practices; (5) generate awareness about sanitation and its linkage with public health; (6) capacity augmentation for urban local bodies (ULBs); and (7) to create an enabling environment for private sector participation in CAPEX (capital expenditure) and OPEX (operation and maintenance).

The Government of India (GoI) estimated the cost of implementation of SBM (U) to be Rs. 62,009 crore. Out of this GoI will fund Rs 14,623 crore and the States or ULBs shall contribute another Rs 4,874 crore for the mission. The balance fund are to be generated through other sources in the form of

beneficiary contribution, user charges, corporate social responsibility (CSR) funds, and private sector participation, to name a few (MoUD, 2014).

There are six key components of SBM (U). They are, provision of (1) household toilets; (2) community toilets; (3) public toilets; (4) solid waste management (SWM); (5) information education and communication (IEC) and public awareness; and (6) capacity building, administrative and office expense (A&OE) (MoUD, 2014).

SBM aims to ensure that no household engages in the practice of open defecation by targeting 80 percent of urban households practicing open defecation for the construction of individual household latrines (IHHL), and for the remaining 20 percent of the households, community toilets are constructed to meet their needs due to constraints of space. Another key focus of the mission is to convert all insanitary latrines into sanitary latrines. The beneficiaries for both components – construction of household and community toilets-are identified by the Urban Local Bodies (ULBs) based on an application or a survey. The central government provides support of Rs 4,000 for the construction of individual household toilets in the urban areas. The payment for this construction is to be released in two installments.

ULBs are encouraged to engage with the private sector through a Public -Private-Partnership (PPP) agreement to construct and manage public toilets the for floating population. All public toilets constructed under SBM (U) must have a minimum 5-year maintenance contract. This is to ensure proper operation of the facilities.

SBM (U) receives 15 percent of the funding for IEC to trigger behaviour change and generate demand for sanitation. IEC plays a vital role in the promotion of the importance of sanitation and hygiene by highlighting its linkages with public health.

Additionally, the aim is to achieve 100 percent collection, transportation, processing and disposal of solid waste in 4,041 cities and towns in tandem with Municipal Solid Waste Management and Handling Rules 2000, which are revised time to time. MSWM is a key component of SBM (U) wherein 80 percent of the urban population is targeted to be covered.

1.2.2 *Swachh Bharat Mission (Gramin) - SBM (G)*

The Nirmal Bharat Abhiyan (NBA), which focused on the acceleration of sanitation coverage has been restructured into the SBM (G) with an aim to create *swachh* villages in order to meet the 5 set objectives of: (a) Improving quality of life in the rural areas, by promoting cleanliness, hygiene and elimination of open defecation; (b) accelerate sanitation coverage in rural areas; (c) motivate communities and Panchayati Raj Institutions (PRIs) to adopt sustainable sanitation practices and facilities through awareness creation and health education; (d) encourage cost effective and

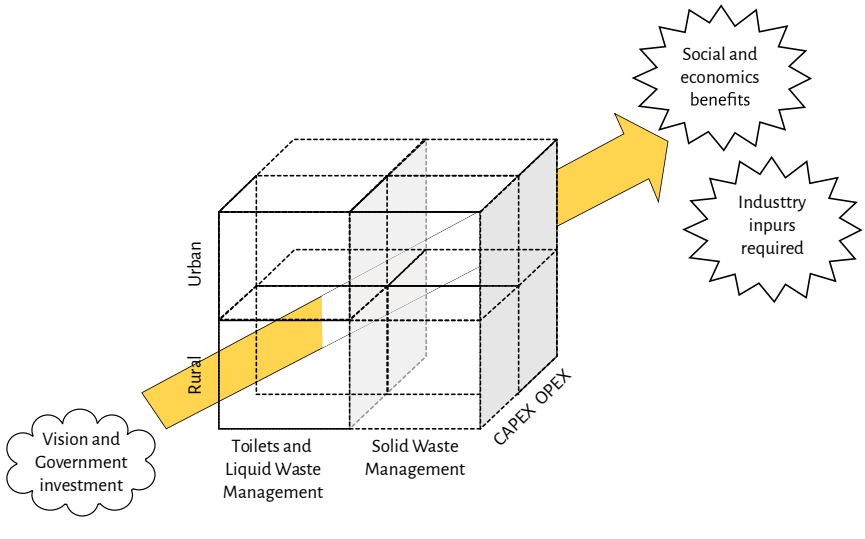
appropriate technologies for ecologically-safe and sustainable sanitation; and (e) develop where required, community-managed sanitation systems focusing on scientific SLWM systems for overall cleanliness in rural areas.

The mission has identified key components to remove blockages in the path of achieving accelerated sanitation coverage. The components of SBM (G) include: (1) start-up activities; (2) IEC activities; (3) capacity building; (4) construction of IHHL; (5) availability of sanitation material-through rural sanitary mart, production centres, and SHGs; (6) provision of revolving fund in the district; (7) micro financing of construction of toilets; (8) community sanitary complex; (9) equity and inclusion; (10) SLWM; and (11) administrative charge. The central government provides a support of Rs. 12,000 for the construction of IHHL, the payment for this is given to the beneficiary in installments.

1.3 ESTIMATING COSTS AND FUNDING REQUIREMENTS FOR BUILDING AND MAINTAINING A SWACHH BHARAT

This section of the report describes and presents the results of an overall model which has been developed to answer a few basic questions about the Swachh Bharat objective of the government. Some of this are – what is the overall estimated capital cost requirement for Swachh Bharat in urban and rural areas? What are the associated operating costs for the assets and infrastructure created through this expected capital investments? What are the various sources of funding possible the capital and operations costs? Which sectors of the industry would see most impact due to the implementation of Swachh Bharat objective? How much would this impact be in terms of current volumes in each of these business? What could be the levels of estimated impact on socio- economic and public health outcomes of the society as a whole? The Swachh Bharat objective as discussed in the earlier section is driven through two flagship programs

Figure 4: Graphic representation of the scope and purpose of the cost and financing estimation exercise



Source: Authors' representation

being run simultaneously by the Ministry of Drinking Water and Sanitation and the Ministry of Urban Development. Other than this there are a number of other programs run by different Ministries at the national level that are also expected to contribute to the Swachh Bharat objective such as the Atal Mission for Rejuvenation and Urban Transformation (AMRUT) run by the MoUD, schemes of the Ministry of Health and Family Welfare, schemes of the Ministry of Water Resources, River Development and Ganga Rejuvenation among others. Most of these programs however focus only on the capital cost requirements. Given this scenario this report is the first attempt to develop an integrated overall cost estimate for the objective of a Swachh Bharat objective. In developing and discussing this model questions about which agencies should be empowered to ensure proper operations? What will emerge as the role and extent of interventions from state governments, local governments and the private sector naturally arise, and are leading questions which need to be discussed, debated and defined as we move forward towards the objective of a Swachh Bharat. The estimation exercise is based on a number of assumptions. Firstly it assumes that the resources, institutions and demand for the Swachh Bharat objective is or will be in place soon. It bases itself on real costs (not those assumed in the SBM guidelines) as provided by technical experts at current prices. The estimated numbers are in 2015-16 prices. The technical systems are seen as integrated between urban and rural areas as far as possible. It relies on existing studies on both industry size in affected sectors as well in estimating the socio-economic and public health impacts. The detailed assumptions are placed in Table 18.

1.3.1 *Methodology*

As discussed in the earlier section SBM is a massive universal programme that spans more than 4,000 cities and nearly 6,00,000 Gram Panchayats (GPs) with an emphasis on construction and use of toilets, and improvement of SWM systems.

Table 2: Methodology adopted for the estimation excercise

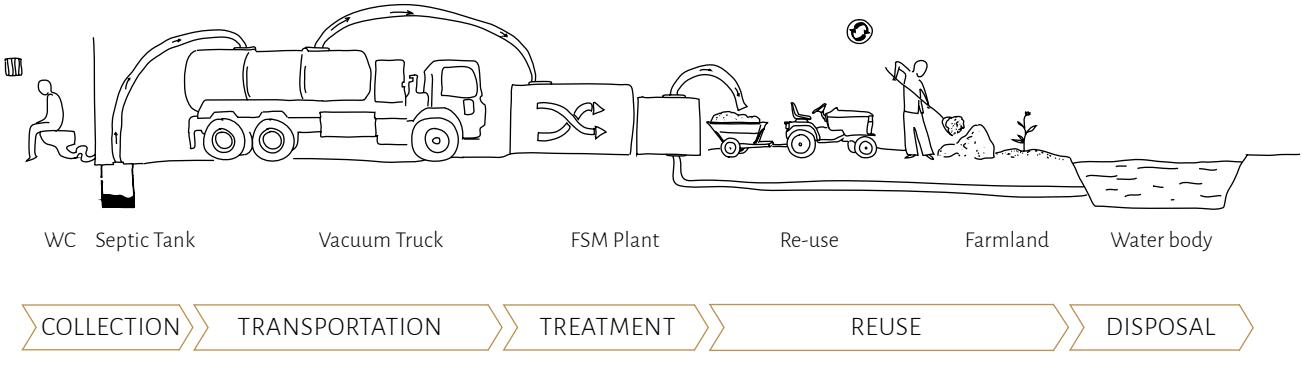
	Infrastructure Estimation	Investments	Financing Options and stakeholder engagement	Industry Linkages
ELEMENTS	Population Projections	Capital Investments	Contributions from GoI, State Governments, local bodies, households, private sector, including CSR	Impact on construction industry & building materials
		OPEX		Manpower
	Quality Assessments	Value chain elements not explicitly covered under SBM		GDP Contribution
				Enabling Mechanism
PREMISE AND ASSUMPTIONS	Decadal growth trend disaggregated to urban, rural and household	Unit rates as per prevalent market rates	GoI & state contributions as per SBM (Urban) and SBM (Gramin) provisions	Unit quarterly estimations based on typology chosen
	Targets in line with SBM (Urban) and SBM (Gramin)	Manpower, operations and maintenance costs at current prices	Unit values as per estimations	Market demand based on secondary sources
	Typology of sanitation and MSW systems assumed as prevalent currently			

The underlying the estimation of costs and funding requirements in this report is a robust methodology, which is based on developing projections on base numbers as documented in the Census in the year 2011. Unit costs of various components including, toilets, sewerage systems, faecal sludge treatment systems, vacuum trucks, solid waste collection bins, compactor trucks, decentralised and centralised composting facilities, waste to energy facilities and scientific landfills among other pieces of infrastructure were taken into consideration, after consultation with industry experts. Based on Census data for 2001 and 2011, and after interactions with planners, a mix of systems and models for service delivery were arrived at to estimate the costs and financing requirements. Table 2 captures the outline of the methodology and sources of data points used in to build the base financial model developed for making a Swachh and Clean India which contributes towards improved public health of the population.

1.3.2 *Elements of the Sanitation and Liquid Waste Management Chain*

Low access and use of safe toilets is a primary outcome of the efforts of SBM. Alongside this, the programme and associated programmes as mentioned in an earlier section also recognize that many households in India having access to toilets are not served by safe conveyance, treatment and disposal systems. The estimation of costs takes the full value chain into consideration in terms of collection, transportation, treatment, reuse and disposal, as shown in Figure 5.

Figure 5: Elements of the Sanitation and Liquid Waste Management Chain



Source: Authors' representation

To address the consequences of poor sanitation on human health and environment, two key infrastructure elements need to be managed well. Firstly, providing the right toilet solution and user interface and secondly treating and disposing off the liquid waste and faecal sludge in a scientific manner; both of which are addressed under the SBM in rural areas and the associated programmes for urban areas. Solutions conceived need to be holistic and systemic, combining technology with institutional arrangements for service delivery, and that promote behavioural change to eliminate open defecation.

1.3.2.1 *Toilets*

The elements of toilets are essentially individual and community toilets in urban areas, institutional toilets in rural areas, and public toilets in urban areas. The calculations appreciate and take into account the fact that while SBM (G) emphasises the creation of institutional toilets (schools, and anganwadi centers) in addition to individual household latrinesi, SBM (U) focuses on conversion of insanitary toilets and creation of additional toilet facilities for households, communities and floating population, who do not have adequate access.

Chart 2: Toilets as per categories in rural and urban areas that require to be built

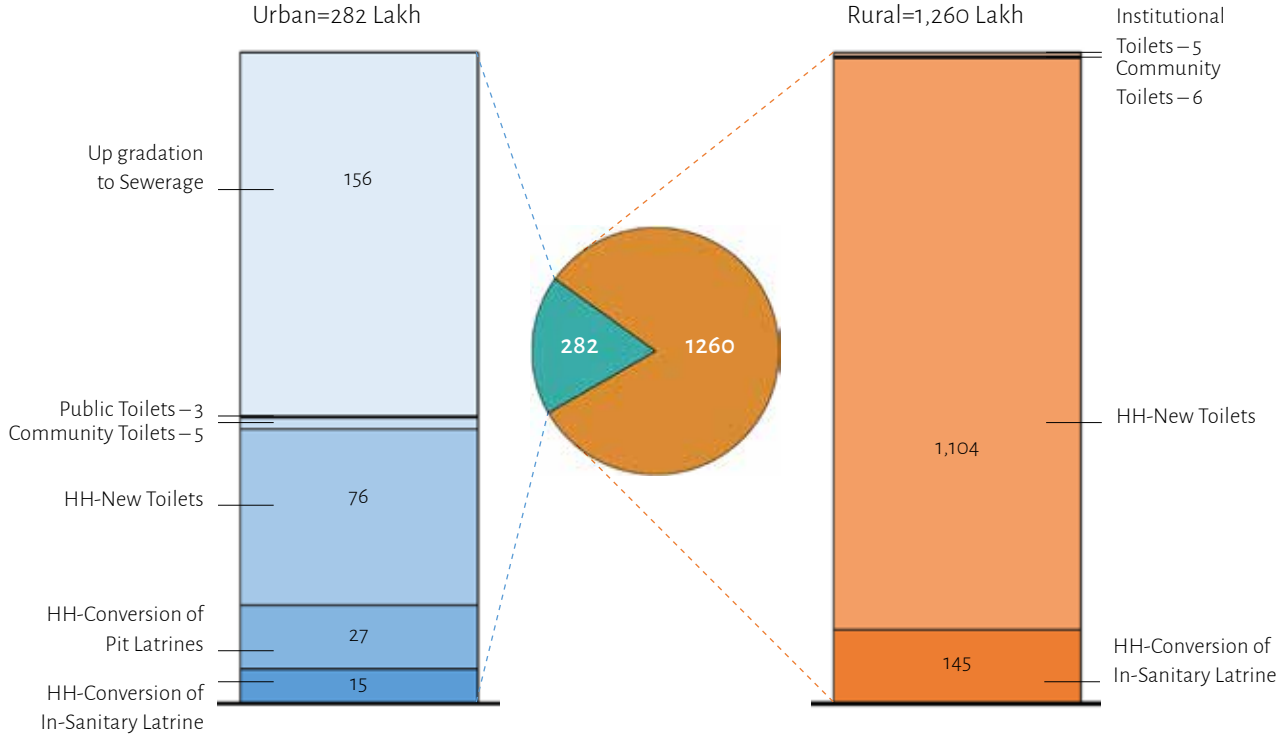


Table 3: Toilet Categorization by disposal system

Types of Toilets in urban and rural areas	SBM								Additional	TOTAL
	Household Toilets			Community Toilets/ Community Sanitary Complexes		Public Toilets		Institutional Toilets	HH Toilets upgraded to sewerage in top 300 towns [i]	
	Septic Tanks	Sewerage	Pit Latrines	Septic Tanks	Sewerage	Septic Tanks	Sewerage	Septic Tanks	Sewerage	
Urban	59,34,389	59,34,389	–	2,92,754	2,30,021	17,645	13,864	–	1,56,66,877	**2,80,89,939**
Rural	6,12,22,032	1,12,44,863	5,24,76,027	5,93,731	–	–	–	4,64,304	–	**12,60,00,957**
Total	6,71,56,421	1,71,79,252	5,24,76,027	8,86,485	2,30,021	17,645	13,864	4,64,304	1,56,66,877	**15,40,90,896**

[i] Households who has septic tank will be converted into sewerage network system and not forming part of open defecation households

Source: Authors' estimates

The programme expects to address upto 80 percent of urban open defecation through the construction of new household toilets. In addition, current insanitary toilets, and 60 percent of pit latrines are proposed to be converted into sanitary toilets. The rate at which households or population is growing year-on-year, has a significant bearing on the number of toilets to be constructed during the mission period and consequently on the cost of the entire programme. The sheer number of individual toilets to be constructed has an implication on type of structures and the ability to find space within the premises, and therefore the cost of the effort. Construction of individual toilets is the largest component of the Mission with only 1 percent of toilets being constructed as community toilets, Community Sanitation Complexes (CSCs) or public toilets. However, the latter provides opportunities for private sector and local stakeholder engagement for improved sanitation services.

Community toilets and CSCs are proposed for the population that is not covered by individual toilets, in urbanii and rural areasiii respectively. Public toilets are proposed for floating population in urban areasiv. Toilets at schools, anaganwadis etc., form the institutional toilets in rural areasv. Toilets also need to be upgraded where sewerage systems are proposed in major urban cities, although these are not explicitly supported under SBM. Community, institutional and public toilet management, so far, is reportedly unsatisfactory because of poor construction, improper drainage of wastewater from the toilet block, and lack of caretaker facilities, among other reasons. The responsibility for operations and maintenance (O&M) activities is not anchored among the community stakeholders and is a matter of contention particularly across shared and community toilets. Chart 2 and Table 3 show different categories of toilets that will be required.

1.3.2.2 *Liquid Waste Management including Septage Management*

Treatment and disposal of faecal matter is crucial from the point of view of health and hygiene. Ideally, entire wastewater (grey water from bathrooms and black water from toilets) need to be collected, treated, reused or disposed in an environmentally friendly manner. However, most local bodies do not have the financial resources required to develop the complete chain of sanitation management. These essential elements need to be addressed incrementally for achieving sanitation objectives.
Given the nature of urban renewal programmes that are being configured, It has been assumed that 300 large cities would have sewerage based systems and the treatment of FSM will be undertaken at the STP. In the rest of the cities a combinationof FSM and sewerage systems would be developed in equal proportion. This has been assumed giving priority to state government policies but incorporating the reality that in smaller cities sewerage may be an unviable proposition especially when compared to FSM systems. Many experts including the authors however would like to back the greater penetration of FSM systems in urban areas but have relied on stated state policies to adopt this approach at the current time

as FSM systems are yet to be generally accepted in India as a sold option to sewerage. It is assumed here, that faecal sludge from rural areas would be treated and disposed at the nearest urban centre. Accordingly the components that would emerge include transportation trucks (vacuum cleaners), FSM plants with drying yards and sewerage treatment plants (STPs) that are connected to the piped sewer networks.

The potential demand for FSM services depends on septic tank, pit sizes, and their filling times. Septic tanks based on their design capacities, require de-sludging or emptying once in 2 – 3 years. An estimated 13,705 vacuum trucks would be required for providing pit emptying services to households. Depending on the size of the city, the number of trucks required would vary. For instance, a city with about a lakh population and assuming a 70 percent coverage of septic tanks or pit latrines, would require at least 2 vacuum trucks. In a larger metropolitan city, like Bengaluru for example, with a similar percentage of septic tanks, more than 300 trucks are currently estimated to be operating. Estimates of numbers of vacuum trucks required are in Table 4.

Table 4: Vacuum or De-sludging equipment estimate

Item	No. of Septic tanks	No. of vacuum trucks required
Urban	6,244,788	1,249
Rural	62,280,066	12,456
TOTAL	**68,524,854**	**13,705**

Source: Authors' estimates

The responsibility for O&M of pit latrines rests with the households, who would need to ensure the pits are emptied at an appropriate time. Pit emptying and de-sludging services and safe disposal of septage at a treatment plant are undertaken by local bodies or line departments, and offers a greater opportunity for engagement of private contractors.

The land for setting up a septage or faecal sludge management plant needs to be identified by the local bodies or the relevant district authorities or could be established at existing STP or sewage treatment and disposal sites.

1.3.2.3 *Rural Sanitary Marts (RSM)*

RSMs provide an effective supply chain solution to facilitate the huge toilet construction activity envisaged in rural areas. SBM(G) encourages the establishment of RSMs close to beneficiary locations and owned or operated by Self Help Groups (SHGs), NGOs, local bodies and other entities as a commercial venture.

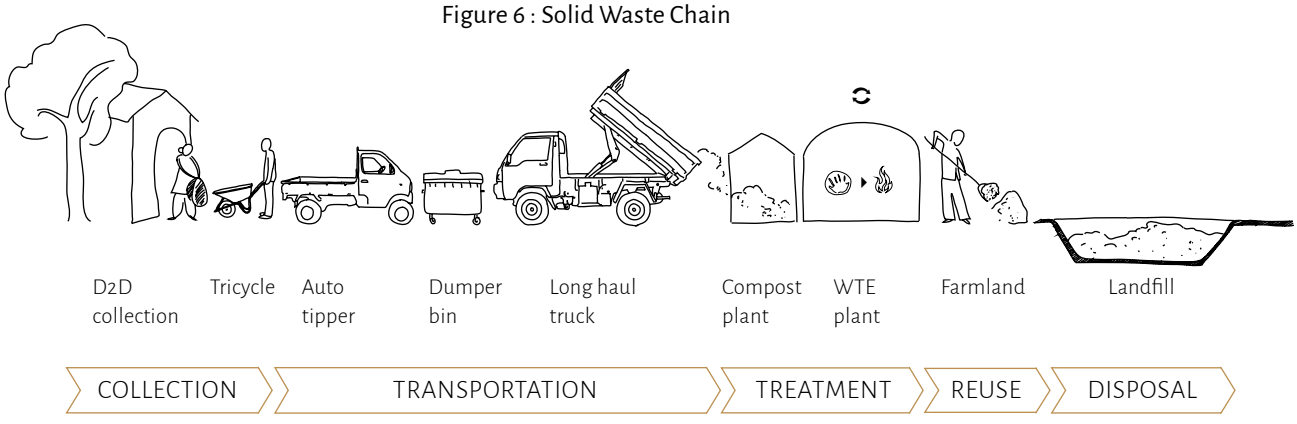
RSMs are intended to carry out a certified inventory of sanitary materials, including a variety of pans (such as ceramic or fiber glass), pipes, fittings, and certified water filters, and also provide technical designs and solutions for supporting the SBM programme.

An estimated 5,564 RSMs, one each at sub-district level is envisaged during the SBM mission period.

1.3.3 *Elements of the SWM chain*

Improving the SWM chain so that the public health benefits are archieved, requires interventions at the household level, in collection and transport of waste and in scientific treatment, reuse and disposal. The Swachh Bharat Mission for urban and rural areas are designed to try and address this challenge. Typical elements involved in creating a secure solid waste management system may be seen in Figure 6.

Figure 6 : Solid Waste Chain



Source: Authors' Representation

A multi-tiered approach (reduce, recycle and reuse) across the elements of solid waste chain has been advised over the last decade and half. Strategies that are being promoted need to take cognizance of the waste composition that has high moisture, biodegradable and inert content. See Chart 3 for composition of waste as per the CPCB. Figure 7 lays out a typical material flow for SWM chain of activities.

Chart 3: Composition of MSW in India

Source: CPCB 2010

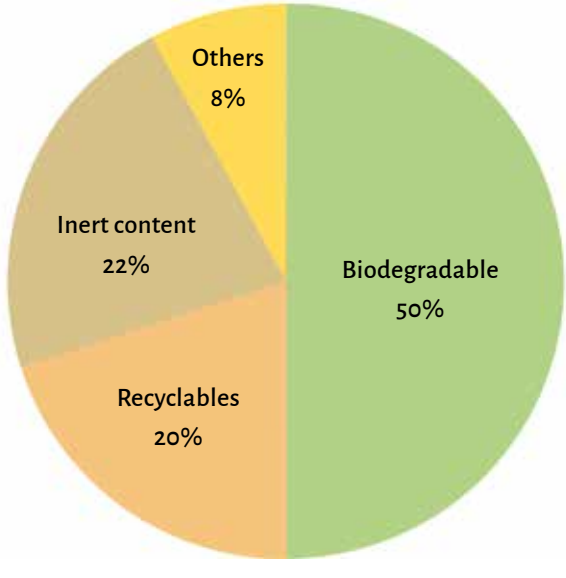


Figure 7: SWM Chain of Activities

Source: Authors' representation

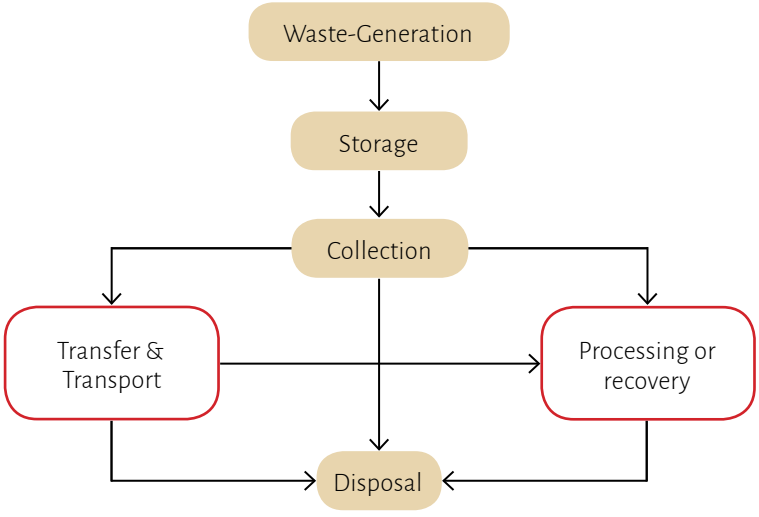
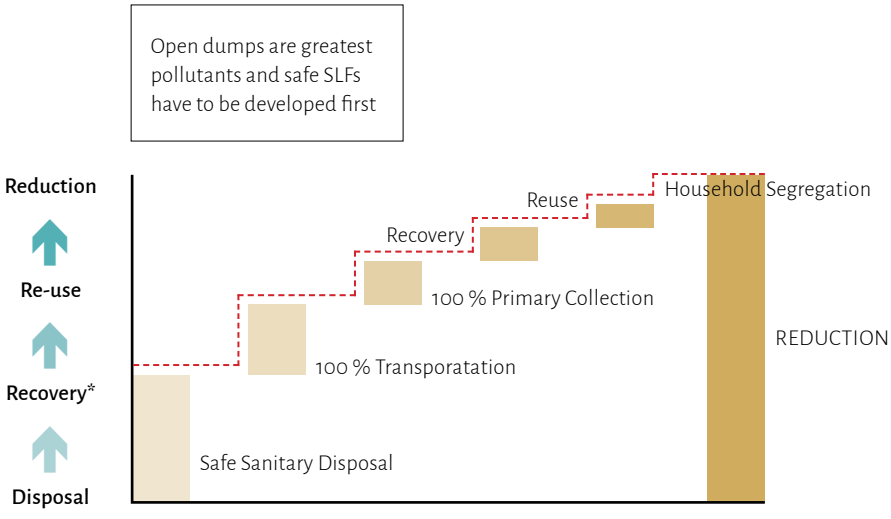


Figure 8 : Value addition from Solid Waste Management components

Source: Authors' representation



There is a significant value addition in terms of managing solid waste at the stage of treatment and disposal of waste, wherein the solid waste is scientifically controlled through landfills or other equivalent systems. The various processes of solid waste treatment are composting, vermi-composting, incineration, power-generation, fuel pelletisation and bio-methanation. These processes ensure that the waste is stabilized and made inert before it is disposed. However, an efficient collection and transportation management system is necessary for maximizing the benefits of a scientific treatment and disposal system. Therefore, the importance of a 100 percent efficient primary collection with source segregation and transportation system cannot be emphasised enough.

1.3.3.1 *Solid Waste Generation*

India's estimated generation of solid waste is of the order of 3.1 lakh Tonnes Per Day (TPD), with urban India contributing to 58 percent of the same.

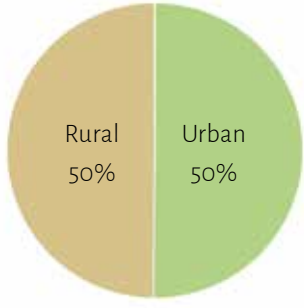
Figure 9 : Waste generation estimate

Waste Generation	TPD[iii]
Urban[i]	154265
Rural[ii]	153210
TOTAL	307475

[i] Assuming a generation of 400 gm/capita/day

[ii] Assuming a generation of 150 gm/capita/day

[iii] Tonnes per day



Source – CPR Analysis

It is estimated that urban India would generate about 436 million tons of solid waste by 2050. Indian waste generation is set to accelerate in relation to other large waste generating nations.

Table 5 : Waste generation: International comparison

Country	2012		Projected for 2025	
	Per capita	Waste Generated (TPD)	Per capita	Waste Generated (TPD)
India	0.34	1,09,589	0.7	376,639
China	1.02	5,20,548	1.7	13,97,755
US	2.58	6,24,700	2.3	7,01,709
Brazil	1.03	1,49,096	1.6	3,30,960

Source: What a Waste: A Global Review of Solid Waste Management: World Bank, 2012

The increasing scale of generation would have its own complexities in terms of appropriate technology adoption, governance and institutional structures. In the case of SWM, there would be an added challenge of managing a large manpower spread across various locations. The sector has been regulated by the MSWM Rules (2000). A new regulatory framework will soon be put out, although the compliance with the existing rules has not been very encouraging. Constraints imposed by regulatory bodies are only expected to be more stringent, hurdles of scientifically managing solid waste increases manifold.

1.3.3.2 *Collection and Transportation*

MSW collection ranges from 70 to 90 percent in major metro cities and is lower than 50 percent in smaller citiesix. The equipment required for collection, transportation treatment and disposal activities in urban areas is the most significant capital cost of the MSW system and varies by the

size of the city. It is assumed that a combination of tri-cycles and auto-tippers would be used to serve half the population each along with long haul vehicles (large capacity vehicles which are used for transportation over large distances) and compactorsx. Estimated equipment requirement is set out in Table 6.

Table 6: Equipment requirements for solid waste management till 2019 in India

Equipment	Numbers
Tri-cycles	2,97,578
Auto Tippers	53,993
Bins	1,54,742
Refuse Compactors or vehicles	2,045
Street Sweeping Equipment	18,18,352

Source: Authors' Estimates

Collection and transportation activities are manpower and logistic intensive. Bangalore employs about 18,000 pourakarmikas, while Varanasi has about 2,800 street sweepers. Litter free urban areas require a significant behavioural change from all stakeholders – residents, floating population, and other users. In addition to providing infrastructure, it is essential that a large scale behavioural change programme be undertaken to create awareness for segregation of waste by households, and limit littering on the streets.

1.3.3.3 *Treatment*

Composting is the most predominant form of treatment adopted in Indian cities. Over the last two decades, multiple efforts have been made to develop Waste-to-Energy (WTE) plants with limited success. Only a couple of plants are operational, with most others shut down as revenue models have not been sustainably established. While efforts for WTE to be commercially viable are undertaken, composting will remain the mainstay for solid waste treatment.

Solid waste that needs to be composted in urban India is estimated to be about 1.0 lakh TPD by 2019.

- Compost as a product competes with fertilisers, although technically it's characteristic is that of a soil enricher.
- The quality of input for the manufacture of compost, i.e. solid waste, is typically uncontrolled, and is a major concern due to the possible presence of hazardous content. Additionally, the quality of output is not consistent. There have been efforts to test and categorise compost by a few manufacturers.
- As the product is of low value, transporting it over longer distances (typically more than 200 kms), without adequate scale becomes uneconomical.
- Large scale production of compost (say more than 100 TPD) at a single place is practiced only in a few cities and is limited in number.

- Pure household waste compost plants are limited in number in other countries as well; typically they are set up as green or garden waste.
- Efforts of GoI to encourage compost usage along with fertilizer sales are positive and are expected to continue in the future.

It is estimated that about 10 WTE plants could be developed by 2019, with an aggregate capacity of 10,000 TPD.

- Tariff required for a financially free standing WTE plant is about Rs.12 KWh. Central Electricity Regulatory Commission (CERC) has indicated a tariff of Rs. 6.82 to Rs. 7.88 for FY 2016xi.
- There is a need for strict environment pollution controls, due to high dust and ash content.

1.3.3.4 *Disposal*

Landfilling is the prescribed mode of disposal as per MSW Rules (2000). However, most ULBs do not have adequate scientifically developed facilities.

- As per the MSW Rules, only inert waste can be dumped in landfills.
- Landfill capacity required by 2019 is estimated to be of the order of 42,000 TPD (of inert waste).
- In addition, capping requirements may exist for about 15 landfill sites across the country.

1.3.3.5 *Solid waste management in rural areas*

In rural areas, solid waste is still not considered a very large management problem requiring high investment or technology solutions. While it is estimated that about 150 gm per capita is generated, organic content comprises 100 gm, with only about 50 gm inorganic matter needing to be managed with resources from outside the village. Most of the waste generated is organic or bio-degradable in nature, and is either fed to animals or composted. Door-to-door collection is not usually practiced. Recyclables and inert waste which requires treatment and disposal is generated in very small quantities. It is assumed, based on some cases, that the inert and inorganic waste material will be stored at village or GP level and transported to the facility near the closest urban centre periodically, for safe reuse and disposal.

1.3.4 *Summary of estimates of Capital Cost and Operations and Maintenance costs for Swachh India*

SBM and the additional elements required for the sanitation will need government (at the national level, state level and city level) to develop a series of sub-projects, ranging from construction of IHHL to developing

city-wide sewerage systems or WTE plants. In line with the Mission's goals, capital investments for creating these assets have been assumed to be made over the period ending 2019, while OPEX for these assets have been estimated for a further 10 years. Post infrastructure creation, investments for development or rehabilitation of various components of sanitation and solid waste management have been estimated, based on physical quantities assessed as described earlier and based on unit costs reflecting prevailing market prices.

1.3.4.1 *Sanitation and Liquid Waste Management Chain Capital Investment Requirements*

The financial model created shows that the overall, investments in toilets and liquid waste management chain amounts to Rs. 3.2 lakh crore, for period ending 2019 across rural and urban areas.

- Capital Investments in rural India amount to 78 percent of the total investments required for creating and upgrading toilets for all, and in associated liquid waste management investments.
- Components directly stated in SBM, amount to about 84 percent or Rs. 2.7 lakh crore.
- Investments as envisaged under SBM (U) comprise 45 percent of total investments in required in urban India, while nearly 99 percent of investments required in rural India relate to SBM (G) provisions. There are other urban schemes such as the AMRUT and the plans around rejuvenation of the national rivers which also address some requirements for capital investment in focused urban areas.

Most of the faecal sludge treatment and disposal systems are expected to be located in or near urban areas, while transportation vehicles are expected to be of much larger proportion in rural India, as shown in Table 7.

- Toilets construction, across all categories, is the single largest component in the sanitation chain comprising 94 percent of total capital investments.
- Estimated total in-house latrines comprise 85 percent of the total toilet investment requirement.
- Community toilets, CSCs, public toilets and institutional toilets account for approximately Rs. 45,000 crore, which is about 15 percent of total toilet investments.
- Transportation and treatment systems comprises Rs. 21,300 crore, which is 7 percent of total capital investment required.
- Public toilets (Rs. 315 crore), FSM plants (Rs. 193 crore) and RSMs (Rs. 56 crore), account for a very small share of total investments, and have a large significant in getting private sector finances and operational challenges.

Table 7 : Capital Investment requirements for Swachh Bharat and Clean India

Rs. Crore

Capital Investment Requirements - Sanitation				Urban	Rural	TOTAL
SBM	Toilets	Household Latrines	Conversion of Insanitary Toilets	4,500	21,717	26,217
			Conversion of Pit Latrines	8,302		8,302
			New Toilets	22,804	165,698	188,502
		Community Toilets or Community Sanitary Complexes		5,228	35,624	40,852
		Public Toilets		315		315
		Institutional Toilets			3,482	3,482
		TOTAL		41,149	226,521	267,670
	Rural Sanitary Marts				56	56
	TOTAL CAPITAL INVESTMENT FOR SBM			41,149	226,577	267,725
Additional	HH Toilets upgraded to sewerage in top 300 towns			31,334		31,334
	Vacuum Trucks for desludging of Septic Tanks or Pits			250	2,491	2,741
	Liquid Waste Mgmt	STP		18,361		18,361
		FSM		193		193
	TOTAL CAPITAL INVESTMENT FOR ADDITIONAL FACILITIES			50,138	2,491	52,629
TOTAL CAPITAL INVESTMENT (SBM + ADDITIONAL)				**91,287**	**229,068**	**320,354**

Source: Authors' estimates

1.3.4.2 *Sanitation and Liquid Waste Management Chain Operation and Maintenance Cost Requirements*

Investments for O&M for a period of ten years post asset creation, excluding the O&M of individual toilets, is estimated to be of the order of Rs. 3.7 lakh crore. Table 8 shows the O&M costs required upto the year 2024.

Table 8 : Ten year operation and maintenance costs for new public assets created upto 2019

Rs. Crore

	Community Toilets or Community Sanitary Complexes	Public or Institutional Toilets	Desludging of Septic Tanks or Pits	FSM or sewerage	Total O & M Estimate
Urban	101,941	6,144	6,914	11,116	126,115
Rural	115,778	90,539	33,929	-	240,246
TOTAL	217,719	96,683	40,844	11,116	366,362

Source: Authors' Estimates

As is evident from Table 8, rural India is estimated to absorb two-thirds of the total O&M requirements over the next ten years. Community facilities such as in community toilets account for more than 80 percent of O&M expenses (Rs. 1 lakh crore) over the next 10 years. CSCs account for 48 percent of O&M expenditure in rural areas.

- Maintenance of public toilets (Rs. 6,144 crore) is nearly twenty times more than the capital investments required (Rs. 315 crore).
- For institutional toilets in rural India, more than Rs. 90,000 crore is required over ten years in comparison to about Rs. 3500 crore. of capital investment for public toilets.
- The cost of maintaining the community toiletsor CSCsor public toilets is more than 5 times their cost of construction.
- Similarly, while the share of vacuum trucks for de-sludging septic tanks or pits (Rs. 2,741 crore) is only 1 percent of the total investment estimates, the share in O&M (Rs. 40,844 crore) is estimated to be around 11 percent.
- There is an opportunity for the private sector in the maintenance of community toilets or public toilets in urban areas. In rural areas, the significant opportunity is in desludging of septic tanks at the household level.
- Structuring of operating and business models and policy initiatives to enable such initiatives would be crucial for successful achievement of sanitation objectives.

1.3.4.3 *Solid Waste Management Chain capital investment requirements for achieving a Swachh Bharat and Clean India*

Solid waste management has been a widely studied sector with a number of reports including the High Powered Expert Committee Report on Urban Infrastructure and Services (HPEC)xii presenting a detailed estimation as part of the overall urban infrastructure financing needs. It must be noted here that the base data in this sector remains perforce sketchy with the Census reporting on solid waste management, and the characterisation studies of SWM being very localized and dated. However, the report has attempted to establish CAPEX requirements for a five-year period, and corresponding OPEX for a period of ten years to assess the share in overall sanitation requirements as in Table 9.

- Nearly Rs. 23,000 crore is required for providing capital investments for the SWM sector over a five-year period.
- Out of this capital investment for SWM in urban India till 2019 is estimated to be just under Rs. 20,000 crore.
- Investments in rural India relate to developing facilities to collect, store and transport inorganic material.
- Collection and transportation investments comprise 37 percent, while treatment and landfilling comprise 54 percent and 9 percent of the investments respectively.

Table 9 : Capital expenditure requirements for solid waste management for Swachh and Clean India till 2019

Rs. Crore

Item	Costs
A. Urban	
Tricycles	595
Auto Tippers	5,129
Bins	493
Refuse Compactors or vehicles	920
Street Sweeping	182
Composting	7,938
Waste To Energy (WTE)	2,750
Landfill	1,838
TOTAL	19,845
B. Rural	
Solid waste Management facilities	2,969
TOTAL INVESTMENT	**22,814**

Source: Authors' Estimates

1.3.4.4 *Solid Waste Management Chain Operation and Maintenance Cost Requirements*

To deliver SWM services in India over the next ten years, it is estimated that Rs. 1.36 lakh crore will be required. A high propotion of this will be towards manpower costs.

Table 10: Operation and Management expenditure requirements for solid waste management for Swachh and Clean India for 10 years

Item	
URBAN	
C and T	1,23,523
Compost	6,588
WTE	1,800
Landfill	4,578
Total – Urban	1,35,114
RURAL	47,023
O&M Total	**1,85,512**

Source: Authors' Estimates

- OPEX for the 10 year period are estimated to be nearly eight times that of the CAPEX for SWM as shown in Table 10.
- Collection and transportation activities (including for rural areas) comprise 94 percent of the O&M costs, while the share of capital costs is only about 45 percent. These are very manpower and logistic-intensive, while treatment and disposal activities are engineering-intensive.

- Most of the activities have significant scope for private sector participation under various forms of engagement due to the operating models and associated technological and management inputs involved.

1.3.4.5 *Overall Summary of estimates of Capital Cost and Operations across a Swachh rural and urban India*

The estimated costs for implementing SBM, both CAPEX (till 2019) and O&M expenses for ten years is approximately Rs. 8.93 lakh crore. Another Rs. 43,200 crore is expected to be spent on soft components such as IEC, capacity building, and administration. The summary of estimated CAPEX and OPEX for SWM have been shown in Table 11.

Table 11: Summary of estimates for CAPEX and OPEX for SWM for Swachh and Clean India for 10 years

Rs. Crore

		Sanitation and Liquid waste management	Solid Waste Management	Total
CAPEX	Total	3,20,354	22,815	3,43,169
	Urban	91,287	19,846	1,11,133
	Rural	2,29,067	2,969	2,32,036
OPEX	Total	3,66,361	1,83,512	5,49,873
	Urban	1.26,116	1,36,489	2,62,605
	Rural	2,40,246	47,023	2,87,269
TOTAL	Total	6,86,715	2,06,327	8,93,042
	Urban	2.17,402	1,56,335	3,73,737
	Rural	4,69,313	49,992	5,19,305

Source: Authors' Estimates

A few highlights that are evident from the table above are

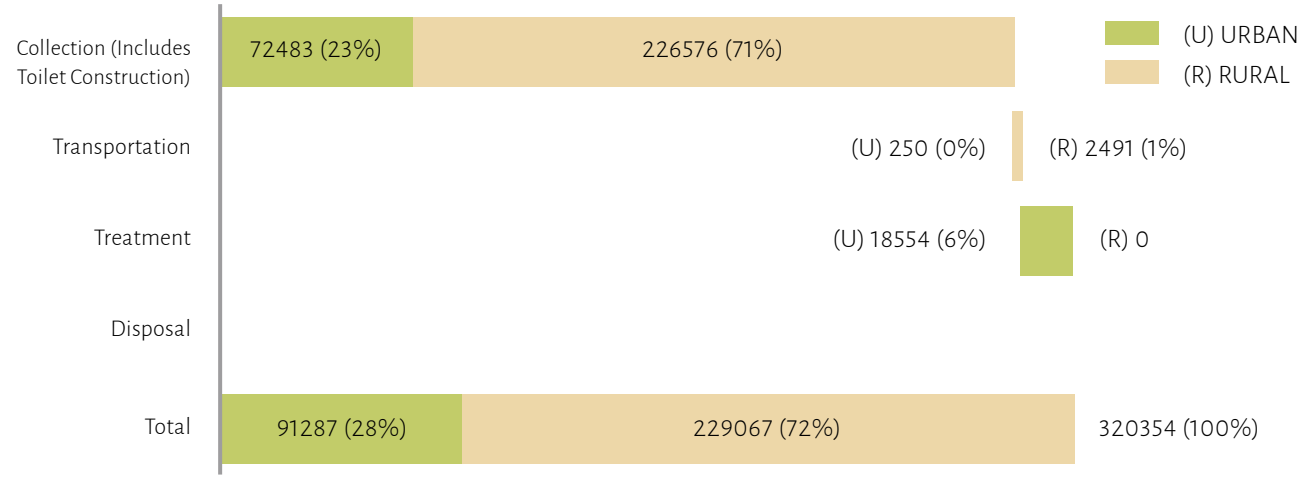
- Expenses towards sanitation are nearly 3.3 times that of MSWM.
- Urban investments are about 42 percent while those in rural India is about 58 percent.
- O&M expenses for ten years are nearly 1.6 times of capital investments till 2019

1.4 POSSIBLE FUNDING STRUCTURE FOR BUILDING AND OPERATING SWACHH INDIA

The Government of India has initiated a number of programmes to create civic infrastructure which have been articulated to leverage private monies and create markets. It is hoped that scale and sequencing of sanitation and solid waste management projects across urban and rural India will encourage industry to invest in the capacity to deliver these projects. Active efforts will be required and enable governments at the implementation level to develop innovative approaches to planning, designing and

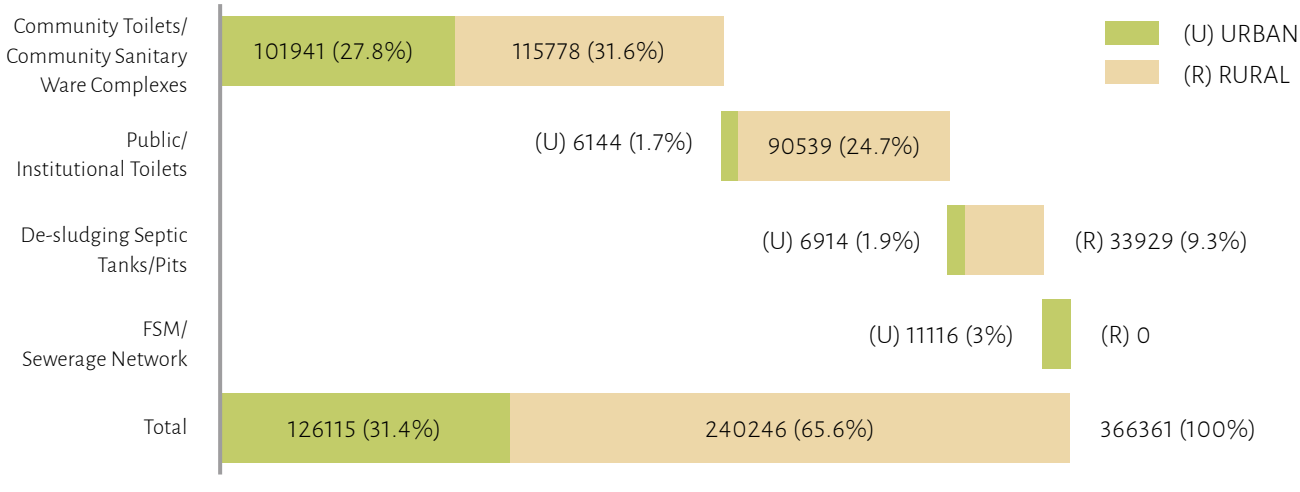
delivering projects. SBM and other schemes rightly focus on outcomes, not prescriptive solutions – this should be backed by innovative approaches to financing, given the expectations of scale. Charts 4 to 7 show the split of expendinture across capital and O&M in each part of the chain of activities.

Chart 4: Capital expenditure for sanitation and LWM for Swachh and Clean India



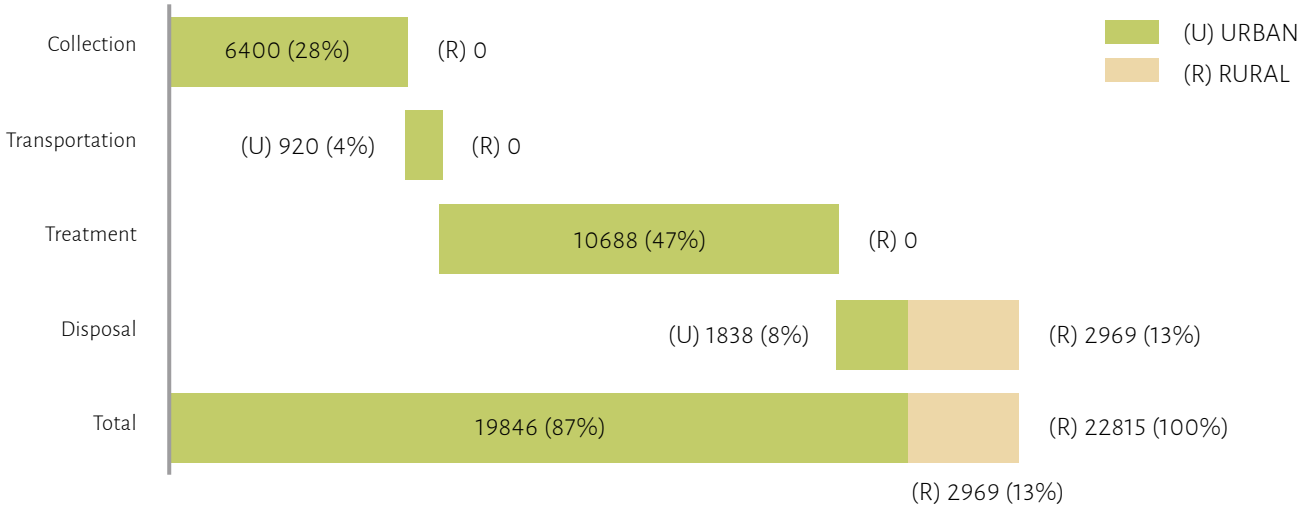
Source: Authors' Estimates

Chart 5: O&M expenditure for sanitation and LWM for Swachh and Clean India for next 10 years



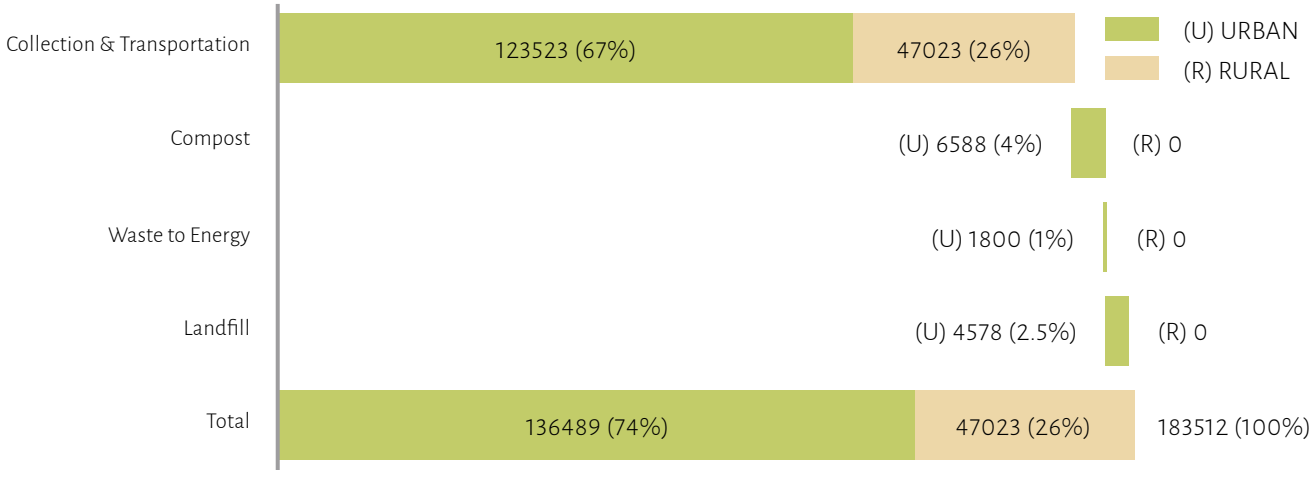
Source: Authors' Estimates

Chart 6: Capital Expenditure for SWM for Swachh and Clean India



Source: Authors' Estimates

Chart 7: O&M Expenditure for SWM for Swachh and Clean India for the next 10 years



Source: Authors' Estimates

1.4.1 *Rural Capital Expenditure – Sources*

The outlay provision in SBM (G) is about Rs. 1,34,000 crore . However, government would be required to spend at least Rs. 1,54,000 crore, as it's currently provisioned share. The difference could be sourced from other on-going programmes of the government (See Table 12).

Table 12: Possible funding structure Rural Capital Expenditure

Rs. Crore

	Investments	Sources of Finance			
Programme Components	**CAPEX**	**GoI**	**State Govt.or ULB**	**Household**	**Other Sources (CSR, private sector, etc.)**
A. Sanitation	2,29,067	1,36,609	48,518	41,045	2,895
HH toilets	1,87,414	1,12,449	37,483	37,483	–
Community Sanitary Complexes	35,624	21,374	10,687	3,562	–
Institutional Toilets	3,482	2,786	348		348
RSMs	56				56
Vacuum Trucks	2,491				2,491
B. Solid Waste Management	2,969		2,969		
TOTAL	2,32,036	1,36,609	51,487	41,045	2,895
C. IEC and Public Awareness	18,563	13,922	4,641		–
D. Admin Charges	4,641	3,481	1,160		–
TOTAL	**2,55,240**	**1,54,011**	**57,288**	**41,045**	**2,895**

Source: Authors' Estimates

- As can be expected the share of HH expenditure at 16 percent is significantly lower in relation to the urban sector where it is expected to be at 46 percent on average, even though bulk of investments are anticipated for construction of individual toilets.
- Communities who do not have individual toilets are expected to contribute towards construction of CSCs.
- While other sources or CSR or private contribution is expected to be only about 1 percent, the same translates to approximately Rs. 2,900 crore; most of this amount is estimated towards purchase of vacuum trucks for desludging toilets. The potential for this exists if toilet construction is undertaken as per design norms, and households pay for periodic cleaning.

1.4.2 *Urban Capital Expenditure – Sources*

Most of the investments are expected to come from individual households as the primary component of SBM is construction of individual toilets, and despite government subsidy as an incentive, on an average, the bulk of the funding can be expected to come from households themselves. See Table 13 for SBM(U) funding.

Table 13 : Possible funding structure Urban Capital Expenditure

Rs. Crore

	Investments	Sources of Finance			
Programme Components	**CAPEX**	**GoI**	**State Govt. or ULB**	**Household**	**Gapor Other Sources (CSR, private sector, etc.)**
A. Sanitation	**91,287**	**6,839**	**20,834**	**60,610**	**3,005**
HH toilets	66,940	4,748	1,583	60,610	–
Community Toilets	5,228	2,091	697	–	2,440
Public Toilets	315	–	–	–	315
Vacuum Trucks	250	–	–	–	250
STP	18,361	–	18,361	–	–
FSM	193	–	193	–	–
B. Solid Waste Management	**19,864**	**3,969**	**1,323**	–	**14,554**
TOTAL	1,11,133	10,808	22,157	60,610	17,559
C. IEC and Public Awareness	**16,670**	**2,193**	**731**	–	**13,745**
D. Capacity Building and A&OE	**3,334**	**439**	**146**	–	**2,749**
TOTAL	**1,31,137**	**13,440**	**23,034**	**60,610**	**34,053**

Source: Authors' Estimates

- The Government of India's share is about 10 percent of the estimated capital expenditure if all additional components are considered in relation to SBM (U) alone. This however, will need to be better understood once the sector specific financing numbers from other associated programmes are available.
- Households and the private sector needs to contribute more than 70 percent of the CAPEX investment. This would be in addition to any user charges that may be levied to provide the services.
- The funding gap in community toilets (after accounting for GoI and state government's share) is estimated to be to the extent of Rs. 2440 crore and needs to be mobilized from communities and the private sector. The development of a robust operating and business model is crucial to ensure that this is achieved.
- Public toilets are supposedly funded entirely on PPP models. Anticipated revenue models from such assets are typically user charges and advertising rights. Experience in some of Indian cities, Shimla for instance, indicates the reluctance of the private sector to invest unless the local body absorbs the capital costs. There may be a need for developing new models with increased state or local body monitoring and financing in some such projects.
- CSR activities are currently largely confined to financing toilets for girls' schools in rural areas. Estimates of potential of CSR funding in India varies widely, and is reportedly to the tune of Rs. 20,000

crore (Ali, 2015: 21). This is much less than the anticipated financing by private sector in capital expenditure in urban India. The balance funding that is required to come from the private sector and other sources would need to be sourced on commercial terms. This essentially points to the fact that CSR funding is only a small component of what needs to be the private sector's role and scope in the SBM.

- A consensus is needed to establish a generic PPP, or a revenue model in all the components of sanitation or solid waste management chain. Tipping fees, CAPEX and OPEX grants are being sought in case of SWM to make the operations stable, predictable and for improving service standards on a continuous basis.
- IEC, capacity building and public awareness campaigns, although funded from government sources, will also require financing from nongovernment sources. Utilising CSR is one of the options.

1.4.3 Rural Operations and Management Expenditure – Sources

State governments or local bodies are expected to finance nearly 48 percent of O&M expenses, while households are expected to contribute 52 percent of O&M expenses in rural areas. The latter's share is for availing community toilet services and desludging of individual toilets. The private sector and government is not expected to have any share in O&M of rural sanitation expenditure.

Table 14 : Possible funding structure for Rural Operations and Management Expenditure

Rs. Crore

	Investments	Sources of Finance			
Programme Components	OPEX	GoI	State Govt. or ULB	Household	Other Sources (CSR, Private Sector, etc.)
A. Sanitation	**2,40,246**	–	**90,539**	**1,49,707**	–
HH toilets	–		–	–	–
Community Sanitary Complexes	1,15,778	–	–	1,15,778	–
Institutional Toilets	90,539	–	90,539	–	–
Vacuum Trucks	33,929	–	–	33,929	–
B. Solid Waste Management	**47,023**		**47,023**	–	–
TOTAL	**2,87,269**	–	**1,37,563**	**1,49,707**	–

Source: Authors' Estimates

1.4.4 Urban OPEX Sources

State governments or local bodies are expected to finance nearly 56 percent of O&M expenses. The private sector is expected to contribute 41 percent. Household expenditure largely relates to desludging and maintenance of HH toilets, in the case of on site sanitation.

Table 15 : Possible funding structure for Urban OPEX

Rs. Crore

	Investments	Sources of Finance			
Programme Components	OPEX	GoI	State Govt. or ULB	Household	Other Sources (CSR, private sector, etc.)
A. Sanitation	**1,26,116**	**–**	**11,115**	**6,914**	**1,08,085**
HH toilets	–	–	–	–	–
Community Toilets	1,01,941	–	–	–	1,01,941
Public Toilets	6,144	–	–	–	6,144
Vacuum Trucks	6,914	–	–	6,914	–
STP	4,296	–	4,296	–	–
FSM	6,819	–	6,819	–	–
B. Solid Waste Management	**1,36,489**	**–**	**1,36,489**	**–**	**–**
TOTAL	**2,62,604**	**–**	**1,47,605**	**6,914**	**1,08,085**

Source: Authors' Estimates

- Government is not expected to directly fund any OPEX at the local level, A tipping fee is expected to be raised as required as a direct charge to residents.
- Private sector finance is expected to be very significant in maintenance of community and public toilets. This is expected to be recouped by user charges, advertisement revenues and any other similar source. It is essential that appropriate structures and operating frameworks be set in place for undertaking the activity.

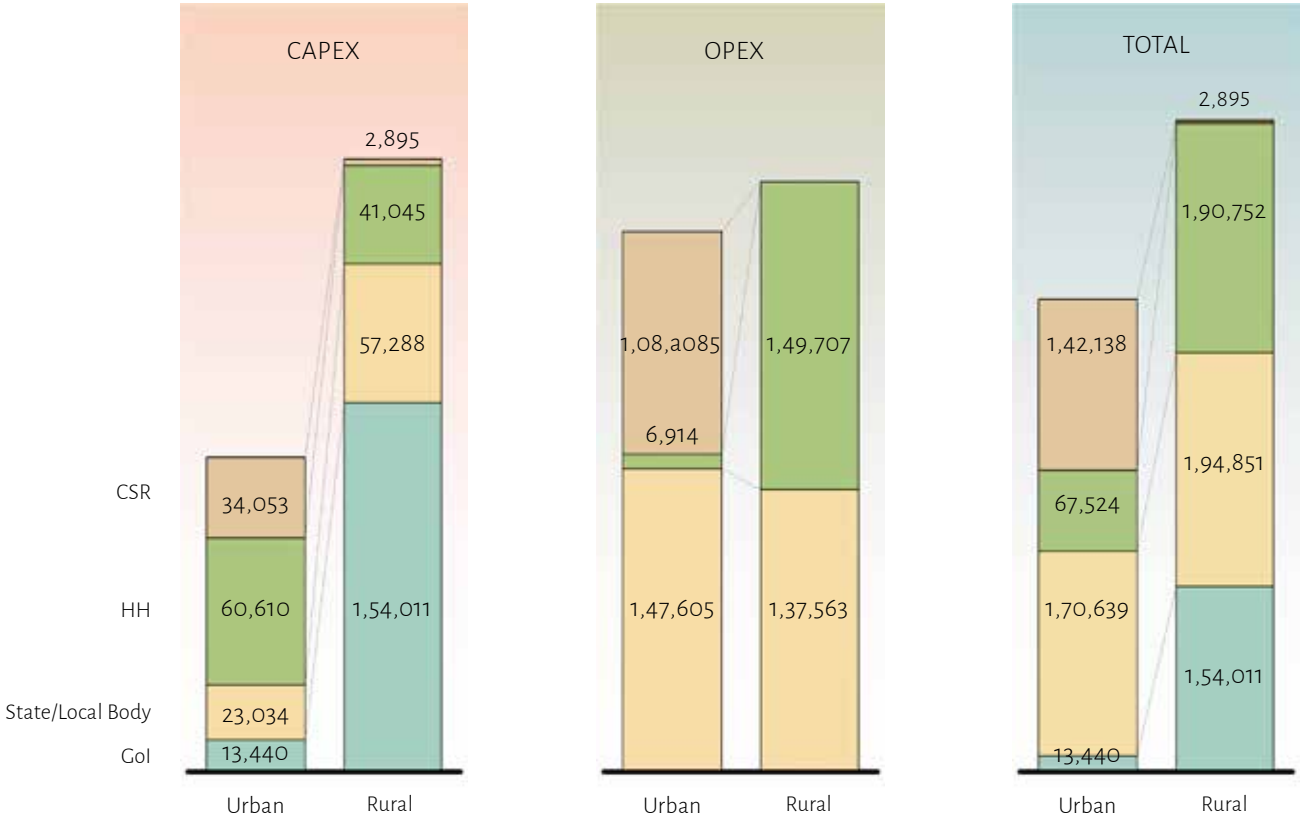
1.4.5 *Programme summary on sources of finance for Swachh India*

Government stakeholders are expected to contribute 57 percent of the total investments estimated in the sanitation programme. Policy initiatives work best when governments decide the most optimal structure of stakeholder roles and responsibilities. Accordingly, governments will also need to determine what a reasonable beneficiary contribution for infrastructure development might be in different circumstances and in different locations of the country.

1.5 NUMBERS PRESENTED INDICATIVE : THE RANGE FROM HIGH TO LOW CASE ESTIMATES CAN BE PREDICTED

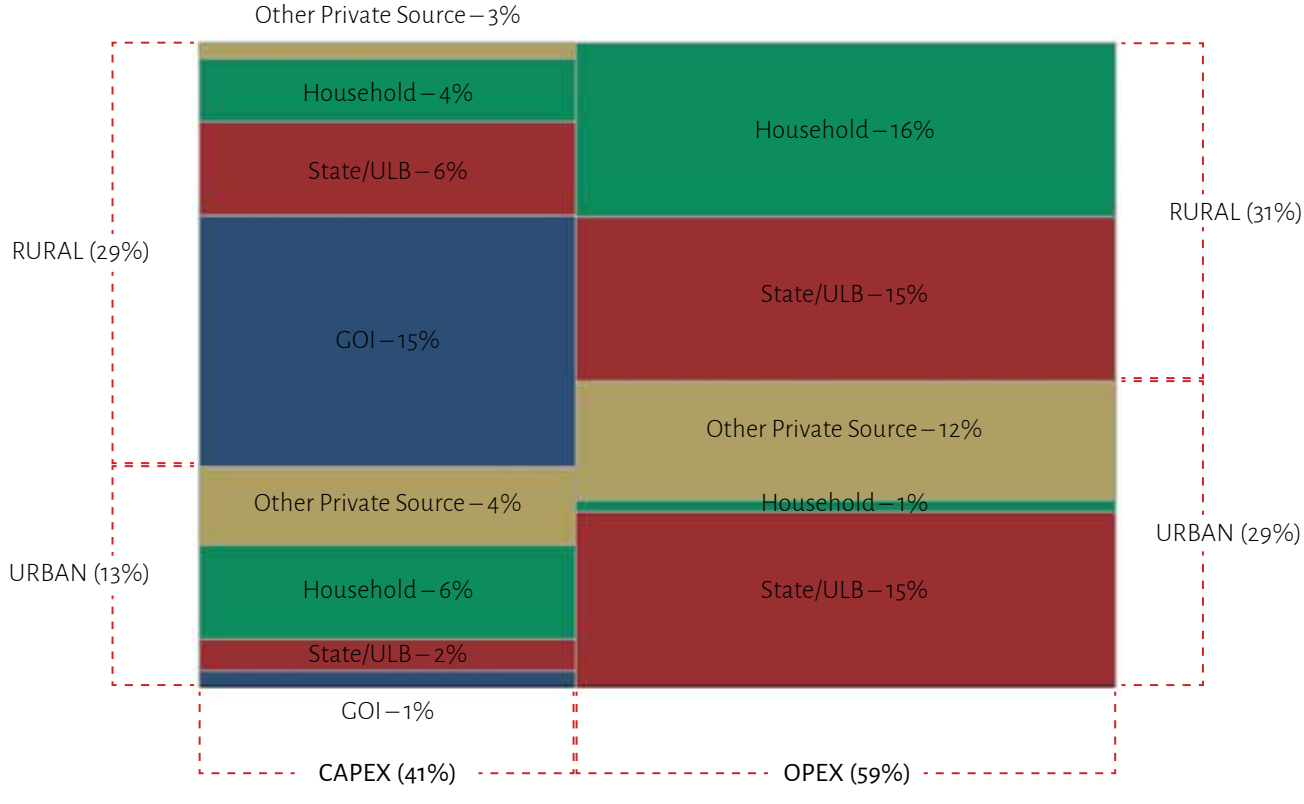
This sector analysis of the effort towards the vision of a Swachh Bharat and Clean India, is based on quantifying the resources and nature of resources required. The earlier sections present a set of numbers in terms of financial resources required. As mentioned earlier, these capital and operational cost numbers are based on a methodology which relies on Census 2011 data, and unit costs that reflect current prices were arrived at after interaction with a number of industry experts. The finite numbers presented in the report are part of a larger range of numbers and should

Chart 8: Possible funding structure for Swachh India (Rs. Crore)



Source: Authors' Estimates

Chart 9: Possible funding structure for Swachh India: As proportions



Source: Authors' representation

not be taken as fixed. The assumptions that have been used in the base case are listed in Table 18. While the base case results (as set out in the Table 18 and as projected by the technical experts contacted as the most likely scenario) (as set out in the Table 18 and as projected by the technical experts contacted as the most likely scenario) have been used to write up the report, the table below also presents the results of a low case and a high case. The low case scenario has reduced unit costs for toilets and other capital assets created under the programme and a slight reduction in input prices, to take into account the possibility of new product innovations that could lead to driving down of costs and larger coverage of models with lower capital and O&M costs, such as more of the additional urban population being served by FSM services than sewerage. In the high case the assumptions take into consideration increasing inputs costs with economic inflators like construction price index and models of solid and liquid waste management which are more mechanized.

It is interesting to note that while there is a range for each of the elements of the cost the scale, size and proportion of different components do not change very significantly between the base, high and low cases.

1.6 ESTIMATES OF IMPACT ON INDUSTRY SECTORS AND THE ECONOMY FROM SWACHH AND CLEAN INDIA MISSION

Like most countries, India too, can use sanitation infrastructure investments as a vehicle to lead development and achieve specific outcomes. Timely investments can underpin a significant increase in the quality of life and re-establish priorities for optimal infrastructure service provision. The objective of making India clean and healthy through interventions in sanitation and municipal solid waste management activities, is possible only if the scale and engagement model is attractive to all stakeholders concerned. In light of this, a comparison of this sanitation initiative has been made with the economy and related industries, to provide an insight on its relevance in the broader development context.

1.6.1 *Estimated Impact on industry sectors from Swachh and Clean India*

While governments' initiate programmes of the nature of SBM, their implementation is undertaken by multiple stakeholders, with consequent effect on various industry subsectors. SBM, when disaggregated into main components has diverse industry affects:

- construction industry,
- equipment suppliers,
- service providers,
- consumer goods,
- training and knowledge sharing agencies and
- banking or financial sector.

Table 16: Estimated impact on particular industry sectors

Sl. No	Industry	Unit	Size	Programme Contribution	% Impact
1	Construction	Rs. Billion	4,930[1]	581	11.8
	Bricks	Billion Units	140[2]	103	14.7
	Steel	Million Tonnes	23[3]	7	6.1
	Cement	Million Tonnes	325[4]	56	3.4
	Sanitaryware	Rs. Crore	3200[5]	274	171.5
2	Equipment (MSW+Vaccum Trucks)	Rs. Crore	4,16,000[6]	41,600	10
3	Fast Moving Consumer Goods-FMCG (Soaps)	Rs Crore	13,200[7]	1810	13.7
4	Microfinance	Rs, Crore	27,900[8]	66,759	239.3

[i] Home Improvement: Building and Home products industry: PWC, September 2013

[ii] http://www.business-standard.com/article/sme/brick-industry-opts-for-automation-innovation-111090600055_1.html

[iii] http://www.aceupdate.com/Article.php?ItemId=2847

[iv] http://www.ibef.org/industry/cement-india.aspx

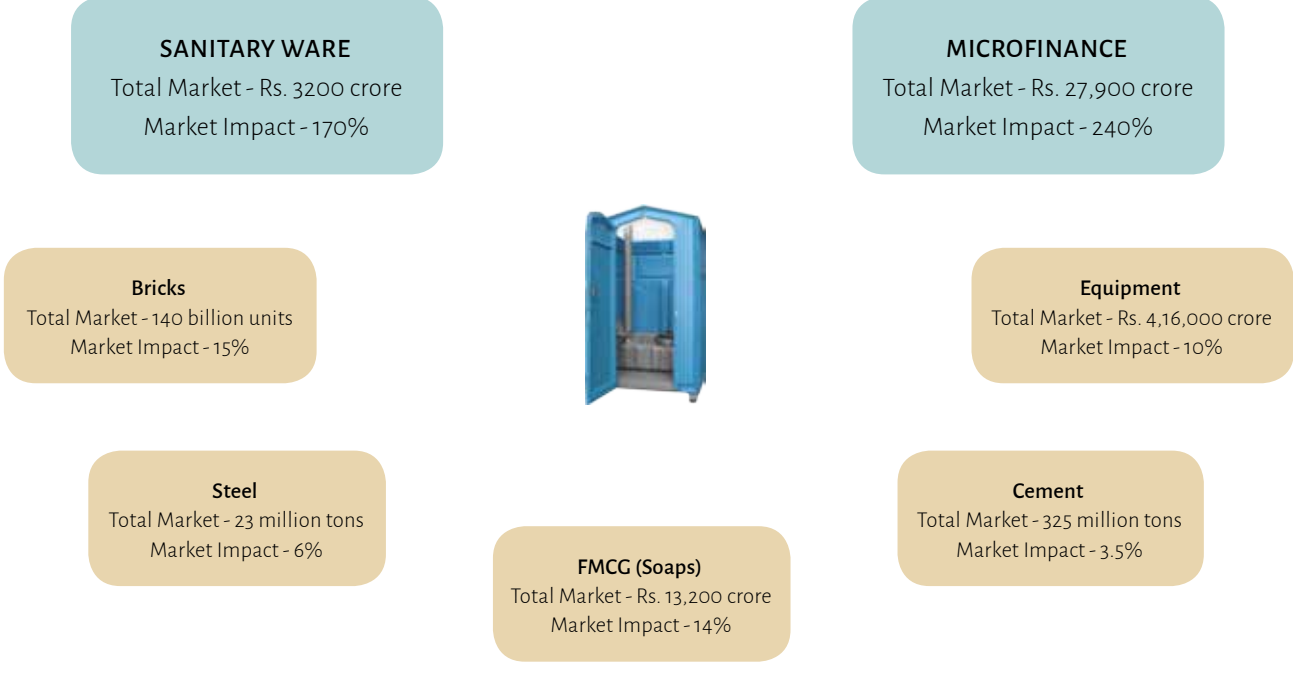
[v] Home Improvement: Building and Home products industry: PWC, September 2013

[vi] http://www.ibef.org/industry/infrastructure-presentation

[vii] http://www.outlookbusiness.com/strategy/feature/the-soap-opera-begins-1195

[viii] The rise, fall and dynamic revival of India's microfinance market: responsibility

Figure 10: Estimates of potential impact on particular industry sectors



Source: Authors' Estimates

SBM and associated activities will have a significant impact on building material industry ranging from 3 percent to 170 percent of the industry market sizes. Building material such as bricks, sand and aggregate, is very unorganized and locally available. It is expected that this programme will have a very significant contribution, with 12 – 15 percent increment per annum. Organized building material (such as steel TMT bars and cement) and construction equipment market will have an increment ranging between 3 percent to 10 percent.

SBM will have a significant impact on the sanitary-ware market. The sector has an equal proportion of organised and unorganised players; given the nature and pricing of the products, the unorganised sector will witness a significant increase.

The microfinance sector has been steadily consolidating in recent past, and is reaching out to the needy across most states. There are an estimated 280 lakh consumers with an outstanding loans of about Rs. 27,900 crore while household contribution (1,129 lakh HHs) towards construction of toilets is estimated to be of the order of Rs. 68,000 crore. Even if a fraction of these HHs convert into microfinance consumers, the industry will witness a significant uptake in size

1.6.2 *Estimated Impact on manpower requirements from Swachh and Clean India*

Sanitation and SWM sectors are labour intensive, and would add to job opportunities across the unskilled and skilled labour markets. It is estimated that to construct individual toilets alone, 160 crore person-days are required; this is nearly 5.5 percent of a 5-year annual average of the Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA) person-months consumed. The programme also provides for Rs. 7,700 crore of IEC and capacity-building opportunities, and Rs. 5.5 lakh crore (for ten years) of O&M opportunities to various service providers in sanitation and solid waste management sectors.

1.6.3 Swachh and Clean India contribution to the GDP and possible impacts

India's GDP for the year ending March 31, 2015 was Rs. 106.44 lakh crore. Investments estimated for sanitising India (CAPEX) for five years in line with SBM and associated components as in the base case of this report is approximately Rs. 3,89,642 crore. This sanitation expenditure is expected to be significant and these estimates show that it could be upto 0.7 percent on an annual basis for the next five years. This spike in investments in sanitation could lead to the mitigation of the estimated 6.4 percent GDP losses in India (Tyagi et al, 2008). The estimate of losses undertaken in 2007 did not monetise environmental pollution and mitigation costs. This reflects that as per this report's estimates the spike in spending over the next five years, and the returns to the economy from Swachh India investments if implemented and adopted in a time bound manner could be 3-4 times the investments made.

The benefits to the economy and society potentially are even greater as there are a number of benefits which have not been quantified, including the potential impact on the infant mortality rates, and climate resilience. This effort when planned well, could provide the equity and dignity issues that it will help addressthat it will help address.

Figure 11:Estimates of potential socio – economic impacts

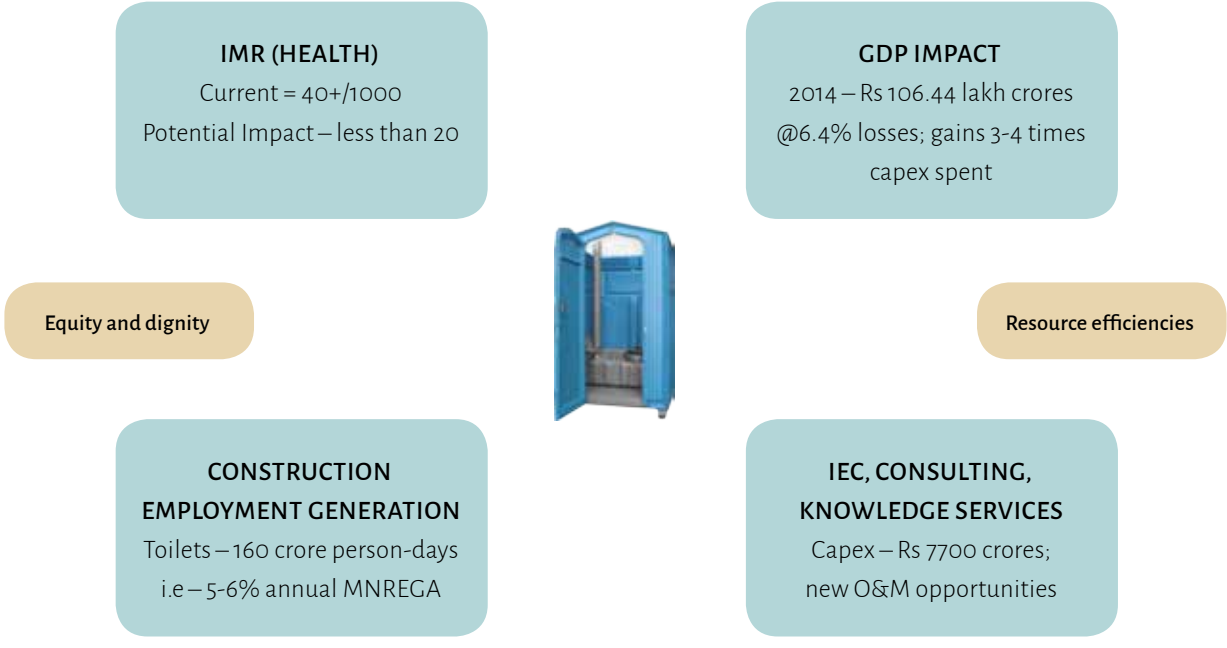


Table 17 : Base case, low case and high case estimates for Swachh Bharat and Clean India over a ten year period

Rs. Crore (in USD, Billion)

	Rural		Urban		
	Toilets and Liquid waste management	Solid waste management	Solid waste management	Solid waste management	Expenditure in each scenario
Capital expenditure					
BASE CASE (as presented in the report)	2,32,036 (35.7)	2,969 (0.5)	91,287 (14.0)	19,846 (3.1)	3,46,138 (53.3)
LOW CASE	2,00,955 (30.9)	2,969 (0.5)	69,852 (10.7)	16,896 (2.6)	2,90,645 (44.7)
HIGH CASE	2,63,045 (40.5)	3,414 (0.6)	97,459 (15.0)	22,796 (3.5)	3,86,714 (59.5)
Operating expenditure					
BASE CASE (as presented in the report)	2,40,246 (37.0)	47,023 (7.2)	1,26,116 (19.4)	1,36,489 (21.0)	5,49,874 (84.6)
LOW CASE	2,40,246 (37.0)	47,023 (7.2)	1,22,843 (18.9)	1,34,426 (20.0)	5,44,538 (83.8)
HIGH CASE	2,40,246 (37.0)	54,077 (8.3)	1,30,412 (20.1)	1,56,962 (24.1)	5,81,697 (89.5)

Table 18: Assumptions used in the base case estimates

Activity	**Elements**	**Assumptions/ Norms**	**Values**
		A. Projections till 2019	
URBAN	Population	Past growth trends (Census)	2%
	Households	Past growth trends (Census)	2.70%
RURAL	Populations	Past growth trends (Census)	1.50%
	Households	Past growth trends (Census)	2.40%
	Institutions (Schools)	Past growth trends (Census)	3.70%
		B. Quantity Assessment	
URBAN	Sanitation	Treatment assumed to be done using centralized systems	
	HH Toilets	a. No. of HH having insanitary toilets (night soil removal as defined in Manual Scavengers Act & MoUD Guidelines) and no. of single pit latrines. (Based on 2011 Census data).	80% of OD
		b. % of HH currently defecating in the open (as per MOUD Guidelines)	
	Community Toilets	% of HH currently defecating in the open (as per MOUD Guidelines)	20%
	Public Toilets	% of population (as per MOUD Guidelines)	5%
	Desludging of septic tanks/ pits	Based on Census 2011 data, 47% of HH toilets constructed are septic tank based.	1 truck for servicing 5000 HH
	Solid Waste Management	Generation to incresae in proportion to population	0.4 kg per capita, 2% increase for life style changes
	Collection	Unit capacities and service levels estimated based on expert interactions and previous studies. Existing stock assumed to be between 30% to 50%.	1 autotipper - 1MT,1 tricycle -0.13 MT
	Transportation & Street Sweeping		Bins and compactors for 1.1 cum and 4.5 cum
	Treatment	WTE has limitations in development. Assumed number of projects based on current developments and expert interviews. Balance would be composting	10 plants WTE of 1000 TPD each; rest composting
	Disposal	Land not costed. Quantities based on expert interactions and previous experiences.	30% of treatment capacity

Activity	Elements	Assumptions/ Norms	Values
		B. Quantity Assessment	
RURAL	Sanitation		
	HH Toilets	a. No. of HH having insanitary toilets (night soil removal as defined in Manual Scavengers Act). Based on 2011 Census data. b. % of HH currently defecating in the open	80%
	Community Sanitary Complexes	One at each village	1 per village
	Desludging of septic tanks/ pits.	Based on Census 2011 data, 48% of HH toilets constructed are septic tank based. No FSM/ UGD assumed. All liquid waste to be transported to nearest city	1 truck for servicing 5000 HH.
	Rural Sanitary Marts	At sub-district level	1 per block/ sub-district level
	Solid Waste Management	Storage place for the inorganic content that cannot be locally disposed.	0.15 kg per capita; 2% for lifestyle changes; One facility per village; one person to collect and transport
		C. Investment Assessment	
Capital Investment	Sanitation	Based on current market rates & material estimation	(Rs).
URBAN	HH Toilets		30000
	Community Toilets		100000
	Public Toilets		100000
	Desludging trucks		2000000
	Solid Waste Management	Based on current market rates	
	Collection	"a. Tricycle b. 1.5 cum bins c. 4.5 cum bins d. Pushcarts"	"20000 25000 60000 7500"
	Transportation	"a. Auto tippers b. Refuse Compactors"	"950000 4500000"
	Treatment	"a. WTE Plant b. Compost Plant"	"Rs. 275 Cr for 1000 TPD Rs. 8 lakhs/ ton"
	Disposal	Landfill Facility	Rs. 5 lakh/ton
RURAL	Sanitation		
	HH Toilets	Market rates and expert interactions	15000
	Community Sanitary Complexes	As per SBM (Gramin) Guidelines	600000
	Desludging trucks	Market rates and expert interactions	2000000
	Solid Waste Management		
	Collection, Storage & Transportation	Based on current market rates	50000 per annum

Activity	Elements	**Assumptions/ Norms**	**Values**
		C. Investment Assessment	
O&M Estimates	Sanitation		
	HH Toilets	Envisaged to be borne by HH	
	Community Toilets	Based on labour and cleaning material costs	250000 p.a.
	Public Toilets	Based on labour and cleaning material costs	250000 p.a.
	Desludging trucks	Per cleaning cycle of a septic tank (2 cleaning cycles assumed for a 5 year period)	3500 per cleaning
	Solid Waste Management		
URBAN	Collection	Salaries, fuel costs and estimated time/ distance	R&M - 10% + Operation Cost – Mileage of 30 Km/Litre and Fuel @ Rs.73/ liter, and assumed travel of 15 km/ day and 330 days of operation
	Transportation	Salaries, fuel costs and estimated time/ distance	R&M - 10% + Operation Cost – Mileage of 6 Km/Litre and Fuel @ Rs.73/ liter, and assumed travel of 15 km/ day and 330 days of operation
	Treatment	Previous experience and expert interactions.	10% of capital costs.
	Disposal	Previous experience and expert interactions.	30% of capital costs. Includes future cell development
	Sanitation		
	HH Toilets	Envisaged to be borne by HH	
	Community Sanitary Complexes	Based on labour and cleaning material costs	250000
RURAL	Desludging trucks	Per cleaning cycle of a septic tank (2 cleaning cycles assumed for a 5 year period)	3500
	Solid Waste Management		
	Collection, Storage & Transportation	Salaries, fuel costs and estimated time/ distance	Rs 5000 pm, 40 km one way/2 trips per month, Rs. 10/km.

1.7 SOME CONCLUSIONS

The positive ramifications of the SBM are manifold;. from improved living standards, to better health status, increased economic productivity, environment protection, and above all ensuring safety, privacy and dignity. The importance of SBM's impact on health and other economic benefits needs to be further underscored. Attempts to capture monitoring indicators in this regard do not seem to be adequately stressed.While the responsibility for implementation of SBM rests with the states and local institutions, it is widely acknowledged, , in literature and by experts, that the required skills and capacities to deliver the mandate are possibly going to be a significant constraint. The plan for strengthening capacities for effective implementation at state and local levels for creating the infrastructure, and subsequently the operations and maintenance of the facilities, needs serious thought.

Based on the declared budget outlays under the programme, it appears that significant funding for project components is expected to come in from the private sector through private investments of CSR initiatives or otherwise. Whether the size of the CSR funding that is available to bridge this gap is sufficient or not, needs to be better assessed and suitable models need to be developed to leverage private and household finance. Suitable alternative financing mechanisms would then need to be explored to ensure projects are not stalled or delayed.

This report has presented a comprehensive look at the Swachh Bharat and Clean India vision to help identify and highlight some of these challenges. It highlights the scope and opportunities the mission provides, describes the role for industry and private engagement and explores how the programmeme can benefit from collaborative stakeholder engagements including public-private partnerships (PPPs). The analysis also provides directions to enable forward planning, appropriate interventions by GoI and other stakeholders for ensuring SBM is on track and sustainable in the longer time horizon.

It is imperative to make investments in the physical fabric of the nation in a way that promotes a shift to better hygienic, sustainable, socially acceptable and environmentally-benign behaviour on the part of all stakeholders. Over the past several years, there have been multiple calls for increased investments be made to close the gap between existing sanitation service levels and estimated requirements for reaching global standards. Implementing national programmes, such as the development of national highways or reforming the power sector, has itself been quite complex. It becomes significantly more challenging in case of a mission for improving sanitation, that involves large scale behavioural and attitudinal changes. The success of the programme will depend on the confluence of multiple forces including adequate capacities in all the stakeholder groups, focused project implementation capabilities, cohesive action across

diverse geographies and political parties, institutional arrangements that incentivize behaviour change in addition to availability of finances in a timely fashion.

Although ambitious, SBM can be achieved by bringing together various components and stakeholders in a comprehensive and collaborative manner. If achieved, this would be one of the greatest social transformations witnessed by the country to raise the bar on quality living standards for all strata of population.

ENDNOTES

1. Conversion of Insanitary Latrine in rural areas is also being considered as construction of new toilets
2. 20% of population; one complex for 120 people
3. One CSC per village
4. Estimated at 5% of urban population; one toilet seat for 600 people, each complex having two WCs.
5. Toilets at 25% of schools/ institutions to be constructed
6. Households who has septic tank will be converted into sewerage network system and not forming part of open defecation households
7. Assuming a generation of 400 gm/capita/day
8. Assuming a generation of 150 gm/capita/day
9. Planning Commission, Government of India (2014)
10. Assumed existing stock: tri-cycles – 50%; auto tippers – 30%; bins – 30%; vehicles – 20%; street sweeping – new ones for all sweepers.
11. CERC Notification on tariffs for Waste to Energy based plants dated August 19, 2015
12. See HPEC (2011)
13. See PWC India (2013)
14. See Roy (2011)
15. See ACE Update.com (2014)
16. See IBEF (2015)
17. See PWC India (2013)
18. http://www.ibef.org/industry/infrastructure-presentation
19. See Gopalan (2015)
20. See Etzensperger (2014)
21. See MOSPI(2015b)

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PART B

DOCUMENTING INNOVATION AND ENTERPRISE IN THE SANITATION ECONOMY

INTRODUCTION, STRUCTURE AND OBSERVATIONS

This section of the report profiles sixteen initiatives as a few examples of innovation and enterprise that the private and non-governmental sector has been doing in the sector of sanitation. This documentation was led by FourthLion Technologies Private Limited and would not have been possible without the cooperation received from the various officials from each of these firms, which we are very grateful for. The cases have been selected to demonstrate the wide variety of interventions being under taken. The cases were not selected out of a comprehensive listing, but more from word of mouth of interesting examples being discussed currently. There is a need to develop a long list and document a number of other cases that we have left out in here and a long list would have a lot of merit but was unfortunately beyond the scope of this section and the report. The examples presented in this section are not restricted to a focus on any particular sub-sector or toilet construction alone. The sub-sectors include toilets, solid waste management, waste water treatment, community engagement for behaviour change, information, education and communication as well integrated approaches. Other than the specific focus of their work, the effort was also to cover projects and firms working on rural and urban sanitation including large -sized firms, smaller firms and non-governmental efforts.

The short descriptions of examples below try to document the motivations, innovations and operating models being employed by each entity in addressing a need that they have identified in the sanitation sector. The ingenuity, enthusiasm and pro-activeness of the leaders of these efforts are notable. The description of each example of private effort in sanitation is based on what the entities themselves provided to the research team. They have been presented in this report as such. The objective of this report was not to scrutinize the claims made by these entities but to document them as per their own perceptions. The scalability and replicability sections too are a documentation of how the entities view their own work within the large scale of the sanitation challenges in India. The purpose of this report is not meant to rank or pass judgments on each effort but to enlist and celebrate the initiatives and innovations in each model and view them as separate responses and approaches to separate contexts.

The sixteen cases have been grouped and presented in four categories, which aggregate models for

- Rural infrastructure offers (4cases)
- Urban infrastructure offers (4 cases)
- Service propositions (5 cases)
- Communication, Education and Behaviour Change focused offers (3 cases)

The categories are aligned to the main parts of the Swachh Bharat Mission, i.e. Rural and Urban. The next section combines rural and urban and focuses on drawing together a number of service propositions, which have developed models which are based on improved operation and maintenance of sanitation facilities. Given realisation that communication, education and behaviour change has to be at the centre of the efforts towards the sanitation vision, there is a specific category reflecting some interesting approaches. As can be expected, there are some cases which could have been located in more than one category, and some firms which are engaged in supporting across categories in their various efforts. For the purpose of this report we have bundled them within one category alone and have primary chosen to document only one flagship component of each firms efforts on sanitation. This is also a limitation of this report.

The cases also reflect the wide variety of financing instruments and structures employed – from financial intermediation for asset creation, private risk capital for developing innovations, funding under private public partnership arrangements, raising project based funding from operations including user charges, application of corporate social responsibility funds, support garnered from external donors and foundations and dovetailing efforts alongside government funding and programmes.

The categories and list of cases covered are given in the table below:

Sl No	Category	Name of firm
1	RURAL INFRASTRUCTURE OFFERS	Chand Industry Group
		Swades Foundation
		Bharati Foundation
		Tata Consultancy Services
2	URBAN INFRASTRUCTURE OFFERS	GMR Varalakshmi Foundation
		JSL Architecture Limited
		Hindustan Zinc Limited
		Ekam Eco Solutions Private Limited
3	SERVICE PROPOSITIONS	Chintan Environmental Research and Action Group
		Eram Scientific Solutions Private Limited
		Gramalaya Urban and Rural Development Initiatives (GUARDIAN)
		3S: An enterprise of Saraplast Private Limited
		Samagra Waste Management Private Limited
4	COMMUNICATION, EDUCATION AND BEHAVIOUR CHANGE FOCUSED OFFERS	Hindustan Unilever Limited
		Feedback Foundation
		Reckitt Benckiser Group

While this section of the report has not been conceived as critique or an exaltation of private sector innovations in the sanitation industry, a short paragraph of some observations are placed below. As elaborated earlier in this section, the cases are as self reported by the firms and officials and so reflect the focus and opinions of the officials. The variation in the details and descriptions around the operational models, costs and revenues sections also arise from this fact. What is notable however in most of the cases is how they reflect a story of leadership and of personal motivation and drive. The cases demonstrate the deep efforts to analyse the context, identify gaps in needs and provisions and conceptualise innovative products and service models to serve these gaps. Most of the cases also demonstrate corporate wisdom and the will to engage in crafting long term solutions in a financially and environmentally sustainable manner as understood by each of the firms themselves. Each of these examples demonstrate remarkable desire and appetite to innovate and take risk towards solutions in particular contexts in sanitation. Achieving the vision of moving India to a higher and improved sanitation status and sanitation consciousness will need many of these efforts to bloom and prosper and many other similar examples of leadership in the sanitation sector. Some questions that we are left with, given the size and nature of the sector presented in Part A of this report and the cases documented in this part, are:

1. How can a support structure be built so that many similar efforts as required in the sector be incubated?

2. Can a layer of aggregator firms also be thought through that could help match these innovative products and services with their markets, be it direct households or local governments?

3. How can the Swachh Bharat Mission specifically or the Government of India as a whole, help promote wider innovation and scaling up of private sector efforts and partnerships in the pursuit of the sanitation vision?

4. What can be done to make user groups, including local authorities be better equipped to support and partner with the private sector and new innovative models for sanitation improvements?

PART B 1

RURAL INFRASTRUCTURE OFFERS

1.1

'*SWACCH SAMMAAN*' BY CI GROUP

Sehat, Swacchata, Sammaan : Sculpturing Toilet Options

ABOUT THE COMPANY / BACKGROUND

The CI Group is a family-owned private manufacturing business, which operates across three verticals: automobile parts, toilet technologies, and safety technologies for homes and vehicles. The sanitation arm is part of 'The Globecrest', a company under the CI Group. The research and development wing of the company is self-financed and has developed a *'Swacch Sammaan', a* prefabricated stone toilet. They developed a plastic prototype that was rejected for a lack of sturdiness and strength; users instead preferred brick toilets. While pre -fab toilets existed, low cost models did not, which left the poor un-served. The company claims that their technology is the cheapest, ready-to-install toilet model in India, targeted specifically at rural households. This model is being promoted as part of the 'Make in India' campaign with a vision of advocating '*sehat, swacchata and sammaan*'.

WHY IS THIS BEING PROFILED?

Other companies typically offer rural households either (i) brick toilets, which generally cost Rs.15,000 or more, and have a time and labour intensive installation process, or (ii) pre-fabricated toilets,which are perceived to be of poor quality. In contrast, the CI Group has developed *Swacch Sammaan* - a ready-to-install toilet model for rural areas, constructed of. At Rs.13,500, the variant is relatively cheaper compared to other alternatives available in the market. Importantly, stone toilets are widely accepted and durable alternative to brick toilets. This also carries the option of adding features such as the ability to function off-grid, waterless flushing, smart waste collection, and composting.

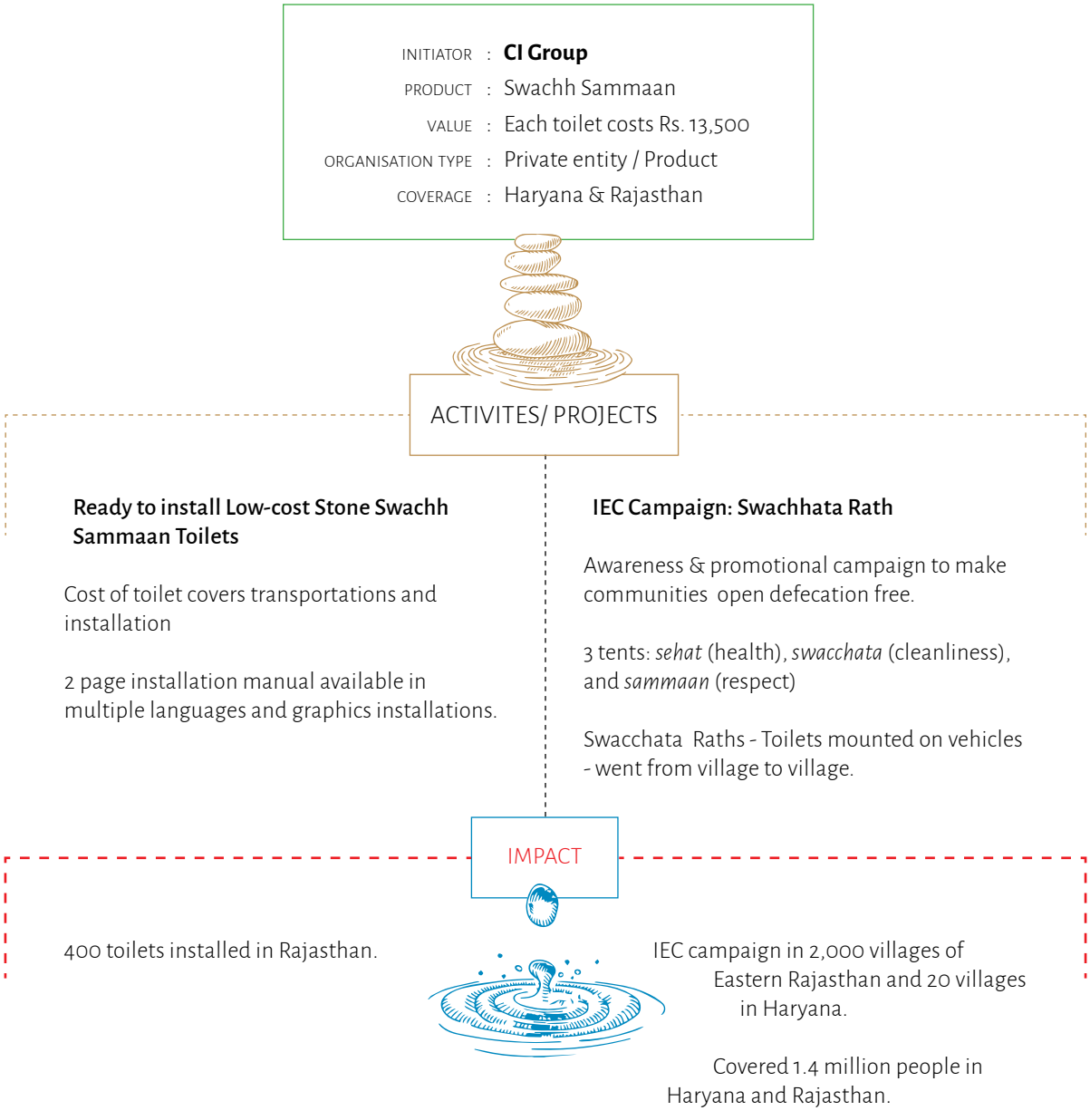
OPERATIONAL MODEL

1. **Swacchata Rath**

   As part of their awareness campaign, the CI Group conducted *Swacchata Raths,* which involved mounting different toilet models on vehicles, and conducting awareness campaigns from village to village. They sought the help of *sarpanches* to mobilize communities,in order to advocate the importance of hygiene; demonstrate the different toilet models; and explain the costs and benefits of purchasing one of these variants. They appealed to people's pride – focusing on what the call thethree tenets of *sehat* (health), *swacchata* (cleanliness) and *sammaan* (respect). The key message during this awareness and promotional campaign is to use the toilet and make their communities open defecation free.

2. **Toilet Model**

   Their demonstration efforts showed that people were largely receptive to the low-cost stone Swacch Sammaan toilets. Although marketed as an affordable toilet models, their technology carries a number of add-on



features such asa waterless flushing system (EcoSan technology), odour minimization, composting, and a smart waste collection system with detachable bags and tanks that eliminates the need for touch. It comes in one-pit, two-pit and four-pit models.

The price of the toilet covers transportation and installation for all beneficiaries. In the event that a beneficiaries wishes to install the toilet by himself or herself, the company provides a two-page installation manual that is available in multiple languages with graphic illustrations, to guide easy installation. Since a number of customers do not know how to connect with people who can empty their pits, the CI Group has also tied up with government-certified contractors who can send out a van to collect the sludge and take it to a sewage treatment plant.

3. **Identifying Potential Clients**

Sarpanches have currently been instructed to collect the names and details of all households who are interested in installing a toilet in their house, who the CI Group will then follow-up with. To facilitate this, they have also appointed a few rural distributors (around 18-20 per district) who will help popularise the toilet models.

(*below left*) Portable toilet model by Globecrest of CI Group, Source- India Mart

(*below right*) Prefabricated toilet model by Globecrest of CI Group, Source- India Mart

"स्वच्छ सम्मान"
COMBINED INITIATIVE FOR A CLEANER INDIA

COSTS / REVENUE

The firm utilized its own resources to fund the research and development stage of the project. Realising the challenges with microfinance, the CI Group designed a system wherein they would cover a cost equivalent to the Swatchh Bharat Mission (SBM) subsidy at the outset and collect the same from the government or panchayat at a later date. They thus collected Rs.1,500 from each villager for toilet installation with the cheques for the subsidies being issued in the name of the CI Group after proofs were sent. This process however required the cheques to be collected from the Sarpanch office at the village level, resulting in delays, and hence they have subsequently discontinued it.

IMPACT

The *Swacchata Rath*, which was their main awareness and promotional campaign for their toilets, was demonstrated in over 2,000 villages of Eastern Rajasthan, particularly around Ajmer and Alwar and another 15-20 in Haryana. Attendance at these meetings varied between 30 and 200 people at each village, with evening meetings seeing greater attendance and success. Including the spread through word-of-mouth, the CI Group estimates that their awareness activities reached about 1.4 million people overall.

They have currently sold about 400 toilets in Rajasthan and expect to sell more through the activities of the village *sarpanches* and rural distributors. Further, they plan to scale up their activities to the Hindi belt of North-Indian states, Gujarat, Karnataka and Tamil Nadu.

REPLICABILITY & SUSTAINABILITY

In order to be able to provide the toilets at a low cost, the group sells these toilets directly, without any intermediaries or sales partners. This has limited their geographical spread to rural locations at a reasonable distance from their fabrication units and might limit their scalability.

The prefabricated nature of these toilets ensures that installation and labour costs are low, in addition to the already inexpensive model. These conveniences might be a strong incentive for people to adopt this design as compared to others.

The CI Group plans to scale up their operations to several states but seeks to partner with micro-financing agencies to fund the toilets, since the lack of finance is the main limiting factor to large-scale implementation.

In order to maintain a competitive advantage, the group does not release any proprietary information on either their toilet design or operational model. The passing of the patent in the near future will ensure that the CI Group will retain sole rights to implement this particular model for the next twenty years, which in turn will make replicability by a competitor difficult.

1.2

ODF COMMUNITIES BY SWADES FOUNDATION

Organising outcomes: Open Defecation Free Communities

ABOUT THE COMPANY / BACKGROUND

The Swades Foundation was started in 1984 as a philanthropic venture called SHARE (Society to Heal Aid Restore Educate). In 2012, this was transformed into the Swades Foundation, as a trust registered under the Bombay Public Trust Act, 1950, with a mission to empower people through five pillars – community mobilisation, water and sanitation, education, health & nutrition, and agriculture and livelihood. The foundation receives 90% of its funds from the Screwvala family, and the remainder from donors such as the Tata Trusts, Reckitt Benckiser and Unit Trust of India. It is headquartered in Mumbai and currently concentrates its efforts to develop the Raigad district in Maharashtra.

The focus on sanitation emerged out of initial attempt to provide schools for girl children. On investigating why villagers in the district refused to send their girls to school, fetching water from distant sources was listed as the key reason for their refusal. It was then that the foundation realised that water and sanitation services would be crucial – initially water supply was focused on. Since 2013, the Foundation has focused on sanitation infrastructure towards making villages and blocks open-defecation free.

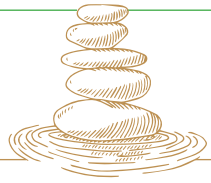
WHY IS THIS BEING PROFILED?

Swades is working with Gram Panchayats to make one district open-defecation free. At present, the focus is on development of 6 blocks of Raigad district (Mahad, Mangaon, Poladpur, Shrivardhan, Mhasala, and Tala), and therein, on 360 Gram Panchayats, covering 2,000 hamlets in 674 villages. These areas were chosen based on the foundation's estimates that 40,000 households in the area did not have access to a toilet.

OPERATIONAL MODEL

1. **Awareness & Demand Creation**
   There are 36 social workers per community mobilisation team, each in charge of 10 gram panchayats, who go into villages to create awareness of cleanliness and hygiene. The emphasis is on problems of open defecation, improved sanitation practices, proper sewage disposal, based on which communities are mobilized to demand toilet construction in their homes. A *Swachhta Rath* was organised – this involved a toilet prototype mounted on a vehicle that went from hamlet to hamlet as part of the Information Education and Communication (IEC) campaign. Over a period of 45 days, the *rath* travelled to 2,000 villages in the 6 target blocks. Additionally, village health workers called "*Swa Raksha Mitras* (SRM) promoted the importance of handwashing on the Global Handwashing Day. 1,154 SRMs visited schools in target areas, and disseminated the message to 15,000 children.

INITIATOR : **Swades Foundation**
INITIATIVE : ODF Communities
TIMELINE : Began in 2013
ORGANISATION TYPE : CSR/ Foundation
COVERAGE : 6 blocks of Raigad— Mahad, Mangaon, Poladpur, Shrivardhan, Mhasala and Tala



ACTIVITES/ PROJECTS

Awareness and demand generation

Social workers responsible for 10 Gram Panchayats (GPs) each.

Create awareness about the health impact of open defecation, and environmental sewage disposal.

Design and construction

Design by Swades foundation; actual construction by local partner vendors

Toilet cabin size constructed: 4 x 3 x 7 cubic feet.

Follow-up IEC

Monthly village meetings organised.

Swa-Raksha Mitras (village health workers) promote toilet use and hygiene education.

IMPACT

Individuals contribute Rs 4,500 towards toilet construction.

Constructed 3,026 individual household toilets.

2. Design & Construction

Community mobilisation, and water and sanitation teams carry out field survey to design a suitable toilet taking into consideration parameters such as per land availability and soil strata. Swades Foundation provides a twin-pit latrine per household in the targeted villages. However, in order to create a sense of ownership, each household is expected to contribute between Rs. 4,500 and Rs. 5,000 towards the construction of each toilet.In places with abundantly available land, a standard toilet cabin size of 4 x 3 x 7 cubic feet is designed. It has partnered with 10 vendors who undertake the actual construction; a formal introduction between the vendors and villages is organised where roles and

responsibilities of all stakeholders is decided upon. Monitoring is done by the foundation throughout the process and a completion certificate is issued at the time of handover. The name of the donor contributing towards toilet construction is branded outside the cabin.

3. **Follow-up IEC**
   Post-construction, the social workers and community mobilisation team organise monthly village meetings to review usage and sanitation habits to ensure sustained change. The SRM also go door-to-door to teach hygiene related practices. The foundation staff also work to form a Village Sanitation Committee (VSC) and work with the committee to monitor proper use of toilets built.

(*below left*) Completed toilet

(*below right*) Soak pit

Beneficiary in front of his toilet, with Tippie Tap to wash hands.

COSTS / REVENUE

To date the Swades Foundation has spent nearly Rs. 7 crore under this programme.

IMPACT

September 2015, the foundation had constructed 3,026 individual household toilets in those homes that had no toilets, or no functional toilets. Their total target for 2015-16 is 8,000 toilets, and by the end of 2017-18, the foundation aims to construct 25,000 toilets. To date, the foundation has reported an improvement in the lives of villagers in the district – where earlier open defecation was prevalent, and a lot of time was spent on the practice, now the household toilets save time. In particular, the elderly have reported a positive response. The foundation has also tracked attendance of adolescent girls, which they claim has increased post their intervention.

REPLICABILITY & SUSTAINABILITY

The model of the Swades Foundation is replicable and scalable, on condition of availability of funds. To tackle this issue, the foundation plans to leverage the Government's Swachh Bharat Mission (Gramin) subsidy. On agreement between a household and the foundation, the money received by the household after construction of the toilet, shall be transferred to the foundation; these funds would then be used to construct more toilets, elsewhere in the district. Households take full responsibility to maintain their toilets. Through its work in the 6 districts, the foundation is targeting approximately 5 lakh people; over the next year, they plan to target 5 lakh more – over the period of intervention, the foundation plans to target a total of 1 million people.

Swachhta Rath

1.3

DISTRICT-WIDE INDIVIDUAL HOUSEHOLD LATRINES BY BHARTI FOUNDATION

Endeavouring Towards an ODF District Through CSR Options

ABOUT THE COMPANY / BACKGROUND

Bharti Foundation, headquartered in Gurgaon, Haryana, and established in 2000 as an Indian Charitable Trust, is the development arm of Bharti Enterprises, committed to creating and supporting programmemes that bring about sustainable change. It works in education through its flagship programme, Satya Bharti Schools, established in 254 villages across six states namely Punjab, Haryana, Tamil Nadu, Uttar Pradesh, West Bengal and Rajasthan. These schools provide free quality education to over 40,000 children. Leveraging its experience in these districts, in 2014, the Bharati Foundation decided to provide an individual household latrine to each rural households in the targeted 900+ villages of Ludhiana, by adopting a district-wide coverage strategy.

WHY IS THIS BEING PROFILED?

Bharati Foundation claims it is one of the few companies that have responded to the Government of India's call for private sector participation in the Swachh Bharat Mission, and demonstrates a working partnership for household sanitation infrastructure delivery. Unlike other companies that have very specific targets, the Bharati Foundation has a holistic approach covering an entire district – thereby focusing on the government's aim of working towards open-defecation free status through functional sanitation infrastructure, both, in households, and, under its "Satya Bharati Abhiyan", in schools.

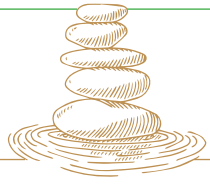
OPERATIONAL MODEL

To deliver this programmeme, Bharati Foundation works with partner agencies on the ground:

1. Beneficiary identification - the partner agencies visit a village and collect the names of the people who do not have a toilet in their homes. This list is vetted through the village Sarpanch, and random sample checks are conducted by theFoundation to verify the authenticity of the prepared list. The list is then displayed in the village as part of a social audit, to collate the names that have been missed or remove those that have been erroneously added to the list.

2. Information and education campaigns (IEC)–the foundation believes that simply constructing toilets for each household will not resolve the sanitation problem; rather,a revolutionary change of mind-set is needed to initiate behavioural change. To do this,the foundation has developed IEC as an integral component of its overall programme. This component is driven by two the change agents - children of Satya Bharti Schools, and the partner agencies.

INITIATOR : **Bharti Foundation**
INITIATIVE : District-wide individual household latrines
TIMELINE : Began in 2014
VALUE : Rs. 100 crore
ORGANISATION TYPE : CSR/ Foundation
COVERAGE : 900+ villages in Ludhiana



ACTIVITIES/ PROJECTS

Beneficiary identification

Partner agency undertakes survey to identify the beneficiaries.

Names vetted by the *Sarpanch*.

Social Audit of the beneficiary list conducted.

Beneficiary list finalised.

Construction of toilets and handover

Households provided with prefabricated toilets (pour flush to leach pit).

Kandom checks to monitor the quality of toilets constructed undertaken.

A photograph of the beneficiary is taken at the time of handover.

IEC

Two change agents: (1) *Satya Bharti School's* children; and (2) partner agencies

Campaign covers: *Gram Sabha* meetings, *nukkad natak*, DocuFilm screening, banners and posters.

IMPACT

Programme rolled out in 500 villages.

25,000 beneficiaries covered.

5,000 IHHL constructed and handed over in 210 villages.

a. Children from the Satya Bharti Schools - children are believed to be agents of change. The children from 50 Satya Bharti schools in rural Ludhiana organize campaigns every second Saturday of each month to create awareness and spread the message about the importance of sanitation and hygienic practices. Bharti Foundation encourages children and teachers of the schools to design posters and banners, that would be useful in motivating people during the campaigns.

b. Partner agencies - the partner agencies help the foundation spread the message of good sanitation practices, usage and operation and management of toilets through various means. A one-to-one session with all the beneficiaries is organised. The following or similar activities are also planned for implementation :
   i. Gram Sabha for every 20 villages where people are motivated to take up hygienic practices.
   ii. *Nukkad nataks* for every 20 villages to champion the cause.
   iii. Video clips to encourage behaviour through visual aid
   iv. Display of banners or posters bearing messages of improved sanitation.

3. Construction of toilets, quality control and handing over - households are being provided with prefabricated and conventionally constructed leach pit, or pour flush toilets depending on the prevailing conditions. According to Bharti Foundation,their own quality assurance and quality control teams conduct random checks to monitor the quality of toilets constructed. After the toilet is then constructed and quality approved by them, the toilet is handed over to the beneficiary. A photograph of the beneficiary standing in front of his/her toilet is taken by the partner agencies and sent to Bharti Foundation;post the validation of which, the relevant partner agency receives its payment. The number of Individual House Hold Lartines (IHHLs) is then updated on the SBM website of the government. The toilets will subsequently be reviewed after one year to check their status.

COST AND REVENUE

Bharti Foundation has committed an expenditure of Rs. 100 crore over a period of three years for constructing toilets in rural households and girls' toilets in Government schools lacking such facilities.

Beneficiary in front of his toilet, with Tippie Tap to wash hands.

SCALE AND IMPACT

Bharti Foundation has already rolled-out its programmeme in more than 500 villages in the identified districts. These villages have been assigned to different partners who undertake the survey, IEC and construction activities in their respective villages. Over 5,000 IHHL have been constructed so far, and handed over in 210 villages, benefitting more than 25,000 beneficiaries directly.

According to the foundation, the full cycle approach from providing a toilet to changing the mind-set of people is reaping benefits. People are pleased with the quality of their toilets and have adopted the practice of defecating in privacy. They realize the benefits of using a toilet and are very happy with their new possession. Women and adolescent girls claim to be at comfort and many people with big families wish they had more than one toilet in their homes.

REPLICABILITY AND SUSTAINABILITY

Bharti Foundation claims its initiative is a unique and impactful model of reaching out to a large number of people and addressing the sanitation issues of a community as a whole. The biggest hurdle that Bharti Foundation faced was in identifying the beneficiaries. Through multiple ways of verifications and social audit of the list of beneficiaries, they feel the obstacle have been overcome. This approach can be easily adopted in any district in India and is a way of addressing the sanitation predicament. Once provided with a toilet, each household is capable of maintaining it.

Bharti Foundation has multiple partners for constructing the individual household latrines and school toilets. It plans to join hands with more vendors to give a greater momentum to the on-going work.

Satya Bharti School IEC

1.4

SWACHH BHARAT, SWACHH VIDYALAYA: TCS APPROACH

BY TATA CONSULTANCY SERVICES (TCS)

Partnering with government for sanitation infrastructure and services for girls in schools

ABOUT THE COMPANY / BACKGROUND

Tata Consultancy Services (TCS) is an IT-services, consulting and business solutions' firm based in India with operations across the globe, offering a consulting-led integrated portfolio of Information Technology (IT), Business Process Services (BPS), infrastructure, engineering and assurance services. The Government of India's *Swachh Bharat, Swachh Vidyalaya* aims to improve the water, sanitation and hygiene facilities in schools. In keeping with this vision, TCS decided to build dedicated sanitation facilities for girl students in 1,433 adopted government schools starting in October 2014.

The impetus for TCS' CSR investment, according to the company, came from the lack of sanitation infrastructure for girls in schools, evinced by statistics from the Unified District Information System data for Education (U-DISE), which demonstrated that in 2013-14, 18% of India's schools did not have any toilet, and 47% did not have separate toilets for girl students.

WHY IS THIS BEING PROFILED?

TCS is one of the few companies that has responded comprehensively to the government's call for private sector intervention in school sanitation. Their model is based on research and collaboration with the government authorities at the national, state, district, and school levels, tailoring infrastructure, behaviour change and IEC requirements in the selected schools. It is also a model that demonstrates the successful engagement of the private sector in the delivery of the objectives of the Swachh Bharat Mission.

OPERATIONAL MODEL

1. ***Baseline survey for identification of schools***
   The TCS Programme Team worked with the Central and State Government authorities to conduct baseline surveys and identify gaps in sanitation requirements. After discussions with the Ministry of Human Resource Development, Government of India, and the respective State Secretaries, and State Project Directors, high priority states were identified, and districts, blocks, and villages without separate, or with dysfunctional girls' toilets were analysed. As the focus is on girls' toilets, the number of units to be installed in the schools is dependent on the girls' enrollment in the selected schools.

2. ***Identification of interventions and partners***
   At the TCS Banyan Park Office, Mumbai, the company conducted a pilot study of shortlisted models prior to state-level roll-out. Multiple parameters were mapped state-wise, such as longevity, ease of transportation, implementation, and maintenance, uniformity of look and feel, product quality, time, and cost. On the basis of this exercise, the company chose its partner agencies for solutions, systems, and

INITIATOR : **Tata Consultancy Services (TCS)**

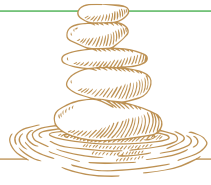
INITIATIVE : Swachh Bharat, Swachh Vidyalaya: TCS Approach

TIMELINE : Began in 2014

VALUE : Rs. 100 Crore

ORGANISATION TYPE : CSR

COVERAGE : covers 1,433 government schools in Andhra Pradesh, Telangana and Bihar



ACTIVITIES/ PROJECTS

Baseline survey for identification of schools undertaken.

Gaps in sanitation identified.

Identification of inventors and partners

Solution providers build toilet units.

System integrator build pits, soak pits and water management structures.

Maintenance partners run on-site teams for daily cleaning, usage promotion, and behaviour change.

Monitoring

Web-based monitoring system that projects planned versus actual progress, provides evidence of work completion and enables real-time control over the programmes activities.

Awareness and BCC

Awareness trainings will be conducted to promote healthy and sustainable sanitation practices, and to highlight the risks of hazardous sanitation among school staff and children.

IMPACT

Identified high priority district, block and villages with dysfunctional toilets or no/inadequate separate toilets for girls in schools.

Constructed sanitation facilities for girl students in 1,433 government schools

maintenance as follows:

- Solution provider partners would build the modular structure for the toilet unit with an integrated overhead water tank, and hand-wash basin. To ensure running water, a line was also connected to the

hand-pump/bore-well. The models could be made up of block and mortar, Fibre Reinforced Plastic (FRP), mild steel, or they could even be eToilets.

- System integrator partners would integrate waste management components into the structure, build the waste management pits, soak pits, and the water management structure. The construction of leach pits and soak pits were designed to avoid groundwater contamination.
- Maintenance partners would run on-site teams for on-ground maintenance, daily cleaning, usage promotion, and behaviour change before eventual handover to school authorities. Where necessary, these partners coordinate with the solution providers and system integrators for necessary repairs or preventive maintenance during the warranty period. A cleaning staff trained on proper methods of cleaning and maintenance, equipped with the required consumables would be available for each of the schools covered by TCS under this programme.

TCS conducted training for all partners to bring them on board with the programmeme and work with the monitoring of the programmeme by uploading information and progress of work on the designed MIS Sytem

3. ***Monitoring***

Leveraging its core competency in IT, TCS developed a web-based monitoring system that served a three-fold purpose in the programmeme – it enhanced the monitoring through projections of planned versus actual progress, provided evidence of work completion through the feature of uploading pictures, and enabled real-time control over the programmeme's activities through a mechanism of online sign-off of checklists defined for implementation partners. Overall, and state progress dashboards were shared with the Ministry of Human Resource Development and the State Authorities on a weekly basis.

4. ***Awareness & Behaviour Change***

In addition to construction and installation of infrastructure, to induce behaviour change in its target audience (school girls, teaching staff and the local communities), TCS' maintenance partners designed awareness and behaviour programmes and activities on the importance of hygiene and cleanliness for every school. Awareness trainings would be conducted to promote healthy and sustainable sanitation practices, and to highlight the risks of hazardous sanitation among school staff and children.

COSTS / REVENUE

The company has earmarked Rs. 100 crore of its CSR funds for the facilities and infrastructure under the programme. Activities commenced in October 2014.

IMPACT

As on July 2015, the company has reported construction of sanitation facilities for girl students in 1,433 government schools across the states of Andhra Pradesh, Telangana, and Bihar. Interventions for handover of newly constructed toilets to the selected maintenance partners is currently underway. Activities related to cleaning, maintenance and behaviour change are expected to begin shortly in all 1,433 schools.

REPLICABILITY & SUSTAINABILITY

The company believes that water availability, maintenance, and monitoring are the pivotal points for the success of such a model. During the surveys, the lack of water supply and availability was one of the main reasons reported for toilets being abandoned or dysfunctional. The company found no single solution across the selected schools, and so solutions were customized for each of the schools depending on the existing situation of water source.

PART B 2

URBAN INFRASTRUCTURE OFFERS

2.1

PAY-AND-USE PUBLIC TOILETS

BY GMR VARALAKSHMI FOUNDATION

Enhancing public toilet usability

ABOUT THE COMPANY / BACKGROUND

GMR Varalakshmi Foundation (GMRVF), is the CSR arm of the GMR Group. GMRVF is a Section 8 (not-for-profit) company, whose Board is chaired by the Group Chairman. The foundation primarily works in four thematic areas - education, health, livelihood and community development. Its activities include operating an engineering college in Kakinada, a 135 bed hospital in Rajam, and several skill development institutes across Tamil Nadu, Andhra Pradesh and Karnataka. The foundation also works with communities in the vicinity of GMR businesses in 22 locations across India, with a staffing of around 100 members. In the sanitation sector, it has built and continues to operate around 14 rural community toilet centres in Andhra Pradesh and Chhattisgarh. It has also built model pay-and-use toilets in Hyderabad and Bangalore. In addition, the foundation has supported over 660 families for construction of Individual sanitary lavatories and construction and renovation of about 60 school toilets at different locations.

WHY IS THIS BEING PROFILED?

The Greater Hyderabad Municipal Corporation (GHMC) invited applications for public toilet blocks on a build, operate and transfer (BOT) model in several locations of Hyderabad around in 2005. Since GMR was constructing an international airport in Hyderabad, GMRVF decided to take up this activity there. Under the public private partnership (PPP) model, GHMC would allocate land to GMR who would then design, build, operate and maintain the toilets for 5 years post construction, after which it would be transferred back to the municipality.

OPERATIONAL MODEL

1. **A survey was conducted in Hyderabad to understand how to plan better facilities .**
   Before construction of the toilets, an initial survey was done of various toilet facilities around Hyderabad to understand the problems and challenges of using public toilets. Several toilets were photographed in order to understand design features, and there was a consultation process with industry experts and users of public toilets. Several issues came out during this study; for instance, location of public toilets needed to be thought through more carefully; the ventilation and lighting were critical features; users were not very responsible in the proper usage of such facilities; often facilities did not have running water; and their maintenance and cleanliness was not very good.
   To address the concerns of usage of public toilets among women, a more comprehensive survey was undertaken among 400 women in Hyderabad. The survey found that women were embarrassed to use

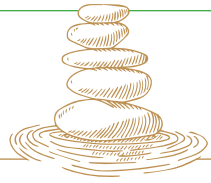
INITIATOR : **GMR Varalakshmi Foundation**

INITIATIVE : Pay-and-Use Public toilets

TIMELINE : Began in 2005

ORGANISATION TYPE : CSR Foundation-PPP

COVERAGE : Bangalore and Hyderabad



ACTIVITIES/ PROJECTS

Survey conducted

Studied existing toilets in Hyderabad to assess the challenges and opportunities of existing solutions.

A comprehensive survey was also undertaken among 400 women in Hyderabad to address usage concerns.

Created model design solutions.

The design included several distinct features such as adequate lighting, separate entrance for men and women, 20-inch wide grill ventilator, and waterless urinals.

Developed Standard Operating Procedure for maintenance.

Monitoring chart with 30 parameters created

GMRVF team member makes unplanned field visits to public toilet blocks at regular intervals.

Conducted workshops on maintenance, technical issues, public interaction, and management.

IMPACT

Toilet construction initiated in 2006.

The toilets in Hyderabad saw usage of more than 1,000 users on peak days .

The Lalbagh toilet is used by 100-175 users everyday.

common entrances to public toilets. The survey also found that many women did not use public toilets because often they looked dark, unlit, and unsafe. Also, they complained of bad smell , unclean surroundings and lack of water. Often garbage dumps located in close proximity to public toilets led to deterioration in hygiene levels.

2. **Creating model design solutions to solve sanitation problems in Hyderabad.**
Several senior architects and designers, including the former Dean of a prominent planning school, were roped in to aid the design, which responded to the issues identified in the survey. The design had a separate closed area for caretakers along with a separate entrance for men and women on either side; adequate lighting was provided in the toilets in order to ensure there were no dark areas; a 20 inch-wide grill ventilator running across the entire structure at a suitable height to provide ventilation and improve lighting was installed. The surroundings of the toilet were landscaped. The toilet model had granite cladding and quality plumbing instruments.GMRVF also piloted innovative features in some of the toilets. For example, GMRVF provided waterless urinals, and experimented with a small child-toilet on the female side to aid younger users in the use of the facilities. The company reports that both these innovations are well received by the public.

Public toilet, GMR Hyderabad

3. **Developing Standard Operating Procedures (SOP) to create model maintenance standards**
Each toilet block in all the eight selected locations had 3 units each for both genders. Each toilet was manned by a caretaker at all times. Daily maintenance was contracted to an expert housekeeping agency. Strict monitoring procedures and elaborate standard operating procedures for maintenance were evolved. GMRVF prepared a monitoring chart with 30 parameters which included availability of water, cleanliness of toilets and wet floors . To ensure regular compliance with these parameters, a GMRVF team member made unplanned field visits to the public toilet blocks at regular intervals. GMRVF also conducted workshops to train the maintenance team on the technical issues as well as public interaction and management to motivate them.

4. Replicating the successful model into another city.

The GHMC reported satisfaction with both the design, construction quality as well as the maintenance of the toilets. After expiry of 5-year lease period, GHMC offered back the toilets for further period to GMRVF. However after shifting office to Shamshabad which was outside the city, GMRVF realised it could not maintain the toilets at the same level. Consequently, it decided not to re-offer itself for this. GMRVF's other foray into urban pay-and-use toilets is in Bangalore, at the Lalbagh Botanical Gardens. The gardens are managed by the Department of Horticulture, Government of Karnataka. GMRVF and the department signed an MOU for the construction and operation of the public toilet block in the garden. The construction was completed in 2012 and made operational in the same year. It is used by the walkers in Lalbagh and members of the Siddhapura slum nearby. The toilet is based on the same design as those implemented in Hyderabad.

GMR toilet gents, Bangalore

COST / REVENUE

The capital expense for each toilet block was borne by GMRVF. The initial user charge for use of urinals was Rs. 1 and for rest rooms was Rs. 2. The user fee was not enough to sustain the level of maintenance required by GMRVF, and therefore the gap funding was covered by GMRVF. The toilets at the various locations in Hyderabad did not have the same usage. Therefore there was a difference between the income generated from each block. Revenue from toilets with very high usage is used to subsidise toilets in locations with low-usage.

"The ideal model for allocating spaces for public toilets in a PPP mode would be the 'plug-and-play' mode, where all basic facilities are already available at the site allocated. However if this is not possible, then at least there should be a single-window clearance for all the basic requirements within a stipulated time-line."

– Avanish Kumar, Senior Programme Leader, GMR Varalakshmi Foundation

"Women must be safe and feel safe using public toilets. It must not be an unpleasant experiece. Those designing and operating toilets must make this a paramount consideration."

– Meena Raghunathan, Director, Community Services GMR Varalakshmi Foundation

IMPACT AND SCALE

The toilets in Hyderabad saw usage of more than 1,000 users on peak days. The Lalbagh toilet is used by 100-175 users every day. This number often goes up during festivals and the annual Flower Show held in Lalbagh, when usage may exceed 500 -600 users daily.

REPLICABILITY AND SCALABILITY

The experience has prompted GHMC to use this as a model for new public toilet construction in Hyderabad. Significant capital and maintenance cost are a major hurdle to scalability.During construction, GMRVF experienced several hurdles, solving which could make the experience easier in PPP. For example, althought site was allotted, the private party had to still go to several departments for permission and access for basic services such as water connection, and sewage lines. Based on these experiences, GMRVF presented a paper at the World Toilet Summit on "Towards a single window clearance for Toilet construction", where they suggested that a single agency

Toilet interior, GMR Hyderabad

Waterless urinals

should handle all approvals for toilet construction. While operating the toilets, GMRVF found that many of the toilets faced problems of vandalism, theft and anti -social elements who indulged in activities such as gambling and drinking at night.

2.2

PORTA TOILETS
BY JSL ARCHITECTURE LTD (JSAL)

Recycling for public toilets

ABOUT THE COMPANY / BACKGROUND

JSL Architecture Limited was set up as a subsidiary company of Jindal Steel Limited, to provide technical and aesthetic solutions for architecture, building, and construction by offering design solutions using stainless steel. In December 2014, JSAL began offering portable toilets using stainless steel.

In November 2014, in response to the announcement of the Swachh Bharat Mission, and based on their experience of providing sanitation solutions to the Indian Railways, the company evolved the concept of the Porta Toilets made out of Stainless Steel and housed in second-hand but refurbished containers. The first toilet was manufactured a month later in December 2014, and to date the company has reported installation of close to 1,000 toilet seats using this concept.

WHY IS THIS BEING PROFILED?

The company is set up as a for-profit market driven model and generates its revenues from its customers, who are other companies, that use their CSR funds to provide these porta toilets to unserved areas e.g. schools without toilets.

OPERATIONAL MODEL

The company sources the containers second-hand from government auctions. These containers are then brought to the factory where material is recycled and transformed into sturdy portable toilets. Wherever necessary, the containers' outside appearance and outlook are made presentable – depending on the customers' preferences, colours and advertisements are placed on the outside; the latter used to generate revenue. Insulation of the containers is also done to protect against the vagaries of cold and heat.

There is no difference in the product developed for urban and rural areas. However, internal refurbishments can be enhanced depending on the requirements of the customers. The company offers an option for automation such as auto-flushing. However, based on a survey carried out by the company, people were hesitant to use fully automated public toilets because of a fear of getting locked inside. There are also additional costs associated with automation such as on-site engineers, call centre, runners, and servers to manage the toilets. For these reasons, the company tends to keep the product features simple in the case of public toilets.

JSAL has a team of around 80 people employed for this purpose. The product is delivered in a time-frame of between 30 to 45 days from the placement of the order. Toilets can be in the form of a single unit, or a compact unit available in options of 6-8 seats and urinals. The body

(*above*) Porta in Jodhpur

(*below*) NDMC toilet

is usually grounded; screws and bolts are hidden to avoid intentional damage to the unit.

Once constructed, the toilets can not be dismantled; the unit can, however be transported from place to place. These units can be installed at government schools, hospitals, sites of tourism, pilgrimage and markets, public auditoria, fair grounds, railway stations, and bus stands. The company provides a one year free maintenance contract, and a guarantee that the product will last for 25 years or more. Regular day-to-day operations and maintenance support is the responsibility of the client.

(*top, L to R*) BPCL toilet; Maruti toilet

(*below*) Single unit modular toilet

COSTS / REVENUE

The Porta Toilets are priced at a total of Rs. 150,000 for a single unit toilet, and community toilets are priced Rs. 650,000 onwards. Disposal tanks cost approximately Rs. 52,000 per unit and are connected to the rear of the toilet unit.

The unit received initial funding from JSAL to set up operations, but was finally set-up as self-sustaining, with earnings from customers or clients that wished to purchase these toilets, usually as a part of their CSR obligations.

IMPACT

To date, the company has set-up about 1,000 toilet seats. Their stated aim is to expand this to at least 2,000 more toilet seats over the next year of operations. The company's operations are set up in Haryana, from where they supply to village schools in Odisha, Telangana, Haryana, as well as to the cities of Jodhpur, Rampur, Delhi, Ahmedabad, Vijay Nagar, and Chennai. Their toilets have been installed at the community level, in schools, and in petrol pumps, in both rural and urban settings. As per the company's records, their customer base includes Honda, Maruti Suzuki, Bharat Petroleum, Hindustan Zinc, Adani, and Municipal Corporations and Municipalities in Delhi and Jodhpur.

REPLICABILITY & SUSTAINABILITY

This unit was set up to leverage the expertise of the company towards a public good. However, the company states that for this initiative to succeed, the parent company must be willing to put in the required time and capital for the initial start up before profits can start to come in. Additionally the initial investment required is quite large because of the fluctuation of the cost the raw material – steel. The units, themselves face price competition from other low-cost toilets. However, the company is pushing the low-maintenance aspect of the toilet, and its longevity of 25 years to market the product more widely.

Porta Toilet interior

"Stainless steel modular toilets provide an appropriate solution for solving the problem of durability. In terms of structural strength, product life, maintenance, hygiene, eco-friendliness, and scrap value, stainless steel toilets have proved to be better than fibre, mild steel or brick-and-mortar toiles."

– Pushpa Chowdhary, Asst. Vice President, JSAL

2.3

SEWAGE TREATMENT PLANT (STP) BY HINDUSTAN ZINC LIMITED

Collaborating at the city-scale

ABOUT THE COMPANY / BACKGROUND

Hindustan Zinc Limited (HZL) is a Vedanta Group company in the zinc, lead and silver business. Their existing corporate social responsibilities investments demonstrate a strong focus on sanitation. Its initiatives towards improved sanitation include construction of toilets in household, community centres, and schools.In addition, HZL 'community behaviour change (CBC)' interventions have also been introduced through project Maryada. Launched on 17th August 2014, the project has run successful awareness campaigns in the rural areas of Rajasthan. In Udaipur, where HZL is headquartered, it has initiated a model that uniquely combines CSR investments through a public-private partnership (PPP), towards the construction of a sewage treatment plant (STP). HZL acquired 2.5 hectares of land for the project in proximity to the Ayad river, through a conciliatory process involving the local community - an example of an organisation acquiring private land for a public good.

WHY IS THIS BEING PROFILED?

It is estimated that Udaipur generates almost 70 million litres of sewage per day. Until the construction of the STP, there was no wastewater treatment facility in Udaipur city. Sewage was dumped into the water bodies in and around Udaipur, that posed safety, health and environmental concerns. HZL represents a unique model of a private company investing in a STP construction, operations, and maintenance, as part of its business model where the treated waste water is utilised by the company for its minerals and the manure goes back to the UMC. The company has managed to develop a model whereby a public good is an integral part of its regular outcomes.

Aerobic Treatment – STP

OPERATIONAL MODEL

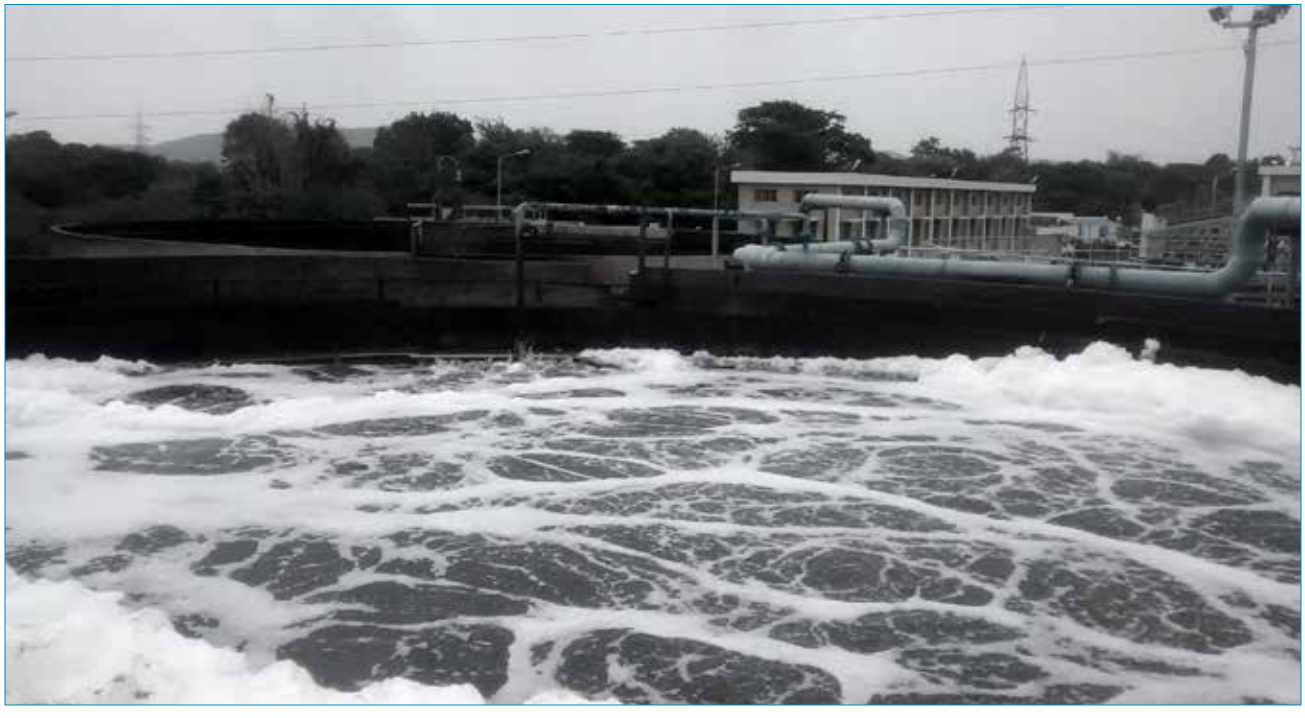
1. **Acquisition of Land**

   HZL asserts that the solution the establishment of a large-scale STP, with the capacity to handle the sewage load. However, due to problems with the acquisition of a suitable site, and local protests, the Udaipur Municipal Corporation (UMC) was unable to construct a STP for wastewater management. This problem was solved by HZL, when it negotiated the required land. HZL transferred the land to the state-owned Urban Improvement Trust (UIT), which in turn leased it back to HZL for the duration of the project. Subsequently,HZL initiated the STP project in May 2010.

2. **Construction**

   The role of UMC was to construct sewage trunk lines connecting domestic sewage lines with the plant, as well as the collection and disposal of the sludge residue from the plant. The role of UIT was to lease the land, back to HZL for the duration of the project. HZL completed the project on 'Design, Build, Own, Operate, and Transfer' (DBOT) basis. This model meant that HZL took overall responsibility for design and construction, while at the same time securing the financing of the required investment. It then acquired ownership of the project, and the subsequent responsibility for the operational management of the plant. At the end of the contractual period of 25 years, the plant would become the property of the municipal corporation. The STP was inaugurated and began operations on 28th March 2014. The plant has daily treatment of 20-22 million litres of sewage per day. The plant only treats domestic sewage. At present, no trunk lines connect the STP to the city, therefore, the STP picks up and treats sewage directly from the Ayad river.

STP – MBBR treatment



Ayad river – STP source

3. **By-products of the STP**

The treated water is used within the plant to water its gardens and lawns. In order to maintain sustainable use of its water sources, 15% of the treated water is discharged back into the Ayad river. The rest of the treated water is pumped to HZL's smelting plants 80 kms away from the STP, providing its smelting plants with a constant source of water at minimal costs. The treatment of sewage also generates a large quantity of manure, which is given by HZL to the UMC, and can be sold by the UMC. When the system is fully institutionalised, it is expected to generate a revenue of around Rs. 1 crore annually for the corporation.

COST /REVENUE

Construction was completed in 14 months at the cost of approximately Rs. 170 crore, borne completely by HZL using CSR funds.The operations and maintenance cost of around Rs.2-3 crores every year is also borne by HZL. The operation of this STP requires minimal operational labour. Only 15 employees, professionally trained in the operation of an STP, look after the operation and maintenance of the plant. This work is contracted to Thermax, an Indian energy company with expertise in waste water management. The treated water obtained for use in their operations offsets the operational expenses.

IMPACT

In the past one year of operation, HZL estimates that the STP has treated the sewage generated from over 20,000 households.According to Mr. Pavan Kaushik, Head of Corporate Communications at HZL, 'in the last one year we have seen a visible reduction in suspended sewage on top of the lakes, and an increase in tourism attracted by the now clean lakes. Due to the zero-discharge policy, the STP has now become a sustainable and reliable source of water for HZL. This has saved the city over 8 billion litres of water till date.

Comparison of drinking untreated treated water

REPLICABILITY AND SUSTAINABILITY

This project demonstrates that private sector investment in large infrastructure projects can serve both, the company's business interests as well as the public good of sewage treatment and environmental pollution abatement, reviving the local economy, dependent on tourism. In essence, the project is almost a closed loop system, making sense in water scare areas.

"In tha last one year, we have seen a visible reduction in suspended sewage on top of the lakes."

– Pavan Kaushik, Head, Corpotare Communications, HZL

There was some resistance among locals amongst the local population due to the land acquisition process, as well as fear that the STP would create squalor in the local community. Over the year of operation of the STP, however, local fears have been allayed. Further, the access road to the plant was located in extremely rugged terrain, making transport of construction material difficult. HZL is also financing the trunk lines, which would connect the existing sewage network to the STP – this is expected to help directly bring domestic sewage from domestic households to the plant. In addition, HZL plans to double the capacity soon, which would lead to it handling around the treatment of upto 40 MLD of sewage per day. As per Mr. PavanKaushik, "the plan is to be able to treat the entire sewage waste within Udaipur".

2.4

WATERLESS URINALS: SAVING WATER FOR BETTER USE

BY EKAM ECO SOLUTIONS

Innovating for resource conservation in sanitation systems

ABOUT THE COMPANY / BACKGROUND

Ekam Eco Solutions is an IIT Delhi incubated start-up, formally incorporated as a company in October 2013, focuses on product development and innovation in sustainable sanitation solutions.The product patented by Ekam is 'Zerodor' (an IIT-Delhi patented product), which, when retro-fitted to urinals, eliminates both odour, and the need for recurring water supply to flush the urinals.

WHY IS THIS BEING PROFILED?

Innovation in sanitation service and infrastructure delivery has been focused towards developing new toilet models for better management and disposal of human excreta, but not much have been done for urination. Urinals generally have water flushing, often perceived to be necessary to maintain hygiene and control bad odour. The average estimated loss of water per urinal per year is anywhere between 50,000 to 150,000 litres. Zerodor results in non-recurring use of water after each use of the urinal, and hence decreases the volume of water use and the release of bad odour in restrooms. This also has implications on the burden of daily operations and maintenance of public toilet facilities, most of which fall into disuse because of cleanliness and odour issues. Also, unlike other innovations, Zerodor can be retro-fit onto existing urinals, and does not require a complete overhaul of the infrastructure in public toilets, and therefore initial capital expenditure is not as high as other infrastructure offerings.

OPERATIONAL MODEL

The product: Zerodor

Zerodor is a patented technology by IIT-Delhi, with dissemination rights exclusively held by the company. The technology prevents release of the bad odour in restrooms. There are two other waterless technologies in the market - membrane trap, and sealant liquid trap. Unlike its competition, Zerodor fitted in urinals doesn't require any replacement. As a result, maintenance needs are minimal and it only needs to be retracted from the trap and cleaned. The same product can also be easily retro-fitted onto old urinals or can be mounted on new urinals, something that is not possible with the sealant liquid traps. Also, since there is no flushing required for maintaining hygiene, wastage of water is addressed. This also helps reduce the pressure on urban sewage. The benefits can be extended to application of urine as a liquid fertilizer for gardens and farm fields. This is made possible by constructing a storage tank connected to multiple urinals and mixing in water in the appropriate proportion.

Manufacturing & Sales of the product

The manufacturing of the product is outsourced. The product is manufactured through the manual injection moulding (MIM) approach where manual labour is involved in developing the product. Sales are

driven through three streams: direct, channel partner, and eCommerce. The company originally started with direct sales only, and later developed their network of NGOs, Dealers and Distributors. Today, their sales network has been established in Uttarakhand, Maharashtra, Karnataka, Goa, Hyderabad and Coimbatore. For direct sales, the company mobilizes plumbing technicians to the client location for installation. These technicians are on company's payroll, and have been trained by the company. Through its channel partners, orders are placed with the company, which then delivers the product to the partner. The partner handles the installation and service locally. The partner also arranges for Annual Maintenance Contract (AMC) if required by the client. Recently, the product has also been rolled out on eCommerce websites such as SnapDeal.com and Amazon.in. The company's objective here is to increase the product's visibility, credibility, reach, and allow small to medium-scale buyers to test out the product.

zerodor™
saves water, removes odour

Benefits of using Zerodor

"I purchased Zerodor and tried it in my office. The results are outstanding. It works well and does not require any water. It makes the urinal waterless and odourless. I want to recommend this product as it saves a lot of water and is low mainteance. I'm amazed that nobody thought of this before."

– A satisfied buyer on Amazon.com

Sustainability

The product has responded to behaviour adaptations. For example, in Delhi's Mother's International School, students were found to be dumping food in urinals that caused frequent blockages. In response, the product underwent design and material changes to address this challenge. Further, due to manual moulding involving labour, the rejection rate remained high at 60%. This however was reduced to 40% after replacing low tensile strength polypropylene with a stronger alternative – ABS. Now with a stabilized product and bigger orders, the company can invest in an automated manufacturing system, known as Automated Injection Moulding (AIM). This, they claim, shall further reduce the operational expenditure per product, and allow them to continue selling the product at competitively lower prices compared to other solutions.

Another challenge includes improvements in clients seeking service - installation and AMC. While this is not an issue in locations with a functional channel partner network, the company always has to mobilise its technicians from the head office in Delhi in locations where this network is absent. This model is difficult and costlier to scale up. To address the issue, the firm is in the process of partnering with service providers who would provide plumbing services across the country.

COSTS / REVENUE

The Technology Development Board provided the initial funding support to the company in the form of a loan for the sum of Rs. 500,000. Apart from this, FICCI have so far provided total funding support of Rs. 1,500,000 through the programme PRAWAH (Promoting Abundance of Water and Sanitation). Under this programme, five waterless urinals are installed in each interested school on the pre-condition that they are willing to take up paid AMC. Some schools in Delhi have benefitted from this programme.

The selling price of the Zerodor (exclusive of urinal pan) is Rs. 4,500, inclusive of installation. The company claims that this is much cheaper as compared to the other two waterless urinal technologies - membrane trap and sealant liquid trap which costs Rs. 5,600 and Rs. 10,000 to 12,000/- respectively.

IMPACT

So far approximately 6000 installations have been completed across 6 states of India which include Delhi, Andhra Pradesh, Tamil Nadu, Madhya Pradesh, Maharashtra and Gujarat. The installations have been undertaken with clients that include Institutes like IIT, IIM and ICFAI, and Corporate companies like Polaris, Google, Dell, Essar Oil, Finolex, ACC Cements, factories of Maruti Suzuki - Manesar, and the defence organisations- the Indian Army and the Indian Navy.

The product is making a major impact on ecosystem sustainability by saving thousands of millions of water.

PART B 3

SERVICE PROPOSITIONS

3.1

MANAGEMENT OF COMMUNITY TOILETS IN PUNE

BY SAMAGRA

Innovating for smarter community toilets

ABOUT THE COMPANY / BACKGROUND

Established in 2012, Samagra is a Pune-based firm with two arms – Samagra Waste Management Pvt. Ltd., and a non-profit, Samagra Empowerment Foundation. Samagra addresses what it sees as the twin issues of sanitation in the slums of Pune – open defecation and the low usage of community toilets in slums, and regular maintenance and upkeep of the community toilets in slums. Samagra has partnered with the Pune Municipal Corporation (PMC) through a PPP agreement to manage community toilets in Pune.

WHY IS THIS BEING PROFILED?

Community toilets in India's slums typically suffer low usage rates, and a host of problems such as poor cleanliness, vandalism, and poor operations. This case profiles a partnership with PMC where rather than construction of new public or community toilets, Samagra provides a profit-based model integrating minimal design interventions for exsiting and toilet operation with both behavioural change and value-added services.

OPERATIONAL MODEL

1. ***PPP Agreement with Pune Municipal Corporation***
   Samagra entered into a PPP agreement with PMC on a trial basis covering a few toilet blocks. Since 2013, they have been allowed to cover 50 toilet blocks in a ward. incentivised by the success of this model, PMC may consider expanding this to a larger number of toilet blocks.

   PMC is in charge of all major repairs, the provision of water, electricity, garbage collection, and connections to the local sewerage network. Permissions issued to Samagra by PMC also include permission to increase the user fee, make design renovations, and the building of the service kiosk within the boundaries of the toilet block. In exchange, Samagra is responsible for the day-to-day operations and maintenance of the toilet blocks.

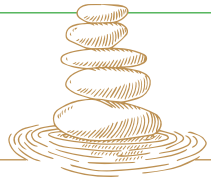
2. ***Research & context-specific interventions***
   Initial surveys conducted by Samagra showed that people expressed a preference for open defecation based on the belief that it was more hygienic than defecating in dingy, smelly and confined toilet cubicles in community toilet blocks. There was a shortage of personnel in charge of maintenance, accessories were frequently stolen, toilets were choked, water and electricity provision was poor, and security concerns deterred people from the local slum community from using these toilets. Samagra therefore developed a model with a combination of design initiatives, and toilet operations, maintenance, and value-added services.

INITIATOR : **Samagra**

INITIATIVE : Management of Community toilets in Pune

ORGANISATION TYPE : PPP with not-for-profit enterprise

COVERAGE : 50 toilet blocks in one ward



ACTIVITIES/ PROJECTS

PPP Agrement with PMC

PMC in-charge of major of major repairs, water and electricity supply, and connection to sewerage network.

Samagna responsible for daily management and maintenance.

Research

To understand local community preferences about sanitation.

Design Interventions

Concrete windows replaced by fibre material for more natural light.

Steps etched to prevent slipping.

Dustbins for sanitary napkins in toilet stalls.

Handwashing stations for children.

Daily Maintenance

Cleaners paid per seat and cover multiple blocks.

Facility Managers responsible for kiosks.

Field Managers cover 10 blocks each.

Operations managers work with communities.

IEC and BCC

Workshops for children and adults, street plays, puppet shows, demonstration of EcoFemme sanitary napkins, community meetings, door-to-door conversations.

IMPACT

Increased usage

231 previously open defecators, now use community toilets regularly.

A clean toilet in the toilet block operated by Samagra, Achanak Chowk, Warje

Better ventilation technology that replaces the previous cement openings with a fibre material

Etched granite steps to reduce slip

3. ***Design interventions instead of new construction***

Instead of construction of new community toilets, Samagra recommended simple design interventions and renovations. For example, concrete windows were replaced by a fibre material that allowed better material and more sunlight, and the granite steps leading up to the toilet blocks, were etched to prevent people from slipping. Dustbins are provided alongside every toilet seat for sanitary napkins; these are emptied everyday by the cleaning team. Separate handwashing stations are set up outside the children's toilet stalls, keeping in mind their height, and soap dispensers. Since metal taps and flush handles are frequently stolen, Samagra has replaced these with plastic taps, and conventional flushing with pour buckets which are brought, in by the users themselves.

4. ***Daily maintenance and services***

Samagra's model is predicated on the existence of field personnel who look after the day-to-day maintenance of the toilet blocks. Facility managers and cleaners are responsible for individual toilet blocks. Cleaners are provided regularly with cleaning supplies and functional machines that limit the need to touch toilet surfaces serving a dual purpose of making the process more hygienic and humane. Cleaners are in charge of multiple toilet blocks and are typically paid per seat cleaned; in some cases, they are also provided accommodation on a sharing basis in the rooms above the toilet block.

The Facility Managers maintain records of every registered household, with fees due a paid and services accessed through the toilet block. They remind users to pay the user fees by the 10th of every month. Facility managers are also responsible for the management of the kiosks at each community toilet block – they offer value-added services such as bank account opening, and digital goods such as mobile recharge, and satellite / cable TV re-charge. For this, the Facility Managers are provided either with a laptop or a mobile phone – both with internet access.

The field staff are overseen by Field Managers – one for cleaning, and another for business development – covering 10 toilet blocks each to oversee the work of the Facility Mangers and cleaners. Additionally, an Operations Manager interacts with community members for their feedback and complaints regarding unclean toilets, in the event of unclean toilets.

5. ***IEC & Behaviour Change communication***

In all targeted communities, in addition to the refurbishment of the community toilets, Samagra engages with the local communities in a number of ways – they conduct workshops for adults and children, street plays and puppet shows, demonstration of the use of EcoFemme sanitary napkins, community meetings, and door-to-door conversations – all in a bid to encourage people to use the toilet, and pay fees for the

Kids' toilets and hand washing station

Child using the handwashing unit at Achanak Chowk, Warje

Children using the toilet block at Achanak Chowk, Warje

services. Audio messages covering sanitation, cleanliness and hygiene practices, are relayed within the toilet cubicles over a speaker to be heard by all users.

COSTS / REVENUE

Samagra was awarded an initial grant by the Bill & Melinda Gates Foundation (BMGF) as part of their Grant Challenges Expo. This fund went towards experiments in Raipur, Bhubaneswar, Delhi, and Bangalore, before finally settling on the operational model in Pune city described here.

The IEC and behaviour change campaign activities are conducted and managed by their non-profit arm, Samagra Empowerment Foundation; funds are crowd-sourced in the absence of other investors. Each toilet block is modelled to be self-sustaining; the main income is through commissions received on value-added services – the company claims to have made Rs. 5 lakh in sales over the last 5 months – and user fees. Samagra raised the user fee from Rs. 30 to Rs. 75 per household per month, and issued an identity card to each household valid for upto 7 members per household. Samagra reports that for every 50 registered households, only 24 pay the monthly fee regularly; however, their field staff do not prevent people from using the facilities if payments are not made.

Poster for LooRewards at the Samagra Office in Pune

(*right*) Toilet block at Achanak Chowk, Warje

IMPACT

Samagra reports significant improvement in toilet usage. There is an increase in membership, although fee payment remains sporadic, and daily usage and footfall has increased. In one of the smaller blocks in Hanuman Chowk, for example the company estimates 800 users on a daily basis, of which, 231 have stopped defecating in the open by using the community toilet. The Ward's Medical Officer opines that this model, including their

emphasis on hand-washing post defecation, has resulted in better health conditions, with lower rates of diarrhoea, and better menstrual hygiene practices.

REPLICABILITY & SUSTAINABILITY

Samagra claims their model is both replicable and sustainable in the long run, but working with local communities requires significant lead time, and in order to break even at current rates, they will need to reach 200 community blocks, covering at least 200,000 users. PMC has suggested that in the interim period, Samagra should tap into CSR funds until a critical mass of users has been reached.

In addition to funding, a critical aspect of the model's sustainability is the intensive field-level human resources, and their almost constant engagement with the local community to get them to use the facilities.

Woman using the banking services at the kiosk outside the toilet block in Achanak Chowk, Warje

3.2

SAFAI SENA: PPP WITH NORTHERN RAILWAYS

BY CHINTAN – ENVIRONMENTAL RESEARCH & ACTION GROUP

Engaged stakeholders addressing multiple environmental and livelihood concerns

ABOUT THE COMPANY / BACKGROUND

Chintan was established in 1999 as an NGO under the Societies Registration Act XXI of 1860, with the aim of addressing issues of sustainable consumption, and environmental and social justice. Chintan is headquartered in New Delhi and has a presence in four states of Uttar Pradesh, Rajasthan, Haryana, and Jammu & Kashmir. Chintan's philosophy is based on the belief that waste pickers constitute the biggest unrecognised labour force that recycles waste in India's cities. In Delhi alone, by their estimate, 150,000 informal sector workers help collect, segregate, and recycle at least 20% of the approximately 8,000 metric tonnes of trash generated daily.

In 2011, Chintan entered into a PPP agreement with Northern Railways to handle waste from trains and platform bins at four railway stations in Delhi – New Delhi, Old Delhi, Hazrat Nizamuddin, and Anand Vihar.

WHY IS THIS BEING PROFILED?

This PPP agreement represents a successful partnership between a government agency and an NGO that combines essential solid waste management, environmental pollution abatement, and ensuring sustained dignity and livelihood of informal sector workers in waste management. For an idea of scale, take the New Delhi Railway Station alone, which handles 300 trains and approximately 360,000 passengers – and their waste, which either gets strewn across the platforms, burnt down into harmful gases, or dumped into landfills. The Solid Waste (Management & Handling) Rules, 2000, mandate segregation, recycling and composting. Further, the National Environment Policy 2006, the National Action Plan on Climate Change, 2009, and the Plastic Waste (Management and Handling) Rules, 2011, all mandate involving waste pickers in waste handling.

OPERATIONAL MODEL

1. *Training & safety kit:* In collaboration with the "Safai Sena", an independent association of informal sector waste pickers, Chintan has trained over 150 men and women waste workers to undertake various aspects of this project, and has provided them with uniforms and Identity cards to identify them as legitimate waste collectors and recyclers.

2. *Waste collection:* These trained waste collectors gather waste from all the trains that arrive on the platform, provide liners for the bins on the platforms, and collect the waste before its spills out and litters the station.

3. *Segregation & Treatment:* A "Material Recovery Facility" (MRF) has been set up by Chintan with their own funds, on land provided by the Northern Railways– the composting section here is 3,200 sq. ft., and has 30 pits. At the MRF, waste is segregated into wet waste, 20-25% recyclables, and 10-15% inert materials that cannot be processed further. Wet waste is converted into compost using an Organic Waste Convertor (OWC). Two women have been trained to supervise the process and ensure that the composting is efficiently done. Compost is then given to Northern Railways at no extra charge; the Railways in turn sends its vehicles to collect the compost periodically.

   This MRF has been set up based on Chintan's experience of establishing five such MRFs in different locations in Delhi and NCR of which Bhopura, in Ghaziabad (Uttar Pradesh) has a composting section of 2,400 sq. ft, 30 pits, and supports 110 waste collectors.

"The work of Chintan at the New Delhi Railway Station shows how not only can urban spaces be sustainable, inclusive, and embracing of the poor, but in fact, the poor such as wastepickers, are germane to the safeguarding of the commons, making them mose usable by all. It was really only on account of the enthusiasm, guidance and the co-creation of the Railway Officials that the project has taken off at all, and it is a PPP project in the true sense."

–Chitra Mukherjee, Manager Chintan

(*above L to R*)

Safai Sena and Chintan team at the Railway Station collecting trash

Material Recovery Facility (MRF), New Delhi Railway Station

(*left*) Segregating waste at the MRF

(*above L to R*)
Composting with Organic Waste Composter
Pit composting

4. *Recycling:* All paper, plastic, metal, cardboard, and glass are segregated for recycling. The PET plastic bottles are shredded to avoid refilling and misuse. The Waste Pickers earn their livelihood from the sale of these recyclable material. The remainder of 10-15% that can not be processed or recycled is transported to the Ghazipur landfill.

COSTS / REVENUE

The cost of operations and maintenance of the MRF at New Delhi Railway Station is Rs. 30,000 per month, which includes electricity and water. Other costs per site of operation include:

- Transportation at Rs. 150,000 per truck, per month
- Rs. 120,000 for uniforms given to the workers twice a year
- Between Rs. 20,000 and Rs. 50,000 for safety gear including gloves, masks, and first aid kits.

The funds for these (and the capital investment for the MRF) are raised by Chintan through its partner donors (including individual donors).

No financial transactions are involved between Northern Railways and Chintan. Northern Railways has allocated land for construction of the MRF, and the compost is collected free of charge by them. The waste pickers earn their livelihood above minimum wage through the sale of recyclable material.

IMPACT

Chintan reports handling approximately 26 tonnes of wet and dry waste per month at these four stations. The bulk of the waste (13 tonnes per day) is generated at New Delhi Railway Station; of this, 2,200 kg of waste per day is recycled. Chintan also reports steady livelihoods of waste pickers above the basic minimum wages, which have reduced their vulnerability

to many economic, social and health risks. They now work in significantly cleaner and safer work environments, and claim to be able to afford their children's education. The PPP agreement has also resulted in environmental benefits from recycling and composting of the majority of waste generated that would otherwise have been dumped untreated in landfills.

REPLICABILITY & SUSTAINABILITY

According to Chintan, there are three key factors in the successful implementation of this model – the collectives of waste workers, the PPP agreement, the CAPEX funding. The model, is of course, dependent on client government bodies such as Northern Railways being willing to enter into such agreements, and renew them regularly. The model is replicable, because the cost to the client is almost negligible beyond the initial investment of land for the MRF. The waste pickers earn directly from funds generated by selling waste, therefore their upkeep and salaries are covered.

Chintan's expansion plans include the North and North-East of India over the next three years where they plan to train informal sector leaders with entrepreneurial skills to run close to 50 similar zero-waste initiatives; Chintan will help them start and run the MRFs.

3.3

CUSTOMISABLE & AUTOMATED ELECTRONIC TOILETS

BY ERAM SCIENTIFIC SOLUTIONS (ESS) PVT. LTD.

Intelligent public toilets

ABOUT THE COMPANY / BACKGROUND

Eram Scientific Solutions (ESS) is a social enterprise that manufactures automated electronic toilets (eToilets) for public use. It is registered as a private limited company, based out of Thiruvananthapuram, Kerala. ESS started operations in 2008, and has fabrication units in Delhi, Bangalore, Chennai, and Thiruvananthapuram.

The company offers Electronic Toilets that automate operations from cleaning after each use, to overall maintenance of the toilet block. The impetus for this came from the company's observation that conventional brick and mortar toilets fall into disuse after 6-9 months of construction because of a lack of maintenance, the public toilet getting defaced, and clogged sewers. The company spent nearly 6 years in R&D on appropriate solutions using alternative material, focusing on automatic cleaning and bio-digester technology.

ESS was one of the 6 winners at the "Reinvent the Toilet Fair" held in New Delhi by the Departement of Bio-technology (DBT), Ministry of Science & Technology, Government of India, and the Bill & Melinda Gates Foundation (BMGF).

WHY IS THIS BEING PROFILED?

This product offering tackles one of the most common problems being faced in the public provision of sanitation services – proper operations & maintenance of facilities. The company's focus on automation of regular day-to-day operations and maintenance offers a solution where public sanitation facilities are kept in working order for a longer period of time, and therefore its use by the public is promoted.

OPERATIONAL MODEL

Models offered:
The standard model offered is a pre-fabricated steel toilet mounted on a civil foundation, usually set-up in 45 sq. ft. of space. The only mandatory requirement for installation of an eToilet, is a water connection. The model has a bio-digester and solar panels installed as part of the unit to tackle dependence on sewer lines, and intermittent or no electricity supply.

The standard model is fully customizable depending on context. For example, ESS has designed a school eToilet model keeping in mind the height and other requirements of school going children. In some cases, which the company calls "She Toilets", the model also offers sanitary napkin vending machines and incinerators for Menstrual Hygiene Management.

Automation:

The company offers 3 categories of automation of cleaning services – use, maintenance, and tracking:

1. A green / red LED indicator outside each toilet cubicle shows its occupancy status. In a pay-and-use model, the toilet cubicle door only opens after a coin is inserted. Audio instruction plays in the local language to guide users on how to use the eToilet. Lights and fans are managed by sensors; turning on only when the toilet cubicle is in use. An emergency button is provided inside the toilet cubicle through which the user can connect with monitoring personnel.

2. Should a user forget to flush, the eToilet will automatically flush to self-clean; the amount of water used depends on the length of time for which the toilet was used – 1.5 litres of water flushed for 2 minutes of use, and 4.5 litres of water flushed for more than 2 minutes of use. After a pre-set number of uses (which can be programmemed for each site), an automatic floor wash and dry takes place to keep the unit clean.

3. The eToilet is GPRS enabled, to allow for self-checks and monitoring through a remote monitoring system at regular intervals. For example, remote flushing can be effected by a real-time command in the control room. The unit can be connected to and accessed through a website or mobile device. The occupancy status of toilets, availability of electricity

Interior of toilet

School toilet

Public eToilet

at the unit, water level in the storage tanks, and other monitoring parameters can be monitored though these web-based / mobile applications by the clients. Additionally, ESS has a monitoring station in Thiruvananthapuram that overseas all eToilets.

COSTS / REVENUE

The standard eToilet model costs approximately Rs. 200,000 to design, manufacture and install, while the most customised variant costs around Rs. 600,000. Variants in terms of material (mild steel / stainless steel) are also available to control costs.

The eToilet generates income from two sources – the first is the user charge collected in a pay-and-use model, and the second is the revenue generated from advertisements displayed on the exterior of the toilet. The company offers almost 1,000 sq. ft. of advertisement area available per toilet block.

IMPACT

To date, ESS has installed over 1,000 eToilets in urban areas of 40 districts, covering 18 states. Some of ESS' clients include Bruhat Bengaluru Mahanagar Palike (BBMP), Kerala State Women's Development Corporation (KSWDC), Nagpur Municipal Corporation, Delhi Cantonment Board, Tirupati Municipal Corporation, Greater Visakhapatnam Municipal Corporation, Bihar Infrastructure Development Corporation, Dhamtari Municipal Corporation, Tata Consultancy Services, and ELCITA Bangalore, to name a few.

REPLICABILITY & SUSTAINABILITY

In its current manifestation, the model is geared to service public toilet needs in urban areas for three reasons - the eToilets are dependent on a regular water supply, the entire monitoring system (including remote monitoring) is dependent on a GPRS connection, and the cost of initial investment and space requirements means that the model is only effective for large-scale use, not household use.

Public eToilets

However, in spite of these issues, ESS claims that the eToilets are resilient to external damage with a life-span of between 10 to 15 years, and that the CAPEX investments can be recovered through both user charges, and advertisement revenue – making the model financially sustainable.

The model can be scaled-up for high-end customers or made affordable for specific target groups. ESS' R&D team is working on a high-end model called the "Imperial Toilet" which would be air-conditioned, and the automation using a vacuum system, should ensure sterilization at all times. ESS has also designed a model called "eLite14" for Tata Consultancy Services (TCS) as part of its CSR initiate to provide school toilets in collaboration with the Government of India's Swachh Bharat Mission.

3.4

MICRO-LOANS FOR WATER & SANITATION INFRASTRUCTURE

BY GRAMALAYA URBAN AND RURAL DEVELOPMENT INITIATIVE

Finance for sanitation inclusion

ABOUT THE COMPANY / BACKGROUND

Guardian was set-up based on the experience of the NGO Gramalaya which aims to create open-defecation free villages in Tamil Nadu. Through its operations over 25 years, Gramalaya observed that the lack of water and sanitation (WATSAN) infrastructure negatively impacted the lives of villagers. Women and adolescent girls in particular were forced to defecate in the open, and usually did so before sunrise or after sunset for privacy. The lack of drinking water facilities meant that women would have to fetch water from long distances. Both affected the health, safety and education of women. In the NGO's experience, the lack of WATSAN infrastructure stemmed from a lack of access to finance. In response, The Gramalaya Urban and Rural Development Initiative (GUARDIAN) was established in 2007 as a not-for-profit microfinance, Section 25 company to provide microfinance loans to women for new toilets, water connections, renovation of existing WATSAN infrastructure, rainwater harvesting, water purification, and biogas plants.

WHY IS THIS BEING PROFILED?

Most banks in the country do not provide stand above loans for sanitation infrastructure and most microfinance companies before the Guardian initiative, did not necessarily focus on financing sanitation infrastructure, low-cost, or otherwise. Guardian was one of the first microfinance institutions in India to fill this gap by providing collateral-free, cash loans to villages in six districts of Tamil Nadu, and continues to be the only company with 100% of its portfolio of loans covering WATSAN infrastructure. Under the Swachh Bharat Mission, there is an expectation of beneficiary contribution for individual household toilets; in the case of the very poor in rural and urban areas, the concern is how to buttress beneficiary contribution towards household sanitation infrastructure. This case provides an example where micro-loans have been used successfully for individual household toilet construction.

OPERATIONAL MODEL

Guardian's operations cover 6 districts in Tamil Nadu, with 8 branches. Its operating model covers:

1. **Mobilising and sensitising the community**
   Prior to launching activities in a particular village or district, community mobilisation and sensitization is achieved by partnering with local leaders, self-help groups of women, and youth groups. Public meetings are usually held to explain issues surrounding open defecation and the importance of toilet use.

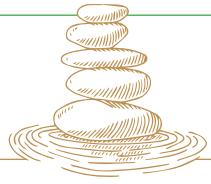
INITIATOR : **Gramalaya Urban and Rural Development Initiative and Networks (GUARDIAN)**

INITIATIVE : Micro-loans for water and sanitation

TIMELINE : Began in 2007

ORGANISATION TYPE : Non-profit microfinance

COVERAGE : Covers 6 districts in Tamil Nadu through operation of 8 branches



ACTIVITIES/ PROJECTS

Mobilising and sensitising the community

Partnerships established with local leaders and SHGs.

Public meetings are held regularly.

Formation of Joint Liability Groups (JLGs) for loan application and approvals

Potential women borrowers are organised into JLGs of five members each.

Field officers assist with the required formalities.

Borrowers do not provide any collateral.

Disbursal of funds and recovery of loan repayments

Micro-loans of Rs. 14,000 for a new toilet.

Renovation of existing toilets – Rs. 5,000.

Repayable at a diminishing rate of 21%

Loans for 18 months.

Promotion of low-cost models

GUARDIAN encourages the construction of low-cost toilets by distributing brochures with details about how to construct these toilets.

IMPACT

Increased demand for toilets in targeted districts.

46,962 loans for a total of Rs. 50.28 crore for household toilet construction.

20,049 loans for new water connections.

73,021 loans of Rs. 65.9 crore disbursed, with a 97% repayment rate (June 2005).

Awareness activities

"Sanitation to all will not be a challenging issue provided the people must understand the consequences of not having toilets."
—GUARDIAN

2. **Formation of Joint Liability Groups (JLGs) for loan application & approvals**
   Potential women borrowers are organised into Joint Liability Groups (JLGs) with five members each; one of whom is the leader. Field officers assist with the required formalities in applying for and approving loans – procuring the necessary paperwork (e.g. identity proof, address proof, and property tax), stamp paper agreements, and interest rate agreements. This is then submitted to district branch officers, where the managers verify the documentation and dates for cash pay-outs. Borrowers are not required to provide any collateral for the loans.

3. **Disbursal of funds & recovery of loan repayments**
   For the construction of new toilets, Guardian provides micro-loans of Rs. 14,000 per borrower, and for renovation of existing toilets, they provide micro-loans of Rs. 5,000. These micro-loans are repayable at a diminishing interest rate of 21% over an 18 month period; in addition to this, 1% of the loan amount (Rs. 140 in the case of a new toilet constructed) is charged as a processing fee by Guardian.

   Loans are disbursed on a single date in the form of cash pay-outs by the field officers. In the month following the disbursal of loans, EMI collection is initiated. Disbursed loans are normally recovered over an

Field Officer conducting his activities

18 month period, with a monthly repayment schedule. Field officers conduct household visits to ensure that toilet construction has been initiated and completed. If required, a leeway of an additional month is given in the event of delays, after which repayment is claimed if a toilet is not built. Guardian claims that by and large, almost all people construct toilets and repay loans in a timely manner; in their experience, such refunds are rare.

A Loan Utilisation Report is manually populated and updated by the Field Officers, and contains details of toilets constructed, and EMI's paid or delayed; this information is fed centrally into an MIS that ensures that individual loans can be traced and accountability can be established.

4. **Promotion of low-cost models**

Although borrowers may utilise the funds to build any kind of toilet they deem suitable, the company encourages the construction of low-cost toilets that may be budgeted within the micro-loan amount. To support this Guardian's field officers distribute brochures with details of how to construct these low-cost toilets, and where possible connections to local masons and cement fabricators are facilitated. The most common model encouraged by Guardian for construction with the micro-loan is a 4' x 4' leach pit model with brick-lined leach pits and a lid.

Water connections established though Guardian's microfinance

COSTS / REVENUE

Guardian is funded by a number of private agencies and banks. The Indian Overseas Bank has funded Guardian with a loan of Rs. 22.5 crore; the company reports that three of seven installments have been repaid to date. Acumen Fund, USA has also contributed US$ 1 million towards Guardian's operations. In the past, several other bodies have also funded them, including Milaap, Bangalore (Rs. 2.9 crore), Friend's of Women's World Banking (Rs. 25 lakh), OIKO Credit (Rs. 3 crore), and NABARD (Rs. 25 lakh).

Revenue generated from interest earned through disbursal of these loans is used to partially finance Guardian's operations and manpower costs. Water.org, USA supports Guardian with a grant to meet partial operational costs. Any surplus is put back into the revolving fund for loans.

IMPACT

As on June 2015, Guardian has recorded 73,021 loans for a total of Rs. 65.9 crore disbursed since its inception, with a 97% repayment rate. Of this, Guardian reports that household toilet construction constitutes the largest share with 46,962 loans for a total of Rs. 50.28 crore. This is followed by loans for 20,049 new water connections. Guardian reports an increased demand for household toilets in the districts where they have been working.

Significantly, based on the experience of the Guardian model, several other micro-finance institutions in India – GrameenKoota, Hand-in-Hand, ESAF, MythiriSarvaSewaSamithi (MSSS), ARC Finance, Scope NGO, Bullock-cart

New toilet built using microfinance

Workers Development Association (BWDA), and Friend's of Women's World Banking (FWWB), have contextualised the model and begun micro-loan offerings for WATSAN infrastructure; on an average, WATSAN loans currently account for approximately 10% of the portfolio of these companies.

REPLICABILITY & SUSTAINABILITY

Guardian reports two challenges in implementation of their model, which could also be faced by other similar initiatives. The first comes from local masons who often urge villagers to build large septic tanks that need not be serviced for a longer period of time, than the brick-lined leach pits that Guardian promotes and have a limited life span of 10-15 years. On an average, Guardian reports that these cost the villagers Rs. 50,000 or more, as opposed to Guardian's model of Rs. 14,000. Guardian mitigates this by convincing villagers through Gram Panchayats and local leaders. Second, their geographical spread and subsequent scale-up, is limited by their funding.

Based on their experience, Guardian reports plans to expand its network to 10 more districts in the state with a target of funding construction of 1 million new toilets. They are also developing a Business Correspondent (BC) model in partnership with the Bank of India (BOI) and NABARD to offer direct loans worth Rs. 7 crore (micro-loans of Rs. 14,000 for new toilets and Rs. 10,000 for new water connections). In this model the formation of JLGs is expected to be supported with a seed capital of Rs. 2,000 per group, while Guardian is expected to oversee group formation and loan recovery.

3.5

O&M OF SCHOOL TOILET FACILITIES IN PUNE

BY SANITATION SOLUTIONS SIMPLIFIED (3S) OF SARAPLAST PVT. LTD.

Scaling-up through partnerships

ABOUT THE COMPANY / BACKGROUND

Founded in 1999, 3S is a for-profit social enterprise of Saraplast Pvt. Ltd. that aims to provide adequate sanitation to those without hygienic sanitation services. Their products include portable restrooms (basic to luxury designs), with sanitation and waste management services which cover the sanitation chain such as design, installation, maintenance, and even septic tank emptying services. The company also offers these sanitation products and services to unserved settlements such as construction sites, slums, labour camps, and schools.

Saraplast's operations have been scaled up from just 750 units in 2009 covering 270,000 services, to 3,800 units in 2014 covering 1.3 million services and 2.2 million users. The company's products and services are functional in Delhi, Bihar, Gujarat, Maharashtra, Karnataka, Tamil Nadu, Telangana and Andhra Pradesh.

This initiative is based on two key learnings through the company's operations. First, that government provides the scale for meaningful and sustainable impact, and second, the biggest issue in provding sanitation solution in slums, is the regular maintenance of public / shared facillities..

In December 2014, the Pune Municipal Corporation permitted Saraplast to run a 12-month pilot in the city to regularly clean and operate 100 toilets in 12 municipal schools. Subject to the results of this pilot, PMC plans to release a tender for all 160 schools.

WHY IS THIS BEING PROFILED?

Saraplast offers services across the complete sanitation service chain, right from design and installation of toilets, to daily waste evacuation (including cleaning of septic tanks). These services are fully mechanized; what the company calls it "no-human-touch" approach. This is particularly important in light of the 2013 Manual Scavengers Act, which includes in its definition of 'hazardous cleaning', individuals involved in handing human waste without protective gear and other cleaning devices and observance of safety precautions. Additionally, this case demonstrates comprehensive O&M solutions through a PPP agreement with an urban local body.

OPERATIONAL MODEL

Saraplast regularly cleans the 100 school toilets under the pilot through an automated process. The cleaning of waste is done using a truck mounted with hi-tech imported vacuum pumps and a high pressure jet for quick evacuation of human waste. These trucks visit each school twice a week. The vaccuum truck is manned by one driver and one technician. The latter's main task is to ensure that the truck has enough water and that all the equipment is functional. A weekly attendance register outside each

Pressure Jet

Evacuation Vehicle

Vacuum Pump

toilet needs to be filled in by the technician on every visit. By automating the process, Saraplast prevents leakages and spillage of waste into the environment.

Saraplast also arranges awareness camps and weekly sanitation drives for school children using cartoons, puppet shows and cardboard messages to spread awareness on the importance of using toilets.

During the implementation of the pilot, Saraplast came across some schools without separate toilets for girls. In these schools, they installed High Density Polethylene (HDPE) toilets for the girls and female teachers as well.

COSTS / REVENUE

The funding for the initiative is provided by an international philanthropic foundation with a focus on education. The total cost to maintain these 100 toilets for a year amounts to approximately Rs. 16 lakh, or Rs. 60 per toilet seat, per day.

"It is what is done in the USA. Robots go into the drain lines to check for corrosion, blockages, etc., and generate adequate actions to correct them."

– Rajeev Kher, Founder, Saraplast

School Toilet O&M

IMPACT

The regular cleaning services under this pilot currently serve 3,200 students and 75 staff. In the first six months of the pilot, as per the company's records, there has been significant improvement in the awareness of children and parents of healthy sanitation practices; the number of children using toilets over a six month period has increased by 22%.

At present, the faecal waste collected by the vacuum truck is disposed off at a site approved by the Pune Municipal Corporation.

REPLICABILITY & SUSTAINABILITY

Pune city is currently experimenting with a number of models for sanitation service delivery, and this pilot represents a partnership between the urban local body and a for-profit social enterprise on operations and maintenance of infrastructure. At present, the cost is being borne by an international philanthropic foundation. Post the 12-month period and subject to the success of the initiative, PMC will takeover the cost of Saraplasts's services.

Additionally, in Patna, Saraplast is piloting its own sewage treatment plant, where water is recycled for industrial and agricultural purposes, and dry waste is used to generate compost. Based on the experience in Pune, the company plans to implement similar model in other locations.

PART B 4

COMMUNICATION, EDUCATION AND BEHAVIOUR CHANGE FOCUSED OFFERS

4.1

DETTOL BANEGA SWACHH INDIA CAMPAIGN

BY RECKITT BENCKISER

Spreading awareness, motivating volunteers

ABOUT THE COMPANY / BACKGROUND

RB (formerly known as Reckitt Benckiser) is a global consumer health and hygiene company with a global portfolio of health, hygiene and home brands such as Nurofen, Strepsils, Gaviscon, Mucinex, Durex, Scholl, Clearasil, Lysol, Dettol, Veet, Harpic, Bang, Mortein, Finish, Vanish, Calgon, Air Wick, Woolite, and French. Over the years, RB has played an active role in tackling public health challenges across the globe. For example, it is the global FMCG Partner for the international charity, "Save the Children" in the fight to reduce under-five diarrhoea. Overall the company aims to reach 200 million people globally to improve their health and hygiene behaviour.

RB's investment into improving health and hygiene in India began in 2006. However, the company strongly felt the need to widen the scope of its efforts to drive habit change towards safe sanitation and good hygiene practices, which it sees as one of the biggest challenges in India. In 2014, RB India lauched a 5 year campaign programme titled, "Dettol Banega Swachh India" to address the rising need of hygiene and sanitation, primarily focusing on two areas:

1. Driving behaviour change towards hand hygiene by creating awareness around the importance of adopting healthy hand-washing habits and setting up hand-washing stations for children; and

2. Improving sanitation facilities by working with NGO partners to identify areas across the country to support the development and maintenance of cleaner toilets.

WHY IS THIS BEING PROFILED?

RB India is one of the few Indian companies that has responded to the Swachh Bharat challenge by focusing on behaviour change, instead of just toilet construction, based on their own experience of running a similar programme for hand-washing over the past 9 years. The programme works with grass-root NGO partners to deliver this campaign. In addition to its own funding commitments, RB India has run a public fund-raising campaign to augment its contribution under the programme.

OPERATIONAL MODEL

1. **NDTV & Dettol "Cleanathon"**
   This was a 12-hour live televised fundraiser on 14th December 2014, in collaboration with NDTV, where viewers could call in and donate to the cause of sanitation. The programme saw the participation of people from all walks of life including corporate leaders, government functionaries, and celebrities.

INITIATOR : **Reckitt Benckiser**

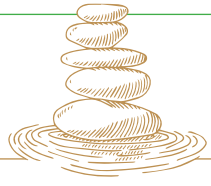
PROJECT : Dettol Banega Swachh India Campaign

TIMELINE : 5 years from 2014; except Handwash programme launched in 2006 and still running

VALUE : Rs. 100 crore

ORGANISATION TYPE : CSR / Foundation / BCC

COVERAGE : All India coverage except for Swachh Express (8 states only)



ACTIVITIES/ PROJECTS

NDTV & Dettol "Cleanathon"

12 hours TV campaign held in December 2014 to launch the project

Dettol-Banega Swachh India Campaign (5 years)

IEC

NGO partners funded to build and maintain toilets

13,000 health volunteers + 8,000 SHGs used to power the campaign

Project Hope (Designed not launched)

Target: poor communities

Focus: awareness, improved sanitation infrastructure, clean drinking water infrastructure, prevention and treatment of diarrhoea

Swachh Express (5 years long campaign)

Mobile IEC campaign (by bus)

Target: 2,000 villages (in the first two months, covered 400 villages in 8 states - Haryana, Bihar, Uttar Pradesh, Rajasthan, Chhattisgarh, Madhya Pradesh, Maharasthra, Jharkhand)

IEC campaign: blogging, Nukkad natak, flyer distribution, docu-film screening, handwash training sessions

School Handwash Programme (2006 onwards)

Pamphlet for schools [indicating a 6 step hand washing process]

Training of school children for handwashing and hygiene

IMPACT

Rs 280 Crore raised for on-ground organisations for infrastructure and advocacy

Development of Hygiene Index

400 villages covered in first two months

400 villages covered in first two months

Clean up drive: Sachin Tendulkar and Banega Swachh India

"We believe India has the potential to realise the Clean India campaign ambition, and have implemented our own programme to support the campaign."

– Nitish Kapoor, Regional Director, RB South Asia

2. Swachh Express

A mobile IEC campaign, "Swachh Express", was flagged off in October 2014 by bus and online. The objective of this is to create awareness around hygiene and sanitation through interactive videos, flyer distribution, posters, hand-washing sessions, and Nukkad Nataks (Street Plays) across the villages covered. A blogger campaign was launched, and 4 bloggers were given the chance to experience the efforts live by travelling on the Swachh Express, and capturing their experience through the blogs.

3. School Handwash Campaign

This is RB India's flagship sanitation campaign which began in 2006, and the experience of which helped launch the 2014 Dettol Banega Swachh India Campaign. The main aim of the programme was to educate students on the importance of school handwash and procedure of 6 steps of proper hand-washing. Each child is also given a Dettol Liquid handwash. All the schools are also given a First Kit to the school and Dettol Handwash Dispensers.

4. Planned initiatives under the campaign

In addition to the existing initiatives under the Campaign, RB India plans to:

- Develop school modules for very young children covering hygiene issues such as personal hygiene, hygiene in school and at home, during illness, and hygiene in neighbourhoods. The aim is to teach these modules through student workbooks, activity-based learning kits and school curricula for teachers to ensure continuous dissemination.
- Work with the Swades Foundation to build 25,000 toilets, provide safe water to 110,000 households, and recruit and train 13,000 health volunteers, and empower 8,000 SHGs to work on community based action for safe sanitation and hygiene.

- Develop a Hygiene Index to provide a standard and holistic measurement of hygiene (personal, food, and environmental hygiene, sanitation, and safe water) to inform policy decision in India
- Develop Project HOPE as a campaign for the bottom-of-the-pyramid communities to increase awareness, improved sanitation, drinking water infrastructure, and prevention and treatment of diarrhoea.

Dettol handwash

COSTS / REVENUE

RB India has committed a sum of Rs. 100 crore towards the campaign. This contribution has been augmented through the Rs. 281 crore raised at the Cleanathon; these funds are used by the partners of the programme for construction of toilets.

IMPACT

- The NDTV & Dettol Cleanathon raise a sum of Rs. 281 crore
- One of the bloggers invited for the Cleanathon in December 2014 and presented with a cheque for Rs. 250,000; she subsequently donated the cheque to the campaign.
- Over two months of its first phase, the Swachh Express covered 400 villages in the 8 states of Haryana, Rajasthan, Uttar Pradesh, Bihar, Jharkhand, Chhatisgarh, Madhya Pradesh, and Maharashtra. The company plans to reach out to a further 2,000 villages over the next 5 years through the Swachh Express.
- Over the last 9 years, the hand-washing campaign reports a coverage of 10 million mothers and children, educating them about the importance of hand hygiene and sanitation.

REPLICABILITY & SUSTAINABILITY

This model is representative of a case where the company has not just put in its own resources through the campaign, but also has undertaken a fund-raiser to augment these funds. The case focuses on long-term change through demand generation for safe sanitation and hygiene, and presents a sample for other initiatives looking to augment their own infrastructure-creation with behaviour change.

4.2

DOMEX TOILET ACADEMY

BY HINDUSTAN UNILEVER LIMITED (HUL)

Creating sanitation entrepreneurs

ABOUT THE COMPANY / BACKGROUND

Hindustan Unilever Limited (HUL) has a company-wide vision to grow their business while reducing the environmental impact of their operations and increasing their positive social impact. The Unilever Sustainable Living Plan (USLP), under which this initiative is placed, has three global goals, namely: (i) help more than a billion people take action to improve their health and well-being; (ii) halve the environmental footprint of the development and use of products; and (iii) enhance the livelihood of millions of people while growing the business. Under the health and hygiene pillar of the programmeme, HUL has identified water, sanitation and hygiene (WASH) as their focus area; programmemes under this are spearheaded by the company's brands in India.

On 19th November 2013, Domex, HUL's leading toilet cleaner brand, announced the launch of the Domex Toilet Academy (DTA) to mark the occasion of World Toilet Day. DTA has both, an infrastructure component of toilet construction, as well as an IEC component for positive behaviour change towards good hygiene practices. By the end of 2015, the initiative aims to build 24,000 toilets in villages where open defecation is a prominent practice, and where people do not have access to toilets. At present, the company claims six operational DTAs in the states of Maharashtra, Odisha and Madhya Pradesh.

WHY IS THIS BEING PROFILED?

Domex Toilet Academy is a unique market-based, entrepreneurial model where community entrepreneurs are trained to offer affordable toilets for the local communities, orient local communities to better sanitation and hygiene behaviour, and post the toilet construction, to sustain their entrepreneurship by selling sanitation products to the communities, as well as check the usage and maintenance of toilets.

OPERATIONAL MODEL

In partnership with the social enterprise eKutir Rural Management Services Pvt. Ltd., the DTA programmeme identifies and selects micro-entrepreneurs to be trained in executing the project in their local communities. These micro entrepreneurs set up Sani-Shops to supply and build affordable toilets for their local communities. Training provided to the micro-entrepreneurs covers finance, operations, human resources, and procurement. In select cases, DTA also provides loans to kick-start the entrepreneur's sanitation business. DTA also collaborates with masons, and raw-material providers to ensure that the entrepreneur-provided toilets are affordable to the target households.

These trained micro-entrepreneurs then go door-to-door in the local communities to generate awareness on sanitation and hygiene, which,

INITIATOR : **Hindustan Unilever Limited (HUL)**
PROJECT : Domex Toilet Academy (DTA)
TIMELINE : Began in 2013
VALUE : Spent Rs. 1.6 Crore on DTA in 2014-15
ORGANISATION TYPE : HUL CSR
COVERAGE : 5 operational DTAs in Maharashtra, Odisha and Madhya Pradesh

ACTIVITIES/ PROJECTS

Toilet construction

Target: 24,000 rural household toilets

Microentrepreneurs selected and trained.

Responsible for the design, construction and installation of toilets in the household.

SHGs link the local community with the micro-finance institution

Communities to purchase toilets from the micro-entrepreneurs.

IEC

Micro-entrepreneurs go door-to-door in the local communities.

Orient local communities to good sanitation and hygiene behaviour.

IMPACT

Programme has reached out to 15,000 people by building 3,000 toilets.

Trained 100 local entrepreneurs to sell and maintain toilets.

Generating demand for sanitation

(*below*) DTA entrepreneur training

in turn, helps to generate demand for household toilets. The initiative handholds these entrepreneurs in the initial engagement with the communities. The entire responsibility of design, construction and installation of toilets in the household lies with the trained micro-entrepreneur. These entrepreneurs further supply hygiene products by partnering with FMCG companies.

DTA also works with local self-help groups (SHGs) linking them to micro-finance institutions to enable them to buy toilets from the local micro-entrepreneur. Currently DTA works with a network of 12,000 SHGs in the

Vidarbha region of Maharashtra. In addition to finance, the programmeme also targets local communities to raise awareness on safe hygiene practices.

Babli- game on website

DTA event

COSTS / REVENUE

The entrepreneurs can be provided seed capital by DTA to set up Sani-Shops, and help with operational costs for the execution of the project. Once established, it becomes a self-sustaining model with minimal further investment required from the funders.

Rs. 1.6 crore was spent on DTA by Hindustan Unilever as part of its CSR in 2014-2015.

IMPACT

To date, the programmeme has reached out to over 15,000 people by building over 3,000 toilets across villages of Odisha and Maharashtra;

activities have recently been expanded to also include the states of Madhya Pradesh and Bihar. So far, the programmeme has trained more than 100 such local entrepreneurs to sell and maintain toilets.

REPLICABILITY & SUSTAINABILITY

DTA represents a sustainable way to help people gain access to a toilet, by treating the toilet across (and related hygiene products) as part of a market model, generating demand for sanitation, and ensuring adequate supply – in terms of infrastructure offers, operations and maintenance support, and related sanitation product markets This market based-model assumes that people are more likely to use toilets when they have invested in the toilet, rather than when it was built for free.

DTA toilet

The DTA model is sustainable because it requires very little capital investment. The key here is the selection of an effective operations partner for community mobilisation, and identification and training of entrepreneurs. Post training, after initial handholding and monitoring, entrepreneurs can take off on their own. It can therefore be easily replicated across geographies by different organisations.

As this is a community-driven model, as long as entrenched community structures such as SHGs and community leaders are mobilised, post the initial stages, very little external input is required.

4.3

MOTIVATING ODF VILLAGES THROUGH BEHAVIOUR CHANGE

BY FEEDBACK FOUNDATION

Catalysing Community Adoption

ABOUT THE COMPANY / BACKGROUND

Feedback Foundation (FF) is the community engagement entity of Feedback Infra Private Limited (FIPL),formerly known as Feedback Ventures Private Limited. It envisions improving lives of people by engaging and facilitating community action for development. FF is registered as a private trust since May 2010, and is headquartered in Gurgaon, Haryana with seven project offices across the country. The Capacity Building Division of Feedback Ventures Pvt. Ltd., started working in the area of water and sanitation after recognising its contribution towards improving health outcomes. The company operates on the principle that mere construction of toilets will not suffice. In addition, emphasis should be on changing the behaviour of the community to adopt safe hygienic practices. The Foundation sensitizes stakeholders at various levels about the issues and possible solutions, one such being the Community-Led Total Sanitation (CLTS) approach - a methodology that was pioneered in Bangladesh and has yielded significant results in ending open defecation.

WHY IS THIS BEING PROFILED?

FF generates demand at the grass roots for safe hygienic practices to scale up the interventions. The demand generated is capitalized by the government at various levels to create an enabling environment for scaling up the programme. After the community is "triggered", people are taught how to construct toilets. The households are motivated to build toilets on their own as no subsidy is provided to them. Until they build and start using a toilet, they are advised on safe sanitation practices, such as not leaving the excreta uncovered. They are also educated about hygienic practices like washing hands after defecating, and before eating. Also, Procurement and Nigrani (monitoring) Committees are formed to identify the best raw materials available for purchase and to monitor whether people are following safe sanitation practices.

The Foundation has vast experience in 'capacity building' interventions at an international, national, and local level. It strives towards sustainable open defecation free status and other safe hygienic practices using the principles of CLTS. To date FF has conducted around 400 workshops across the country with its programmematic interventions, and approximately 1000 villages that have been reached– initiating people to adopt a safe and hygienic lifestyle. The Foundation claims its efforts have resulted in the construction of 50,000 toilets since its intervention.

OPERATIONAL MODEL

The foundation provides the following services in the sanitation sector:

1. **Implementation support**: FF facilitates the district and block to create ODF villages through pilot programmes. This involves implementing the CLTS approach in selected blocks and Gram Panchayats(GPs) of the

district. The district administration is always kept in the loop to monitor the progress and to ensure availability of adequate funds and robust supply chain mechanism. Once the community achieves ODF status, it is celebrated by conducting a Walk of Pride

2. **Handholding support**: The objective is to build the capacities of a core group for implementing the CLTS approach at the field level. The capacity of the core team is built through rigorous training in the design of community-led approach practices. The idea is to provide technical support in implementation of programme initiatives. This is done to create exemplary cases of open-defecation free communities, who are then able to self sustain by selecting members of the core team from within the communities themselves.

3. **Capacity Building Trainings &Workshop** :FF has conducted around 400 trainings and workshops across various states in India, and in Nepal. The types of capacity building trainings cover themes such as sensitisation, training of trainers, training of motivators, and follow-up workshops.

COST /REVENUE

All projects taken up by Feedback Foundation are funded by entities such as multilateral and bilateral agencies or corporates. Some of its' past funders include the World Bank, WSP - South Asia, UNICEF, FF Works.

Triggering of communities

IMPACT

Feedback Foundation has conducted its behaviour change programme utilising the CLTS methodology in 18 states of India. Through its capacity building programmeme, the Foundation has motivated approximately 1000 villages in 160 districts in these states. As a result, in the last five years over 50,000 toilets have been built in these communities. Hundreds of people have been motivated and trained to work towards eliminating the country's problem of open defecation. FF is empanelled as the Key Resource centre (KRC) under the ministry of Drinking water & Sanitation (M/o SWS), Government of India.

School sensitization

REPLICABILITY AND SUSTAINABILITY

FF believes that for their approach to be replicable, the following needs to exist:

1. A significant number of motivators should be trained to ensure a multiplier effect
2. Local champions and government support is needed to sustain the results once the foundation's efforts are withdrawn.
3. A professional cadre of experts must be identified, developed and trained in the CLTS approach independently. These could then be deployed on a wider scale. However, their training needs funding, which could be either sourced from government or multilateral agencies

Pledge by the community not to defecate in open

"Toilet is constructed at three places, in mind, in heart, and finally on ground."

– Ajay Sinha, CEO, Feedback Foundation

About CPR

The Centre for Policy Research (CPR) has been one of India's leading public policy think tanks since 1973. The Centre is a non-profit, independent institution dedicated to conducting research that contributes to a more robust public discourse about the structures and processes that shape life in India. CPR's community of distinguished academics and practitioners represents views from many disciplines and across the political spectrum.

It is one of the 27 national social science research institutes recognized by the Indian Council of Social Science Research (ICSSR), Government of India. It is set apart by its multi-disciplinary approach and unique blend of scholarship and practical expertise. CPR's faculty have considerable impact on policy and public debates on a variety of issues including environmental law and governance; economic policy; law and regulation; urbanisation, water and sanitation; public Accountability; Climate Change and International relations and security . Senior faculty collaborate with more than 50 young professionals and academics at CPR, and with partners around the globe to investigate topics critical to India's future.

CPR embodies a vibrant community that is committed to the highest standards of excellence in public-policy research. An active academic life is sustained via resources that are available to all faculty members of CPR, and in some cases to external partners as well. These resources include a well-stocked library, contemporary conference facilities and information technology infrastructure. CPR also provides access to various external resources through memberships or partnerships with external institutions.

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About CII

The Confederation of Indian Industry (CII) works to create and sustain an environment conducive to the development of India, partnering industry, Government, and civil society, through advisory and consultative processes.

CII is a non-government, not-for-profit, industry-led and industry-managed organization, playing a proactive role in India´s development process. Founded in 1895, India's premier business association has over 7,900 members, from the private as well as public sectors, including SMEs and MNCs, and an indirect membership of over 200,000 enterprises from around 240 national and regional sectoral industry bodies.

CII charts change by working closely with Government on policy issues, interfacing with thought leaders, and enhancing efficiency, competitiveness and business opportunities for industry through a range of specialized services and strategic global linkages. It also provides a platform for consensus-building and networking on key issues.

Extending its agenda beyond business, CII assists industry to identify and execute corporate citizenship programmes. Partnerships with civil society organizations carry forward corporate initiatives for integrated and inclusive development across diverse domains including affirmative action, healthcare, education, livelihood, diversity management, skill development, empowerment of women, and water, to name a few.

In its 120th year of service to the nation, the CII theme of "Build India- Invest in Development, A Shared Responsibility", reiterates Industry´s role and responsibility as a partner in national development. The focus is on four key enablers: Facilitating Growth and Competitiveness, Promoting Infrastructure Investments, Developing Human Capital, and Encouraging Social Development.

With 66 offices, including 9 Centres of Excellence, in India, and 8 overseas offices in Australia, Bahrain, China, Egypt, France, Singapore, UK, and USA, as well as institutional partnerships with 312 counterpart organizations in 106 countries, CII serves as a reference point for Indian industry and the international business community.

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