

Revisiting the role of funding: Lessons from expenditure and performance on cleanliness in Indian cities

SHISHIR GUPTA AND RISHITA SACHDEVA

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**Formerly Brookings India.

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Executive Summary

In India, an estimated 480 million people—1.5 times the entire population of the United States—live in cities and towns and this is expected to increase to about 600 million by 2030. Other than the scale, there is not much to cherish about the quality of life Indian cities offer to an average city dweller. For example, only 75-80% of municipal waste is collected, a marginal improvement from 72% in 2010, and out of this, only about 22-28% is processed and treated. Similarly, water availability is about 70 lpcd in urban areas compared to 135-150 lpcd required for hygienic living, and the list goes on. However, a low level of service delivery is not fait accompli for a lower middle-income country like India. In 2011, an Indian government appointed High Powered Expert Committee (HPEC) noted that “*the state of urban service delivery in India’s cities and towns is far poorer than is desirable for India’s current income levels.*” (HPEC, 2011, p.43)

There is widespread realisation in India of the need to undertake fundamental reforms in urban governance, planning and funding to enable cities to provide globally accepted service delivery levels. Poor service delivery, despite being a multifaceted problem, is often attributed largely to lack of funding. India’s municipal revenue as a percent of GDP has remained constant at 1% since 2007-08. This is very low compared to other developing nations such as Brazil and South Africa whose ratio stood at 7.4% and 6% respectively in 2010.

Estimates suggest that India needs to spend six to eight times more per capita on urban infrastructure, every year, for the next 15-20 years to be able to provide acceptable levels of service delivery across key urban services. Around 80%¹ of this estimated spend is required to build capital intensive urban infrastructure like affordable housing, mass rapid transit systems like metro network, more roads, etc. and relatively little is needed to provide services like solid waste management (SWM), which keep cities clean, but are not capital intensive. Since capital intensive urban infrastructure in most Indian cities is not financed by the urban local bodies (ULBs) anyway, it begs the question, is lack of funding really the primary reason Indian cities are not able to provide acceptable levels of services such as SWM. Furthermore, is it true that higher the spending on SWM, better the service delivery?

We probe these questions by comparing revenue expenditure² that our sample of 27 cities are incurring on SWM services, relative to what they ought to spend³ to provide acceptable levels of service delivery, with their current performance on cleanliness.⁴ The results are counterintuitive. Lack of funding is not a binding constraint in every city to deliver acceptable levels of SWM services. Nineteen out of 27 cities spend more than the required amount, yet none has a perfect cleanliness score. Nine out of these 19 spend at least 1.5 times more than the benchmark amount. Secondly, while expenditure has a significantly positive influence, it explains only 23% of the variation in performance, indicating the importance of non-monetary factors such as better city governance.

While there is overwhelming evidence that city finances need to be strengthened significantly, the findings of this paper suggest that there is an equally important need to map the expenditure and outcomes achieved across a range of urban services. This would help establish where funding is a real constraint, and where lower service delivery could be due to other reasons such as inefficient and ineffective usage of funds. This will increase transparency and accountability and improve allocation of funds across services within a city. It will also help unearth best practices amongst Indian cities, which may be easier to adopt than global best practices since they are located within our political economy. Early observations suggest the key role that stable city leadership, effective public-private partnerships, and citizen engagement have played in providing better SWM services. For example top performing cities such as Indore has had the same mayor and commissioner since 2015 and has involved 850 Self-Help Groups (SHGs) for citizen awareness campaign on waste segregation; Amdavad and Pune municipal corporations have adopted a PPP model to collect and transport waste from the city. Focus on expenditure and outcomes assumes even greater importance due to the fiscal stress caused by COVID-19, making devolution of funds to the third tier all the more challenging.

¹ In MGI (2010), 82% of \$1.2 trillion investment is devoted to urban roads, mass transit and affordable housing. In HPEC (2011), 70.3% of INR 30.9 trillion is devoted to urban roads and urban transport.

² SWM is more of a revenue expenditure exercise. Capital expenditure accounts for only 15% of total expenditure on SWM while urban roads and transport account for 82% and 60% respectively (High Powered Expert Committee, 2011).

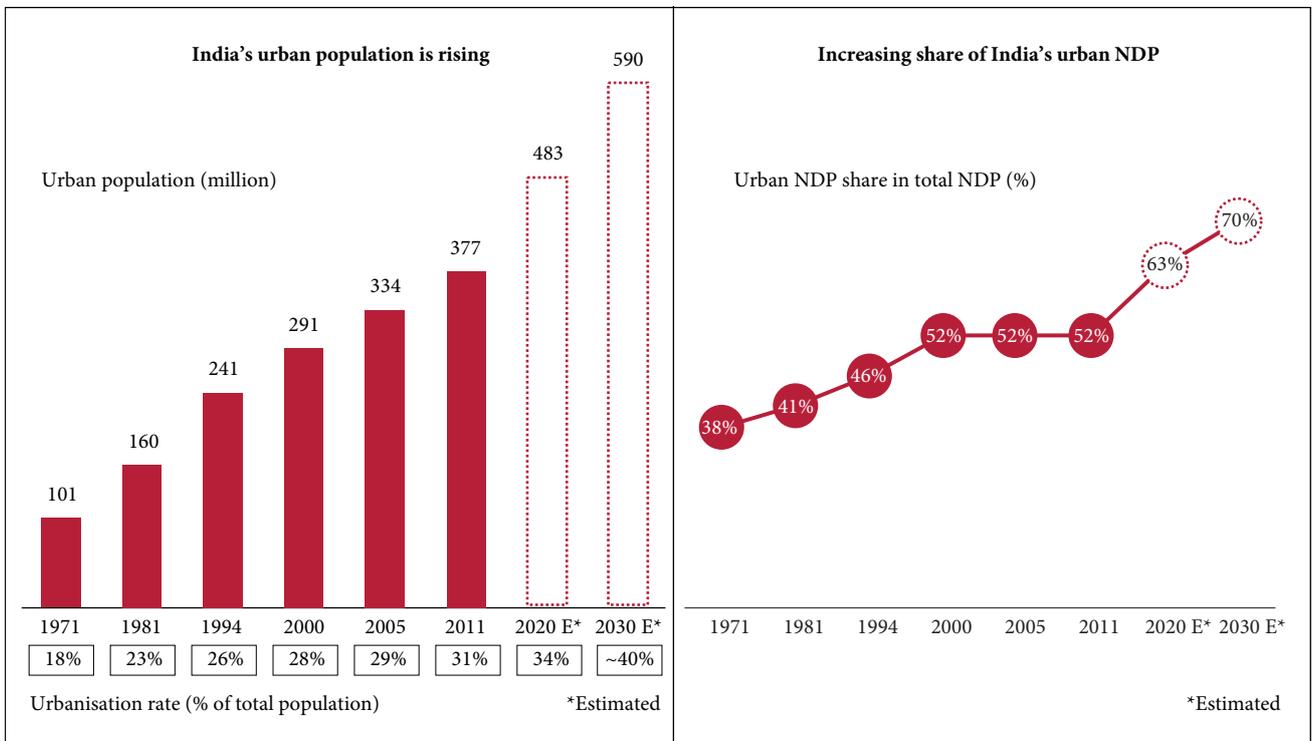
³ Based on recommendations provided by (High Powered Expert Committee, 2011).

⁴ Measured by Swachh Survekshan, an annual cleanliness survey conducted by MoHUA for Indian cities since 2014.

Introduction

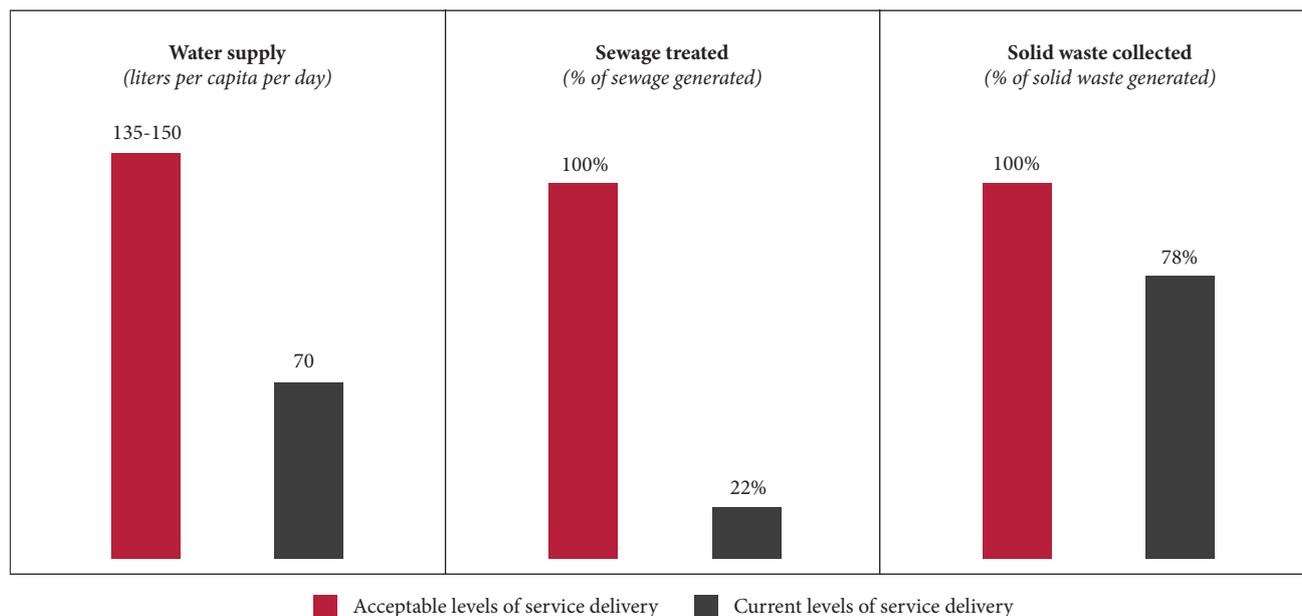
India is urbanising rapidly; the urban share of population has steadily increased from 18% in 1971 to about 34% by 2020. It is expected to touch 40% by 2030, amounting to approximately 600 million urban inhabitants. Increasing urbanisation is a systemic phenomenon observed globally, characterised by the workforce moving away from agriculture to non-agriculture jobs and people moving away from villages to cities in pursuit of better livelihoods. While urbanisation has followed the standard script, the same may not be true with respect to how much value India has derived from this rural-urban shift. The urban share of Net Domestic Product (NDP) was 38% in 1971, which grew steadily to 52% by 2000. However, from 2000 to 2012, the urban share of NDP has remained constant at 52%. Since the urban population has increased steadily from 2000 to 2011, the constant urban share of NDP implies that per capita urban NDP growth has been lower than rural growth during this time period. This may be an indication that urban centres are not able to create enough high productive jobs and/or not allowing existing inhabitants to increase their productivity fast enough. It is noteworthy that increasing share of urban NDP between 1971-2000 and stagnant share between 2000 to 2012 is accompanied by increasing share of rural manufacturing, which steadily increased from 26% of overall manufacturing in 1971 to 51% by 2012 (Chand, Srivastava, & Singh, 2017). It would be interesting to observe whether urban share of NDP increases over time to around 60% by 2020 as estimated by multiple credible sources.

Figure 1: India’s urban population and NDP share



Source: Indian Census, National Accounts Statistics, (United Nations, 2015), (MGI, 2010), (CREDAI-CBRE, 2019)

Low and deteriorating levels of basic civic services could be one of the reasons for lower productivity growth in urban areas compared to the countryside in the more recent years. As shown in Figure 2, in an ideal scenario, 100% of the solid waste generated must be collected. For Indian cities, currently only 78% of solid waste is collected. Poor service delivery is not only a problem pertaining to SWM. The acceptable level of water supply should be between 135-150 litres per capita per day in an urban setting; at present, Indian cities provide about 70 litres per capita per day (Ministry of Housing and Urban Affairs, 2019). This hampers their ability to create gainful employment for a large share of the population and provide services necessary for a dignified human life.

Figure 2: Acceptable and current service delivery levels

Source: MGI (2010), *India's Urban Awakening*. HPEC (2011). Ministry of Housing and Urban Affairs (2019), *Urban Development*. TERI (2018), *India's rampant urban water issues and challenges*

A low level of service delivery is not a fait accompli for a lower-middle-income country such as India. In 2011, a government appointed High Powered Expert Committee (HPEC) had noted that “*the state of urban service delivery in India's cities and towns is far poorer than is desirable for India's current income levels.*” (HPEC, 2011, p.43).

Literature suggests improvements in planning, governance and funding, coupled with innovative practices and use of technology as the key building blocks to improve service delivery (MGI, 2010). While efforts have been made to improve on these, implementation remains woefully inadequate and largely on paper. For example, the 73rd and 74th Constitutional Amendment Act (CAA) of 1992, which recognised Panchayats and urban local bodies (ULB) as the third tier of government, was a step in the right direction. However, nothing much has changed on this front over the last 20-30 years. “Key problems in urban governance include weak legal and institutional framework within which the ULBs operate and their poor capacity including lack of professional and sensitised cadre, to perform their development and regulatory functions” (Planning Commission, 2011,p.2). Likewise, the Fifteenth Finance Commission report for 2020-21 recommended that 4.31% of the divisible revenue pool should be allocated to local bodies, up from 3.54% in 2019-20. Despite this higher provision, ULBs are largely dependent on Central and State grants which constrain their ability to invest in infrastructure and improve quality of service delivery. Municipal tax revenue as a share of GDP has declined from 0.30% to 0.25% between 2010 and 2018. During the same period, the combined tax revenue of Centre and States as a share of GDP has increased from 16% to 18% (Ahluwalia, et al., 2019).

Literature review

The existing work on service delivery by Indian municipalities can be classified into three broad strands. The first focuses on the fundamental reforms to improve service delivery, most often concluding that increasing funding is the most crucial aspect. A second set of studies focuses on the input side of service delivery, giving primacy to municipal governance. The third strand links input indicators with outcomes achieved in terms of service delivery. This paper adds to the third strand of literature by linking expenditure with service delivery and its performance.

Fundamental reforms to improve service delivery, especially higher funding: Two major reports on urban reforms in India, McKinsey Global Institute (2010) and High Powered Expert Committee (2011) defined urbanisation as an inevitable outcome of the faster rate of growth to which the India economy has transited, and yet cities are failing their residents in providing basic quality of life. These reports conclude that one of the most critical puzzles to solve is to generate adequate funding for building and maintaining urban infrastructure to improve service delivery. India's municipal revenue as a percent of GDP has remained constant at 1%, which is very low compared to other developing nations such as Brazil and South Africa whose ratio stood at 7.4% and 6% respectively in 2010 (Ahluwalia, et al., 2019). MGI (2010) estimates that India needs to spend US\$1.2 trillion on urban infrastructure over the following 20 years and suggested that a large chunk of this expenditure can be financed by cities themselves, especially by the larger ones. Majority of this investment requirement is for capex intensive activities; In MGI (2010), 82% of \$1.2 trillion investment is devoted to urban roads, mass transit and affordable housing. In HPEC (2011), 70.3% of INR 30.9 trillion is

devoted to urban roads and urban transport. This infrastructure spend was estimated keeping in mind urban inhabitants by 2030 and how much does it cost on a per capita basis to provide for acceptable service delivery levels for each of the key urban services. Successive Finance Commissions have also endorsed higher financial devolution to cities, resulting in share of urban bodies increasing from 0.78% of the divisible revenue pool in the Eleventh Finance Commission to 4.3% in the just concluded Fifteenth Finance Commission (Aiyar, 2021).

Weak governance constrains decision making and financial sustainability of ULBs: There is a lack of stable and sound decision-making at the municipality level (Glaeser, 2019; Janaagraha Centre for Citizenship and Democracy, 2017). Janaagraha's annual survey of India's city system (ASICS), which scores cities based on their quality of life, policies and institutional processes to evaluate the quality of governance, finds 10 months to be the average tenure of a municipal commissioner, which is too short to make any meaningful contribution to a city's functioning. About 54% of cities do not generate enough revenue to meet their salary costs and 70% of the cities had budget variance of over 30%, pointing to instability in management and resource allocation. Despite the benefits attached to having an independent source of revenue, municipal revenue has remained stagnant at 1% of GDP between 2007-08 and 2017-18. Moreover, ULBs in India are heavily dependent on higher-level government transfers and are not empowered to mobilise financial resources through raising taxes or levying user fees or unlocking land value. The current user charges are insufficient to cover Operation and Maintenance (O&M) expenditure and absence of business models eliminate possible private investments (Ahluwalia, et al., 2019). The State Finance Commissions (SFC) make recommendations regarding sharing of taxes and revenues between the state and its respective Municipalities and Panchayats, and formulate action plans for the cities on various fronts. However, the latest fifth SFC report refers to different time periods for different states.⁵ Furthermore, even if majority of the suggestions are accepted by the state government, they are not actually implemented (Gupta & Chakraborty, 2019).

Linking input and output of service delivery: There is relatively less literature for this third strand linking input with outcomes. Bandyopadhyay (2014) in a study covering 718 ULBs in Tamil Nadu, finds that ULBs with better revenue-generating ability have higher efficiency in resource utilisation and service delivery. Similarly, 'Municipal Performance Index' (MPI), one of the latest initiative by Ministry of Housing and Urban Affairs, Government of India, ranks cities based on an index comprising of various input and outcome indicators. It evaluates 111 municipalities across five broad verticals, namely: Governance, Technology, Planning, Services, and Finance. MPI's findings suggest that municipalities without financial autonomy have weaker governance and poorer service delivery.

The current paper contributes to this third strand of literature by attempting to establish a link between expenditure incurred and outcomes achieved on SWM services. It is worth pointing out that the major studies (MGI, HPEC) that focused on urbanisation challenges in India and offered recommendations on how to correct these issues including the need to significantly increase urban infrastructure did not look at existing efficiency or sufficiency of expenditure across key services and whether there is scope to achieve better service delivery without spending more. Since India is still a lower middle-income country, it is imperative to optimize efficiency and this paper is an attempt in that direction.

Approach and methodology

Despite the clear and present need to improve city finances, it is not obvious if resource scarcity is a good enough explanation for why Indian cities seem unable to provide acceptable levels of services such as solid waste management, which are relatively resource light. The question becomes more acute since most cities do not spend, from their budgets, in building capital-intensive urban infrastructure. This paper attempts to shed light on this conundrum by asking to what extent is lack of funding the primary reason why Indian cities are not clean enough? And secondly, is it true that higher the spending, cleaner is the city?

We tried to probe this by linking expenditure on SWM and city⁶ cleanliness for a sample of 27 cities for which both the data points are available for a common year. SWM was a natural choice to link service delivery with expenditure, because of three main reasons. First, input and outcome variables are both available. For input, we have used revenue expenditure on municipal SWM available from the budget documents and for outcome, we used results of the Swachh Survekshan (SS) 2016 survey, which ranks urban local bodies (ULBs) on the basis of their performance in managing SWM. Such regular surveys are not available for other services, such as water supply, public transport, etc. Second, performance on SWM is mainly dependent on revenue expenditure as the associated activities are daily garbage collection, salaries of employees, etc. The ideal share of capital expenditure in total expenditure on SWM is 15%, while for other services such as urban transport and urban roads, the share is significantly higher at 60% and 80%, respectively (McKinsey Global Institute, 2010; High Powered Expert Committee, 2011). Thus, *ceteris paribus*, cleanliness of a city is significantly more dependent on 'here and now' type revenue expenditure. Third, SWM is one of the most basic services and is provided by municipalities everywhere, as opposed to some combination of state and cities for other services like transport, which might muddle the link between expenditure and performance.

⁵ 5th SFC report for Haryana give recommendations for the period 2016-17 to 2020-21, while the same report for Odisha gives recommendations for 2020-21 to 2025-26.

⁶ City and ULB is used inter-changeably.

Swachh Survekshan survey

The Ministry of Housing and Urban Affairs (MoHUA), Government of India, has been publishing the world's largest cleanliness survey, Swachh Survekshan, since 2016. Starting with evaluating the performance of 73 major cities in 2016, it expanded to 4,242 cities and towns by 2020. The survey evaluates performance on two main civic services: solid waste management, and elimination of open defecation. 65% of the evaluation pertains to SWM,⁷ making it appropriate to measure delivery of SWM services.

The survey methodology involves three stages; first, self-assessment of service level progress; second, observations by an independent body to verify self-assessment; and third, collecting citizen feedback.⁸ (Table 1).

Table 1: Stages of Swachh Survekshan survey

Stages	Description
Service level progress	Municipalities submit self-assessment based on a standardised survey.
Independent observations	An independent body judges the authenticity of the self-assessment claims made by municipalities.
Citizen feedback	Citizen feedback is incorporated using Interactive Voice Responses (IVR) surveys and through mobile app and website. ⁹

We looked at each question in the service level progress section of the survey and categorised them into either input or outcome bucket; input referred to processes and mechanisms, whereas outcome referred to metrics linked to actual outcomes with respect to service delivery levels, such as garbage collected, transported, treated, etc. Our assessment indicates that 70% of weightage in the survey is given to achieving SWM and sanitation outcomes,¹⁰ and only a minor proportion for inputs.¹¹

Surveys could be volatile and/or faulty. To check for the stability of the survey, we analysed SS marks for cities that have ranked in the top 20 at least once between 2016 and 2020 and have also been included in the survey for all the five years. In Table 2, the percentage scores have been colour-graded for each city across time. A majority of the cities show stable performance in the survey. That is, if they start strong, they remain strong and vice versa, and if they improve or worsen, it is more a systematic change than volatility caused by the survey. For example, Mysuru's score is between 87-89% and New Delhi Municipal Corporation (NDMC) score is between 84-90%, through the five years. The survey also captures cities such as Ghaziabad, which started weak in 2016 with a score of 41%, but has shown consistent improvement and reached 71% by 2020. Lastly, the results are broadly intuitive; richer and better planned municipalities like NDMC and Chandigarh Municipal Corporation, for example, have high scores and industrial towns like Kanpur and Jamshedpur are relatively lower in this list. Given its outcome focus, coupled with plausibly correct and stable results, we felt comfortable using it as an outcome indicator.

⁷ Based on 2016 SS survey.

⁸ From 2019, another stage was included, which includes third party assessment for two categories, garbage free cities and open defecation free protocols.

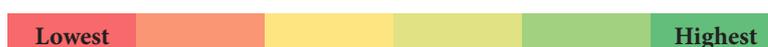
⁹ Minimum sample size of 1000 surveys or 0.1% of city population, whichever is less.

¹⁰ In the ULB budget documents, sanitation and SWM are used interchangeably.

¹¹ Based on 2018 SS survey.

Table 2: SS scores over five years for major cities

CITY (ULB)	Scores (%)				
	2016	2017	2018	2019	2020
Mysuru	87%	87%	89%	88%	88%
Chandigarh	86%	85%	91%	76%	83%
Delhi-NDMC	85%	85%	90%	84%	87%
Visakhapatnam	82%	90%	89%	75%	82%
Surat	80%	88%	83%	77%	92%
Rajkot	79%	82%	75%	80%	86%
Pimpri Chinchwad	78%	66%	73%	65%	66%
Pune	77%	83%	87%	69%	75%
Navi Mumbai	77%	85%	88%	83%	91%
Vadodara	76%	85%	73%	60%	81%
Amdavad	73%	83%	84%	83%	87%
Thane	68%	60%	74%	64%	77%
Hyderabad	68%	80%	77%	69%	67%
Nagpur	67%	58%	71%	63%	72%
Bhopal	67%	90%	92%	76%	84%
Vijayawada	64%	81%	90%	78%	88%
Indore	64%	90%	93%	93%	94%
Jaipur	62%	48%	74%	67%	61%
Gwalior	62%	77%	77%	63%	78%
Nashik	62%	55%	70%	62%	79%
Gandhinagar	57%	81%	77%	75%	84%
Kanpur	55%	53%	69%	62%	63%
Jabalpur	44%	53%	77%	73%	73%
Varanasi	42%	76%	76%	61%	61%
Jamshedpur	41%	67%	76%	76%	86%
Ghaziabad	41%	34%	75%	78%	71%



Source: Swachh Survekshan 2016-20. The cities are colour-graded, i.e., if the performance improves in the following year, the colour becomes greener. If the performance worsens, the city colour becomes yellow or a dark orange (worse-off)

As with any other survey, there are some limitations to the methodology and implementation of SS as well. First, the independent observation section of the survey is based on randomly selected parts of the city, such as a random selection of seven wards out of four zones to assess the claim of door to door garbage collection, or a sample of randomly selected shopkeepers/vendors to assess the claim of daily sweeping. But the survey does not mention the method followed for this random selection, which would be appropriate to remove bias between richer and poorer parts of the city. Second, in the citizen feedback component, the authors filled out the 2021 survey form and found that the questions are subjective, asking respondents to rate the overall cleanliness of commercial and residential areas. Third, the citizen feedback component of the survey can be taken multiple times by one individual possessing multiple phone numbers. Lastly, there has been a significant reduction in internal consistency of the survey components over the years. In 2016, the correlation between different stages of the survey ranged between 0.51 to 0.70, but in 2020, the range reduced to 0.09-0.52, indicating higher disparity in ranking done under different stages of the survey.

Municipal expenditure on SWM

Providing SWM services is a municipal duty in most Indian cities. We found municipal spend data on SWM for 39 major ULBs, which were also part of the SS in 2016.¹² Since municipal accounts are known to be relatively less reliable, we scrutinised them closely to try and minimise the degree of unreliability in our analyses. Post stress-testing the budget documents, 27 ULBs were selected for the final sample and analyses.

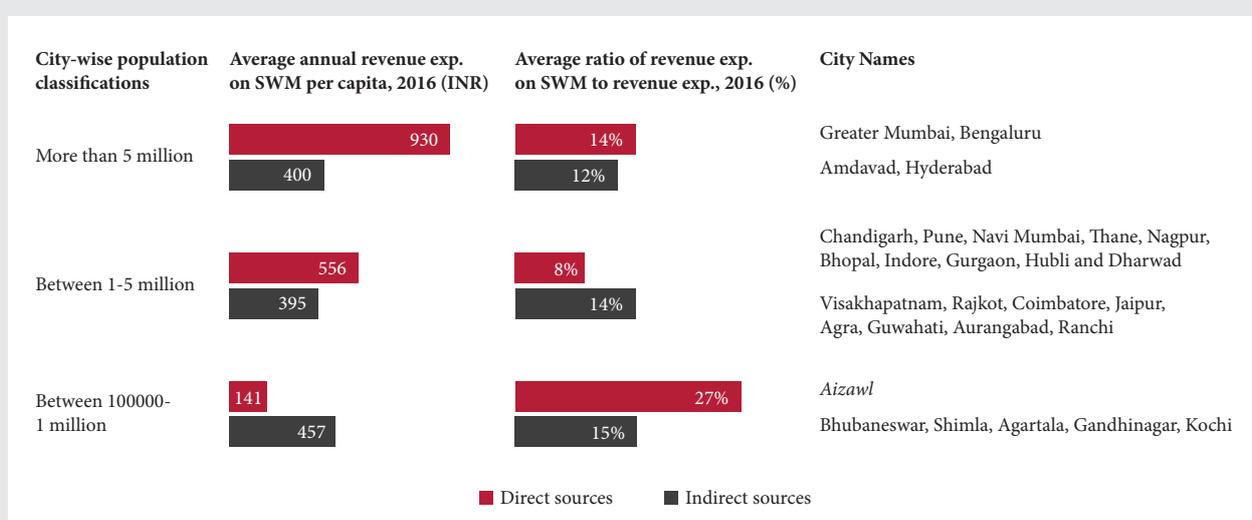
¹² To calculate the per-capita SWM revenue expenditure, we used to census population numbers for the ULBs

Challenges of dealing with municipal accounts

- Municipal budget documents are not uniform across cities.** Municipal budgets capture SWM spend in two broad types, direct and indirect spend. Direct type refers to cities that capture SWM spend in their budgets as a distinct line item. Indirect type refers to cities whose SWM expenditure is estimated by adding relevant categories such as door-door waste collection, garbage collection, salaries of 'safai karamchari', mosquito eradication etc. As shown in the budget snapshots below, Indore municipal corporation's budget clearly mentions expenditure on SWM; however, Greater Hyderabad's municipal corporation budget does not clearly mention the same. For the latter, we added multiple categories to create a SWM expenditure by the municipal corporation.

In our final sample of 27 cities, for 12 cities the SWM spend was directly available and for 15, we estimated it by adding the individual line items. To make sure we didn't err in estimating SWM spend for the indirect type cities, we compared the ratio of SWM to revenue expenditure for both the categories and found no systematic over or under estimation across the two archetypes.

Figure 3: No systematic difference in direct and indirect data estimates



Source: Respective ULBs budget documents

Note: Direct source refers to where SWM expenditure is mentioned as a clear sub-heading and indirect source refers to when various headings are added up to get the relevant SWM expenditure. Average SWM per-capita expenditure is calculated by dividing total SWM revenue expenditure by total population of all the cities in the concerned classification.

- Some budget documents were available only in the local language.** For example, the Amdavad Municipal Corporation budget is available only in Gujarati. In addition to local languages, making the budget documents available in a more widespread language would permit both government and non-government entities to refer to them for policy and research. Janaagraha Centre for Citizenship and Democracy has taken a step in the right direction with CityFinance, a platform that serves as a national framework of standardised, timely and credible financial information on cities. The need is to deepen this initiative, so that it captures and shares disaggregated budget details in a standardised format and language.
- Differences across budget estimates, revised estimates and actual expenditure.** Budgets for a particular year may be available in three distinct formats calculated at different time periods: budget estimates, revised estimates and actual expenditure. Usually, level of precision improves between budget estimates to revised estimates and from revised estimates to actual expenditure. Budget estimates are available for all the cities in our cohort, whereas actual expenditure is available just for a handful of cities. There could be significant divergence across the different types of estimates. For example, for Gurgaon, actual expenditure for 2016-17 was 30% less than the budget estimate. Similarly, Praja Foundation (2018) highlighted the under-utilisation of Greater Mumbai Municipal Corporation budget: In 2016-17, 73% of the budget allocated to roads was unutilised; 33-35% of the health budget remained unutilised between 2014 and 2016. Also, we found that for 2014 and 2015, the actual expenditure on SWM is 20-22% less than the budget estimated.

Indore Municipal Corporation

SCHEDULE WISE, DEPARTMENT-WISE BUDGET ESTIMATE

Schedule And Department Budget (2017-2018)

(Rs In Lacs) Rupees In Lakh Hindi

MPMAM HEAD	Actual 15-16	Estimate 16-17	Revised Estimate 16-17	Budget Estimate 17-18	Quarterly Allocation				
					Q 1	Q 2	Q 3	Q 4	
					Quarter Allotment				
MPMAM Head	Previous actual True	Estimate True	Revised True	Next estimate True					
5 REVENUE PAYMENTS CURRENT YEAR									
Planning Regulations									
Total For Planning Regulations	0.92	15.35	15.35	24.35	6.09	6.09	6.09	6.09	
Public Works									
2001 Self Finance	19.04	835.60	835.60	653.00	163.25	163.25	163.25	163.25	
2021 Roads and Pavements	6.02	24.00	24.00	15.00	3.75	3.75	3.75	3.75	
2022 Bridges and Flyovers	0.39	209.75	209.75	307.75	76.94	76.94	76.94	76.94	
2027 Public Works	1394.27	5954.62	5954.62	6718.62	1679.66	1679.66	1679.66	1679.66	
Total For Public Works	1419.72	7023.97	7023.97	7694.37	1923.59	1923.59	1923.59	1923.59	
Health									
3031 Public Health	8847.58	11090.51	11090.51	13863.51	3465.88	3465.88	3465.88	3465.88	
Total For Health	8847.58	11090.51	11090.51	13863.51	3465.88	3465.88	3465.88	3465.88	
Sanitation and Solid Waste Management									
4041 Solid Waste Management	158.10	2479.00	2479.00	779.00	194.75	194.75	194.75	194.75	
Total For Sanitation and Solid Waste Management	158.10	2479.00	2479.00	779.00	194.75	194.75	194.75	194.75	
Civic Amenities and Public Convenience									
5051 Water Supply	19055.40	37163.70	37163.70	44304.88	11076.22	11076.22	11076.22	11076.22	

{Direct budget source}

Source: Indore Municipal Corporation budget 2017-18

Account Code & Description	Actuals 2016-17	BE 2017-18	RBE 2017-18	BE 2018-19
23050-21 : Road cutting restoration	1,418.92	3,186.00	8,600.00	9,300.00
23051-01 : Repairs and Maintenance to City Level Parks	1,051.40	1,178.00	1,317.00	1,342.00
23051-03 : Repairs and Maintenance to Colony Parks	1,660.28	2,407.00	3,276.74	2,911.00
23051-05 : Repairs and Maintenance to Play Grounds	228.87	536.00	316.00	496.60
23051-06 : Swimming Pools	104.74	104.00	123.00	140.00
23051-08 : Repairs & Maintenance	0.23	-	-	-
23051-09 : Repairs and Maintenance to Public Toilets	82.76	198.00	322.00	241.00
23051-12 : Avenue and Other Plantations	-	30.00	40.00	45.00
23051-13 : Traffic islands/ Central Media	-	20.00	20.00	20.00
23051-15 : Repairs and Maintenance to Buril Grounds	158.75	456.00	425.00	453.00
23051-20 : Swatch Bharath	30.18	380.00	333.00	393.00
23052-05 : Repairs and Maintenance to - Buildings(Civil)	916.74	1,249.00	1,210.00	1,407.00
23052-06 : Maintenance of Heritage Structures / Buildings	-	70.00	72.00	77.00
23053-01 : Repairs and Maintenance to - Heavy Vehicles	1,270.19	3,255.00	2,830.20	2,816.50
23059-01 : Repairs and Maintenance to Furniture, Fixtures and Equipment	14.61	20.00	53.00	62.20
23059-02 : Repairs and Maintenance to Computers & Net Work	63.23	407.00	213.00	314.00
23059-10 : Road Marking	164.12	5.00	627.00	615.50
23080-05 : Mapping, Plotting & Drawing Expenses	-	3.00	11.00	16.50
23080-06 : Naming & Numbering of Streets	-	5.00	-	5.00
23080-07 : Demolition & Removal Expenses	192.43	287.00	430.80	402.00
23080-08 : Quality Control Expenses	2.02	44.00	43.00	61.10
23080-11 : Expenses on Unclaimed Dead Bodies	35.00	24.00	54.00	56.00
23080-12 : Control of Stray Animals	901.97	996.00	923.00	1,187.50
23080-13 : Sanitation / Conservancy Tools, Material and Expenses	1,227.56	1,814.00	1,579.60	1,605.20
23080-15 : Maintenance of Garbage Dumping Yards / Transfer Stations/Dumper Bins	1,672.70	2,044.00	2,751.76	2,333.00
23080-16 : Maintenance of Slaughter Houses	-	75.00	15.00	66.00

{Indirect budget source}

Source: Hyderabad Municipal Budget 2018-19

अमदावाद् म्युनिसिपल कोर्पोरेशन

२.४ डेपूटल आवड :

सन् २०१७-१८ ना वर्षमां डेपूटल आवडको सुधारेल अंदाज नीचे मुजम छे.

(₹. करोडमां)

क्र.सं.	विगत	२०१७-१८ लो मूला अंदाज	२०१७-१८ लो सुधारेल अंदाज
१.	रेवन्यु पुर्तमांशी विकास कामो माटे तजवील	१६३.००	१०११.००
२.	स्वार्थिज जयति मुष्यमांशी शहरी विकास योजना	५००.००	५००.००
३.	टेक्ष डी बोर्ड	११०.००	०.००
४.	JANURM अन्वये सरकारश्रीनी आर्ट	१०.००	१०.००
५.	डेपूटल ओकडिक्टनुं भेवेल्स	७५.००	३१.५०
६.	संसदसभ्य/धारासभ्यश्रीना मत विस्तारमां विकास कामो माटेनी आर्ट	२३.००	२२.००
७.	ग्र.लम.ओड.जी. ली आर्ट	१८.००	२५.००
८.	लापो पंचवती आर्ट	८०.००	८०.००
९.	डायर टेक्षनी आवड	२२.००	२२.००
१०.	७०:२०:१० रड्डीम डेकणना कामो अल्पयेनी राज्य सरकारश्रीनी आर्ट	०.००	५२.००
११.	मुष्यमांशी गृह योजना - EWS - LIG आर्ट	२०.००	०.००
१२.	मुष्यमांशी गृह योजना - EWS - LIG लामार्थी इलापो	८०.००	१८२.००
१३.	RAY अन्वये आर्टला कामो	१५.००	१८.३०
१४.	SRFDCL - लोन रि-पेमेन्ट	०.००	७४.००
१५.	मेट्रो प्रोजेक्ट	२०.००	२०.००
१६.	स्मार्ट सिटी	२०.००	०.००
१७.	समूत	१२०.००	४५.००
१८.	EWS भेलीक्रीशरीसी लोन	५०.००	०.००
१९.	प्रधानमांशी आवड योजना	१७५.००	१२५.५०
२०.	AMC-MET लोन	०.००	१३.५०
२१.	अन्य आवड	११९.००	५३.००
कुल.....		३३१०.००	२४५०.००

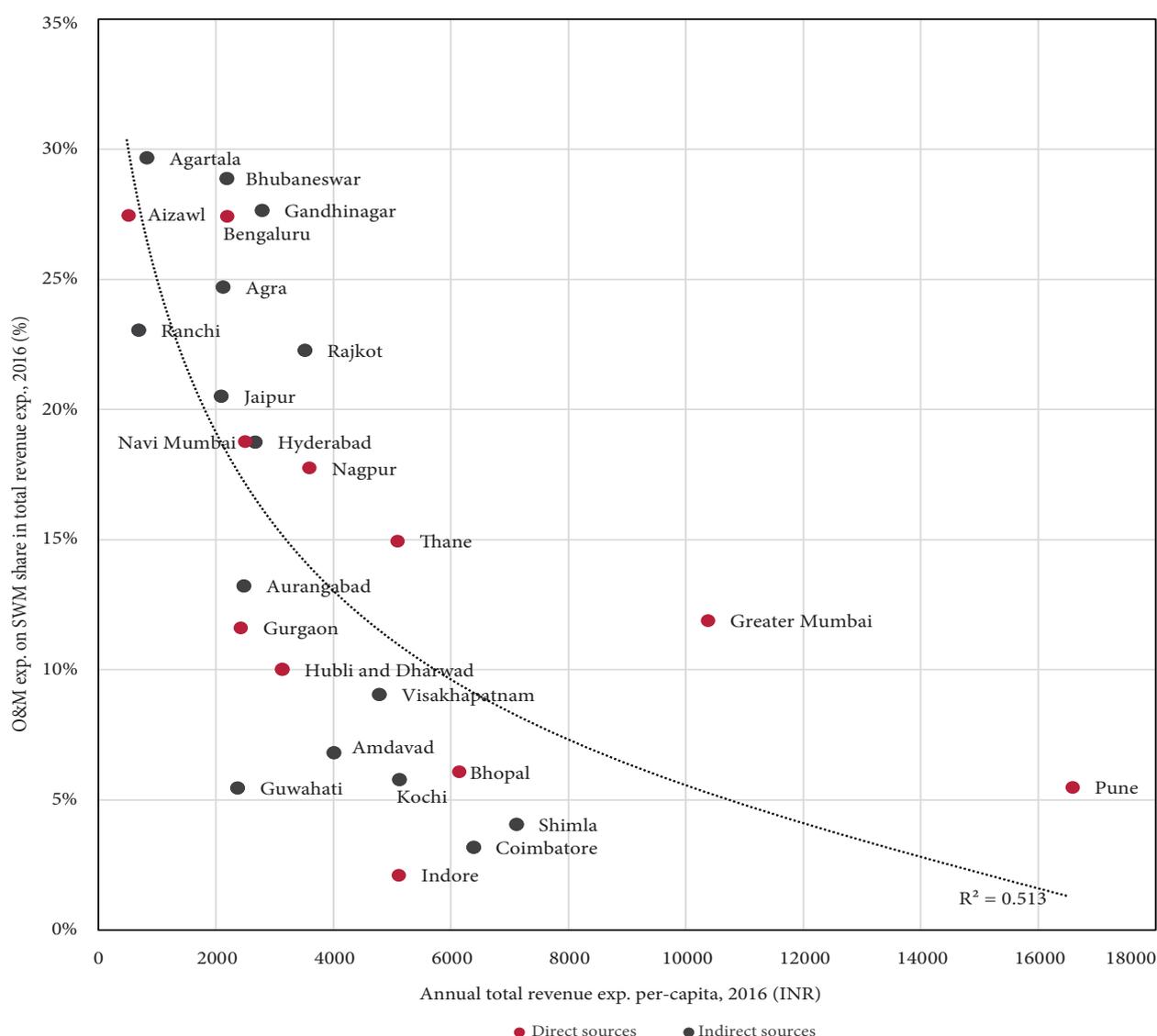
सन् २०१८-१९

Source: Amdavad Municipal Budget 2018-19

Share of expenditure on SWM in overall revenue expenditure ranged between 2% to 30% in our cohort of 27 cities. Ahluwalia & Patel (2018) suggest that SWM accounts for 15%-25% of the municipal revenue expenditure. However, our range has been improvised based on the trend evident from seemingly reliable data. Indore and Pune, for which revised estimates were available from direct sources, SWM was only two and five percent respectively of their overall revenue expenditure. We examined the relationship between share of SWM in revenue expenditure and the absolute per-capita revenue expenditure. Four key observations emerged from analysing municipal spend on SWM for these 27 cities:

- Share of SWM spend declines with overall revenue expenditure.** On an average, the share of solid waste management in total revenue expenditure is lower for cities with higher overall revenue expenditure, as evident from Figure 4. For example, Bhubaneswar spends 29% of overall revenue expenditure on SWM, and its revenue expenditure per-capita is INR 2,200, compared to Coimbatore which spends 3% on SWM when its annual revenue expenditure per-capita is INR 6,400. Since SWM is a basic service, it commands a significantly higher share of spend when budgets are limited. However, its share declines as cities get richer, indicating that the spend required on SWM is not expenditure elastic. In other words, if cities have more money to spend, they would not proportionately increase the spend on SWM.

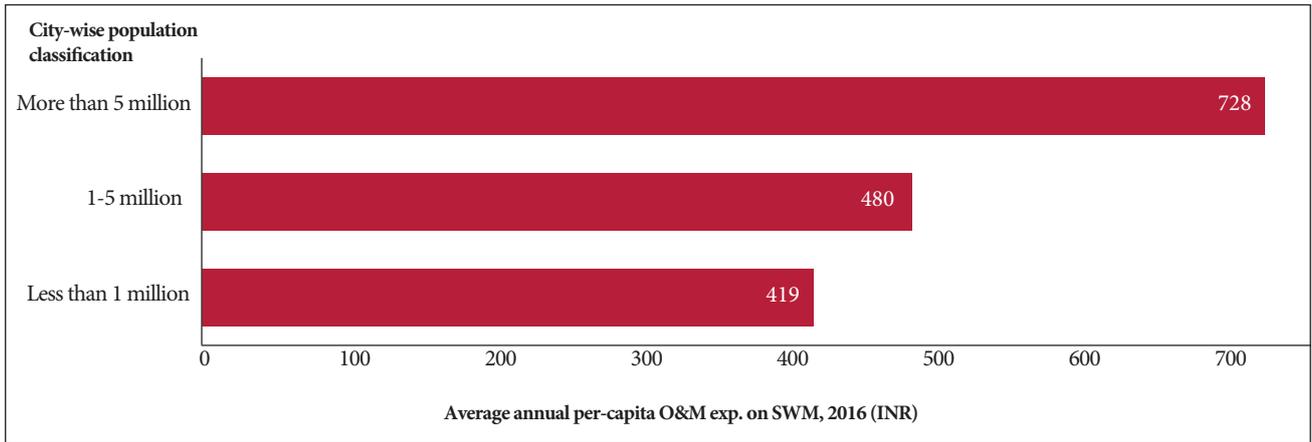
Figure 4: Share of SWM in overall revenue expenditure declines as overall revenue expenditure increases



Source: Respective ULBs budget documents

- Big cities spend significantly more per capita on SWM, despite not generating higher waste per capita.** On comparing the per-capita SWM revenue expenditure of cities across different population classifications, we see that big cities, on average, spend 1.6 times and 1.8 times of what is spent by cities having population between 1-5 million and less than 1 million, in per-capita terms, respectively (Figure 5). Greater Mumbai has a population of more than 5 million and spends INR 1234 annually on SWM. Bhopal with a population of 1-5 million and Kochi with a population less than 1 million, spends INR 373 and INR 296 respectively annually on SWM. This is because bigger cities are usually richer and hence can afford to spend more in absolute amount on SWM.

Figure 5: Bigger cities spend more on SWM per-capita, 2016 (INR)

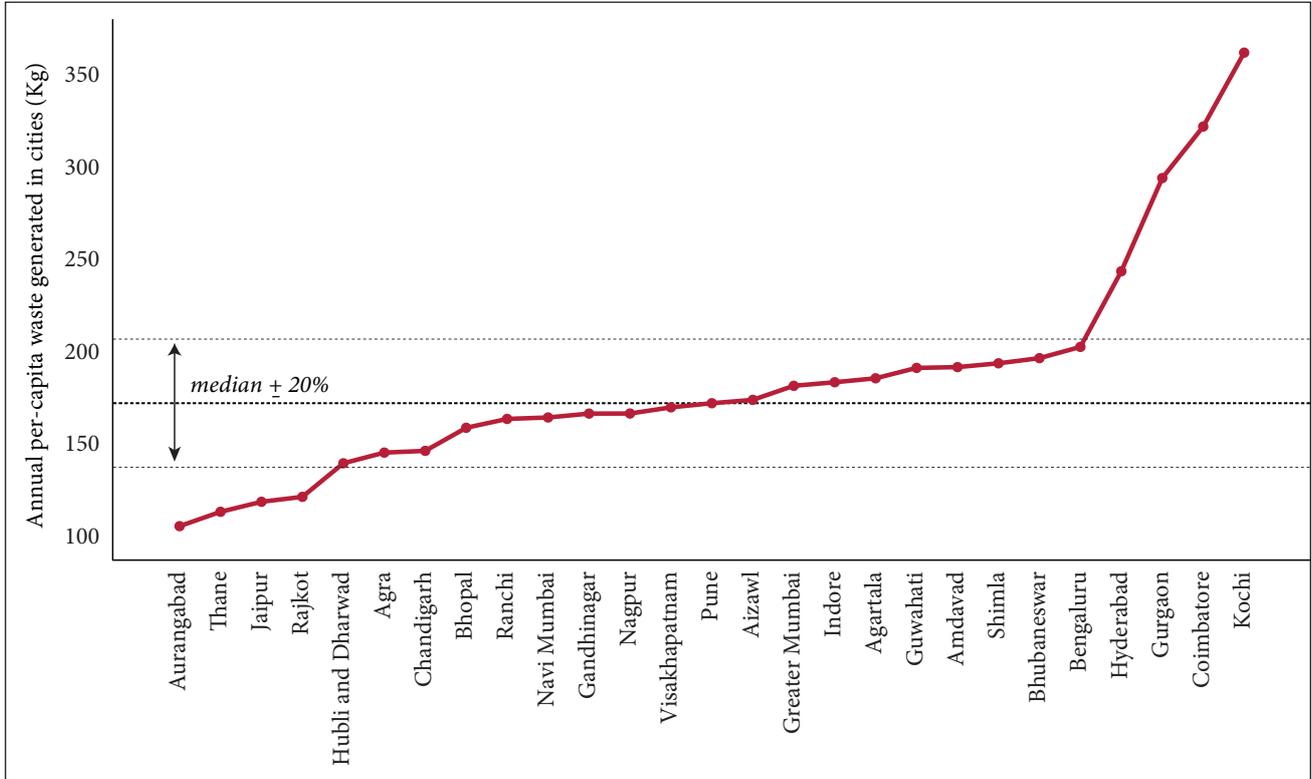


Source: Respective ULBs budget documents

Note: Average is taken by dividing total SWM revenue expenditure of all the cities in a population category by their total population sum.

What is intriguing is that this higher spend is not attributed to higher per capita waste generation in these bigger cities. The correlation between per-capita waste generated and spend is negative 0.25. Two-thirds of our cities generate per-capita annual waste within the +20/-20% median range. This trend is also evident across the three population classes of cities as well. Three out of four cities in ‘more than 5 million’ population bracket generate per-capita annual waste within the above stipulated range. Similarly, five out of six cities with ‘less than 1 million’ population generate waste within the median range. And finally, 11 out of 17 of the cities in ‘between 1 to 5 million’ population classification are within the median waste generation range. (Figure 6).

Figure 6: Per-capita waste generation does not vary much across the cohort of cities



Source: Respective ULBs budget documents, (Henam & Bandela, 2020; Gupta & Chakraborty, 2019)

Note: The waste generated data varies between 2013 and 2019

- **On an average, capital cities tend to spend more than their peer cities in the same state.** For example, Greater Mumbai in Maharashtra has the highest SWM per-capita expenditure of INR 1,234 compared to Pune at INR 910, Navi Mumbai at INR 469 and Thane at INR 760. Similarly, in Gujarat, the capital city Gandhinagar (INR 771) spends thrice that of Amdavad (INR 273). In Madhya Pradesh, Bhopal (INR 373) spends thrice that of Indore (INR 108) and in Haryana, Chandigarh (INR 438) spends double of Gurgaon (INR 282). In Karnataka, Bengaluru (INR 555) spends almost double of Hubli and Dharwad (INR 313). This may be because capital cities get higher budgetary allocation from the state, allowing them to spend more.

Role of PPPs in SWM

It is important to realise that Public Private Partnerships play a big role in the provisioning of SWM services across a large number of Indian cities. PPPs have a central role, especially in the collection and transportation of solid waste. There are two ways this usually takes place:

- The private company collects, transports and segregates waste and charges a user fee to all the households or commercial areas it caters to. For example, in Pune, SWaCH caters to 850,000 households and charges a user fee of INR 70 per household per month. Similarly, in Greater Mumbai, the municipal corporation caters to 75 lakh slum population for SWM. The corporation annually spends INR 80 crore, which is a matching grant equivalent to twice the money generated through user fees collected from the slums of INR 20 per household per month.¹³
- The municipal corporation gives out contracts for garbage collection, transportation and segregation to third parties. But the third parties do not charge the people any fees and are compensated by the municipalities.

Recommended SWM spend per-capita benchmark

HPEC (2011) recommends per-capita O&M expenditure requirement for eight services provided by cities across different population classification. HPEC O&M expenditure consist of O&M of physical assets, staff, and related administrative cost which is equivalent to the revenue expenditure in our analysis.¹⁴ For SWM, benchmark O&M spend is estimated to achieve perfect service delivery. *“The assessment of investment requirements by the Committee is based on the service standards prepared by the ministry of Urban Development which is: 100 percent waste collection, treatment and disposal of solid waste for all cities”* (HPEC, 2011). We have adjusted the recommended expenditure by taking into account the inflation as of 2016.

Table 3: HPEC O&M SWM expenditure recommendations, per-capita per-annum

Population classification		HPEC O&M SWM recommendation, 2009-10 prices (INR)	HPEC O&M SWM recommendation Inflation adjusted 2016 prices (INR)
Class IA	> 5 million	269	430
Class IB	1-5 million	189	302
Class IC	100000-1 million	135	216
Class II	50000-100000	113	181
Class III	20000-50000	113	181
Class IV	< 20000	113	181

Source: HPEC(2011), Authors' analysis

¹³ Based on conversations with those involved in the two respective projects.

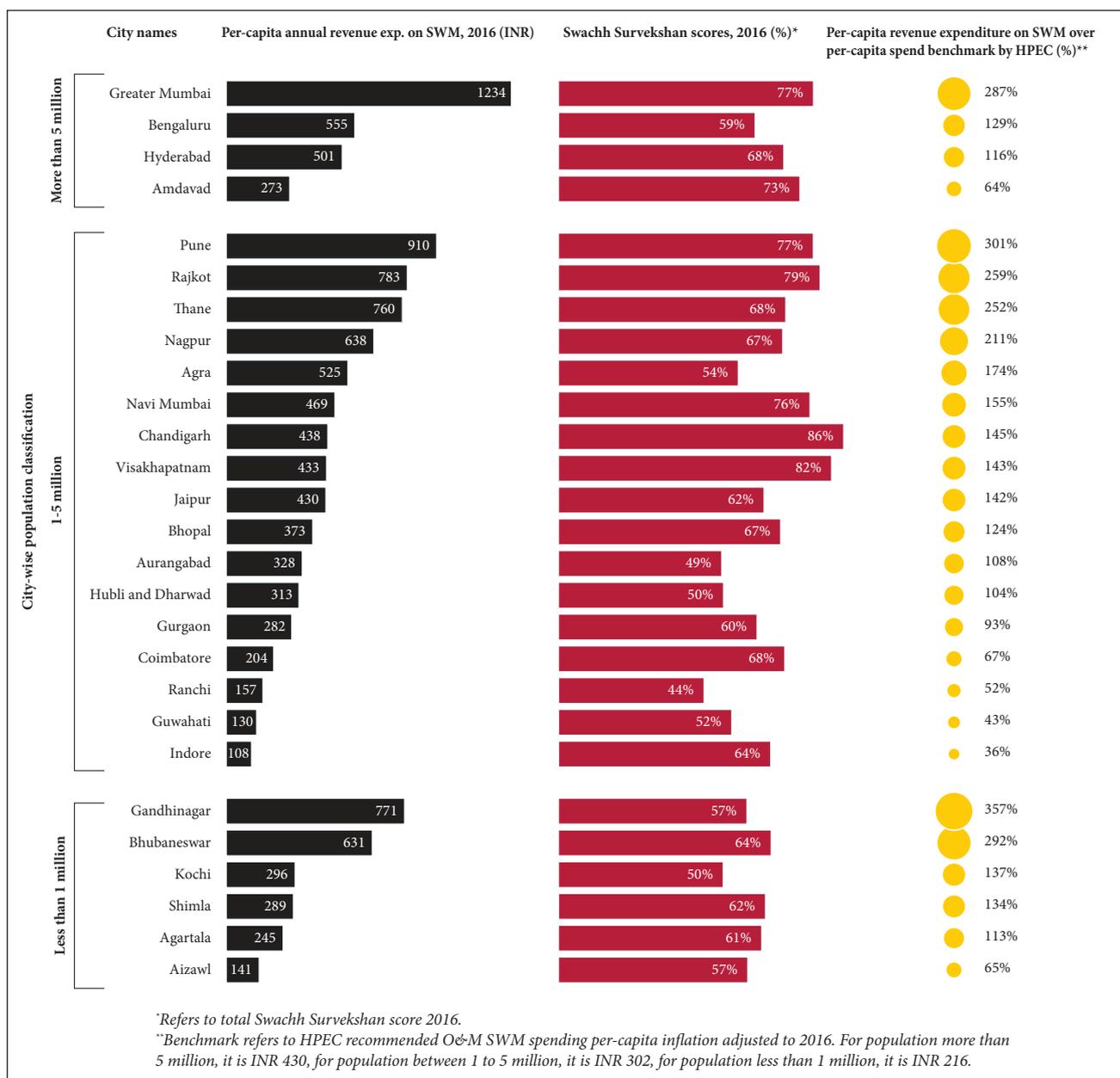
¹⁴ Revenue expenditure includes establishment, administrative, O&M, program expenses, and interest and charges.

Key Findings

We compare revenue expenditure that our sample of 27 cities are incurring on SWM services, relative to what they ought to spend to provide acceptable levels of service delivery, with their current performance on cleanliness based on Swachh Survekshan. HPEC (2011) recommended per-capita revenue expenditure for SWM is taken as the benchmark spending. Two key findings emerge out of our analysis:

- Majority of cities in our sample spend more than the HPEC benchmark.** 19 out of 27 cities in our sample spend more than the HPEC revenue expenditure benchmark, and yet none of these cities achieve ‘perfect’ SWM service delivery standards as expected by HPEC (Figure 7). Also, for a large number of these cities, the spend is significantly higher than the benchmark. Nine out of these 19 spend at least 1.5 times more than the benchmark amount. Clearly, for these cities, spend is not the binding constraint explaining the inadequate provisioning of SWM services. It points to the need to look at efficiency and effectiveness of the expenditure.

Figure 7: Relationship between survey scores and benchmark SWM per-capita expenditure (%), 2016



Source: Respective ULBs budget documents

- **Funding explains about 23% of the variance in SWM performance.** We analysed cleanliness performance as a function of SWM spending and amount of waste generated. Our results indicate that while SWM spend per-capita is positive and statistically significant at 1% level, waste generation is completely insignificant. The Adjusted R-square is 0.23 meaning that SWM spend per-capita explains only 23% of variation in SS performance (Table 4).¹⁵

Table 4: SWM per-capita revenue expenditure explains only 25% of variation in performance

VARIABLES	(1) OLS
	Dependent variable = Ln(SS)
Ln (SWM revenue spend per-capita)	0.137***
	(0.0443)
Ln (waste generated per-capita, per-annum)	0.0382
	(0.124)
Constant	6.131***
	(0.780)
Observations	27
R-squared	0.237
Robust standard errors in parentheses	
*** p<0.01, ** p<0.05, * p<0.1	

Source: Respective ULBs budget documents, Swachh Survekshan 2016, (Henam & Bandela, 2020; Gupta & Chakraborty, 2019)

Funding remains an important component to improve service delivery for cities such as Ranchi and Guwahati, whose spend in 2016 was INR 157 and INR 130 respectively, much lower than the HPEC benchmark of INR 302¹⁶ and have a poor SS survey score of 44% and 52%. Nonetheless, this is not universal; cities that spend more are not necessarily better off than those who spend less. For example, in the population category of 'more than 5 million', Amdavad and Greater Mumbai scored 73% and 77% in 2016 SS respectively but have large variations in their per-capita SWM revenue spent of INR 273 and INR 1234 respectively. Jaipur and Chandigarh, both with population between 1-5 million, have similar spend per-capita of INR 430 and INR 438 respectively on SWM and yet have a stark difference in their scores, 62% and 86% respectively (Figure 7).

¹⁵ When one takes into account the private expenditure through PPPs for collection and transportation of waste, ULB's overall spend on SWM would increase, further strengthening the first key finding. The second key finding may change once we incorporate the private spending. However, we do not expect it to change much, since private spend is generally a very small fraction compared to the municipal spend.

¹⁶ Inflation adjusted.

Concluding remarks

We have made a sincere effort to underscore the importance of mapping a closer relationship between funding and outcomes of service delivery in urban centres using SWM as an example. We hope that this exercise helps policymakers and practitioners to identify if it is indeed the lack of money, or lack of effectiveness in utilization that hampers effective service delivery. Our early observations point to three possible non-monetary factors explaining better performance on SWM.

- **Stable city leadership** – *municipal commissioners and mayors who have been in position for a long period are more able to improve the service delivery.*
 - In Indore, both the mayor and the commissioner of the municipal corporation have held their positions since 2015.
 - In Ghaziabad, the mayor has been in position since 2017. Ghaziabad had approximately constant revenue expenditure in 2018 and 2019; however, it has been consistently improving its performance and entered the list of top 20 cities in the survey by 2019.
 - Janaagraha Centre for Citizenship and Democracy, (2017) finds 10 months to be the average tenure of a municipal commissioner, which is too short to make any meaningful contribution to a city's functioning.
- **Citizen involvement** – *cities which have achieved better SWM results have also been successful in involving their citizens in the process. This has been possible by encouraging a behavioural change to promote waste segregation at the household level.¹⁷*
 - Indore achieved 100% household waste segregation permitting the municipal corporation to eliminate garbage dumps. In 2011, the municipal solid waste collected was 750MT/ day, which increased to 1115MT/day in 2017, collected from source. Indore deployed public awareness campaigns on how households could convert waste into useful products such as compost and fuel. This was possible because of the municipal corporation's active participation, along with non-government organisations (NGOs) and private entities. The municipal corporation, with the help of 850 Self-Help Groups, spread the message about the importance of waste segregation at source, and conducted composting awareness campaigns. (Smart City Indore, 2017).
 - The municipal corporation of Nawanshahr in Punjab started a massive behavioural change campaign in September 2017, which was a decentralised and cost-effective approach to SWM with the participation of community members. Within a year, they achieved 100% source segregation, and the city has become almost bin-less, transforming Nawanshahr into the number one ULB in the North Zone in the 2020 SS survey (Ministry of Housing and Urban Affairs, 2019).
- **Public private partnership** – *better performing cities allow for division of responsibilities between municipalities and the private sector, thereby improving service delivery.*
 - Amdavad consistently ranked in the top 20 in SS between 2016 and 2020. Effective Public Private Partnership (PPP) has played a big role in Amdavad's performance on SWM. To ensure household waste segregation, and efficient collection of waste, Amdavad introduced a waste collection system, collaborating with private contractors who deployed vehicles with body containers to collect waste directly from residential areas and transport it to dumping sites. In total, 866 vehicles collect waste from 14 lakh residences, covering all seven zones of the city. The waste collection is not restricted to households and also includes waste of street food vendors and restaurant kitchen waste. These vehicles have GPS and RFID to enable monitoring of movement and functioning (Tata Trusts, 2019). Amdavad also instituted PPP at three other levels: Construction and demolition waste management, composting of flower waste, and material recovery.

HPEC (2011) refers to governance as the weakest and the most crucial link where improvement is necessary to support the urban transformation in India. "Without this, additional capital investments in urban infrastructure will not result in improvements in service delivery" (HPEC, 2011, p.14). Our study on spend and outcomes on SWM and early observations on potential non-monetary factors points in the same direction.

¹⁷ Henam & Bandela (2020) emphasis that segregating waste at source is the most crucial step in SWM.

Appendix

Appendix table 1: Summary table of ULBs' SWM exp., revenue exp., waste generated and population

S. No.	Municipal corporation/ ULB	RE/BE/ actual ¹⁸	Direct/ Indirect	Expenditure data source	Population classification	SS score, 2016 (out of 2000)	Total SWM revenue expenditure, 2016 (INR crore)	Total revenue expenditure, 2016 (INR crore)	Per-capita waste generated annually (kg)	Population 2016 (lakhs)
1	Municipal Corporation Chandigarh	BE	Direct	Municipal budget 2016-17	1-5 mil	1716	46	na	148	10
2	Greater Visakhapatnam Municipal corporation	Actual	Indirect	Municipal budget 2018-19	1-5 mil	1643	85	936	171	20
3	Rajkot Municipal corporation	BE	Indirect	Municipal budget 2016-17	1-5 mil	1574	116	522	123	15
4	Municipal corporation of Greater Mumbai	Actual	Direct	Municipal budget 2018-19	more than 5 mil	1534	1,564	13,158	183	127
5	Pune Municipal corporation	BE	Direct	Municipal budget 2016-17	1-5 mil	1533	315	5,748	174	35
6	Navi Mumbai Municipal corporation	Actual	Direct	Municipal budget 2017-18	1-5 mil	1513	66	353	166	14
7	Amdavad Municipal corporation	Actual	Indirect	Municipal budget 2018-19 ¹⁹	more than 5 mil	1452	170	2,499	193	62
8	Thane Municipal corporation	RE	Direct	Municipal budget 2017-18	1-5 mil	1367	169	1,132	115	22
9	Coimbatore City Municipal corporation	BE	Indirect	Municipal budget 2016-17	1-5 mil	1361	23	713	324	11
10	Greater Hyderabad Municipal corporation	Actual	Indirect	Municipal budget 2018-19	more than 5 mil	1355	395	2,107	245	79
11	Nagpur Municipal corporation	BE	Direct	Municipal budget 2016-17	1-5 mil	1348	166	936	168	26
12	Bhopal Municipal corporation	BE	Direct	Municipal budget 2016-17	1-5 mil	1336	74	1,226	160	20
13	Bhubaneswar Municipal corporation	RE	Indirect	Municipal budget 2017-18	less than 1 mil	1279	60	209	198	10
14	Indore Municipal corporation	RE	Direct	Municipal budget 2017-18	1-5 mil	1276	25	1,176	185	23
15	Shimla Municipal corporation	RE	Indirect	Municipal budget 2017-18	less than 1 mil	1244	5	132	195	2
16	Jaipur Municipal corporation	BE	Indirect	Municipal budget 2016-17	1-5 mil	1236	150	731	120	35

¹⁸ RE refers to revised estimates, BE refers to budget estimates, actual refers to actual expenditure as mentioned in the respective budget sources.

¹⁹ Translated to English by Pathy Budget Centre.

17	Agartala Municipal corporation	RE	Indirect	Municipal budget 2017-18	less than 1 mil	1222	12	40	187	5
18	Municipal corporation of Gurgaon	RE	Direct	Municipal budget 2017-18	1-5 mil	1194	32	272	296	11
19	Bruhat Bengaluru Mahanagara Palike	Actual	Direct	Municipal budget 2018-19	more than 5 mil	1182	571	2,089	204	103
20	Aizawl Municipal corporation	BE	Direct	Municipal budget 2016-17	less than 1 mil	1138	5	17	176	3
21	Gandhinagar Municipal corporation	BE	Indirect	Municipal budget 2016-17	less than 1 mil	1133	16	57	168	2
22	Agra Municipal corporation	BE	Indirect	Municipal budget 2016-17	1-5 mil	1081	93	376	147	18
23	Guwahati Municipal corporation	BE	Indirect	Municipal budget 2016-17	1-5 mil	1041	14	247	193	10
24	Hubli-Dharwad Municipal corporation	BE	Direct	Municipal budget 2016-17	1-5 mil	992	32	324	141	10
25	Kochi Municipal corporation	RE	Indirect	Municipal budget 2017-18	less than 1 mil	990	18	309	364	6
26	Aurangabad Municipal corporation	BE	Indirect	Municipal budget 2016-17	1-5 mil	981	45	338	107	14
27	Ranchi Municipal corporation	RE	Indirect	Municipal budget 2017-18	1-5 mil	874	19	82	165	12

Source: Respective ULBs budget documents, Census 2001 and 2011, Swachh Survekshan 2016, (Henam & Bandela, 2020; Gupta & Chakraborty, 2019)

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