

# Cleanest City of India in Swachh Bharath Mission (2015-16): Mysore Model and the Lessons for other Cities

Manjunatha SN, Bhavani Nivetha M\*

## ABSTRACT

**Background:** Mysore was ranked as the cleanest city for the second successive time in 2016. Total sanitation is the goal of Swachh Bharath Mission and good practices and models need to be shared and adopted. In this context an explorative research was conducted to prepare the list of key drivers for sanitation in Mysore. **Methods:** The sanitation value chain for Mysore city was constructed. It consisted of containment, emptying, transport, treatment and disposal. The key stakeholders in this chain were interviewed and field visits were done for status and process assessment. Stakeholders in this chain were grouped for common roles and strength, weakness, opportunity and threat analysis was done. Individual interviews and focus group discussions were conducted. **Results:** In Mysore we have found that only 10% of the households depend on onsite facilities for faecal sludge management and 88% of the household have direct sewer connections. Only 12% of the sewage is left untreated into receiving waters or the natural environment. Door to door collection of solid waste is present in all the corporation wards. Open air defecation is far and few and restricted to couple of slums and construction sites. Bylaw framing, planning, implementation of solid waste management by the municipal corporation is satisfactory. **Conclusion:** The city of Mysore had a good history and basic infrastructure since a long time. The Swachh Bharath mission played a catalytic role in the acceleration of sanitation process. Involvement of voluntary organizations, good leadership at municipal corporation level made this success possible.

**Key words:** Swachh Bharath, Key sanitation drivers, Sanitation value chain, Faecal sludge management, Solid waste management.

## INTRODUCTION

Sanitation generally refers to the provision of facilities and services for the safe disposal of human urine and faeces. Inadequate sanitation is a major cause of disease world-wide and improving sanitation is known to have a significant beneficial impact on health both in households and across communities. The word 'sanitation' also refers to the maintenance of hygienic conditions, through services such as garbage collection and wastewater disposal.<sup>1</sup> In 2015, only 39% of the global population (2.9 billion people) used a safely managed sanitation service – defined as use of a toilet or improved latrine, not shared with other households, with a system in place to ensure that excreta are treated or disposed of safely. Poor sanitation is linked to transmission of diseases such as cholera, diarrhoea, dysentery, hepatitis A, typhoid and polio.<sup>2</sup> Only 31 per cent of India's population use improved sanitation, in rural India only 21 per cent use improved sanitation facilities.<sup>3</sup> About 53.1% of the households do not have a toilet and 38% of urban households in India use septic tanks as onsite sanitation facilities.<sup>4</sup> Half of the Indian population (52%) is still defecating in the open.<sup>5</sup> In order to improve the sanitation in India the government of India

launched its ambitious programme "Swachh Bharat Mission"(SBM) in 2014 with the following objectives

- Elimination of open defecation;
- Eradication of Manual Scavenging;
- Modern and Scientific Municipal Solid Waste Management;
- To effect behavioral change regarding healthy sanitation practices;
- Generate awareness about sanitation and its linkage with public health;
- Capacity Augmentation for ULBs to create an enabling environment for private sector participation.<sup>6</sup>

Mysore is the second largest city in Karnataka and plans for organized development of the city exist as far back as 1904.<sup>7</sup> Karnataka is also one of the states in the country to have state sanitation strategy. So, when swachh Bharat abhiyaan mission conducted a survey, Mysore was declared as the cleanest city in the country for two consecutive years (2015 – 2016).<sup>8,9</sup> It is important to analyse how Mysore managed to achieve this feat, so that even other cities in the country can emulate the model Mysore follows. This will help the

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country to achieve and sustain the mission's objective in future. Sustainable sanitation is possible only by thorough understanding of the sanitation. The sanitation value chain is the collection of units and processes involved in the management of human waste, starting with the user interface (e.g., the toilet), collection, transport, treatment and ending with the reuse of the material resources (e.g., water, nutrients, energy, organic matter); this reuse may be indirect (After the material is returned to the environment) or it may be direct. It identifies the main components that need to be addressed in order to provide safe and sustainable Water, Sanitation and Hygiene (WASH) services for communities. They include ensuring the availability and storage of water, the design and construction of toilets for specific target groups and creating systems of disposal and treatment for solid and liquid waste.<sup>10</sup> In order to get an understanding about the sanitation situation in Mysore, in this study we constructed the sanitation value chain for liquid waste disposal in Mysore.

## MATERIALS AND METHODS

### Objectives

1. To conduct a SWOT analysis of sanitation situation at Mysore.
2. To identify the key drivers for the success in Sanitation.
3. To identify the lessons for other cities to emulate.

### Methodology

**Study period:** October 2016-June 2017.

**Study setting** Mysore city coming under the Jurisdiction of Mysore city corporation.

**Study design:** Mixed method (Quantitative and Qualitative).

**Data collection:** This was a mixed method study where both qualitative and quantitative data was collected. For qualitative data group discussion was done using nominal group technique/ Quantitative data was collected using semi-structured questionnaire on the stake holders and record review was done.

**Sample size:** 19 for in-depth interviews and 6 for group discussion (2 were conducted).

### Data Capture Methods

1. Field visits: visited Waste collection points and Sewage treatment plant with checklists.
2. Group discussions with key stake holders including waste handlers, corporation officials, people's representatives (corporators) and general public.
3. In depth Interviews with selected key stake holders.
4. Review of data sources maintained at treatment plants and corporation offices.

### Data Analysis

Saturation was reached within 15-20 people. Interview and discussion data was transcribed and analyzed using ethonograph software version 6.7. Triangulation was done between quantitative and qualitative data.

## RESULTS

**Table 1: SWOT Analysis of Sanitation Situation in Mysore.**

Strengths	Weakness
<ul style="list-style-type: none"> <li>• Manual scavenging is eradicated</li> <li>• Historical advantages of underground drainage systems and good city planning</li> <li>• Very less slum population</li> <li>• City of palaces which is a tourist attraction with world famous Dasara festival.</li> <li>• Political will is very strong</li> <li>• People are very committed in maintaining the city clean causing excellent community participation</li> </ul>	<ul style="list-style-type: none"> <li>• Poor inter-sectoral coordination</li> <li>• Sewage treatment plant still besides residential area</li> <li>• New Land filling area is yet to be commissioned.</li> <li>• Enforcement of law is not very strong</li> </ul>
Opportunities	Threats
<ul style="list-style-type: none"> <li>• Since cultural capital of Karnataka lot of importance is given by the policy makers</li> <li>• Many NGOs are working in the cleanliness drive with good track record</li> <li>• More than 80% of population is literate</li> <li>• Corporate Social Responsibility from companies like Infosys and other private sectors.</li> </ul>	<ul style="list-style-type: none"> <li>• Possibility of water scarcity in case of monsoon failure can affect the sanitation situation.</li> <li>• Rapid growth of population causes added burden for existing resources</li> <li>• New industries entering into City hindering the cultural status.</li> </ul>

**Table 2: Solid Waste Management in Mysore.**

Solid waste management in Mysore
<ul style="list-style-type: none"> <li>• Coloured bins (Red and blue) are distributed to citizens for segregation of dry and wet waste at source.</li> <li>• Door to Door collection is done in all 65 wards</li> <li>• Vehicles transporting waste are monitored using GPS</li> <li>• Outsourcing of waste collection is done in some wards to private sector</li> <li>• 4 Zero Waste Management plants are set up in different parts of the city to treat solid waste</li> <li>• Vegetable waste is sent to Pinjrapole society for feeding stray cattles</li> <li>• Vermicomposting is done at Chamaraja Zoo Gardens</li> <li>• Eco friendly vessel washing powder and toilet floor cleaning powder is prepared from citrous fruit wastes and others</li> <li>• Organic manure is produced from waste and is sold at subsidized cost.</li> <li>• Banning of plastic carry bags is in effect in entire city</li> <li>• Mobile app for informing corporation authorities regarding violations</li> <li>• On line grievance addressal for the public</li> </ul>

**Table 3: Solid Waste Collection in Mysore.**

Total amount of solid waste generated per day (in tonnes)	Total amount of municipal solid waste collected per day (in tonnes)	Number of public dustbins	Number of vehicles for transportation and disposal	Area of land fill site (in Km)	Percentage of household covered by door-to-door collection
240	240	2871	52	Yet to be commissioned	30

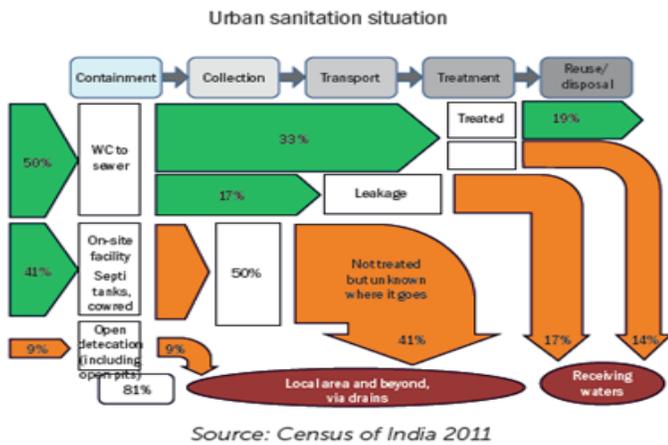


Figure 1: Sanitation Value Chain of Urban India.

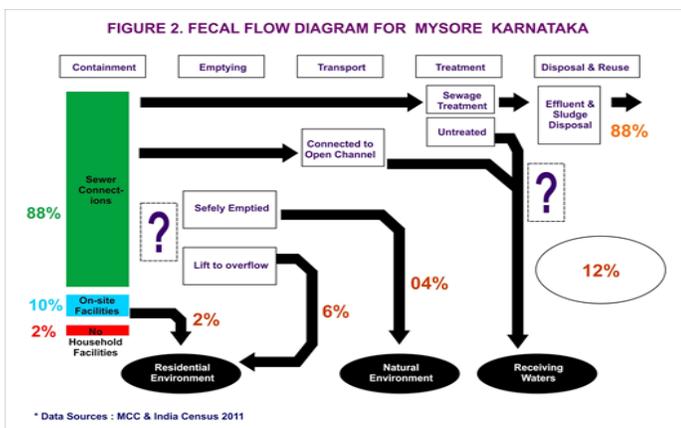


Figure 2: Sanitation Value Chain of Mysore City.

**DISCUSSION**

In Mysore we have found that only 10% of the households depend on onsite facilities for faecal sludge management and 88% of the household have direct sewer connections. Only 12% of the sewage is left untreated into receiving waters or the natural environment (Figure 2). Other cities like trichy which also made to top 5 cleanest cities had 60% of the city with sewer connections,<sup>12</sup> other city Chandigarh also had 95% of the population catered to by sewer connections.<sup>13</sup> On the other hand according to census 2011, about 45 per cent of urban Indian households depend on on-site facilities for faecal collection and containment (Figure 1). The Performance Assessment System (PAS) project conducted by the CEPT University also showed similar results, Under this project, the service level benchmark data submitted to Government of India by 16 states covering 1564 cities reveal that 1190 cities are completely dependent on On-site sanitation (76%), 369 (24%) cities use a mixed system with both sewer network and on-site systems and there are only 5 cities with full sewer systems.<sup>14</sup> All these results point out that a well-established sewer connections in Mysore is one of the important driver for the clean city status. Although sewer connections form important part of the Sanitation Value chain it is responsible only for collection and containment, proper treatment and disposal should be coupled with that in order to maintain good sanitation. In our study the data shows that 88% of the faecal waste is safely treated and disposed. Mysore is adequately equipped with sewerage treatment plants with present sewerage capacity of 157.65 MLD which was designed as per the requirements of the city in the year 2011.<sup>7</sup>

Other cities which fared better in swachatha survey like trichy with 59% sewer connections showed that 60% of the faecal waste was safely disposed, Delhi with 68% sewer connections showed that 56% of faecal waste was disposed of safely. So, the cities with sewer connections show better treatment and disposal of waste which was also the case in Mysore. Centre for Science and Environment (CSE) set out to follow the trail of human excreta in 11 cities across India, which showed alarmingly poor results in Srikakulam, Solapur and Dewas where only 0%, 2% and 7% of faecal waste was safely disposed had more than 50% dependence on onsite facilities.<sup>12</sup> In another extensive desk review to capture the status of Faecal Sludge Management in six states namely Delhi, Gujarat, Madhya Pradesh, Maharashtra, Uttar Pradesh and Tamil Nadu it was again concluded that adequate facilities and services for collection, transportation, treatment and disposal of urban domestic septage (Faecal waste from septic tanks) do not exist in Indian cities. Most On-Site Sanitation Systems (OSS) are emptied manually in the absence of suitable facilities.<sup>15</sup> The Figure 2 depicts the faecal flow of the nation in the urban area which shows that most of the faecal sludge ends up in the environment and only 19% of faecal matter is safely disposed and 0% from onsite system is managed properly. Another Review of Faecal Sludge Management in 12 Cities was undertaken to analyze faecal sludge management in a variety of cities from Latin America, Africa, South Asia and East Asia which showed that Almost two-thirds of households in the cities studied rely on on-site sanitation facilities, On average, faecal waste from only 22 percent of households using on-site systems is safely managed, In only two of the 12 cities studied was faecal waste from more than 50 percent of households using on-site systems safely managed. The city which was chosen from South Asia was Delhi, it was shown that 0% of waste from on-site system were managed properly.<sup>16</sup> All the above results point out that underground sewer connections are return leading to safe disposal of faecal sludge as it is almost always connected with proper disposal and treatment system. The reason for this maybe because maintenance of onsite facilities lies with the owner and there is no binding rule for regular desludging and cleaning. Many other factors like non-availability of mechanical instruments, cost can also play a role. So, from our data it is clear that the sanitation value chain system functioning in Mysuru is wholesome, the reason mainly can be attributed to underground sewer connections coupled with well-functioning safe disposal facilities. The swacha bharaat mission was launched in 2014, but the main objective of the mission was on only a part of sanitation value chain like Containment and collection. Though it is mentioned in the mission guidelines that construction of latrine should be coupled with sewer connection and proper disposal or in the absence of sewer connection an on-site sanitation facility with provision for proper treatment and desludging, the reality is not so.<sup>6</sup> Almost half the Indian household depends on the on-site facilities for faecal disposal but we are still not equipped with necessary facilities to properly treat and dispose/reuse the faecal sludge. The mapping of faecal flow in every city will help us to find the bottle necks encountered across the faecal management chain. It has been proposed in SBM(U) that all the cities should come up with city sanitation strategy, the formulation of such sanitation value chains across various cities will serve as the starting point in designing these strategies. The strengths identified for successful sanitation system in mysore included eradication of manual scavenging (Table 1). Despite progress, manual scavenging persists in India. According to the India Census 2011, there are more than 2.6 million dry latrines in the country. Since Mysore is 88% dependant on underground Sewer connections with only 5% of slum population the manual scavenging was easy to eradicate as only on-site facilities require manual cleaning.<sup>7</sup> Another strength is the political will and community participation which were the key drivers for success in Mysore. Maharashtra took the top rank hosting 6 cities that score in the top 20 mainly because of the extraordinary political will showed by

the state, State level initiatives were successfully reflected at city level in the form of innovative ideas and effective implementation to achieve the status of Open Defecation Free state.<sup>17</sup> The importance to Mysore city given by policy makers is of paramount importance which was identified as an area of opportunity, other major cities like Delhi, Navi Mumbai, Vishakapatnam, Chandigarh which constantly features in the clean city list also reflect the same situation.<sup>5,8</sup> Another area that has to be taken advantage of in Mysore is Corporate Social Responsibility (CSR) by companies and Non-governmental organization involvement (Table 1). In a study facilitated by Indian sanitation coalition analyses was done on CSR efforts in WASH by the 100 companies, it was reported that 90% of the 100 companies reported at least one CSR intervention in WASH over the last three years, it also indicated that one of the most popular states for CSR in WASH was Karnataka with 13 companies working for sanitation.<sup>18</sup> Many national and international NGO's like Centre for science and environment, Wateraid have been working with good track record assisting the government in research activities, coming up with sanitation plans for cities and sludge management workshops for stakeholders. New landfill site is still under consideration in Mysore which is one of the weakness, According to CPCB, 2013 report, till date, India has 59 constructed landfill sites and 376 are under planning and implementation stage. Apart from this, 1305 sites have been identified for future use. Clearly the landfill sites across the nation are inadequate and Mysore which is leading the country in many sanitation parameters is also suffering the same fate. Poor-intersectoral coordination is another weakness, Sanitation is a complex topic, with links to health and to social and economic development. It affects many but is championed by few, full involvement of the health sector in sanitation is crucial along with all other concerned departments and agencies to achieve better sanitation. With regard to solid waste management Mysore has taken various innovative approaches (Table 2). No city in India can claim 100% segregation of waste at dwelling unit, Mysore is striving to achieve this by provision of free bins to households. Even a city like Mysore was able to achieve only 30% door to door collection of waste, on an average according to national data only 70% waste collection is observed, while the remaining 30% is again mixed up and lost in the urban environment (Table 3).<sup>19</sup> This was an important gap identified, the performance in Mysore was very low compared to national status. In contrast to above finding, Alappuzha is among five places in the world that have been recognised by the United Nations Environment Programme (UNEP) as success stories in fighting the problem of solid waste.<sup>20</sup> The city has come up with a decentralized approach to solid waste management which can be replicated in other cities, a city like Mysore can certainly try to adopt such an approach which will help to retain its clean city status.

## CONCLUSION

The construction of sanitation value chain of Mysore has helped us to trace the faecal flow in the city. The faecal sludge management of Mysore is excellent with 88% of waste being properly disposed. The main driver identified for this is the well-established sewer connections around the city. The Sanitation situation is good in Mysore but certain areas identified in SWOT analysis like the threats of population explosion and urbanization and weakness of poor solid waste management has to be addressed if Mysore wishes to retain its clean city status in future.

## Limitation

The study was done by reaching as many stake holders possible, but there are chances of missing information. The study utilized many secondary data so there are chances of information bias.

## CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

## ABBREVIATIONS

**SBM:** Swachh Bharat Mission; **ULB:** Urban local bodies; **WASH:** Water, Sanitation and Hygiene; **PAS:** Performance assessment system; **CEPT:** Centre for Environmental Planning and Technology; **OSS:** On-site sanitation systems; **CSE:** Centre for science and environment.

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