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Lifting the Lid off the Toilet- Understanding the Indian Context and A Case on Samagra Empowerment Foundation

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## LIFTING THE LID OFF THE TOILET- UNDERSTANDING THE INDIAN CONTEXT AND THE CASE ON SAMAGRA EMPOWERMENT FOUNDATION

### Introduction

In 2014, the Indian Prime Minister, Narendra Modi, announced the Swachh Bharat Mission (SBM), otherwise known as the Clean India Mission. Its aim is to free India from open defecation by 2019. Since 2014, SBM has been instrumental in the construction of about 92 million toilets in rural areas, 5 million individual toilets in urban areas and 400,000 community toilets in urban areas. In total, 3,558 Indian cities have been declared free of open defecation.<sup>1</sup> Since inception in 1947, India has struggled with the issue of open defecation. Narratives of this struggle focus on India's unique socio-cultural background, economic constraints and geographic diversity as potential contributors to this issue, and trace its roots to India's colonial period.<sup>2</sup> SBM is not India's first sanitation drive. India has had a string of sanitation initiatives. The first rural sanitation program was part of Indian inaugural five-year, post-independence plan of 1954.<sup>3</sup> The Slum Sanitation Program of 1995, Total Sanitation Campaign of 1999 and the Nirmal Bharat Abhiyan in 2000 are some of the recent sanitation efforts. Common to all of these programs are criticisms that they while they create new infrastructure for water distribution, they do not result in sanitation.<sup>4</sup> However, unlike the many programs that preceded it, SBM achieved unparalleled attention from global media, policy makers, practitioners and researchers across the world.<sup>3</sup>

In 2017, Swapnil and Samagra team sat in their office in Pune and wondered whether SBM had indeed made Urban India free of open defecation. Swapnil Chaturvedi and Tania Ganguly, , the dynamic couple duo had left behind their software jobs and comfortable lifestyles in USA to start a social enterprise called Samagra in their homeland, India with the goal of tackling the wicked problem of open defecation and providing dignified toilet access to millions of women and girls living in urban slums of India. In 2017, two equally passionate members, a gifted engineer, Rahul Nayak and an educator, Iti Mathur joined their team. Samagra's original business model focused on building and maintaining toilets for the urban poor. However, by 2017, having gone through multiple business model iterations, they had revised their business to use state of the art technology and reduce the operating expenses of school, public and community toilets in urban slums of Pune. By 2017, Samagra had developed memorandums of understandings (MOUs) with 6 municipalities across the country to build & maintain public and community toilets.

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<sup>1</sup> Swachh Bharat Mission. (2019, April 23). Swachh Bharat Mission- Gramin (All India). Retrieved from Swachh Bharat Mission: <https://sbm.gov.in/sbmReport/home.aspx>

<sup>2</sup> Banda, K., Sarkar, R., Gopal, S., Govindarajan, J., Harijan, B. B., Jeyakumar, M. B., ... & Thomas, V. A. (2007). Water handling, sanitation and defecation practices in rural southern India: a knowledge, attitudes and practices study. *Transactions of the royal society of tropical medicine and hygiene*, 101(11), 1124-1130. Teltumbde, A. (2014, November). No Swachh Bharat without annihilation of caste. *Economic and Political Weekly*, 11-12.

<sup>3</sup> Biswas, D., & Jamwal, P. (2017). Swachh Bharat Mission: Groundwater Contamination. *Economic and Political Weekly*, 52(20), 18-20.

<sup>4</sup> McFarlane, C. (2008). Governing the contaminated city: Infrastructure and sanitation in colonial and post-colonial Bombay. *International Journal of Urban and Regional Research*, 32(2), 415-435.

Yet, the founders wondered how sustainable & impactful their current business model was. They worried how better they could scale up their model and improve the social order of sanitation in India's urban settlements. They needed to decide whether the operational model and institutional logics adopted by them were indeed amenable to the dissemination of a public policy such as SBM.

### **Open Defecation and Sanitation Crises in India**

The World Health Organization (WHO) reports that open defecation is the deadliest sanitation practice across the world.<sup>5</sup> India has the highest incidence of open defecation in the world, with over 500 million people defecating in open spaces according to a study by the WHO and UNICEF.<sup>6</sup> Researchers have reported that rural India suffers more from issues of open defecation than urban India.<sup>7</sup> There is, however, a debate on whether this rural-urban distinction is a mere legacy of the colonial era, reflecting categorization of India into two groups. Previously, India had been divided into the British citizens and the natives and now the urban and rural Indians.<sup>4</sup> In spite of the disagreement on whether the urban-rural divide is man-made and whether indeed rural India displays more instances of open defecation, there is consensus among researchers that the issues surrounding sanitation and hygiene are different in urban and rural India.<sup>8</sup> Studies show that the Indian urban slums are the worst hit areas in terms of sanitation, water supply and health.<sup>9</sup> For instance, a study by Kumar Karn and Harada in 2002 suggested that the entire slum populations of Muttumariamma Nagar in Malad, Mumbai and more than 40% in Rajiv Gandhi Nagar in Dharavi, Mumbai resorted to open defecation.<sup>10</sup> Muttumariamma Nagar and Rajiv Gandhi Nagar housed 5,700 and 7,600 people respectively.<sup>9</sup> Sixty-four million Indians reside in such slums.<sup>11</sup>

In spite of large-scale national and international efforts, reports show that the policies intending to eradicate open defecation in India have failed.<sup>12</sup> Moreover, India's sanitation issues

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<sup>5</sup> Ambesh, P., & Ambesh, S. P. (2016). Open defecation in India: A major health hazard and hurdle in infection control. *Journal of clinical and diagnostic research: JCDR*, 10(7), IL01.

<sup>6</sup> World Health Organization, & United Nations International Children's Fund. (2017). Progress on drinking water, sanitation and hygiene: 2017 update and SDG baselines.

<sup>7</sup> Elledge, M. F., & McClatchey, M. (2013). India, urban sanitation, and the toilet challenge. *RTI Research Brief*.

<sup>8</sup> Bathija, Geeta & Sarvar, Rana. (2017). Defecation practices in residents of urban slums and rural areas of hubballi, Dharwad: a cross sectional study. *International Journal Of Community Medicine And Public Health*. 4. 724. 10.18203/2394-6040.ijcmph20170747.

<sup>9</sup> The World Bank. (2019, June 14). World Bank. IBRD. IDA. Retrieved from The World Bank Data: <https://data.worldbank.org/indicator/SH.STA.ODFC.ZS>

<sup>10</sup> Kumar Karn, S., & Harada, H. (2002). Field survey on water supply, sanitation and associated health impacts in urban poor communities-a case from Mumbai City, India. *Water Science and Technology*, 46(11-12), 269-275.

<sup>11</sup> Canadian Broadcasting Corporation. (2013, March 22). Retrieved from CBC World News on 2019, June 14: <https://www.cbc.ca/news/world/india-census-says-1-in-6-lives-in-unsanitary-slums-1.1403897>

<sup>12</sup> Chaplin, S. E. (2011). Indian cities, sanitation and the state: the politics of the failure to provide. *Environment and Urbanization*, 23(1), 57-70. Hueso, A., & Bell, B. (2013). An untold story of policy failure: the Total Sanitation Campaign in India. *Water Policy*, 15(6), 1001-1017.

reveal a gaping divide between theory and practice.<sup>4</sup> For instance, in 2013, Hueso and Bell identified that unlike the government reported statistic of 68% sanitation coverage, coverage was about 31% of rural India.<sup>13</sup> Although the colonial and post-colonial discourses on Indian sanitation hold the local socio-religious systems and educational backwardness as the major culprits, these are just two of a number of underlying causes of the problem. Some academic studies have identified that the issue is a lack of focus on demand, and correspondingly that Indian sanitation issues can be resolved with bottom of the pyramid innovations that meet market demand.<sup>14</sup> There is also an on issue with sanitation operations. Indian sanitation policies disproportionately focus on creating new infrastructure and generating demand.<sup>13</sup> These policies overlook and neglect the poor monitoring procedures, bureaucratic inertia, and widespread corruption in the Indian sanitation systems.<sup>4</sup> In short, the problem is more about operating practices than capital expenditure and building projects that capture the attention of the world.

### **Making Toilets Work in India: A Brief History**

India's contemporary sanitation problems, including the practice of open defecation, have its roots in the colonial era.<sup>15</sup> Ancient and pre-industrial India had sanitation practices similar to those of other civilizations. The people of Harappa, a Bronze Age Indus Valley city built on the banks of Ravi circa 2600 BC (situated in present day Pakistan), had a sewage system akin to the gold standards of global sanitation at that time.<sup>3</sup> For subsequent centuries, Indians had pit and bucket toilets.<sup>6</sup> The bucket toilets were similar to the chamber pots that were prevalent in Europe. These mechanisms worked with the periodic manual scavenging of human excreta from pits and buckets. It was during the overlapping periods of colonialism and industrialization that Indian sanitation practices diverged from Western hygienic transitions.<sup>16</sup> Instead of a transition from cesspools to sewers systems that brought sanitation to the masses, as occurred in much of Western Europe from the 1850s to 1920s, India's history is distinguished by the development of open defecation practices in urban areas and highly uneven sanitation standards among large populations in both urban and rural regions.<sup>17</sup>

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<sup>13</sup> Hueso, A., & Bell, B. (2013). An untold story of policy failure: the Total Sanitation Campaign in India. *Water Policy*, 15(6), 1001-1017.

<sup>14</sup> Ramani, S. V., SadreGhazi, S., & Duysters, G. (2012). On the diffusion of toilets as bottom of the pyramid innovation: Lessons from sanitation entrepreneurs. *Technological Forecasting and Social Change*, 79(4), 676-687.

<sup>15</sup> Chaplin, S. E. (1999). Cities, sewers and poverty: India's politics of sanitation. *Environment and Urbanization*, 11(1), 145-158.

<sup>16</sup> Fam, D., Lopes, A., Willetts, J., & Mitchell, C. (2009). The challenge of system change: an historical analysis of Sydney's sewer systems. *Design Philosophy Papers*, 7(3), 195-208. Geels, F. W. (2006). The hygienic transition from cesspools to sewer systems (1840–1930): the dynamics of regime transformation. *Research policy*, 35(7), 1069-1082. Stanwell-Smith, R. (2003). The infection potential in the home and the role of hygiene: historical and current perspectives. *International journal of environmental health research*, 13(sup1), S9-S17. Tomes, N. (1990). The private side of public health: sanitary science, domestic hygiene, and the germ theory, 1870-1900. *Bulletin of the History of Medicine*, 64(4), 509-539.

<sup>17</sup> Ghosh, A., & Cairncross, S. (2014). The uneven progress of sanitation in India. *Journal of Water, Sanitation and Hygiene for Development*, 4(1), 15-22.

To understand India's contemporary sanitation problems, it is helpful to know about its colonial and industrial past. In brief, whereas Western European sanitary reform movements eventually led to major public works with the backing of the voting public, in India, colonial and local interests and the lack of broad enfranchisement until 1947 meant reforms and sewer infrastructure projects were delayed or scaled back while new urban neighbourhoods were built.

Under the East India Company's rule from 1757 to 1858, port cities such as Bombay and Calcutta emerged as major trade centres in opium and cotton.<sup>18</sup> During the period, rural Indians migrated to these cities, giving up traditional occupations of agriculture and fishing to work in the new factories trading with the industrial firms in Britain.<sup>12</sup> The rise in Indian factory production led to increased water effluent that in turn reduced the availability of water for both rural and urban areas.<sup>4</sup> The problem was exasperated by overcrowded cities without access to sewers.<sup>4</sup> The dwellings included narrow low-rise tenement apartments that were plagued by cholera related deaths.<sup>19</sup> The cholera was a due to the contamination of drinking water by nearby open cesspits.<sup>20</sup> In response to these conditions, migrant workers started using nearby waterbodies for open defecation, leading to further pollution of the environment.<sup>18</sup> The villagers who migrated to the newly formed urban cities were forced to give up their earlier practices of defecation. In rural areas, they had either used pit toilets or employed the vast distances and natural landscapes for areas of privacy. However, in crowded Bombay, this sense of privacy became a luxury.

As with many European cities during the 1850s and 1860s, the abysmal living conditions of the poor were studied but not remedied. In the case of Bombay, deputy inspector general of hospitals, Andrew Leith, studied the cause of disease in the Bombay streets and advocated for better public health and sanitation infrastructure.<sup>21</sup> Another British reformer, the engineer Henry Conybeare, drew up plans for the Vihar water works, which was to be India's first municipal water project. The proposal was to create dams on the Mithi river, north of Bombay, and store rain water in an artificially created lake named Vihar. Seeing that water shortage and drainage would lead to major crises in the coming years, Conybeare also planned a comprehensive drainage system for Bombay, which he believed would elevate Bombay's living conditions to European standards.<sup>4</sup> To manage and finance the projects he proposed that the government create a joint stock company, with revenue from local taxes. He believed that the community would welcome the project and that the significant benefit of assured water supply throughout the year would offset the tax costs.<sup>18</sup> He failed to appreciate the influence of Bombay's political dynamics and British colonial prejudices.

The Bombay presidency did not have sufficient resources to support the plan. It relied on local credit and support to funnel funds coming from the opium trade in Bengal to the west

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<sup>18</sup> Dossal, M. (1988). Henry Conybeare and the politics of centralised water supply in mid-nineteenth century Bombay. *The Indian Economic & Social History Review*, 25(1), 79-96.

<sup>19</sup> Leith, A. (1864) Report on the sanitary state of the island of Bombay. Bombay: Education Society Press.

<sup>20</sup> Farooqui, A. (1996). Urban development in a colonial situation: Early nineteenth century Bombay. *Economic and Political Weekly*, 2746-2759.

<sup>21</sup> Doshi, S. (2014). Imperial Water, Urban Crisis: A Political Ecology of Colonial State Formation in Bombay, 1850–1890. *Review (Fernand Braudel Center)*, 37(3-4), 173-218.

coast.<sup>22</sup> Bombay presidency local support was from the wealthy Bohras (Muslim traders), merchants (mostly Parsis or Zoroastrians) and the commercial Hindu and Jain castes (aka Banias).<sup>21</sup> Bombay's vocal and powerful mercantile community did not welcome the Vihar water works project. They underplayed the water crises of Bombay, suggested that this project would supply more water than the city's inhabitants needed and proposed less expensive solutions for immediate water shortage issues. Mostly they were apprehensive about the increase in taxation.

British officials in India also undermined the waterworks projects with doubts that it could succeed. Municipal commissioners in Bombay expressed concern that Hindu "fanatics" and Muslim pilgrims would spread cholera through their religious practices.<sup>19</sup> They believed that native spaces were prone to disease and feared that diseases would spread to what they believed to be the civilized quarters of the world being inhabited by non-native people.<sup>19</sup> Moreover, they suggested that although an educated class of Indians were available, sanitation inspectors should be imported from Europe so that uncleanness could be better detected.<sup>19</sup>

Eventually, the Vihar water work project went ahead, but the proposed supply of 20 gallons per day per person to the 750,000 residents of Bombay was reduced to 5 gallons per day. In contrast, London residents received 31 gallons per day per person.<sup>18</sup> The result was that while England moved from the miasma theory of hygiene in the 1850-80s, to the bacteriology theory during 1880-1945 and then later to new ecological models, leading the sanitation transition in most of its western colonies, India fell behind.<sup>23</sup> India as a British colony and Bombay as India's major trade centre, found its sanitation movement from the 1850s to 1940s frustrated due to political interests of the British rulers and the elite Bombay traders.

After Independence in 1947, a renewed focus on developing national infrastructure from both Indian federal and provincial governments provided improved health and sanitation services with a specific focus on building necessary infrastructure.<sup>13</sup> However, in a society deeply rooted in a prejudicial caste system, class interests held back significant reforms. The major beneficiaries of the new infrastructure were the Indian upper and middle classes who could afford the urban health and hygiene services being provided by the government.<sup>12</sup> The poor continued to lack proper sanitation. In the absence of strong collective action from the poorer classes of the society, India's sanitation efforts failed to make any significant impact for them.<sup>13</sup> This has led to the present situation characterized by a proliferation of overlapping, government sponsored programs for sanitation reform. In addition to the SBM, the ongoing sanitation initiatives include the Integrated Low-Cost Sanitation Scheme, Mega City Scheme, Integrated Development of Small and Medium Towns, National Urban Sanitation Policy, and Accelerated Rural Drinking Water Supply Program.<sup>24</sup>

## Urban and Rural Sanitation Issues in Contemporary India

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<sup>22</sup> Subramanian, L. (1996). Indigenous capital and imperial expansion. *Bombay, Surat and the West Coast, New Delhi*, 27-28.

<sup>23</sup> Melosi, M. V. (2008). *The sanitary city: Environmental services in urban America from colonial times to the present*. University of Pittsburgh Pre.

<sup>24</sup> Showkat, N. (2016). Coverage of sanitation issues in India. *Sage Open*, 6(4), 2158244016675395.

Open defecation in urban and rural India are motivated by different historical contexts and involve differing practices.<sup>25</sup> While both urban population suffer from a lack of well-maintained infrastructure and inconsistent water and electricity supply, the rural population have less hygiene awareness and a stronger adherence to traditional sanitation norms based on caste and gender prescriptions.<sup>26</sup> To understand sanitation issues in rural India one must know something about the caste system.

The Indian caste system is over 3,000 years old. The caste system prescribes that people born into the Hindu faith are designated a certain caste in the womb. The castes are mutually exclusive, exhaustive and drawn from the broader Varna system described in the ancient texts of Dharma-Shastras (treatises on duties, rights, laws, conducts, virtues that one should possess, and the right way of living). Varnas are hereditary and endogamous. There are four Varnas: Brahmins (priest and teachers); Kshatriyas (Rulers and Soldiers); Vaishyas (the traders and the moneylenders); and Sudras (menial laborers). The Varna system prescribes that Adi Sudras (the untouchables), the people who fall beyond the Varna classification, are born as untouchable as a punishment for grievous sins of their past life.<sup>27</sup> Specific sub-groups within Adi Sudras were entrusted the menial task of manually scavenging human excreta from open pit toilets or bucket toilets. The historically disadvantaged groups of Adi-Sudra people and the unclassified groups of indigenous people were designated as scheduled castes and tribes in the Indian constitution in 1950.<sup>28</sup> According to the 2011 census, the Indian population consists of 80% Hindus, 16.6% scheduled castes and 8.6% scheduled tribes.<sup>29</sup>

Although the caste system was banned with Independence in 1947, many Indians in rural and remote areas still adhere to caste prejudices and caste based occupational practices. In rural areas, many houses have indigenous Indian toilets, where the person using the toilet squats over a toilet pan. These toilets might have a water seal and use a flushing system or be a dry toilet. Usually, they are close to the house or in the adjacent yard. The dry Indian toilets are emptied manually from time to time.<sup>30</sup> People belonging to the Adi Sudra castes, also known as Harijans or Dalits, have come to resist the caste impositions and/or demanded significant wages for their tasks. This in turn has influenced the practices of former upper caste community members in rural areas, who then choose to openly defecate in fields (with the natural privacy of green shrubs) rather than pay the wages that are now being demanded. Thus, rural open defecation

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<sup>25</sup> Tagat, A., & Kapoor, H. (2018). "Sacred nudging" and sanitation decisions in India. *India Review*, 17(3), 301-319.

<sup>26</sup> Gupta, A., Coffey, D., & Spears, D. (2016). Purity, pollution, and untouchability: challenges affecting the adoption, use, and sustainability of sanitation programmes in rural India. *Sustainable Sanitation for All: Experiences, challenges, and innovations*, 283.

<sup>27</sup> Deshpande, A. (2000). Does caste still define disparity? A look at inequality in Kerala, India. *American Economic Review*, 90(2), 322-325

<sup>28</sup> Jangir, S. K. (2013). Reservation policy and Indian constitution in India. *American International Journal of Research in Humanities, Arts and Social Sciences*, 3(1), 126-128.

<sup>29</sup> Census India (2011). Retrieved from <http://censusindia.gov.in/pca/Searchdata.aspx>

<sup>30</sup> Ramani, S. V., SadreGhazi, S., & Duysters, G. (2012). On the diffusion of toilets as bottom of the pyramid innovation: Lessons from sanitation entrepreneurs. *Technological Forecasting and Social Change*, 79(4), 676-687.

practices are shaped by a lack of well-developed sewage infrastructure, poverty, disregard for personal hygiene and an affinity towards traditional personal habits. Like in most systems of oppression and discrimination, the vulnerable sections of the society suffer the most. Hence, children, women and especially the women of lower caste communities suffer the worst sanitary crises in rural (and urban) India.<sup>31</sup> To protect themselves from sexual predators, village women who lack proper toilet facilities gather in groups and walk to far-off regions away from the village centres so that they can defecate before the rest of the village wakes up. Through the day, these women restrict their food and water intake so as not to have to relieve themselves.

The issues of the urban populations are different. The urban rich and the middle classes in India have modern sanitation facilities. The poorest of the poor in urban India live in the slums and on pavement. At the bottom of the pyramid, to a certain extent, caste dissipates.<sup>32</sup> When constrained for basic resources, people no longer see caste and religious divisions. However, in the absence of caste, lack of resources such as space and infrastructure emerge as the causes of open defecation. Typically, these urban open defecation practices occur under conditions with less privacy than afforded in rural areas.<sup>33</sup> In non-residential urban areas, there are few public toilets and, if they exist at all, they are not well maintained. In the slums, people do not have enough space to build individual toilets. Instead, these residents typically rely on community toilets, if operational. However, many fall into disrepair soon after they are built.

### **The Slums of Pune**

Sanitation issues also differ among urban slums in India. The West is familiar with Indian slums and their dire living conditions through movies such as the *Slum Dog Millionaire*. Several Harvard business cases have capitalized on the mass-market appeal and romanticized the poverty of the Mumbai slums too.<sup>34</sup> Most of them showcase the slum of Dharavi, dubiously named as Asia's largest slum. Not far from Dharavi, resides the not-so-famous slums of Pune. The slums of Pune are different from the slums of Mumbai.

Pune and Mumbai are cities in the State of Maharashtra. The Maharashtra government's improvement, clearance and redevelopment act of 1971 defines slums as loosely defined and congested unhygienic area or buildings that are a public hazard. The city of Pune has 11 slums. Remarkably, all of them are in the immediate vicinity of multi-story skyscraper residences of the middle-classes and the wealthy. Half of Pune lives in these slums, crammed into a mere 10% of the city's land.<sup>35</sup> Whereas the slums of Mumbai are inhabited mostly by a transient population of

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<sup>31</sup> Devika, J. (2010). Egalitarian developmentalism, communist mobilization, and the question of caste in Kerala State, India. *The Journal of Asian Studies*, 69(3), 799-820. Sreekumar, S. (2007). The land of 'gender paradox'? Getting past the commonsense of contemporary Kerala. *Inter-Asia Cultural Studies*, 8(1), 34-54.

<sup>32</sup> Sen, S., Hobson, J., & Joshi, P. (2003). The Pune Slum Census: creating a socio-economic and spatial information base on a GIS for integrated and inclusive city development. *Habitat International*, 27(4), 595-611.

<sup>33</sup> Bapat, M., & Agarwal, I. (2003). Our needs, our priorities; women and men from the slums in Mumbai and Pune talk about their needs for water and sanitation. *Environment and Urbanization*, 15(2), 71-86.

<sup>34</sup> Iyer, L., Macomber, J. D., & Arora, N. (2009). Dharavi: Developing Asia's Largest Slum. HBS Case, (710-004).

<sup>35</sup> McGeough, D. D. (2013). Laboring for community, civic participation, and sanitation: The performance of Indian toilet festivals. *Text and Performance Quarterly*, 33(4), 361-377.



single men who have come to the big city in search of jobs, Pune slums are home to families. These residents of Pune slums are quite stable. From data collected on one of the 11 Pune slums containing 52,740 people, 39% of the earning men work in construction and 23% in service industries.<sup>36</sup> In data from another of the Pune slums, families stay an average of 21 years.<sup>31</sup> Most of the Pune slum dwellers come to escape the drought prone outskirts of Maharashtra. The slums are usually built on lands designated as unbuildable by the city, such as the sides of railway tracks, hill slopes, and river valleys. It is in these slums of Pune that Samagra chooses to focus its operations.

### Samagra Genesis and Funding Partners

Samagra was founded as a for profit organization in 2010. Samagra's mission has been to enable the poor, especially women and girls lead healthier, productive, dignified and empowered lives. Samagra aims to provide the urban poor access to cleaner toilets via public toilets, school toilets, and community toilets. They work in partnership with Institutional, CSR and NGO partners such as Bill and Melinda Gates Foundation, Persistent Foundation, MASHAL, Cohesion Foundation, and CHF International and Urban Local Bodies (ULBs) such as the Pune Municipal Corporation.

### Samagra 1.0: Service Model

In addition to ensuring clean toilets, Samagra 1.0 was also committed to disseminating auxiliary services around public toilet blocks. These services included financial health services (including saving accounts, health insurance), access to digital goods (mobile phone and TV recharge, bill payment services) and access to life improving products and services (clean water and sanitary napkins). Samagra 1.0 model thus worked towards creating a dynamic urban space, providing access to socially impactful goods and services for the Bottom of the Pyramid (BOP) population. In their impact study on Samagra 1.0 in 2017, Swapnil and Samagra Team found out that they had had 140,000 daily users. 35,000 of these users were children and 70,000 were women. They also realized that they had reduced open defecation in the area by 50%.

### Samagra 1.0 Model



Figure 1: Samagra 1.0 Model

<sup>36</sup> Sen, S., Hobson, J., & Joshi, P. (2003). The Pune Slum Census: creating a socio-economic and spatial information base on a GIS for integrated and inclusive city development. *Habitat International*, 27(4), 595-611.

Source: Samagra

## **Samagra 1.0 Impact**

Samagra 1.0 managed over 3200 toilet seats and served 140,000 users daily with clean sanitation services across over 100 slums in Pune, India. Samagra toilets were used over 50 million times. Samagra 1.0 enabled 5000 families to save 25,00,000 Rupees collectively and avail micro-insurance services. This equipped poor and ultra-poor families with tools to withstand poverty traps. Samagra 1.0 employed 120 men and women as cleaning and financial entrepreneurs. This doubled or tripled their family incomes thereby alleviating their poverty.

## **Insights from Samagra 1.0 Model:**

However, while taking stock of their performance in the last 5 years, Swapnil and the Samagra Team identified certain pertinent challenges to scaling their business model. As their operational contexts changed from one community to another, they found it difficult to identify, engage, and form rapport with the key influencers, community leaders and ULBs. Without real time data on the availability of water and power in the toilets, they found the resolution and decision making on operational and maintenance issues very tiring. Further, without data it was almost impossible to engage ULBs to provide resources or utilities.

Although Samagra 1.0 was viable in the community, engaged with the bureaucracy, achieved enhanced market engagement, and provided quality services to the end customer, Swapnil and his Team had to agree that their model was not scalable. They knew that the local community-based operators were aware of the nuances of each geographical context and the power influencers in each area. From experience, they had seen that the ULBs were very responsive when the local community members of each context filed complaints directly to the ULB bureaucrats. Further, when provided unbiased data, authorities at the ULBs could not refute the unavailability of utilities. At the end of 2017, when revamping their business model, the Samagra Team had three main challenges to overcome.

How do they revamp their business in such a way that they better engage and enable local operators?

How can we develop a scalable solution that enables communities to exert their rights to clean sanitation?

How can we develop a scalable solution that provides unbiased data that enhances visibility, monitoring, accountability and engagement with all the three major stakeholders at play namely, the Sarkaar (Government), the Bazaar (Market) and the Samaaj (Community)?

## **Samagra 2.0: SmartLOO**

Instead of solving the problem themselves, with Samagra 2.0 Model, the Samagra team is focused on building Digital Infrastructure for Public Sanitation that is designed to distribute the ability to solve sanitation problems to local stakeholders. With their new SmartLOO platform, Samagra ceased to be a toilet builder and a public toilet maintenance operator. Samagra also

closed its for-profit operations and became a non-profit to be able to better play the role of platform provider. Samagra's SmartLOO platform monitors the availability of scheduled water, electricity, and cleaning services in the toilets. Under their 2.0 model, Samagra retrofits existing toilets with Internet of Things (IOT) and Artificial Intelligence (AI) based devices and measure the odor, usage, effluent, electricity, luminosity and water in the toilets. Further, they also gather customer feedback. They use an AI based decision engine software to analyze this data and issue alerts and provide feedback to engage stakeholders and foster significant behavioural change. The data from the sensors is used to train AI algorithms and generate cross-facility insights. SmartLOO enables Samagra to evaluate the facilities in real-time and alert concerned officials/operators as and when required.

Samagra provides the insights drawn from the gathered data to local administrators, policy makers, and Non-Government Organizations (NGOs) focusing on cleanliness (Swachata committees) so that they can hold the responsible toilet cleaners and government officials responsible for their inefficiencies. Samagra works off the simple philosophy that a common pool of resources is efficiently managed by accruing a sense of ownership and accountability among the multiple levels of stakeholders. With SmartLOO, Samagra 2.0 achieves a digital infrastructure platform for urban sanitation that engages internal stakeholders effectively. Through Samagra 2.0, the retrofitting of existing toilets occurs in two major steps of installation.

### ***Installation Step 1. Sensor Deployment.***

Samagra employees visit and ascertain the viability of retrofitting a potential school or public toilet. In the first step, the team installs a SmartLOO Hardware (sensors & a master unit) to measure electricity, Usage counters to measure the daily usage, Luminosity sensors to measure the incidence of light, Smell sensors to measure odor, and Feedback units to gather customer feedback. This step is usually completed by the installation partners in 3-4 hours. Installation partners usually include Non-Government or Community Based Organizations working in the area, youth groups and equipment installers. The data from this SmartLOO enabled toilet is gathered in the SmartLOO cloud in real-time.

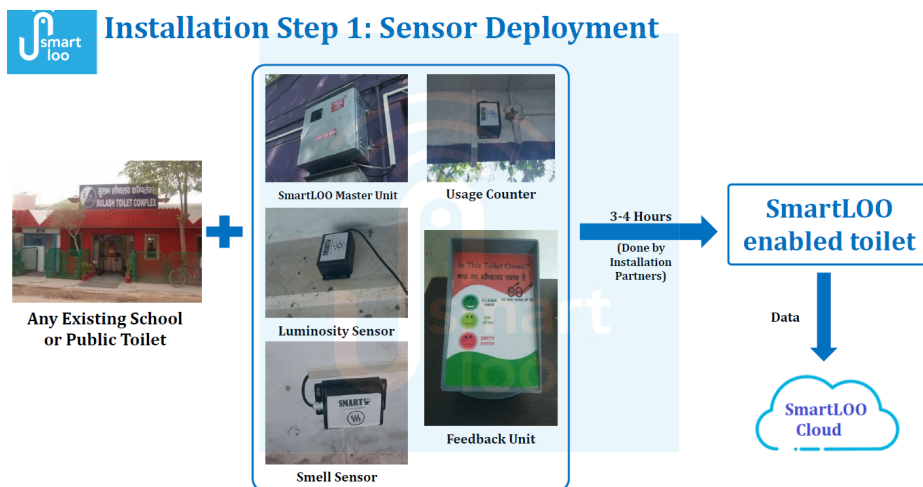


Figure 2. SmartLoo Installation

Source: Samagra

**Installation Step 2. Integration with City IT Infrastructure.** The SmartLOO cloud is set up in such a way as to have transparent interactions with the municipal corporation's existing IT infrastructure. The data from the sensors are fed into a trained AI algorithm to generate actionable insights and decision tools for administrators and stakeholders.

The SmartLOO is deployed at no costs for the ULBs or the integration partners. This enables Samagra to deploy SmartLOOs at an accelerated pace without the hassle of participating in government tenders or Requests For Proposals (RFPs). Samagra receives unrestricted funding from institutional funders, CSRs, grants, donors and Human Network International. These funds aid Samagra in covering their product development and deployment expenses such as piloting, testing, business and product development, R&D, product maintenance, organizational overheads, and human resources. In addition to the installation partners, during the integration stage, Samagra works closely with smart-city, e-governance companies and ULB consultants such as ASCI and KPMG.

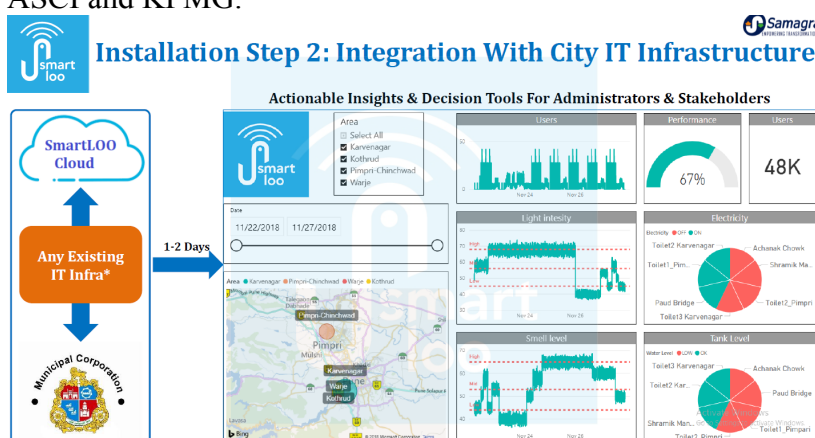


Figure 3. SmartLoo Integration  
Source: Samagra

## Samagra 2.0 Impact

With the SmartLOO platform, Samagra 2.0 has been able to reduce the resolution time of public toilet maintenance issues by 90%. Further, repair costs were reduced by 50%, cleaning and utility costs by 20%, and complaints by 70%. Thus, SmartLOO has been able to engage the accountability of varied stakeholders, increase the visibility of public toilets, and save money for ULBs. Samagra 2.0 is viable in community contexts, efficiently engages government and community partners, is scalable and provides a quality solution to a dubious problem. Although based out of Pune, Samagra has developed 110 memorandums of understandings (MOUs) with municipalities across the country to monitor the operation of public toilets.

Samagra 2.0 aims to engage government and community partners and provide a scalable solution to the open defecation problem in Indian urban slums. Although based out of Pune, Samagra has developed 110 memorandums of understandings with municipalities across the country to monitor the operation of public toilets.

**Organizational Structure:** Samagra has three teams working together to accomplish the desired impact. These teams are named Smart, Swachh, and Saksham. The Smart team is responsible for designing and disseminating IoT based SmartLOO platforms to ULBs and sanitation providers. The Swachh team trains and engages local communities and other stakeholders to create a sense of ownership over common pools of resources and thereby sustain the model. The third team, Saksham, provides capacity building support to ULBs to streamline usage, adoption and decision making.

## Competitors

**Sulabh.** Sulabh International is a Social Service Organization founded by sociologist and social activist Dr. Bhindeswar Pathak in 1970. In dense public areas such as bus and train stations, market and religious places, Sulabh toilets offer a pay per use model at a rate of 5-10 Rupees per use. Sulabh is an innovative pit toilet solution with steep pit sides and two water sealed deep pits. Compared to other market offerings, Sulabh toilets are extremely cheap<sup>37</sup>. The cost of production and deployment of Sulabh toilet vary between 3000 and 60000 Rupees. However, the Sulabh toilet is unsuitable for coastal areas with a high water table. Although Sulabh toilets employ a business model that engages market partners, it does not engage with community or government members.

**Eram Scientific.** Eram Scientific was found by Dr. Siddeek Ahmed in 2008. This Trivandrum based company runs as a for profit organization. Eram Scientific solutions offers the floating populations of busy urban centers a self-cleaning e-toilet on a pay per use model. They too charge around 5-10 Rupees per use. However, Eram's solution entails quite an expensive toilet design that comes to around 10000 USD. Eram's solutions engage market partners as well, but fails to engage the community or the government.

**Shelter Associates.** Shelter Associates was found by Ms. Pratima Joshi in 1994 as a civil society organization. Shelter Associates also uses spatial data to compute the households that lack basic sanitation facilities and access to sewers. Shelter Associates aims to provide building materials and other facilities to build individual toilets in the impoverished urban households. Shelter Associate's One-Home One-Toilet (OHOT) model involves a key role of market players and governments. Their operations are located in Maharashtra. Shelter's OHOT model is not viable to dense urban slums of India where there is no central sewerage infrastructure

**Gramalaya.** Gramalaya is a Non-Government Organization based out of Tiruchirappalli, Tamil Nadu, established in 1987 by Sairam Damodaran. They provide micro-finance for sanitation, help build child friendly toilets in rural areas with community participation, train communities to manage pay and use latrines and spread awareness on health and hygiene through school health

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<sup>37</sup>. Pathak, B. (2011). Sulabh sanitation and social reform movement. *International NGO Journal*, 6(1), 14–29.

programs. For its community toilet operations, Gramalaya enlists the collaboration of community and market agencies. However, Gramalaya has not been able to successfully replicate its Trichy Community Toilet Model elsewhere.

### **Samagra 2.0 - Looking Forward**

In the next two years, Samagra 2.0 aims to deploy SmartLoo in 5000 seat pilot across 10 Indian cities and pave the way for National Adoption of SmartLoo. They want to optimize their costs and finalize the product design to accomplish a target production cost of 2500 Rupees per seat and a deployment cost of 1000 Rupees per seat. This would enable Samagra 2.0 to “smartify” one toilet seat and maintain it for 5 years for just 10,000 Rupees. Samagra aims to develop a diversified funding model incorporating multiple sources such as grants, CSRs, retail funding, and hyper-local funding approaches to be able to accomplish its goals. They want to strengthen their core team to include accomplished and experienced personnel in AI/ML technologies, and Governance

### **Concluding Remarks**

In two years, Samagra hopes to be adopted across country. However, Samagra Team still wonders how they could better tap technology to provide clean toilets for all. They are constantly striving for better ways to sustain and improve their existing business model. The founding team of Samagra wonders how better they could deploy technology to elicit the engagement of the Government, the community and the market in providing clean toilets for all.

## **BRIEF TEACHING NOTE**

**(Please contact the authors to receive the detailed teaching note)**

### **TEACHING OBJECTIVES AND POSITIONING**

This case can be used to initiate discussion on a variety of management topics including:

1. Influence of historical narratives on how entrepreneurs develop technical solutions to compete with existing technology and solve social problems
2. Importance of engagement of stakeholders in solving social problems
3. Influence of environmental variables on how entrepreneurs choose specific institutional mechanisms to legitimize a business model within a technological regime
4. Strategies to adapt business models and sustain engagement of stakeholders with varied risks and benefits

### **BACKGROUND READINGS**

1. Geels, F. W. (2006). The hygienic transition from cesspools to sewer systems (1840–1930): the dynamics of regime transformation. *Research policy*, 35(7), 1069-1082.
2. Ostrom, E. (2009). A general framework for analyzing sustainability of social-ecological systems. *Science*, 325(5939), 419-422.

### **ASSIGNMENT QUESTIONS**

1. How does the historical and social context of the land affect Samagra's strategic orientation?

2. How does Samagra 2.0 manage to engage stakeholders better than Samagra 1.0?
3. Discuss why Samagra chooses to employ a coercive institutional mechanism and monitor the governance of public toilets.
4. Use Ostrom's Social-Ecological Systems framework to analyze the sustainability of Samagra 2.0.

## TARGET AUDIENCES AND COURSEWARE

We have prepared this case for teaching graduate level business, technology management, entrepreneurship, and public policy students. In this teaching note, we have provided different discussion avenues such as strategy, entrepreneurship, sustainability and public policy dissemination.

## CASE ANALYSIS AND CLASS PROCESS

| Assignment Questions   | Case Discussion  | Class Process   | Duration<br>(3 hours) |
|--|--|---|-----------------------|
| How does the historical and social context of the land affect Samagra's strategic orientation?                         | As depicted in the failure of Vihar water works project, and Samagra 1.0 ages later, the complex context necessitates enhanced stakeholder engagement and Samagra 2.0 eventually chooses a business model that facilitates such deep interactions with vested parties.       | Instructor introduces the case and invites the class to suggest if and why and how they think the Indian context has influenced Samagra's strategic orientation.  | 30 minutes            |
| How does Samagra 2.0 manage to engage stakeholders better than Samagra 1.0?  | Samagra's stakeholders are identified as the community toilet users, ULBs, maintenance workers, bureaucrats, community leaders and local politicians. The class identifies how Samagra 1.0's interactions with all the relevant stakeholders were limited.                   | Instructor asks the class to opine on whether Samagra 2.0 does indeed provide better stakeholder engagement than Samagra 1.0 and encourages the class to debate and justify their observations.                                       | 20 minutes            |
| Discuss why Samagra chooses to employ a coercive institutional mechanism and monitor the governance of public toilets. | Outsiders/entrepreneurs enter socio technical systems of transition employing one of the three institutional field mechanism of coercion, mimicry or norms. The technological regime and the social context affects the outsider's choice of institutional field mechanisms. | The class is asked to come prepared with the background reading on Geel's article and identify whether Samagra does enter India's hygiene transition as an outsider entering the technological regime.                                | 40 minutes            |
| 10 minute break  |  |   |                       |
| Use Ostrom's Social-Ecological Systems framework to analyze the sustainability of Samagra 2.0.                         | Ostrom's SES framework highlights the interactions between the social economic and political systems, users, outcomes and related ecosystems. The same framework can be used to explain Samagra's choice of 2.0 business model.  | The class is asked to come prepared with the background readings and invited to present their analysis of Samagra 2.0 using Ostrom's framework.   | 20 minutes            |
| Debriefing   | All the key concepts on sustainability framework analysis and technological regimes are highlighted in the debrief on the case.  | Instructor briefs the class on the various sustainable technical alternatives Samagra can employ to engage the various stakeholders and how the Indian context necessitates intense stakeholder engagement in solving social problems | 40 minutes            |