



# Assessing Urban Infrastructure Service Delivery with Reference to Expenditure Norms: A Study of Two Indian Cities

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**Abstract.** India has been grappling with the challenge of providing urban infrastructure services in the wake of the rising levels of urbanisation and the increasing number of cities. Urban infrastructure service delivery norms have been developed in India from time to time so that the Urban Local Governments [ULGs] plan and implement infrastructure service provisioning while allocating adequate fiscal resources. These norms also aid in assessing civic infrastructure service delivery as well as estimating financial resource requirements to provide civic services. This paper attempts to examine whether large Indian cities spend adequately on the civic infrastructure services when compared to the corresponding expenditure norms. Based on the data collected from the ULGs of two large cities – Hyderabad and Pune – it assesses the adequacy of ULG spending on five major civic infrastructure services – water supply & sewerage, storm water drains, roads and streetlights – by comparing with the corresponding financial expenditure norms. The study finds that the study cities fall short of spending on some civic services like water supply and sewerage but they meet the expenditure norms of roads and streetlights. Pune fares better than Hyderabad when it comes to meeting expenditure norms. The results imply the need for better allocation of fiscal resources by the ULGs and better channelling of fiscal resources by the Central and State governments to the ULGs, as enshrined under the 74th Constitutional Amendment Act.

**Keywords:** Urban infrastructure, Civic Service delivery, ULG Spending, Physical and financial norms

## 1 Introduction

India has been experiencing a rapid urbanization for the last few decades. According to the Census data, India's urban population stood at 377.21 million; there was a population addition of 181.83 million during the decade of 1901-2011 at annual growth rate of 2.76% [1]. [2] estimated it to grow to 550 million by 2030. The level of urbanization [or, the share of urban to total population] has increased from 27.81% to 31.16% during this period [3]. According to the UN population projections, India's urban population was expected to rise by another 497 million persons in the year 2050 [1]. With this addition, India's urban population will be about 900 million by 2050, and

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India's level of urbanization will surpass the level of 50%. However, there are other estimates which suggest that India's urbanization levels would have reached 40%. And it might achieve 50% level of urbanization much earlier in 2030.

The rising urbanization of population is accompanied by the rising number of urban areas. The total number of urban areas went up from 5,161 in 2001 to 7,933 in 2011. The urban areas are classified into two types [3]: [a] Statutory Towns, which are declared by the State government as urban areas and are governed by a statutory urban local government viz., municipal corporation, municipality, cantonment board or notified town area [b] Census Towns, which are the urban areas that satisfy the criteria of having [i] a minimum of 5,000 people [ii] at least 75% of the male main working population engaged in non-agricultural activities and [iii] a population density of at least 400 persons per sq km. Table 1 shows a rise in the number of urban areas in the classification as well as the population in them during 2001-2011.

**Table 1.** Urbanization Changes during 2001-11

Urban Area Classification	2001 [No.]	2011 [No.]	Change in 2001-11 [No.]	Population 2001 [mn]	Population 2011 [mn]	Population Change 2001-11 [mn]
Statutory Towns	3,799	4,041	242	265	323	58
Census Towns	1,362	3,892	2,530	21	54	33
Total Urban Areas	5,161	7,933	2,772	286	377	91

Source: Census [3]

It is important to note that among all urban areas, larger cities assume a greater share of urban population. The Class I cities [Cities with more than 100,000 people] have the bulk of population in 2011 – 265 million, which constitutes 70% of the total urban population. Within Class I cities, the cities with more than a million population [or, million-plus cities] constitute 160.7 million, which is about 42.6% of total urban population. The mega cities or cities with more than 10 million population constitute 12.9% of total urban population. The number of million-plus cities stood at 53 in 2011, up from 35 in 2001; the number of mega cities stood at 3 in 2011. The urban population share of million-plus cities has been growing during 2001-11 while that of mega cities has been declining.

The rising urbanization trends of the country exert a pressure on the Urban Local Governments [ULGs] to provide urban infrastructure services to the resident population. Indian Constitution mandates the ULGs to provide such urban infrastructure services to the citizens [5]. The scope of urban infrastructure services to be provided in the Indian cities is laid down in the respective State Municipal Acts. Municipal legislation distinguishes urban infrastructure services into [6]:

[a] Obligatory Functions, which include Core Urban Services such as water supply, sewerage, drainage, solid waste management, roads and street lighting.

[b] Discretionary Functions, which include Other Urban Services like parks, playgrounds, recreation centers, markets, primary education, traffic control etc.

The ULGs are mandated by the respective State municipal legislations to plan, develop, maintain and expand the provision of infrastructure services so that they are made available to all citizens in their jurisdiction. Planning for the provision of urban infrastructure services is the beginning point of infrastructure service delivery, which is envisaged in the form of [7].

Strategic Planning, through land use master plans of cities that provide for/ allocate land for various civic infrastructure services on city space and also lay down plans for their development in planned locations.

Operational Planning, through the estimation of the quantum of civic infrastructure services to be provided as well as maintained and the allocated financial resources to meet the costs of service provision.

Strategic planning of urban infrastructure services takes place only periodically as master plan is made for every 20-30 years and its revision is done for every 5 years. Therefore, strategic planning assumes importance when such city master plan is made or when the revision of it is done. Whereas, operational planning is carried out every year in the form of annual budget of the ULG, wherein fiscal resource allocations are made; therefore, it plays a vital role in the delivery of urban civic infrastructure services to citizens. It is this annual budget that provides for both capital and operational expenditure on urban civic services.

In order to plan the provision of urban infrastructure services, certain 'norms/ standards' for civic infrastructure service provision have been evolved over time. These norms/ standards serve as guidelines for the operational planning of civic infrastructure service delivery in cities [8]. They are of two types:

[i] Physical norms, which set the minimum level [or standard] of civic infrastructure service to be provided to the citizens through public works.

[ii] Financial norms, or cost norms, which refer to the unit costs/ expenditure for the delivery of the civic infrastructure services to the citizens.

### **1.1 Physical Norms for Civic Infrastructure Service Delivery**

From time to time, various government institutions/ agencies have laid down the physical norms for the delivery of urban infrastructure services so that the ULGs can plan, develop, operate and maintain such urban civic infrastructure services. Table 2

shows the list of such urban service norms/ standards defined by various agencies/ institutions of the Government of India.

**Table 2.** Urban Norms/Service Standards of Various Agencies

<b>Civic Service</b>	<b>Source Agency</b>	<b>Service Standards</b>
<b>Water Supply</b>	Zakaria Committee, 1963	[i] 157.5 lpcd for city size A [ii] 202.5 lpcd for city size B
	National Master Plan – India, 1983	140 lpcd with 90% population coverage
<b>Sewerage/ Drainage System</b>	National Master Plan – India, 1983	100% population coverage by sanitation facilities in Class I cities
<b>Refuse disposal</b>	NIUA Research Study – Management of Urban Services, 1985	100% disposal of generated wastes
<b>Street lighting</b>	Committee on Plan Projects [COPP], 1973	One lighting pole per 100 ft [~30 m] of distance
<b>Roads</b>	Central Road Research Institute	75-100% coverage by surfaced [all weather] roads in municipal area

Source: NIUA [6]<sup>22</sup>

One of the recent most initiative is the Service Level Benchmarking initiative of the Ministry of Urban Development, Government of India [GoI]. The [9] embarked on a major initiative of establishing service delivery norms/ standards and compare the performance of ULGs on such benchmarks. It came out with a set of ‘Service Level Benchmarks [SLBs]’ for four major urban infrastructure services – water supply, sewerage, solid waste management and storm water drains.

## 1.2 Financial Norms for Civic Infrastructure Service Delivery

Zakaria Committee [4] is the first attempt to establish the service expenditure norms for the financial planning of urban civic infrastructure services in Indian cities. It has laid down both physical and financial norms for civic infrastructure service delivery in different city-size classes so that the ULGs can make financial planning and make fiscal resource allocation in their annual fiscal plans/budgets. Table 3 shows the per capita normative cost/ expenditure estimates originally made by the committee. They are revised to current levels while accounting for cost inflation by several practitioners and researchers in order to estimate the resource and revenue gaps as well as to assess the adequacy of spending on such civic infrastructure services. Tables 4a and 4b show such revised normative cost/ expenditure estimates.

**Table 3:** Zakaria Committee Estimate of Desired Revenue Expenditure on Services [Rs/ca]

Service Category	Class A Special	Class A	Class B	Class C	Class D	Class E
Water supply	10.80	10.20	9.80	8.64	7.56	7.42
Drainage and sewerage	12.20	11.90	10.80	9.30	8.70	8.20
Roads and works	2.50	2.20	1.80	1.35	1.20	1.10
Streetlights and electricity	3.00	2.85	2.50	2.30	2.15	2.00

Source: [10]

**Table 4a** Zakaria Committee Norms for Core Urban Services [Capital]

Core Service	Weighted Average Price [Rs/Capita]
Water Supply	907.88
Sewerage	1234.92
Solid Waste Disposal	NA
Storm Water Drains	621.43
Roads	1063.74
Street Lighting	527.57

Source: [11]NB:1997-98 Prices

**Table 4b** Zakaria Committee Norms for Core Urban Services [O&M]

City Size [Population]	All Services [Rs/Capita]	Core Services [Rs/Capita]
> 20 lakh	698.99	457.89
5-20 lakh	627.07	436.20
1-5 lakh	536.62	400.05
0.5-1 lakh	443.75	346.87
0.2-0.5 lakh	389.93	315.06
< 0.2 lakh	338.52	300.76

Source: [11]NB:1997-98 Prices

## 2 Service Delivery Norms Application Studies: A Review

While the above urban infrastructure service delivery norms/ standards have long been existing to guide the ULGs for planning and providing such civic infrastructure services, their actual application by the ULGs is not clear or less known. Therefore, various research studies have applied these very norms for assessing the physical and financial performance of the ULGs with reference to civic infrastructure delivery and

also for estimating the civic infrastructure service delivery gaps/ deficits. Accordingly, there are two strands of the empirical literature in such assessment: [i] the comparison of actual civic service delivery status with the corresponding physical norms [ii] the comparison of actual civic service delivery with the corresponding financial norms.

## 2.1 Physical Assessment of Civic Service Delivery

[12] is perhaps the first initiative to set urban infrastructure service norms/ benchmarks for four major urban infrastructure services by comparing the service levels in a dozen cities of South Asia, including a few Indian cities. The report sought to serve as a reflective tool for improving urban civic service delivery through service level benchmarking across the cities.

[13] is one of the first few studies that assessed the status of delivery of urban civic services in a cross section of Indian cities and examined the institutional arrangements with regard to the same. The research pointed the complex arrangements and coordination difficulties in civic infrastructure delivery in large cities. It suggested a governance framework for better delivery of urban civic services.

The [14] has attempted to compare as well as rank the ULGs of select 194 cities based on their service status with reference to the Service Level Benchmarks [SLBs] laid down by it. It graded the service performance of each ULG with reference to each of the civic infrastructure service based on the level of civic service with reference to the SLB level and even colour coded the same.

[15] examined the current status of service delivery of urban infrastructure services in the case of Lucknow city. Based on the secondary data collected from Lucknow municipal corporation, it compares the civic infrastructure service delivery with reference to service norms – both physical and financial norms – and finds that the service delivery is below the norms and the spending on services is inadequate. It points to the shortcomings in institutional arrangements and weaknesses in the service delivery in the study city.

[16] made an assessment of the financial management and service delivery of a cross-section of cities through a non-parametric analysis and ranked them on the basis of such non-parametric analysis.

[17] is one of the few studies that examined status of urban civic service delivery at the community level water supply in three Indian cities – Gwalior, Indore and Jabalpur. Based on the sample survey of the citizens' experience of service delivery in the communities in the select cities, they compare it with the service delivery norms and suggest co-production models for improving the civic infrastructure service delivery in them.

[18] examined the linkage between basic urban services and human development. Based on state level data on urban civic services, it comes out with an urban Service Delivery Index [SDI] and compared how states perform on such index, which was also

shown in cob-web diagrams. It also examines the linkages between service delivery performance and Human Development Index [HDI] of the states to find a positive association between them.

[19] examined urban civic service delivery status in two large Indian cities – Hyderabad and Pune – and compared it with service physical norms. Based on the pilot study over a sample of populations in these two Indian cities, they make both the comparison of civic service delivery with reference to physical norms as well as between the study cities. The study points to the need for better governance and accountability for improvement.

[7] examined urban civic service delivery status in two large Indian cities – Hyderabad and Pune – and compared it with service physical norms. Based on the detailed sample survey over a sample of populations in these two Indian cities, they make both the comparison of civic service delivery with reference to physical norms as well as between the study cities. The study points to the need for better governance and accountability for improvement.

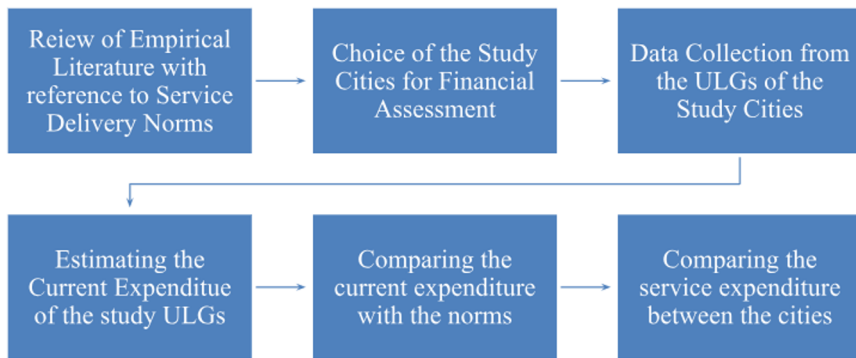
### **3 Study Approach and Methodology**

The literature review of empirical studies on urban infrastructure service norms indicates that comparing civic service delivery with the physical norms and between the cities has been well attempted throughout and even until recently. Financial [or, expenditure] norms application has been done by few studies but not recently. There have been very few attempts to make use of the expenditure norms to estimate the resource requirements of urban infrastructure development in India. Moreover, the financial expenditure/cost norm application studies mostly utilized the cross-sectional study frameworks rather than the case or comparative analytical framework. Therefore, there is a gap in literature to fill and the need for examining the expenditure performance of cities with reference to service delivery expenditure norms.

In this context, the current study attempts to assess the financial [expenditure] performance of select Indian cities by comparing their expenditure levels with the corresponding expenditure norms/ benchmarks. We have chosen Hyderabad and Pune as the candidate cities for making such an assessment, as these are the cities with a large and growing urban population along a strong economic activity presence in them. The study was carried out for the period of 2010-2017 prior to the occurrence of the Covid 19 when the data was collected from the field by visiting the respective ULGs. The current study is aimed at addressing the following research questions:

- i. Do the large Indian cities spend adequately on civic infrastructure services when compared to the expenditure norms?
- ii. Does the expenditure performance with reference to service spending norms vary across the cities?

Figure 1 shows the study methodology. The study began with collecting budget data from the ULGs of study cities – Greater Hyderabad Municipal Corporation [GHMC] and Pune Municipal Corporation [PMC]. While making use of the Census [3] population, we made projections for the study period by using the past computed annual population growth rates of 2001-11. We estimate the current spending on services for each year of the study period by using the service-wise spending by the ULG and the projected city population for that year. We compare the actual spending of the ULGs against the financial/ expenditure norms established by Zakaria Committee [4] expressed in current prices, which are widely used to assess the adequacy of spending. They are revised and brought to the current levels using the price indices. Here, the focus is on both capital as well as O&M spending of the study ULGs on core civic infrastructure services viz., water, sewerage, streetlights, roads and storm water drains.



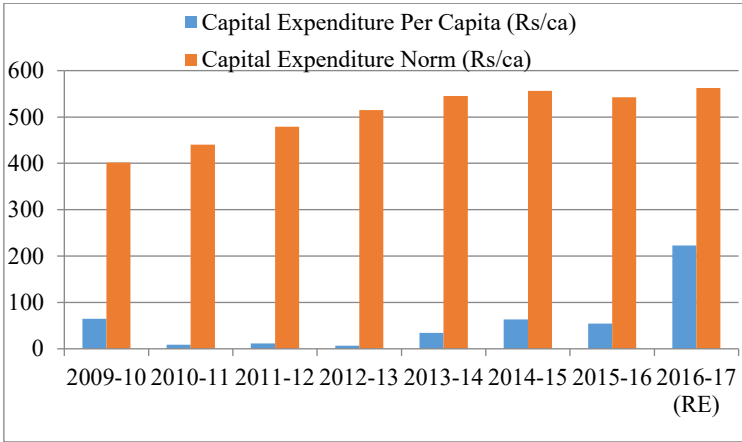
**Fig.1.** Methodology of the Study

## 4 Normative Assessment of Expenditure on Civic Infrastructure Services by Study ULGs

This section assesses the financial performance of the study ULGs - GHMC and PMC - in terms of their current spending on major/core civic infrastructure services vis-à-vis the expenditure norms to provide the civic infrastructure services of desirable level/standard. An expenditure gap of the ULG implies that the ULG expenditure falls short of the normative expenditure on a particular civic infrastructure service and vice versa.

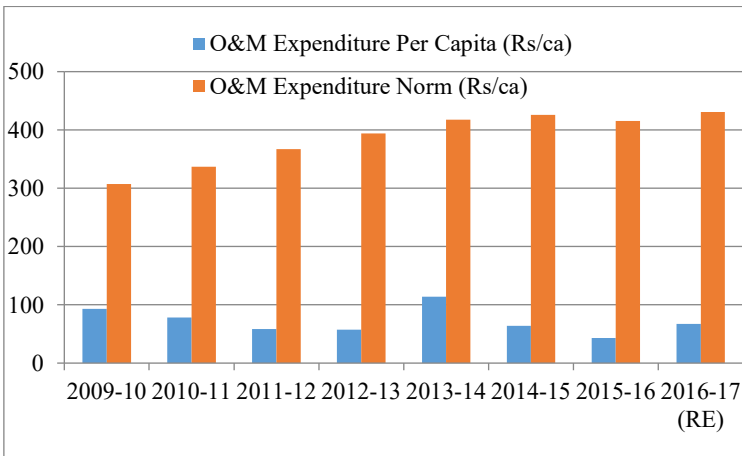
### 4.1 Water Supply & Sewerage

Figures 2a and b respectively summarize the trends of capital and O&M expenditures of the GHMC on water and sewerage. The decline in spending is a cause of concern for a growing city. The spending was lower for several years, yet an unrealistically high provisioning ways made for it in the last annual budget. The per capita capital and O&M spending was lower than the expenditure norm [in current prices] and the gap was widening over time, especially in the O&M of water supply and sewerage service.



Source: Based on the GHMC Budgets and Revised Norms

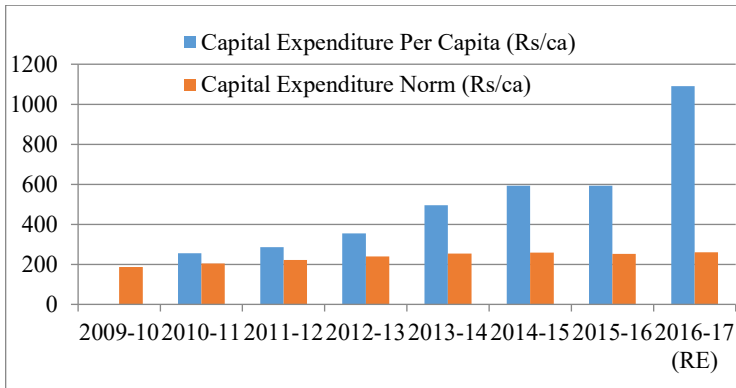
**Fig.2a.** Trend of GHMC Capital Expenditure on Water & Sewerage against Expenditure Norm



Source: Based on the GHMC Budgets and Revised Norms

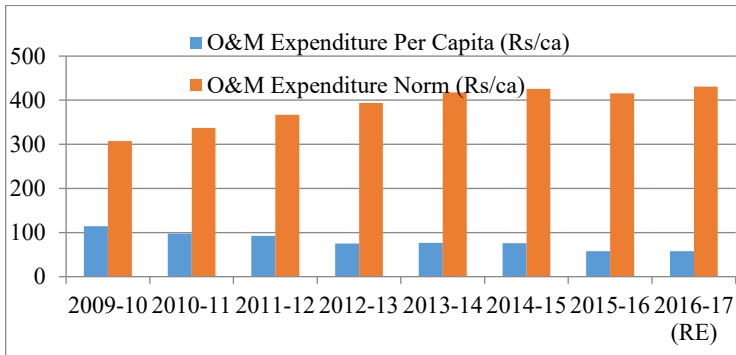
**Fig.2b.** Trend of GHMC O&M Expenditure on Water & Sewerage against Expenditure Norm

Figures 3a and b show the trends of capital and O&M expenditures of PMC on water supply over time. The PMC has been spending enough on new capital formation, which is evident from its capital spending on water supply higher than the expenditure norm and the surplus spending was progressing over time. However, the opposite holds for the O&M expenditure on water supply i.e., its spending was declining and well below the spending norm. It appears that the PMC was focusing more on bringing the suburban areas under water supply network and, therefore, spending more on it. Pune has topographical advantage, which might be working in its favor as far as the O&M expenditure is concerned.



Source: Based on the PMC Budgets and Revised Norms

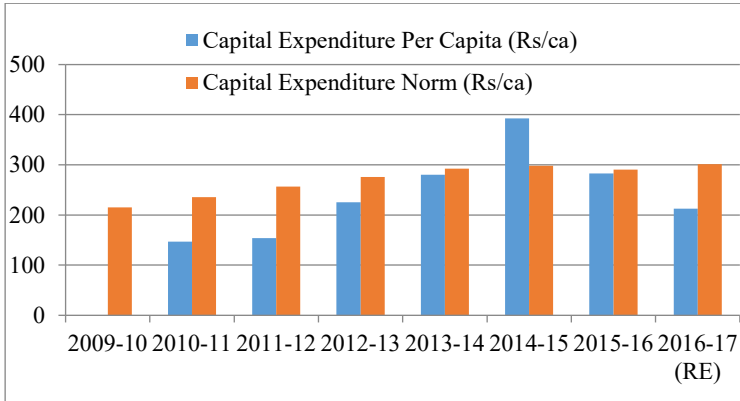
**Fig.3a.** Trend of PMC Capital Expenditure on Water supply against Expenditure Norm



Source: Based on the PMC Budgets and Revised Norms

**Fig.3b.** Trend of PMC O&M Expenditure on Water supply against Expenditure Norm

Figure 4 shows the trend of capital expenditure of the PMC on sewerage. The capital spending of PMC was less than adequate [when compared to spending norm] in all but one years, which is a cause of concern for a growing city. In the absence of sewerage coverage, the suburban areas, being connected with water supply, would discharge sewer into drains/nalas that take it into larger surface water bodies like lakes and rivers. This results in the choking of lakes and rivers with sewerage water into them. The cut in capital spending in 2016-17 would have been on account of revenue shocks to the PMC.

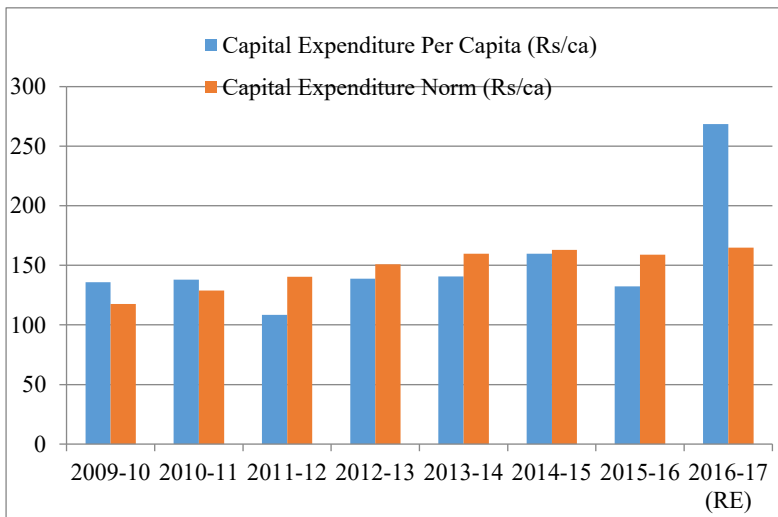


Source: Based on the PMC Budgets and Revised Norms

**Fig.4.** Trend of PMC Capital Expenditure on Sewerage against Expenditure Norm

**4.2 Storm Water Drains**

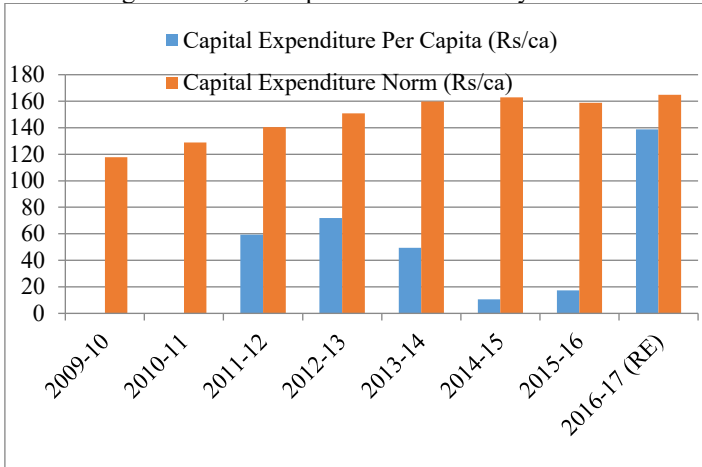
Figure 5 shows the trend of capital spending on storm water drains by the GHMC, which was rising very slowly over time. The city was battered by floods, which would have led to priority in the spending with a large provisioning made in last fiscal year. The expenditure gap, i.e., the difference of actual expenditure per capita and spending norm, was positive but small and narrowed down in its size. Therefore, the spending of GHMC on this civic infrastructure service has improved over time.



Source: Based on the GHMC Budgets and Revised Norms

**Fig.5.** Trend of GHMC Capital Expenditure on Storm Water Drains against Expenditure Norm

Figure 6 shows the trend of spending on storm water drains by the PMC, which was reduced over time. Evidently, the capital spending on storm water drains was not enough when compared with the norms. A large provision was made in last fiscal year, which appears to be unrealistic given the revenue income shocks received by the PMC. The city was battered by monsoon floods that would have led to priority in spending on this. The expenditure gap, i.e., difference of norm and actual expenditure per capita, has only been widening over time, except for the last fiscal year.

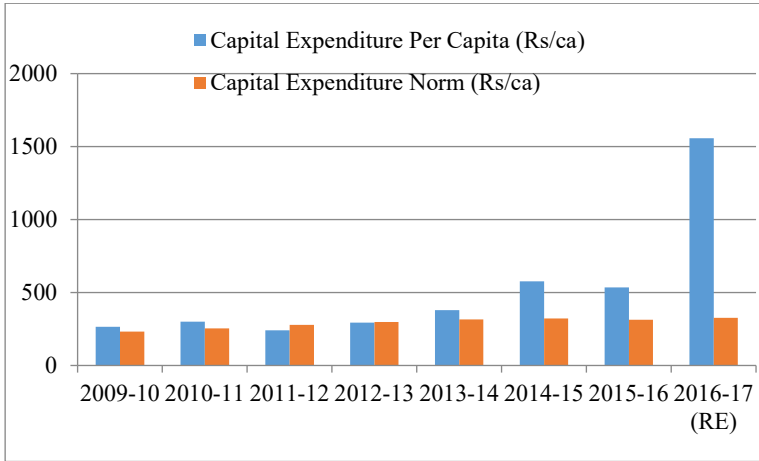


Source: Based on the PMC Budgets and Revised Norms

**Fig.6.** Trend of PMC Capital Expenditure on Storm Water Drains against Expenditure Norm.

### 4.3 Roads

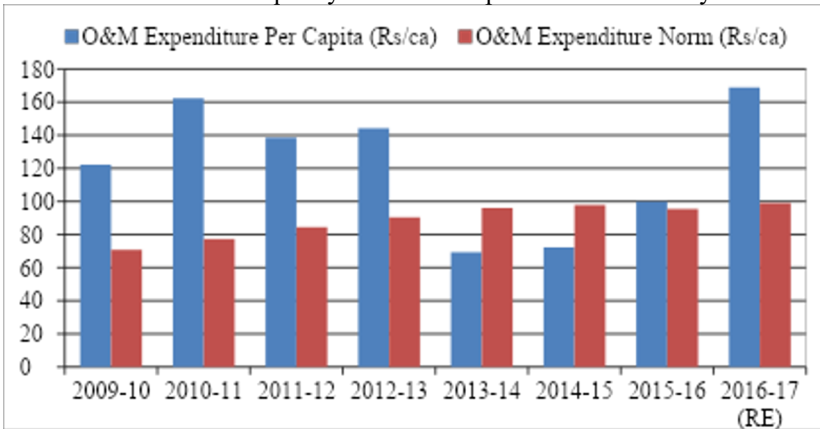
Figure 7a shows the trends of capital spending on roads by the GHMC over time. The capital spending on roads increased over time to the level of above or at par with capital spending norm; a large provisioning was made in last fiscal years. The capital expenditure gap with regard to this was negative [or surplus spending above the norm] in most years except in the years 2011-12 and 2012-13, implying more than adequate spending on this service. The rise in capital spending during the last two years is due to the Strategic Road Development Project [SRDP] undertaken by the GHMC.



Source: Based on the GHMC Budgets and Revised Norms

**Fig.7a.** Trend of GHMC Capital Expenditure on Roads against Expenditure Norm

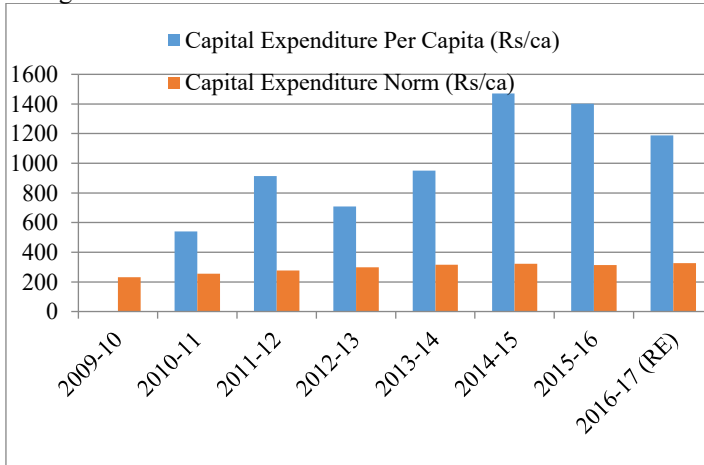
Figure 7b shows the trends of O&M spending on roads by the GHMC over time. The O&M expenditure of the GHMC on roads was fluctuating and declining over time, but it is well above than the norm prescribed in the first half of the study period. However recently, the spending on O&M has been declining [below specified norm] perhaps due to the GHMC’s focus on capital spending. Overall, however, the O&M spending on this civic infrastructure service appears to be adequate [or more than adequate], though we cannot reflect on the quality of roads and pavements in the city.



**Fig.7b.** Trend of GHMC O&M Expenditure on Roads against Expenditure Norm

Figure 8 shows the trend of capital spending on roads by the PMC over time. It shows that the capital spending was increasing over time [especially in the last few years] and a large [unrealistic] provisioning was made in last fiscal year. The rise in spending in

last two years is perhaps on account of the PMC's drive towards concretization of arterial roads and major city roads. There was adequate capital spending by the PMC on roads service, which is evident from a surplus spending when compared to the spending norm for this service.

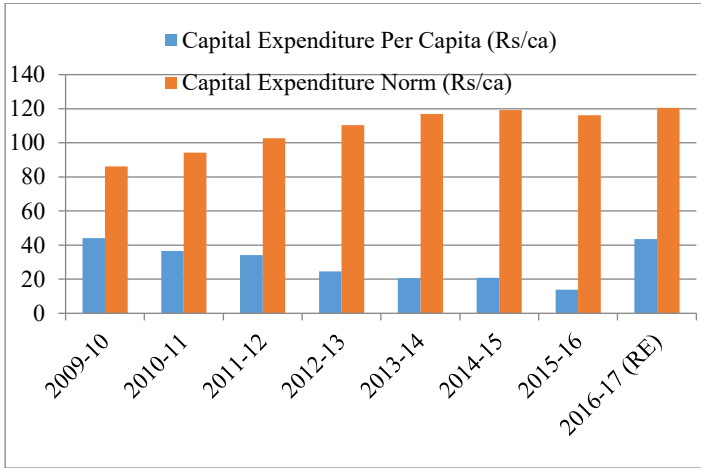


Source: Based on the PMC Budgets and Revised Norms

**Fig.8.** Trend of PMC Capital Expenditure on Roads against Expenditure Norm

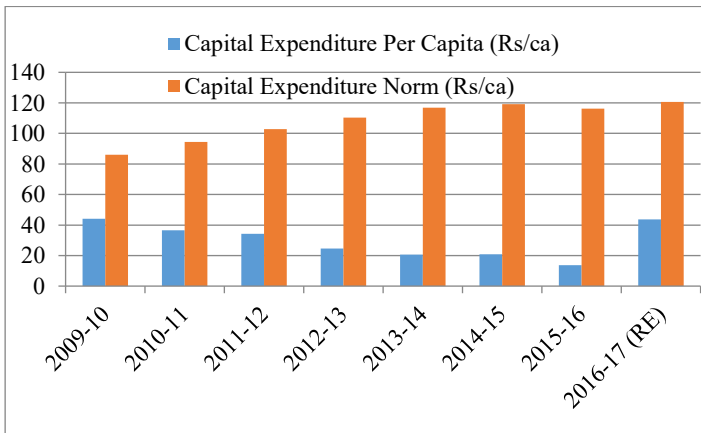
#### 4.4 Street lighting

Figures 9a and b respectively summarize the trend of the capital and O&M expenses of the GHMC on street lighting. The decline in capital spending by the GHMC is perhaps on account of a lesser amount of urban area left to be covered. Accordingly, the expenditure gap, i.e., difference between capital expenditure per capita and spending norms, was widening, similar as with water supply and sewerage. The actual O&M expenditure per capita on street lighting was more than that laid down by the norm, reflective of adequate spending by the GHMC on the O&M of this civic infrastructure service. GHMC might have lesser capital spending [which is below norm] because it would have already exhausted covering most of the areas with streetlights; its O&M expenditure is able to meet the norm due to the regular maintenance and replacement expenditure incurrence.



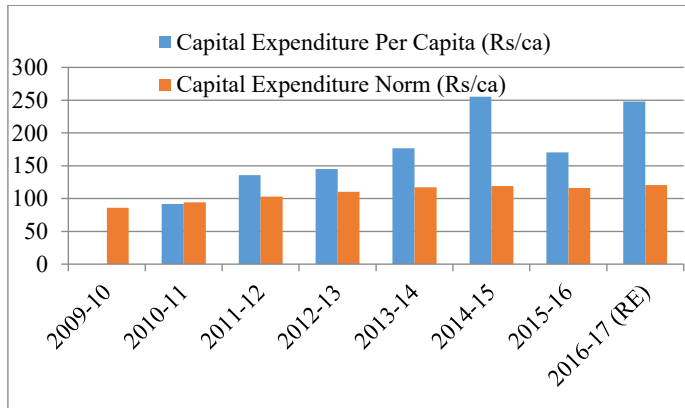
Source: Based on the GHMC Budgets and Revised Norms

**Fig.9a.** Trend of GHMC Capital Expenditure on Streetlights against Expenditure Norm



**Fig.9b.** Trend of GHMC O&M Expenditure on Street lights against Expenditure Norm

Figure 10 shows the trend of capital expenses of PMC on street lighting, which has been increasing over time. It reflects that the PMC drive to bring more areas [especially suburban areas] under the service and, therefore, spending adequately. There was always a surplus capital spending when compared to norms, which was increasing over time.



Source: Based on the PMC Budgets and Revised Norms

**Fig.10.** Trend of PMC Capital Expenditure on Streetlights against Expenditure Norm

## 5 Conclusion

With the rising urban population and the rise in the number of cities, the provision of urban civic/infrastructure services is a major challenge faced by the ULGs of Indian cities. Service delivery norms have been developed from time to time for planning the provision of urban infrastructure services; they include both physical and financial norms of civic infrastructure service delivery. This study made an assessment of the ULG expenditure on civic infrastructure services by comparing it with the revised Zakaria Committee financial expenditure norms in the case of two large Indian cities – Hyderabad and Pune. A comparison was also drawn between the study cities in order to assess the relative performance.

The results show that when compared to the spending norms, the GHMC was not spending enough on the capital development of three major civic services – water supply and sewerage, storm water drainage and streetlights when compared to the corresponding expenditure norms. However, it spent adequately on capital development as well as the O&M of roads service; it also spent adequately on the O&M of streetlights but did not spend adequately on the O&M of water supply service. The PMC's capital spending was adequate in the case of core civic services like water supply, roads and streetlights; but its capital spending was not adequate in the case of sewerage and storm water drains when compared to the financial expenditure norms.

The O&M expenditure of water supply of PMC is also below the corresponding norms. Pune, therefore, fares better than Hyderabad when it comes to meeting expenditure norms.

Therefore, although both ULGs are spending enough on some core civic infrastructure services, the spending deficits/ expenditure gaps in a good number of core civic services

also imply either revenue inadequacy or expenditure misallocation or both. Therefore, there is scope for fiscal improvement through the reorganization of ULG expenditure from surplus spending civic services to the deficit spending civic services wherein the spending did not meet the norms. Moreover, the inadequacy of revenues to meet the service norms implies that the finances of the study ULGs need to be strengthened. It brings to fore again the issue of 'financial autonomy' of ULGs, which exists in a limited amount. Although large ULGs are not fiscally dependent upon upper tier governments, their finances get affected by upper tier government decisions [financial and otherwise]. The State and Central governments need to work towards strengthening the fiscal autonomy of ULGs, as enshrined under the 74th Constitutional Amendment Act, by giving more revenue raising powers while also taking measures to improve civic services.

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