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Closing the gap between sustainability and affordability: communal sanitation in urban slums of India

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This research paper is based on assessment of community toilet blocks in urban slums of Lucknow and Kanpur, UP, India. The objective of the research was to assess the current set of practices and usages from perspective of financial sustainability and affordability of services to urban poor. Economic analysis shows that low-income households are currently paying 3 to 6 times the UN standard for accessing affordable sanitation, and 104 times that of an affluent household with a household latrine. Financial and managerial structures vary across facilities, with observed under-budgeting resulting in poor sanitation access and services. The lessons learnt include developing existing community toilets as WASH Resource Centers through diversification service, major role of women in managing these to ensure gender inclusive model and city or sub city -level cluster based management through a federation of Community toilet blocks, ensuring financial and operational sustainability.

Introduction

There is a high cost associated with missing and inadequate sanitation. Poor sanitation is responsible for 15% of the global disease burden (The Lancet, 2008), and diarrhoea is the leading cause of death in children under 5 in India (WHO, 2009). Further, fecal contamination of the water supply leads to malnutrition, stunted growth and long-term cognitive defects (Spears, 2013). The opportunity cost of missing sanitation services manifests as a loss in productivity as large as 6.4% of India's GDP (WSP, 2010). The Swachh Bharat Mission (SBM), announced by the Union Government in 2014, has brought sanitation to the forefront of national and state policy and action.

33% of India is urban (World Bank, 2015) and 1/8th of urban India resides in slums (Census, 2011). Poor living characteristics are typical of slums – often including inadequate access to water and sanitation. As per the JMP guidelines, 'communal toilet facilities' (including Public Toilets, Community Toilets and Community Managed Toilets) are 'limited' at best, with individual household latrines being the ideal solution. However, households in urban slums face many barriers to accessing individual household latrine due to prohibitively high capital costs, small plot sizes, semi-permanent housing structures, uncertain land tenure, low household income, and the caste-dimension of emptying household pits (WSUP, 2011). Therefore, community toilet facilities remain relevant in providing sustainable sanitation to urban slums.

Community toilets in Indian slums are often found to be inadequate due to poor maintenance, insufficient funding, poor construction standards, lack of hygienic disposal technology, and overall lack of cleanliness (WSP & World Bank, 2016). This research focuses on financial and managerial sustainability of community toilets in two cities of Uttar Pradesh state in India namely – Lucknow and Kanpur. The research aims to assess the current inequities between urban poor and well offs in access to sanitation services and provide benchmarks for the operation and maintenance of communal toilets based on the economic analysis and observations from field research. This research also examines the trade-off between the financial burden on the urban poor in access to sanitation services and that often a cash-strapped urban local body towards sustainable use of community toilet facilities and suggests strategies to improve their revenue generation capabilities while keeping its user base at optimum scale for same ensuring affordability of the urban poor.

Research methods

This paper is based on is a non-experimental mixed-methods study confined to 'community toilets' in Lucknow and Kanpur cities. The methods include a combination of field research (interviews, observation and audio-visual methods), secondary research and interviews with government officials and practitioners. During site visits, the features, facilities, condition and hygiene levels of the toilet blocks were recorded in an observation guide and triangulated with interviews. Caretakers and/or managers of the toilet block were interviewed to understand the management model, operation and maintenance and the financial management of the facility. User surveys were conducted to understand their sanitation preferences, their level of satisfaction with the facilities and their proportional expenditure on sanitation services.10 communal toilet blocks were visited in total, 5 each in Lucknow and Kanpur. 63 users were interviewed in Lucknow, and 20 in Kanpur. Interviews were conducted in Hindi by the principal author, accompanied by a practitioner familiar with the given site. However, issues such as the cost of land, treatment costs and size of unit (number of cubicles) are not included in the research analysis.

Key findings from the research study

1. Community contributed less than 4% of capital cost (Rs. 200 or 3.08 USD per family) in only 1 of the 10 community toilet facilities and rest were constructed by either government or other donors support. In short, a 100% capital cost subsidy was observed to be a prerequisite for community sanitation blocks in Lucknow and Kanpur.
2. Operational expenditure varied across the toilet blocks, due to differences in managerial structures. Table 1 provides an overview of the monthly expenditure, revenue generation and user traffic reported by four community toilets.

Table 1. Monthly operational expenditure, revenue generation and user traffic

Toilet block name	Monthly operational expenditure (in INR)					Monthly estimated revenue generation (in INR)	Average users per day
	Caretaker salary	Cleaner salary	Cleaning materials	Electricity	Total		
Madiau	5,000 x 2	5000	800 (guesstimate average)	1200 (assuming same as in HAL)	17,000	45000	300
Balaganj	4000	1500	800 (guesstimate average)	1200 (assuming same as in HAL if they were paying for it)	7500	37500	250
Bundeshwar	3000	n/a	600	1200 (assuming same as in HAL)	4800	9000	60
HAL	8000	4000	900	1200	14100	37500	250

Securing accurate estimates of operational expenditure was challenging due to opacity of management, potentially unsustainable operational structures and/or incomplete reporting of expenses. For example, the 8-seat communal toilet at *Dulli-mulli ka haat*, Kanpur operates under a complete subsidy from the Nagar Nigam (including capital cost, sewerage connection, electricity, water supply, and large repairs) and charges no user fees. Small repairs are taken care in informal manner by users.

Another common management structure for which estimates are difficult to obtain are the Sulabh Toilets. Sulabh International manages and operates 72% of Lucknow's public toilets (City Sanitation Plan: Lucknow, 2011), but its business model is outside the public domain. From the interview with full-time caretaker at the JK Mandir Sulabh Toilet, it was found that the operational expenditure was managed entirely by Sulabh.

The *Deendayalpuram* toilet block, built in 1997 build on 30-year maintenance contract, is a good example of the consequences of underestimation of O&M and overestimation of toilet lifespans. 30-year maintenance contracts have failed in Pune and Mumbai as well because they do not fit the changing agendas of the NGOs and the political changes at the city, state and national level[1].

The key findings from table 1 states that (i) There is enough revenue base potential in each of the community toilet blocks at current levels of charging and (ii) Due to lack of non-transparent management and monitoring system, the surplus revenues are pocketed by care takers and intermediaries over and above their stipulated salaries and are largely unaccounted for.

Revenue generation from all facilities (excluding Dulli-mulli ka haat, and perhaps JK Mandir in Kanpur) was singularly through user fees. The modal user fee was Rs. 5 (0.08 USD) per person per use. However, there was some variation in user charges across facilities, as shown in Table 2, below.

Table 2. Variation in user fees across toilet blocks

Toilet block name	User charge structure (in INR)
Balaganj; Bundeshwar; HAL	Rs.5 per use
Madiau	Rs. 5 per use for men (women, children free)
Deendayalpuram	Rs.5 per use of latrine, Rs.6/bath, Rs.2/children under 5, Rs.3/children from 5-10 yrs, free for disabled/elderly
Sarsaiya ka Ghaat	Rs. 90/family/month (old card holders), Rs. 120/family/month (new card holders),Rs. 2/use without card, Rs. 5/use for outsiders
JK Mandir - Sulabh	Rs. 80/family/month (up to 4 per family), Rs. 100/family/month (more than 4 per family), Rs. 5/use by outsiders

- Only 10% of all users interviewed in Lucknow were women. Further, 3 out of 5 toilet blocks in Lucknow reported that usage by women is negligible – less than 10 women per day. One of these toilets even waived user fees for women. These toilets were mostly public and hybrid toilets. The 'pure' Community Toilets in Lucknow and Kanpur reported equal usage by men and women. None of the caretakers were women in the community toilets visited. Only 1 of the 10 toilet blocks visited had separate stalls for children. Apart from this, no toilet block had facilities for disabled or elderly persons. **The above findings indicate exclusion of women and children and also differently abled people is embedded in male dominated current management models of community toilets in Lucknow and Kanpur.**
- The economic burden of sanitation on low income groups: In absolute terms, expenditure on user charges are Rs. 750 (11.5 USD) per month for the observed average family of 5. The percentage of total income spent on sanitation facilities (excluding water) is between 2.5% and 24% of self-reported income with an average spent of 10%. This expenditure is 11.8% and 13% of the minimum wage for semiskilled and unskilled workers in Uttar Pradesh[2], respectively. ***Using either method of estimation, the urban poor are found to be paying 3 to 6 times what is considered affordable by the UN standard of affordability.***

– To estimate the operational expenditure of sanitation facilities for individual household latrines in middle and high-income households, the sewerage tax for residents of Lucknow in the city's three most affluent wards (high land value and therefore highest tax) was calculated[3]. The average annual sewerage charges for households of 2000 sq. ft. in these wards was found to be Rs. 604.80 (9.3 USD) – a monthly charge of Rs. 50 (0.8 USD). For comparison – the equivalent tax for a low-income household in the three wards of the city with the highest slum population, assuming a household size of 500 sq. ft. is Rs. 86.4 (1.3 USD) per year, or Rs. 7.2 (0.11 USD) per month. ***The current expenditure on sanitation by the population served by community sanitation facilities is 104 time higher than what is being spent by a low-income household served by individual household latrine connected to sewerage network***

– It can be argued that the households with individual latrines are paying the difference through the capital costs. In Table 3, the low-end estimate of Rs. 15,000 is used to illustrate the prohibitively high capital costs of household sanitary latrine for low income groups. Only a minority of users interviewed self-reported a salaried income. The low propensity to save for daily wage workers further makes daily user fees more feasible than saving for household latrine. ***Therefore, in practice, low-income groups are found to be paying disproportionately high amounts for a lower quality of sanitation services in Lucknow and Kanpur***. The user fee structure of communal sanitation facilities needs to reflect this understanding and cater to the poorest income groups through its revenue structure.

Table 3. Capital costs for Construction of low cost household Latrine compared to household income for different tax brackets

Tax bracket	Monthly Income (in INR)	Capital cost of IHHL as % of monthly income
Minimum wage	Rs. 5,750	260%
No tax	< Rs. 20,833	> 72%
5%	Rs. 20, 833 to Rs. 41,666	36% to 72%
20%	Rs. 41,666 to Rs. 83,333	18% to 36%
30%	> Rs. 83, 333	< 18%

- A realistic estimate of operational costs and affordable user fees for communal toilets: Common basic costs accounted are caretaker and cleaner salary, cleaning materials, electricity and water supply, and small repairs – which, for the most part, are manageable at the toilet block level. However, certain aspects of O&M expenditure are either left out or severely underestimated, leading to the poor estimation of life-cycle costs of communal sanitation facilities. This leads to the steady deterioration of the infrastructural and hygienic conditions of these facilities. Table 4 provides an estimate of the per month revenue required to make an individual toilet block financially sustainable.

Table 4. Estimated monthly costs for recurrent O&M expenditure for communal toilet blocks (in INR)

Item	Cost as per frequency	Monthly estimate
Caretaker salary	Rs. 8000/month	Rs. 8000
Cleaner salary	Rs. 150/day	Rs. 4500
Cleaning materials and safety equipment	Rs. 1500/month	Rs. 1500
Electricity and water supply	Rs. 1500/month	Rs. 1500
Small repairs	Rs. 400/month	Rs. 400
Desludging of septic tanks and cleaning of water tanks	Rs. 10000/year	Rs. 830
Other capital maintenance expenditures including re-painting walls every year, any major repairs to walls, fixing locks, etc.	Rs. 10,000/year	Rs. 830
Replacing borewell	Rs. 10,000 in five years	Rs. 70
Total revenue required to break even		**Rs. 17,630**

The minimum required monthly revenue for an individual toilet block is approximately Rs. 18,000 (277 USD). Toilet facilities charging Rs. 5 (0.08 USD) per use require a minimum traffic of 120 users per day to break even. To estimate monthly charges, it is assumed that 50% of the community has household toilets. The average number of households per slum in Lucknow is 184 (City Development Plan, 2015). To break even, such a facility would require a monthly charge of Rs. 200 (3.08 USD) per household (compared to the current average of Rs.750/household/month or 11.5 USD). However, the affordability analysis shows that Rs. 5 (0.08) per use is 'unaffordable' for the target group.

A user fee of Rs. 2 (0.03 USD) per use pushes the required average traffic to 300 users per day – higher than the observed average of 256 users per day. This user traffic will be challenging to sustain in the medium-to-long term. In the context of monthly user charges, an expenditure of Rs. 40 (0.62 USD) per person per month is deemed affordable. However, it is important to account for the inability of households

to make lumpsum payments. Therefore, a weekly charge of Rs. 10 (0.15 USD) per person or Rs. 40 (0.62 USD) per household may be more appropriate. The monthly household charged should not exceed Rs. 120 (1.85 USD). As per this analysis, Table 5 summarizes the maximum permissible user fees for using communal toilets. In either case, individual toilet blocks may have high fluctuation in user traffic, making revenue generation uncertain. **Therefore, it is recommended to broad base the community toilet blocks services as WASH Resource Centre cross subsidizing the sanitation services with sale of safe water and low cost hygiene products.** Further, the proposed recommendations are based on averages and do not account for the low revenue generating toilets. This concern can be addressed at the city level.

Table 5. Proposed maximum permissible limit for user charges

Category	Sub-category	Average monthly Income per capita	Maximum monthly sanitation expenditure	Maximum per use charge
User interviews	Daily wage workers[4]	Rs. 2250	Rs. 67	Rs. 2.25
	Other	Rs. 1890	Rs. 56	Rs. 1.86
Minimum wage	n/a	Rs. 1437	Rs. 43	Rs. 1.43

City-wide management of WASH services for urban poor: a federation of community sanitation blocks converted into WASH resource centres

Community Toilet blocks converted into WASH Resource Centers run on model of livelihood promotion for women Self Help Groups through adequate regulation may be federated to have economies of scale and maximization of revenue for professional management of community toilets and further cross subsidizing community sanitation facilities with sale of SAFE water and low cost hygiene material such as sanitary pads, soaps and other cleaning material for use in poor households in catchment of these community toilet facilities. This network of WASH Resource Centers can be a single city-wide network, or a centrally managed set of toilet clusters based on assessment of economies of scale. In a city-wide network, all toilet blocks or WASH Resource Centers shall be part of the network will have a centralized financial management within overall regulation by the urban local bodies. Alternatively, WASH Resource Centre clusters can be made based on user traffic and revenue generation potential so that each cluster is financially sustainable (with average traffic of 300 users/day), with the high-traffic WASH Resource Centre subsidizing operation costs for the low-traffic WASH Resource Centre.

The municipal body would be required to set and regulate user charges for basic sanitation and water only, accounting for affordability to the urban poor. For Lucknow, it is recommended that per-use charges have a maximum limit of Rs. 2 (0.03 USD) and monthly household charges not exceed Rs. 120 (1.85 USD). Thus, the revenue structure can remain pro-poor and a larger scale of operation can help to cut costs.

Conclusion

Community toiles are critical for universalizing city-wide sanitation services in areas including slums. Capital investment into building community toilet blocks is available through local, state and national governments, private donors, NGOs etc including that in Swachh Bharat Mission. However, making then accessible to those, who do not have access to household latrines and ensuring financial sustainability to maintain their hygiene standards, services and infrastructure is a huge challenge. The primary research conducted in this study sheds light on the current conditions of such toilet blocks, their financial and managerial structures and suggests a plan for improving sustainability of communal toilet facilities in cities of Lucknow and Kanpur in India.

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Notes

1. Interviews with members from Shelter Associates, Pune and SPARC, Mumbai.
2. Rs. 6,350/month (97.7 USD) for semi-skilled and Rs. 5,570/month (85.7 USD) for unskilled workers.
3. Details of the tax calculation method were obtained through an interview with the Swachh Bharat Mission representative at the Lucknow Nagar Nigam, and the Nagar Nigam website was used for obtaining the relevant data.
4. It should be noted that this is an average figure and fails to account for the high uncertainty and extremely low propensity to save associated with income for daily wage workers.

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