

Urban Infrastructure Development and Local Self-Government: A Study of Bhubaneswar Municipal Corporation

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The Urban Local Self-government is supposed to provide basic infrastructure to its citizens. To fulfill their requirements, the local self-governments need to provide for infrastructure. In view of the current developments due to the availability of the service of Jawaharlal Nehru National Urban Renewal Mission (JNNURM) to Bhubaneswar city, a city survey was conducted in Bhubaneswar to find the preparedness and adaptability of the Bhubaneswar Municipal Corporation in providing urban infrastructure facility to its citizens. The survey shows that though the changes are perceived to be good, the citizens still feel that in some areas of crucial interest, like maintaining inner city heritage and providing adequate health and sanitation, the corporation has failed.

Introduction

In developing countries like India, there is a tremendous pressure on the urban areas. Constant influx of population into urban centers creates great pressure on the available infrastructure. The pressure is not only in terms of physical delivery, but also in terms of financial burden that the urban local bodies like municipal corporations have to face. Both the government and local bodies are always on the toes to create better infrastructure facilities to the citizens. It is estimated that from a mere 29% of the urban population in 2000, the increase would be 40% by the year 2030. The major reason of such growth is the great rural-urban divide in terms of available earning opportunity and civic facility and the large growth in IT-ITES investment in the major urban locations of India, which is drawing in huge amount of population across the country to these locations. The major metros apart, there has been a growth of tier II cities which attract a population of over half a million or will do so in the near future. To develop these cities, physical infrastructure has been taken up by the Central Government and State Governments in structured and cooperative manner by designing modality and giving institutional support to such urban infrastructure growth and requirement.

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Establishment of the Indian Infrastructure Finance Company which floats Special Purpose Vehicle (SPV) for infrastructure finance, enabling public-private partnership and designing its modality by the government both at state and the Center, and establishing special funds for urban infrastructural development by identifying the needs and growth areas under Jawaharlal Nehru National Urban Renewal Mission (JNNURM) are some of the pivotal steps that are being taken. In this context, the current study was taken up in the city of Bhubaneswar, since it has been identified with few other cities in India by the JNNURM. A critical study followed by a survey of the citizens in finding their aspirations and the gap in the provision of urban physical infrastructure has been taken up in the study.

Bhubaneswar, the capital city of Orissa, was formed in the early 1950s as a modern facility township. Soon it became one of the most important destinations of the eastern part of the country due to its strategic location. In the recent past, the city was identified under JNNURM to facilitate large infrastructural development. However, it has been found that despite the growth and development initiative, the citizens do find their life in some respect has tightened up, whereas it has become eased in some respects.

This study was taken up to find the reaction of the people in response to the change, specially the large facelift of the city and the new private-public partnership model that the Bhubaneswar Municipal Corporation (BMC) has taken up in order to sustain the development.

Objectives

The study aims at finding the citizens' reaction to the changes taking place in the city, and more so, to extract common factors underpinning their concern for the city. In order to do so, the BMC has been chosen. To understand the major bottleneck for creating and delivering urban infrastructure, the study examines the preparedness of the BMC towards it, and at the end, a random sample survey of 600 odd people in the city was conducted to see whether they feel that BMC has stood up to the expectations of the citizens and address their problems. These 600 people were from almost all walks of the city life.

BMC Introduced

Bhubaneswar Municipal Corporation (BMC) is one of the largest municipal and urban local bodies of Orissa, together with the Cuttack Municipal Corporation covering an area of 135 sq. km. The new city of Bhubaneswar was formally inaugurated in 1954 with the State sifting its capital-base from Cuttack to Bhubaneswar. The original plan of Bhubaneswar¹ was to accommodate a total population of 25,000 people, but it had accommodated up to 4,23,465 people, other than a floating population of another 5,000-10,000 entering the city every day for reasons of seeking employment or stopover in transit camps or to meet the government officials at the state headquarters.² A city of about 10 sq. km in 1950s covering

¹ The city of Bhubaneswar was designed and planned by the famous French town planner Otto H Koenigbarger who also designed few other cities including Chandigarh and Bhopal.

² The Census Report, 1991, GOI. According to official sources of Orissa, it is supposed to be around 8 lakhs in post-census 2001.

five identically divided zones (named Units) with a Notified Area Council (NAC) status had now spread cover 135 sq. km comprising 31 wards and 46 villages.

Financial Position

The financial report of Orissa states that "Bhubaneswar, because of its political and administrative significance, experienced both physical expansion and population growth. During 1991-2001, the city registered 65% increase in its population. Today its population is approaching 8 lakhs."

Because of the population growth and the consequential civic and sanitary requirements, infrastructure development and popular demand, the city of Cuttack and Bhubaneswar were declared corporations with the coming of the Orissa Municipal Corporation Act, 2003 (on February 11, 2003). This modification was to bring enormous change in their responsibility and task. However, no significant change was observed in their financial position. The income earned internally by BMC was little more than Rs. 5 cr during 2000-01. Tax revenue and non-tax revenues collected by this corporation was nearly Rs. 20 lakhs. BMC had the lowest salary expenditure of 1.71%, which rose to 16.98% during the current financial year. The development expenditure of BMC was 58.2% in 2000-01 and it declined to 53.34% in the current financial year. BMC is struggling to meet the fund requirement for its infrastructure and development activities because of poor revenue collection machinery and inability to add new tax and non-tax revenue to its earning statements. BMC could garner Rs. 20,83,92,900 to meet its requirements for various activities.³ The availability of external funds increased to Rs. 274,578,308 in the current year.

Bottleneck in Infrastructure

It is understood from the above discussion that Bhubaneswar has been typically growing. The ever mounting pressure of population in the state and the capital city has already started to show its mark on the landscape. Bhubaneswar, once known for having good motorable roads, is a sign of pity now. Potholes, blockages and ebbing drains due to ill adjustment of drainage and roads have become common. Total road length in Bhubaneswar is about 806.139 km, which is about 0.001 km per capita and desperately low. Of the total road length, only 530 km is black topped (tar filled), which is about 65%. The remaining 35% is either cement concrete or unmetalled and earthen. The bottleneck in terms of drains is worse with only 85 km of drain, which is about 0.000106 km per capita or about 0.001%.

Officially, Bhubaneswar has about 59 notified and 131 non-notified slums. But BMC, in its city plan document, has noted that there are about 99 unauthorized slums in the city and estimated to be around 250 in the next 10 years. This is primarily because of the migration of the rural poor to Bhubaneswar for livelihood.

³ It is interesting to note that both the Bhubaneswar and Cuttack Municipalities use single entry system for book-keeping. Both the institutions notified for request of proposal (for consulting assignment) through the State Urban Development Agency for "Double entry and accrual based accounting" under GOI-UNDP.

Bhubaneswar has 16 medical units, out of which one is a BMC-run hospital. The city has several private clinics and hospitals besides the government-run hospitals and dispensaries. There is only one burial ground and crematorium maintained by BMC, besides several other cremation grounds which are not in the city's plan or are not authorized. A detail of BMC holdings is given in Table 1.

The city also has a gross shortage of houses, where the per capita holding is 6.63 per lakh of population.

Table 1: Bhubaneswar Municipal Corporation (BMC) in 2006-07			
Item	Description	Heads of Holding	The Nature of Holding
1.	Geography	Population	4,23,465 (1991 census) (8 Lakhs approx. as per recent government estimate)
		No. of Wards	31
		No. of Villages	46
		No. of Houses	53,046
2.	HRD	Primary Schools	9
		M.E. Schools	1
		High Schools	7
		Library	1
3.	Health and Sanitation	Allopathic Dispensaries	5
		Homeopathy Dispensaries	10
		Sulabh Souchalays	11
		Public Toilets	6
		Public Urinals	9
		Public Parks	7
		Burial Ground and Crematorium	1
4.	Animal Care	Veterinary Hospital	1
		Canine Houses	3
		Slaughter House	1
5.	Communication	Total Road Length	806.139 km
		Black Topped	530.069 km
		Cement Concrete	34.114
		Metalled	152.101
		Unmetalled	65.907
		Earthen	23.947
6.	Slums	Total Slums	190
		Notified	59
		Non-notified	131

Source: <http://www.orissa.nic.in/khurdha/bmc.htm>

Response to the Change

The bottleneck in urban infrastructure has been more or less attributed to the inadequate plan to accommodate the fast changes which occur in the demographic and geographic pattern of the urban locality. In response to this, BMC called for capacity building for decentralized urban governance and created a City Development Plan (CDP) in 2006 under the JNNURM (submission for Urban Infrastructure and governance and submission for basic services to the poor), created by Community Consulting India Private Limited. The document created a vision, mission and approach to the city development.

It created a measure for the demographic, economic and land use pattern of Bhubaneswar. The purpose of the plan was to achieve its vision of "achieving holistic and sustainable development through improved urban governance, adequate level of service provision and delivery, reform driven urban management leading the city to be resource rich, vibrant in economy, clean, green, comfortable, safe and enjoyable place."

The document identified six Mission areas, such as:

1. Economic and Urban Development;
2. Infrastructure Development (Provision and Delivery);
3. Environment Improvement;
4. Urban Poor and Slum Upgradation;
5. Urban Management; and
6. Reforms and Urban Governance.

Recent Works Undertaken

In the recent past, BMC has undertaken reconstruction of roads either black-topped or cement concrete types across the city and its suburbs. Besides, it has taken to renovate open wells, sewerage and water supply pipes in the city. An amount of Rs. 1,36,12,500 has been estimated for the work. A break up of various works is given in Table 2.

Table 2 indicates the direction in which BMC is undertaking its development work. Priority has been given to road building and maintenance as it is the most crucial link in the development of infrastructure. However, it is not understood as to what the next priority is. A lopsided development of infrastructure would not be proper for the development of the city.

Completion of Jobs and Modality

The progress of the works undertaken last one year is impressive. Almost all the major works taken up are either completed or are on the verge of completion. The major works, including the lighting of the external and main streets, beautification of the city through maintenance of heritage walls (painted with decorative pictures highlighting various aspects of Orissa's civilization), establishing shopping and vending zones on road sides by mitigating the offshoot of errand shops, which have come up on major road sides. Major roads are being made into double lane roads. Barricading the cycle tracks from the motorable road and laying of pedestrian pathway are complete on some major roads.

Name of the Work Undertaken	Nature of the Work	Value of the Work Undertaken (in Rs.) (figures in the brackets indicate the percentage of the total amount under sanction)
Roads	Urban (black top and cement concrete)	7,665,800 (56% approx.)
Roads	Outskirt of Bhubaneswar (black top, concrete and mud top)	2,755,800 (20% approx.)
Open Well	Reconstruction and Maintenance	94,900 (0.69% approx.)
Drainage	Construction and Maintenance	1,094,000 (8.03% approx.)
Water Supply	Construction and Maintenance	2,42,000 (1.78% approx.)
Road Culvert	Construction	96,900 (0.71% approx.)
<i>Source: BMC tender notice No. 1561, dated January 27, 2007, file no: XI-PW-34/06</i>		

It may be interesting to note that most of the developmental maintenance has been dealt with through Public-Private Partnership. The major corporate partners include Bharati Airtel, Anil Dhirubhai Ambani group, POSCO, OMC, Aircell and IMFA to name a few. The facility provided to the private partner in return is by the way of space for visibility and advertisement exclusively. Roads have been provided with advertisement kiosks with illumination from inside to provide both day and night visibility. Besides, BMC with an organization called 'Team' has floated several points where, high-end electronic display boards are available for advertisement.

Survey of the Citizens of Bhubaneswar

A survey of about 600 persons was conducted across Bhubaneswar to find out their response to the urban development that is being effected by BMC and whether the change has been meaningful or not. The respondents included people from all walks of life and from both genders across a wide age group. Table 3 presents the data structure of the survey.

Data Structure

The largest group of respondents are aged between 40 and 50 years, followed by 30-40 years (Table 3). The least number of respondents were in the 60 years and above category. Since the data were collected by a survey method, it was ensured that absolute randomness was kept in the process of collection. The total area in Bhubaneswar which was covered during the survey is in Units 1, 2, 3, 4, 5, 6, 8 and 9, parts of Acharyvihar and Vanivihar, Shaheed Nagar, Satayanagar, Rasulgarh, BJB Colony, Old town, Chandrasekarpur, Bamunda BDA colony, Nayapally N6, N5, N2 and N1, Jaydev vihar, Aerodrome area.

Table 3: Profile of the Respondents of the Survey			
Age	Gender	Number of Respondents	Total
20-30 years	Male	89	120
	Female	31	
30-40 years	Male	92	128
	Female	36	
40-50 years	Male	128	230
	Female	102	
50-60 years	Male	63	89
	Female	26	
60 years and above	Male	28	33
	Female	5	
Total		600	600

Methodology

Factor analysis was carried out using Q-matrix method by applying SPSS (V-11). Under the Q-matrix method, single direction correlation is determined between the variables or cases. Once the matrix is determined, the least factor is extracted by solving the matrix.

The main statistics extracted are factor loading, h^2 , H , Eigen value, percentage of common variance and percent of total variance. The main explanations to these are given below:

Factor Loading: Loading measures which variable is involved in which factor, to what degree and in what direction. This can be interpreted like coefficient of determination.

h^2 : It is the proportion of a variable that is involved in the factor. $(1 - h^2)$ is equal to the degree to which a variable unrelated to the other variables may be calculated.

H (percentage of total variation in the data):

$$H = \frac{\text{Sum of all } h^2}{\text{Number of Variables}} \times 100$$

Eigen Value: It is the sum of the squares of each factor loading.

Percentage of Common Variation: Eigen value divided by the number of variables of each case. This is expressed per factor.

Percent Total Variation: Eigen value divided by the number of variables or cases. This is explained per factor.

Analysis and Interpretation of the Factor Analysis for Availability of Infrastructure

The correlation matrix in Table 4 shows the following attributes. Adequacy of infrastructure has the highest relation with the facility provided followed by road quality and maintenance. It is also having high amount of association with portable water and public facility besides

Table 4: Correlation Matrix of the Factors to Availability of Infrastructure in Bhubaneswar

Variables	<i>AD</i>	<i>RQ</i>	<i>SL</i>	<i>SLI</i>	<i>F</i>	<i>PW</i>	<i>PF</i>	<i>DS</i>	<i>IS</i>	<i>HHA</i>
<i>AD</i>	1.00									
<i>RQ</i>	0.637	1.00								
<i>SL</i>	-0.447	-0.429	1.00							
<i>SLI</i>	0.390	0.352	-0.972	1.00						
<i>F</i>	0.677	0.612	-0.930	0.931	1.00					
<i>PW</i>	0.631	0.584	-0.947	0.949	0.998	1.00				
<i>PF</i>	0.610	0.580	-0.948	0.956	0.996	1.00	1.00			
<i>DS</i>	0.326	0.359	-0.975	0.995	0.910	0.932	0.940	1.00		
<i>IS</i>	0.388	0.674	-0.900	0.935	0.832	0.846	0.850	0.910	1.00	
<i>HHA</i>	0.631	0.384	-0.907	0.943	0.952	0.961	0.961	0.906	0.930	1.00

Notes:

<i>AD</i> : Adequate Infrastructure	<i>PF</i> : Public Facility
<i>RQ</i> : Road Quality	<i>DS</i> : Drainage System
<i>SL</i> : Street Light	<i>IS</i> : Increase in Slums
<i>F</i> : Facilities Provided by BMC such as Parks, Public Toilets, etc.	<i>HHA</i> : Health and Hygiene in Slums.
<i>PW</i> : Portable Water	

the health and hygiene provided by BMC to slums that has developed in the recent past. The road quality shows high association with the portable water and public facility indicates that the respondents give equal importance to these facilities. The availability of street lights is negatively associated with all the other infrastructure indicating that the respondents felt that it is not given adequate priority, and where there is some growth in other sectors, this is one area where it is absolutely ill-cared for. However, it is interesting to see that inner street lighting factor has high correlation with almost all the other variables. One would, therefore, interpret that as this facility increases or decreases, the requirement and need of the citizen to inner street light factor (a must for any city) increases. Facility provided is highly associated with other infrastructure provided or felt needed such as inner city lighting, portable water, drainage system, etc. Portable water is highly associated with facility provided and health and hygiene for slums. It may be felt that the citizens of Bhubaneswar both perceived and felt that the portable water is a facility which is adequately provided by BMC, but it has been under pressure due to growth of slums and the adequacy of portable water is required for slums. Public facility has the highest link with inner city street light and adequacy of facility provided along with the portable water. Drainage system has the highest relation with inner city street light, portable water and public facility. Increase in slums has high relation with the health and hygiene for slums and public facility.

Interpreting Table 5, we get that SPSS (V-11) has extracted two principal factors using 30,000 data points spelled across 10 variables for 600 respondents on a scale of 5 points.

Variables	Principal Factor Matrix		h^2	H
	I	II		
<i>AD</i>	0.607	0.637	0.810	10.34%
<i>RQ</i>	0.519	0.771	0.133	–
<i>SL</i>	–0.965	0.148	0.049	–
<i>SLI</i>	0.966	–0.238	0.056	–
<i>F</i>	0.992	0.123	0.421	–
<i>PW</i>	0.996	0.750	0.229	–
<i>PF</i>	0.995	0.554	0.837	–
<i>DS</i>	0.949	–0.254	–0.990	–
<i>IS</i>	0.890	–0.401	–0.438	–
<i>HHA</i>	0.974	–0.674	–0.145	–
Eigen value	8.100	1.330	–	–
% of total variation	68.143	26.336	–	–

By observing the correlation matrix and principal factor matrix, one can see that Factor 1 is associated with facility provided, portable water, public facility and health and hygiene for the slums. Hence, Factor 1 can be named “Public facility and infrastructure provided by BMC”; whereas Factor 2 is associated with an adequacy of infrastructure, road quality perceived by respondents and public facilities. Hence, it can be named “Adequacy of public facility of infrastructure by BMC”. By verifying h^2 , we see that association is high with Factor 2 in case of adequacy of infrastructure, and in case of public facility and infrastructure, we observe that street light availability on main roads have no impact on Factor 1, which means that it is not the beatification of the external and outer road which the citizens of Bhubaneswar are concerned with. Inner city street lights, drainage system, increase in slum and health and sanitization in slum are negatively related to Factor 2, which means they are not adequate and are matter of concern for the citizens of Bhubaneswar. The percentage of common variation is high in case of Factor 1, which means that the concern for public facility and infrastructure are high for the citizens, whereas that of Factor 2, i.e., adequacy of public facility of infrastructure by BMC is low, which can be interpreted that the respondents believed that the adequacy of infrastructure facility in Bhubaneswar is low. The percentage of common variation in data explained by all factors (H) is 10.34, which are adequate.

Analysis and Interpretation of the Factor Analysis for Current Development of Infrastructure in Bhubaneswar

The variable ‘change in the city’ is highly related to ‘changed life by change in the city’ and the effect of change is good on the life of the citizens (Table 6). Whereas it has negative relation to ‘change opinion seeking’ and opinion of the citizen being implemented and ‘inner city heritage’. This indicates that despite the fact that the citizens of Bhubaneswar feel that there are changes and they are good, at the same time, they think that BMC

Variables	CH	CL	CG	CO	CI	ICH
CH	1.00					
CL	0.998	1.00				
CG	0.978	0.998	1.00			
CO	-0.758	-0.768	-0.799	1.00		
CI	-0.813	-0.814	-0.840	0.831	1.00	
ICH	-0.773	-0.745	-0.774	0.998	0.791	1.00

Note:
 CH : Change in the city felt CL : Changed life by the change in the city
 CG : Change is good for life CO : Change opinion
 CI : Change opinion implemented ICH : Inner city heritage maintenance

has not been able to make an inclusive growth and has destroyed the inner city heritage. On a similar line, whether the change was meaningful for the citizens, it has been found good for life. Again, it implicates that the change is not inclusive and failed to protect the inner city heritage. The factor, change is good for the life of the people, shows high relation with felt changes in the city and change in the city has changed the life. Change opinion seeking was found highly related to change implementation as BMC did not take many people into confidence and did not transform many suggestions to changes. The other variables namely opinion seeking by BMC, taking opinion in confidence, while implementing changes and the inner city heritage maintenance, seem to have high relation with each other and bear less relation with the rest. This indicates that though the respondents felt that the change is good, yet they felt that BMC has not taken their opinion in carrying out the change, nor have they been able to maintain the inner city heritage.

Variables	Principal Factor Matrix	h^2	H
CH	0.948	0.521	30.083
CL	0.952	0.561	-
CG	0.964	0.204	-
CO	-0.919	0.208	-
CI	-0.910	0.679	-
ICH	-0.899	-0.368	-
Eigen Value	5.214	-	-
% of Variation	86.90%	-	-

One single factor was extracted which can be distinctly featured as "change in the city of Bhubaneswar". The percentage of total variation is high indicates effectively the two factors with a total explanation of 30% (Table 7).

Conclusion

Bhubaneswar is one of the growing cities of Eastern India. One can easily gauge that due to its geographical possibility it has

attracted large investment and growth. Fired by the JNNURM, the city has seen major changes. The shift of power to develop the municipal corporation, forward looking governance and pressure of population has made the whole thing charged at Bhubaneswar. The results of the surveys show that though the citizens of Bhubaneswar found that there has been good growth in the city, yet there is a lot of gap in the development. Besides, they found themselves not in the process of participation while it came to the cities development. The private-public partnership for many look cosmetic in nature and for some it was felt that the change was needed to give the city a universally acceptable looked in these globally changing environments. The reaction was mixed. The change is definitely out of necessity rather than adversity alone. ☐

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