

Public Sanitation Condition of Pimpri Chinchwad, India

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Abstract- Sanitation is a broad term which includes safe disposal of human waste, waste water and solid waste, domestic and personal hygiene, food hygiene, etc. The bad sanitation conditions results in depleting social, environmental and health conditions. Safe disposal of human waste is the most important aspect of sanitation. In developing country, over 80% diseases are caused due to infections transmitted through direct or indirect routes from human waste. To improve and understand sanitation condition in Pimpri Chinchwad area a rapid baseline assessment study is done. This paper talks about the existing condition and challenges of sanitation in Pimpri Chinchwad, India.

Keywords – Operation, Maintenance, Toilet, Urban Services, Sanitation

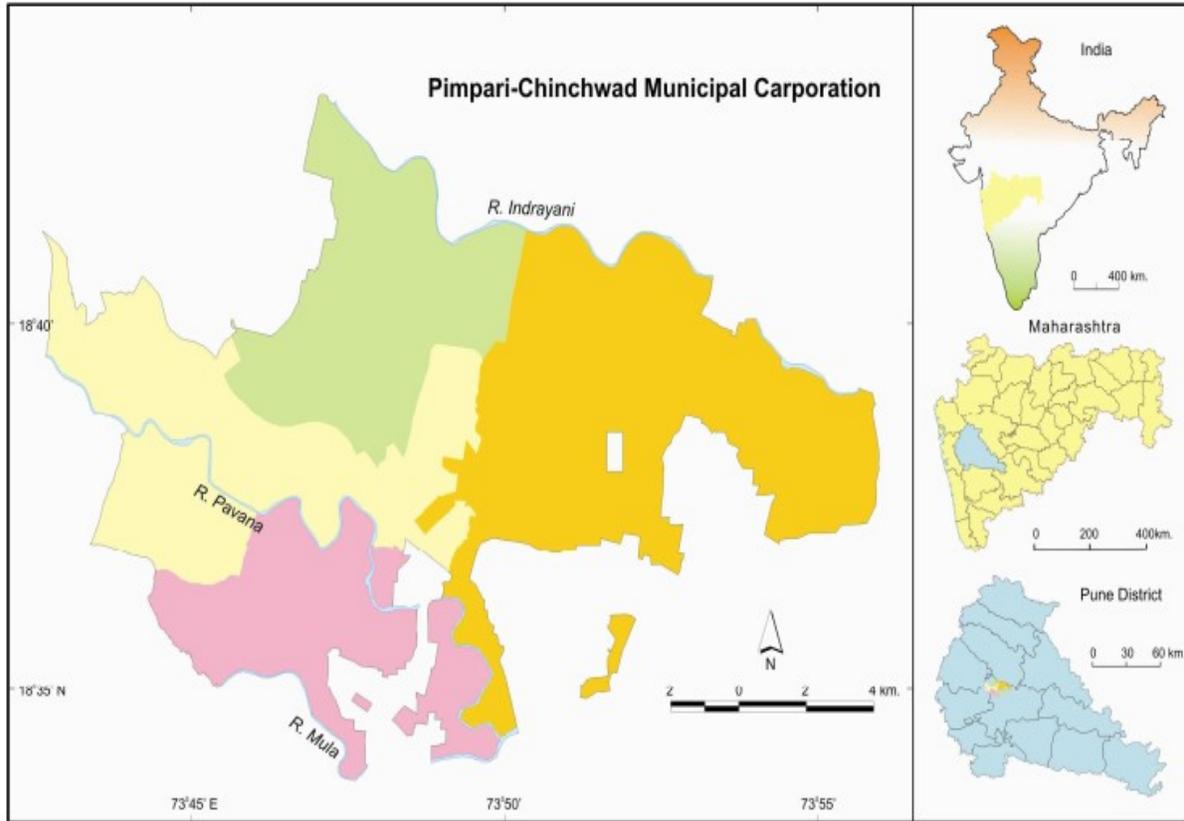
I. INTRODUCTION

Government of India's (GoI's) Swachha Bharat Mission (SBM) was announced on October 2nd, 2014 with a target of making India open defecation free by October 2nd, 2019, the 100th birth anniversary of Mahatma Gandhi. Given that 49.8 percentage of the country's population continues to defecate in the open, the provision of clean and well maintained public and community toilets requires immediate and rapt attention. (Dirk & Murlidhar, 2016). The norms according to SBM state that public toilets (PTs) should be provisioned at the rate of 1 unit per 100 male users and 1 unit per 50 female users and community toilets at the rate of 1 per 35 male users and 1 per 25 female users. These norms indicate the total footfall that a toilet unit will get, however, they do not account for peak loading factor. (Dirk & Murlidhar, 2016)

II. CITY PROFILE OF PIMPRI CHINCHWAD

In case of two-dimensional image, after a DWT transform, the image is divided into four corners, upper left corner of the original image, lower left corner of the vertical details, upper right corner of the horizontal details, lower right corner of the component of the original image detail (high frequency). You can then continue to the low frequency components of the same upper left corner of the 2nd, 3rd inferior wavelet

Pimpri Chinchwad is one of the fastest growing cities in Maharashtra & even in India. With census 2011 population touching 17.29 lakhs, the city has provided alternative destination to Pune. Pimpri-Chinchwad is situated towards the northeast of Pune and 160 km. from Mumbai. The city is predominantly an industrial hub, which has developed largely during the last four decades.



Map 1. Base map of Pimpri Chinchwad

Industrialization in Pimpri area triggered with the establishment of Hindustan Antibiotics Limited in 1956. The establishment of the Maharashtra Industrial Development Corporation (MIDC) in 1961-62 considerably facilitated industrial development in the area. The establishment of large-scale core industries has led to the growth of ancillary and small-scale industries in and around this industrial belt.

III. DEMOGRAPHY OF PIMPRI CHINCHWAD

Pimpri Chinchwad provides huge employment avenues on account of its matured automotive & manufacturing industry. With development of IT in the region, city has further attracted influx from different part of the country. Past six decades have witnessed tremendous growth in the population of the city on account of its employment attractiveness, good infrastructure and affordability. A growth rate of roughly 150% was witnessed during the 1971-81 decade. Since then, there is a marginal dip in the growth rate. However, even then it is much more than the national average. The 2011 census records PCMC as one of the fastest growing city in the country. Following table presents the decadal change & the growth rate of PCMC since 1961.

Table 1: Demography of Pimpri-Chinchwad

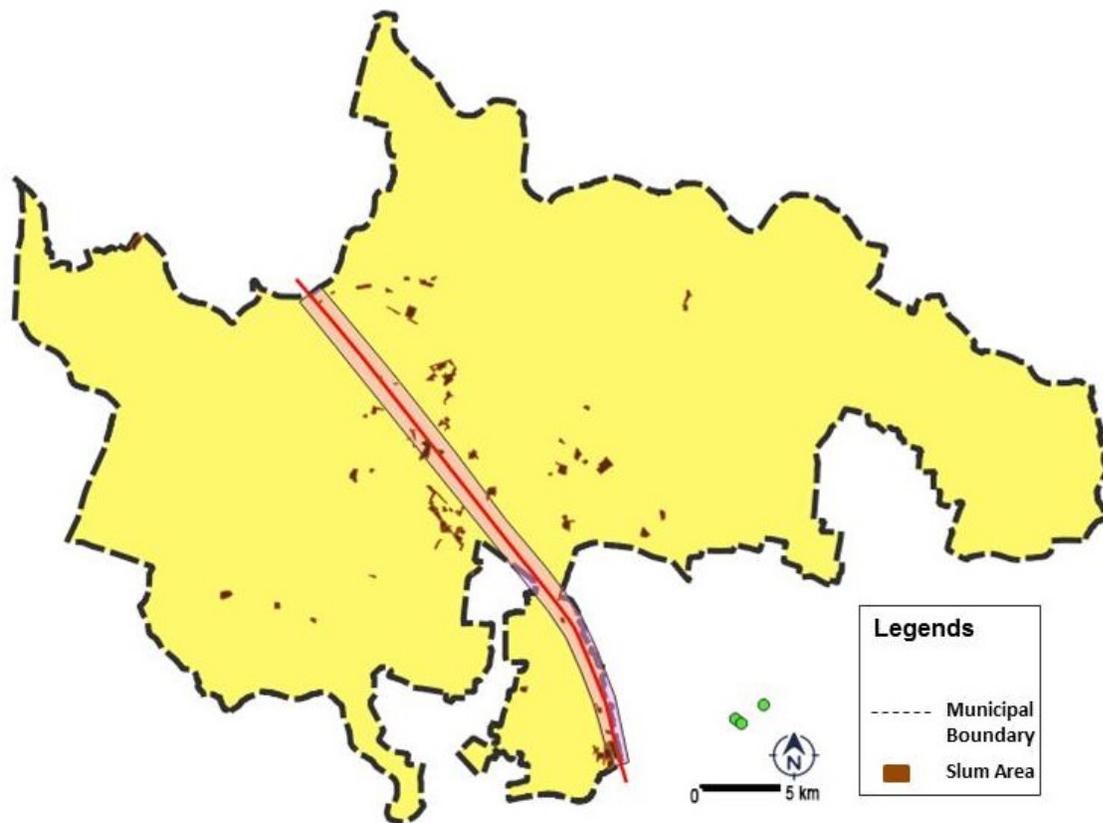
Census Year	Population	Decadal Change	Growth Rate (%)
1961	39,654	-	-
1971	98,572	58,918	148.58
1981	251,769	153,197	155.42
1991	520,639	268,870	106.79
2001	1,006,417	485,778	93.30
2011	1,729,320	722,903	71.82

Population of Pimpri Chinchwad as per census 2011 is 1,729,320 souls of which 945,914(54.70%) are males and 783,406(45.30%) are females giving a sex ratio of 828 females per 1000 males. Pimpri Chinchwad has an average literacy rate of 87.19, higher than the national average of 74.04%. This increasingly growth rate of population is responsible for increasing the demands of residential land. Consequently population growth is one of the important factors in changing the demand of infrastructure in PCMC.

2.1 Slum Demography Of Pimpri Chinchwad–

Urban slums are the most vulnerable section of the society in terms of access to sanitation. More often basic details such as total slum population, number of households, status of sanitation in these areas is unavailable with municipal authorities. This demographic information forms the basis of planning premises.

In 2002, the Government under its resolution dated 11/07/2001, carried out a slum survey which identified 71 slum pockets (35412 hutments) with a population of 1,46,054 persons of the identified 71 slum pockets in PCMC, 61 were declared. Though the proportion of population living in slums has decreased from 27 percent in 1971 to 13 percent in 2001, in absolute terms, there has been a rapid growth of slum population. In 2014 government identified 72 areas as slum area all are shown on map. (Mayank & Rima, 2014)



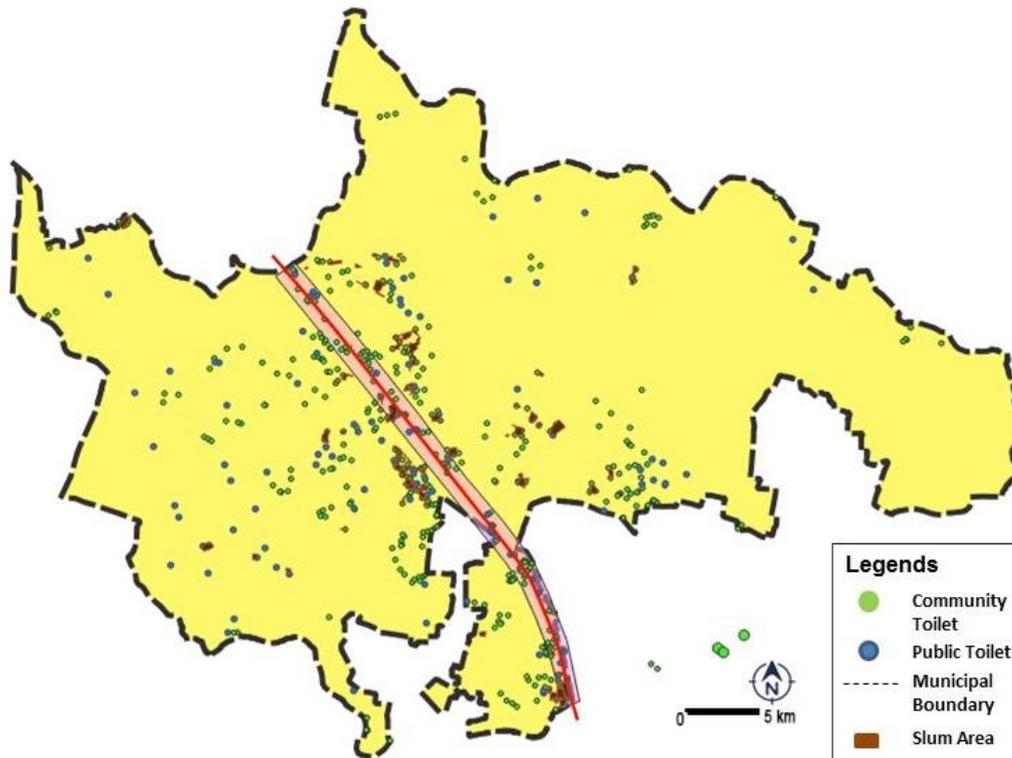
Map 2: Identified 72 Slums

The sanitation condition in slum area is major concern of the study. PCMC have recorded a maximum increase in number of public and community toilet (CTs) during 2008 – 12. PCMC constructed 410 community toilet and 116 Public toilets but still 5 % urban population in Pimpri-Chinchwad is practicing open defecation. To overcome this issue community toilet is good option for poor residents.

Table 2: PTs & CTs in PCMC

Category	Toilets
Municipal Toilet	395
Sulabh Toilet	41
Mall/Shopping Complex	5
Petrol Pump	43
Railway/Bus Station	6
Park/Lake	21
Government Building/Public Hospital	21
Other	3
Grand Total	535

Pimpri Chinchwad has total 536 public toilets, out of which 420 community toilets and 116 Public toilets are within municipal boundaries.



Map 3: Location of PT/CT

IV. EXISTING SANITATION STATUS IN PIMPRI CHINCHWAD

Access or rather Coverage of individual toilet is more appropriate indicator of sanitation situation in the city. Pimpri Chinchwad Municipal Corporation (PCMC), in 2013-14 notified their service level benchmark of coverage toilets as 95%. However analysis based on the recently concluded census 2011 reveal that following results.

Table Sanitation Coverage details of PCMC as per Census 2011

Table 3: Toilet Statistics in PCMC

Total HH in PCMC	4,10,858
No of HH having Individual Toilets	3,47,132
No of HH using Public Toilets	52,042
No of HH Defecating In Open	11,684

Based on this information, 84% of the households in PCMC have individual toilets. Another 13% depend on community toilets. Rest 3% people practice open defecation. Thus, although open defecation does not seem to be a widespread phenomenon, & is mostly limited to slum pockets. This needs to be tackled on priority basis using customized approach for each slum pocket. Blanket approach of providing community toilets without public consultations, as observed, has low acceptability as well as sustainability. Thus, this subject needs a more serious approach & wider participation of target audience. To summarise, the following are the major areas of problem, which shall be included in this study to understand the situation better.

1. Sewerage disposal.
2. Operation and maintenance of toilet
3. Construction and up-gradation
4. Rehabilitation of existing toilet

To understand the issues related to inefficiency of existing toilets a rapid baseline assessment of toilets is done in Pimpri-Chinchwad. To understand the issues and sanitation condition of public toilets a primary survey is required. Study shows through the flowchart.

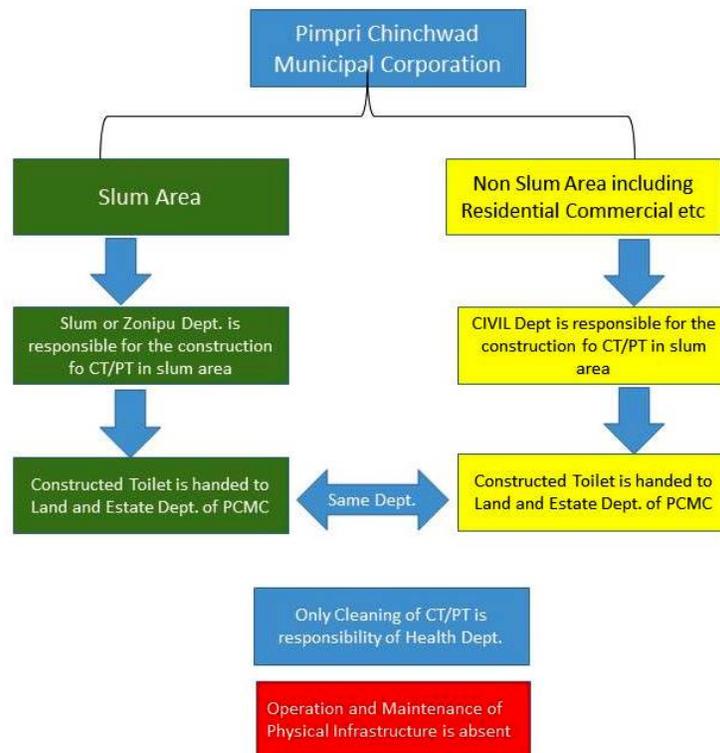


Figure 1. Survey Findings

Survey shows that operation and maintenance is absent in governance system. Secondary survey gave the data of locations for public and community toilets. Officials of municipal council talks about governance, operation and Maintenance cost per toilets as per guidelines of PCMC. Study find that health department is responsible for daily cleaning of PT/CT, but operation and maintenance fund allocation is absent. PCMC Authority allot 250 Rs./Daily for 1 toilet which include cleaning material, Payment of employee and maintenance related issues which is not sufficient to maintain the toilet block. The following image shows the condition of toilets in pimpri chinchwad area.

They all are facing maintenance issues like damaged door, absence of tube light and hygiene issues like absence of regular cleaning.



Figure 2: Lokshahir Annabhau Sathe Nagar, Bhind Bus terminus



Figure 3: Premier Plaza, Service Rd, Anand Nagar



Figure 4: Chinchwad Station Road, Saibaba Nagar



Figure 5: Service Rd, Morewadi, Chinchwad

V. ISSUES

Study reveal that many community toilets remain under such insanitary conditions that users do not like to enter them; they prefer open air defecation. Major deficiencies identified by survey are:

- (i) lack of cleanliness and poor up-keep (noticeable more in the case of 'No-Pay & Use' toilets),
- (ii) Insufficient water supply and poor lighting,
- (iii) Inappropriate location,
- (iv) Poor construction standards,
- (v) Insecurity (specially for female users), and
- (vi) Inadequate funds for operation and maintenance.

In Pimpri Chinchwad area operation and maintenance is key concern, to understand this concern best practicing models from around the world are china and Kenya which faced these issues in successful way.

A. Case Study -I: Kenya

The main principles of the public sanitation facility management system state that the public sanitation facility is operated by an operator. The operator is contracted to provide sanitation services on behalf of the WSP, but is not an employee of the WSP. The operator provides the said services at the facility as his/her private business undertaking. The operator can be an individual or a group (for example a registered self-help group) or from the private sector. The selected operator signs a contract with the Water and Sanitation Program (WSP), which stipulates in detail the rights and responsibilities of both parties as well as the rights and responsibilities of the customers and other stakeholders. Customers of the facility have to pay for the use of the public toilet. If additional services are provided e.g. water kiosk, shower or laundry facilities they have to pay the stipulated tariffs accordingly. The tariffs customers have to pay for a visit to the toilet or the shower or for buying water at the kiosk are proposed by the WSP in consultation with the Water Service Boards and approved by the Water Services Regulatory Board. In other words, operators are not allowed to determine the price of water and sanitation services.



Figure 6: Public Toilet at Kenya



Figure 7: Public Toilet at, Nairobi, Kenya

Source: <https://www.standardmedia.co.ke>, By Pkemoi Ngenoh

The operator is allowed to sell other goods at the public sanitation facility. The contract specifies the types of goods, which are not allowed to be sold at the public sanitation facility. The operator has to acquire a business license from the Council. The operator and the public sanitation facility itself are monitored and inspected by designated staff of the WSPs who use the “Checklist for Public Sanitation Facilities”.

B. *Case Study – 2: Public Toilets in Yufeng, China*

Yufeng district is governed by the Liuzhou (City Region) Municipal Government. LZ City Appearance Bureau is responsible for municipal sanitation functions in the city including solid waste management and public toilets. More than seven percent of residential buildings in the city do not have independent toilet facilities, and hence residents from these properties are entirely dependent on this type of Public Toilets.

The O&M management of PTs on a day-to-day basis is carried out through the following three methods:

1. **DESD Staff:** DESDs assign their temporary and/or permanent workers to carry out cleaning of some PTs in the district.
2. **Contracted Out Type I No-revenue Deposit PTs:** these are PTs that managed by individual contractors who collect tariffs from users, but do not submit any contract fees to the district ESD, as these are deemed to just about covering the operational (labour) expenses. The contractor or his/her agent is present at the premises during the hours that the PT is open.
3. **Contracted Out Type II Revenue Deposit PTs:** these are PTs that managed by individual contractors who collect tariffs from users, and submit contract fees to the district ESD every month, on the basis of the price quoted by the contractor in an annual auction. These are for PTs that make operational profits (over and above labour costs), and the contractor or his/her agent is present at the premises during the hours that the PT is open.

In the Contracted out Type II model, the contractor is to provide his/her own tools whereas the ESDs provide the cleaning materials for both types of contracts. In all the above cases, the DESD directly takes care of water (some limits may be prescribed) and carry out major and minor repairs; as also carries out cleaning of septic tanks, etc. (Somnath & Yue, 2005)

Annual O&M Costs incurred by DESDs for PTs (RMB)

Table 4: Annual O&M costs profit in 2005

ITEM	Yufeng
Water Charges	276,000
Labour Costs(Wage and welfare)	378,000
Maintenance & Repairs (Minor & part of Major)	100,000
Disinfectant and Cleaning Materials	13,000
Total Annual O&M Cost	767,000
Total PTs	41
O&M COST PER PT	18,707

Annual Income	120,000
Percent of O&M Cost Recovered	16%

Source: District ESDs, Team Analysis, Nov 2005

The above data study shows that china is generating revenue in percent of O&M cost, in 2005 it was 16% of O&M cost. Study shows that number of paid user is high than people preferred to go to unhygienic toilet for free.

VI. CONCLUSION

The most suitable operations and business model, toilets can be grouped based on certain parameters. The data of individual toilets is aggregated for each cluster to identify the most appropriate cluster approach – optimizing both operationally and financially. The city inventory database forms the basis for the cluster analysis. The toilets may be operated and maintained either free of cost or by levying a user fee depending on the location and requirements. Fund from municipalities, self-help groups and Corporate Social Responsibility funds may be appropriated for the same. Periodic monitoring of the performance of the private agencies is essential to ensure compliance with the contract conditions.

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