

Amitabh Kundu*

Micro Environment in Urban Planning - Issues concerning Access of Poor to Basic Amenities

Introduction

CONCERN for environment is often viewed as elitist in the context of urban planning. In a country like India, with more than thirty per cent population living below the poverty line, a strategy for bringing about rapid economic growth is considered to be more urgent than measures protecting environment. There can be nothing more erroneous than this. It can be demonstrated that poorer sections of the urban population, because of their location, physical living conditions, socio-psychological attitudes etc. become much more vulnerable to the problems of ecological degradation and environmental pollution than the others. Also, the better-off sections can afford to take measures at an individual or community level for protecting themselves against certain kinds of environmental problems. Poor, on the other hand, get hopelessly exposed to all these. Also, they have to spend most of their income on food and energy and are left with virtually nothing to improve their physical conditions of living or that of the neighbourhood.

Environmental degradation creates problems for urban population both at the macro as well as micro level. Destruction of green cover or open space, location of large chemical factories, pollution in river or major sources of drinking water, absence or break-down of sewerage treatment plants in large cities etc. pose a threat to the health of almost entire population in a city. These can be considered as macro level problems. The location of small scale or household based chemical or other units in highly congested areas, unhygienic working conditions therein, absence of protected water and sewerage/sanitation facilities in slums etc. create serious environmental problems for the people (sometimes only for a segment of it) residing in these localities. These can, therefore, be described as micro level problems. It would be worthwhile to analyse the environmental concerns, policies, schemes and expenditures in India, classifying them into the above mentioned categories.

It is difficult to find solutions to the macro environmental problems through individual or community efforts because of the huge capital and current expenditure involved in it. The

* Dr. Amitabh Knudu is Professor at the Centre for the Study of Regional Development, Jawaharlal Nehru University, New Delhi -110067.

avowed concern of the richer sections of the urbanites for the macro problems is, therefore, understandable. They can always create a micro environment within their localities, largely independent of that prevailing in the city, through private investments. They are, therefore, anxious to ensure adequate public expenditure by central, state or local governments to improve the macro environment in the city. To a certain extent, they have been successful as they are able to dictate the political process, particularly that of resource allocation, at all the three levels of governance.

It is erroneous to hold that the poor face no threat from the deterioration of the macro environment in the cities or towns. They, however, perceive the dangers from their micro environment as more immediate and definite. These dangers also become extremely critical due to their low affordability. They often tend to be indifferent to the macro level issues because of lack of education and awareness and also sometimes because they believe that others would take care of these in any case.

The problems of micro environment are nonetheless quite critical in several large cities. It can be demonstrated that the number of persons affected due to deficiencies in the micro environment is much larger than that due to the macro environment. The segmentation of large cities into rich and poor localities and pushing out of the poor into marginal lands and peripheral areas have resulted in sharp differentiation in the level and quality of basic amenities among localities. A different system of services is provided by the municipality or arranged by the local residents themselves in the slum areas that generally do not meet the standards of health or hygiene. This puts the need to improve the micro environment in these localities into a sharp focus.

In the present paper, an attempt has been made to examine the nature and magnitude of disparity in the access of water supply and sewerage/sanitation facilities to people in different levels of consumption expenditure in the urban areas, using the data from the 38th and 42nd Round of the National Sample Survey (NSS). The following section deals with the access of people in different consumption brackets, particularly the poor, to water supply system in urban areas. Similarly, the third section deals with sewerage and sanitation facilities. The pattern of disparity in the distribution of these basic amenities in the urban areas has been analysed in the two sections, based on secondary data as also a review of the studies on the subject. Certain results from a primary field survey conducted by the author for a Finance Ministry Project (Kundu, 1991) have also been incorporated in these sections. The environmental implications of the unequal distribution of the amenities have been discussed in the concluding section.

Access to Water Supply

The access of the people in different consumption brackets to water supply facilities has been analysed primarily based on the NSS data (42nd round) for the year 1986-87, as discussed above. The households covered by the NSS have been classified into ten fractiles in the ascending order of monthly per capita expenditure, each comprising roughly ten per cent of the households. The bottom-most and the top-most fractiles have further been divided into two, each comprising five per cent households. Information on water supply distribution is given by the NSSO for these twelve fractiles.

Table 1 shows the percentage distribution of persons using the major sources of drinking water over the fractile groups. Undoubtedly, taps, that provide treated water through piped system is the best and most convenient form, as far as urban water supply is concerned. It is noted that on an average 72.43 per cent of the urban population in the country are having taps as the major source of drinking water. There is, however, significant variation in the availability of tap water facilities across the consumption fractiles. The population served by tap water increase steadily from 61.34 per cent for the lowest fractiles to 89.23 per cent for the highest fractile. It is true that a substantial proportion of population among the bottom three fractiles have an access to tap water but the percentage figure is much lower than the average for all classes. It is well known that tap water is the most convenient and subsidised facility in almost all the cities and towns in the country. It may be observed, using the NSS data, that among the people obtaining water from taps, 85 per cent are served by the public sector agencies. It can, therefore, be argued that the richer sections of the population are benefiting more than the poor from this heavily subsidised tap water supply provided largely by the government.

TABLE 1 : PERCENTAGE OF PERSONS USING THE MAJOR SOURCES OF DRINKING WATER TO TOTAL PERSONS OVER FRACTILE GROUPS

<i>Categories</i>	<i>Tap</i>	<i>Tank & Pond reserved/or Drink</i>	<i>Tubewell-HandPump</i>	<i>Pucca well</i>	<i>River, Canal, Spring</i>	<i>Tanks</i>	<i>Other</i>
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>
0-5	61.34	0.50	19.32	15.55	.82	0.53	2.50
5-10	63.06	0.67	17.43	17.20	.39	0.38	1.94
10-20	63.67	0.40	19.81	14.42	.35	0.30	1.75
20-30	68.69	0.31	18.15	11.41	.35	0.33	0.66
30-40	69.69	0.12	18.74	10.28	.77	0.20	1.99
40-50	70.77	0.19	15.80	11.87	.24	0.36	0.57
50-60	75.73	0.16	13.87	8.77	.28	0.42	0.48
60-70	76.94	0.20	13.45	8.04	.36	0.34	0.54
70-80	82.24	0.11	10.34	5.97	.16	0.32	0.48
80-90	84.28	0.07	9.31	5.00	.23	0.30	0.72
90-95	85.28	0.14	9.58	3.82	.14	0.02	1.35
95-100	89.23	0.10	6.26	3.05	.76	0.00	0.09
All	72.43	0.25	15.44	10.26	.40	3.32	1.02

SOURCE : Based on NSSO (1990), Number 361,42nd Round.

It may be noted in Table 1 that whereas 19.32 and 15.55 per cent of the population at the bottom fractile depend on hand pumps and pucca wells respectively, the cor-

responding percentages are 6.26 and 3.05 for the top fractile. It is well known that in obtaining water from these two sources, capital and current expenditures on the part of the individual are generally very high. It is thus evident that a higher percentage among the poorer households are obliged to find their own sources of drinking water instead of depending on the government system. The opposite is true for the households in higher consumption fractiles.

TABLE 2 : SPECIALISATION INDEX FOR MAJOR SOURCES OF DRINKING WATER OVER FRACTILE GROUPS

<i>Categories</i>	<i>Tap</i>	<i>Tank & Pond</i>	<i>Tubewell</i>	<i>Pucca well</i>	<i>Rvier, Canal</i>	<i>Tanker</i>	<i>Others</i>
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>
0-5	.85	2.00	1.25	1.52	2.07	1.65	2.44
5-10	.87	2.68	1.13	1.67	.98	1.18	1.90
10-20	.88	1.58	1.28	1.41	.88	.95	1.71
20-30	.95	1.25	1.17	1.11	.87	1.04	.65
30-40	.96	.49	1.21	.93	1.93	.63	1.17
40-50	.98	.75	1.02	1.16	0.62	1.13	.56
50-60	1.09	.62	.90	.85	.71	1.32	.47
60-70	1.07	.78	.87	.78	9.1	1.07	.52
70-80	1.13	.43	.66	.58	.41	1.00	.47
80-90	1.16	.26	.61	.49	.58	.93	.70
90-95	1.18	.58	.62	.37	.36	.06	1.32
95-100	1.23	.42	.40	.30	1.93	-	.09

SOURCE : Based on NSSO (1990), Number 361,42nd Round.

Table 2 shows the specialisation index for major sources of drinking water. The index indicates the relative dependence of people on different sources of drinking water. This has been worked out by dividing the percentage share of each fractile in the total number of persons using a particular source by the share of that fractile in total population. The index S_{ij} for the i th fractile and j th source of drinking water may be written as follows:

$$S_{ij} = \frac{(\text{Persons in the } i\text{th fractile using the } j\text{th source}) / (\text{All persons using the } j\text{th source})}{(\text{Persons in the } i\text{th fractile}) / (\text{All Persons})}$$

It may be seen in Table 2 that the values of the index for the taps increase smoothly from lower to higher fractiles. This corroborates the argument based on Table 1 that people in the higher fractiles have an advantage in their access to tap water than those in lower fractiles.

The value of the index goes over unity in the expenditure fractile 50-60 and goes up steadily to 1.23 for the top-most fractile. For all other sources of drinking water like tubewell, pucca well etc., the pattern is just the opposite. Poorer people, thus, obtain water from sources that are generally less hygienic, less reliable and more expensive.

TABLE 3 : PERCENTAGE OF PERSONS BY MAJOR SOURCES OF DRINKING WATER AMONG HOUSEHOLDS BELONGING TO BOTTOM FORTY PER CENT EXPENDITURE FRACTILE TO ALL PERSONS IN THE SAME FRACTILE

States	Tap	Tubewell/ Hand Pump	Pucca Well	Tank/ Pond	River/ Canal	Tankers
1	2	3	4	5	6	7
AndhraPradesh	70.63	14.81	16.70	0.40	0.37	0.76
Assam	33.34	49.10	11.81	1.18	1.65	-
Bihar	36.02	34.13	26.98	0.82		0.21
Gujarat	90.27	16.00	1.74	-		-
Haryana	78.01	21.99	-	-		-
Himachal Pradesh	93.30	1.02	3.10		2.59	-
Jammu & Kashmir	91.21	31.63	0.42		3.28	1.76
Karnataka	78.52	6.93	11.45	1.96		-
Kerala	43.52	.52	54.48	1.08		-
Madhya Pradesh	76.39	8.80	13.42		0.65	-
Maharashtra	90.26	2.08	7.09		0.11	0.05
Orissa	42.33	15.18	35.00	2.83	5.06	-
Punjab	52.75	47.05	0.20	-		-
Rajasthan	74.64	9.01	15.41	-		-
Tamil Nadu	67.54	17.78	10.17	3.90	1.43	2.10
Tripura	77.36	16.14	19.54	2.01		-
Uttar Pradesh	47.85	35.77	14.67		0.22	-
West Bengal	60.50	42.77	8.35	-		0.02
All India	66.01	18.74	12.99	.36	.52	.32

SOURCE : Based on NSSO (1990), Number 361,42nd Round.

Disparity among different classes in their access to the sources of water comes out more sharply in Table 3 where the figures of bottom five fractiles are clubbed together. This table thus gives information regarding the access of bottom 40 per cent households to different sources of drinking water across the states. It is noted from this table that 66.01 per cent

population among the bottom forty percent households have access to tap water whereas the corresponding figures for all fractiles is as high as 72.43 per cent. For sources of water other than taps, the figures for this category of population are higher than that for the total urban population. Among the bottom 40 per cent households 18.74 and 12.99 per cent population obtain water from hand pumps and pucca wells respectively whereas the averages for all fractiles are 15.44 and 10.26 only for these two sources (Table 1).

It may be argued using the NSS data that the level of development of the state has a direct relationship with the per cent population covered through formal water supply system. Aggregative figures from the 42nd Round of NSS show that in the less developed states like Assam, Bihar, Kerala, Orissa and Uttar Pradesh, the per cent population served by tap water is much lower than the national average. It is now seen from Table 3 that the percentage of population belonging to the bottom 40 per cent category served by tap water in these states is much less than their state average. On the other hand, in the states like Gujarat, Maharashtra, Haryana, Himachal Pradesh, Jammu and Kashmir etc., where the coverage of population through tap water is high, a high percentage of poorer people are also getting the advantage, as the state figures in Table 3 are higher than the national figures. However, in relation to the population belonging to the higher fractiles in the same state, their share is definitely lower, as observed through the detailed analysis of the NSS data.

It is, thus, evident that about 34 per cent of the population among the urban poor are not being covered by formal piped water supply and that they are obliged to draw water from sources that are mostly private, at a payment higher than the formal system. In the relatively less developed states, the percentage of poor outside the tap water system is also high—over sixty per cent. The variations in coverage between lower and upper fractiles of population work out to be very high in the less developed states.

The major limitation of the 42nd Round NSS data is that it does not indicate the quality and quantity of water available to a household. Access to any source of water does not indicate adequacy of water or its potability. Also NSS provides no information on the labour or time spent in obtaining the daily water requirement. An attempt, therefore, has been made here to supplement the data on access through field surveys in selected cities and also through the information available from surveys and studies conducted by other researchers. National Institute of Urban Affairs (NIUA, 1989) in a recent study has shown—based on information provided by the Government of Madhya Pradesh — that the supply through public standposts (which usually is the source of tap water for majority of urban poor) varies between 22 lpcd (litres per capita per day) and 36 lpcd whereas the supply through domestic connections varies from 36 lpcd to 120 lpcd. The study further shows that in the sample towns of Karnataka, the percentage of population depending on public standposts and getting a supply of less than 20 lpcd varies between 14 to 70. The National Commission on Urbanisation (1988) notes that "the per capita water consumption was reported to be between 10-25 litres per day in slum areas of Bangalore". It is, therefore, evident that in most cities, per capita water supply to the poorer sections of the population is much below the recommended minimum. The discussion with concerned officials of the municipalities in the cities of Calcutta, Delhi and Ahmedabad during the field survey for the Finance Ministry Project also corroborated this. According to a tentative estimate, given by the officials in the

Ahmedabad Municipal Corporation, 25 per cent of the population within the municipal area consume 90 per cent of the water supplied while the remaining 75 per cent population have to do with only 10 per cent of the water. In Calcutta and Bombay, too, the supply in slum areas through public standposts is much less than in other areas. In Calcutta, per capita water supply in slums is 20 gallons whereas in non-slum areas, it is 60 gallons. In Bombay, the corresponding figures are 90 lpcd and 130 lpcd respectively. All these figures substantiate the conclusion based on the NSS data that the distribution of water in urban areas is extremely inequitable and biased against the poor.

The number of persons served per standpost in slum areas is much above the recommended maximum under different slum improvement programmes (e.g. EIUS norm is one tap for 150 people) in all large cities. A survey conducted by the Town and Country Planning Organisation (TCPO, 1984) shows that the number of slum dwellers per standpost comes to 170 in Rajkot, 200 in Ahmedabad, 421 in Kolhapur, 454 in Miraj and 692 in Godhra. The significant finding of the TCPO study, covering thirty urban centres belonging to different size classes, is that a substantial segment of the slum population in many of these cities is doing without the public water supply.' The study cites the example of Kolhapur where a major slum cluster of 3502 persons depended just on two wells. Our field survey data for Delhi brought out that about 200 families are served by a standpost in the selected slums.

Accessibility to a water source also does not mean that it is available easily near the premises. In many localities, the public standpost is situated at considerable distances from the hutments. The NIUA (1989) survey shows that as many as 31 per cent of the sample households have to walk between 50 feet to 100 feet to collect water and many among the poor, their women and children, cover the distance not once but several times a day to collect their daily requirement. During the field survey in Ahmedabad, it was observed that in the eastern part of the city — which has been recently included in the municipal corporation — poor people have to walk more than half a kilometre to get a bucketful of water from the road side taps where the water supply is very erratic and remains only for a short period of time. In Delhi, 37.3 per cent of the population surveyed identified the water source being away from their houses as the major difficulty in getting water. Another important factor affecting the access of the poor to water is low water pressure and short duration of supply in public standposts. They have to wait in long queues for their turn and in Delhi more than 30 per cent people complained of this.

Access to Sanitation Facilities

The basic information on the access of people in different consumption brackets to sanitation facilities analysed in this section, are available from the 38th Round of the NSS for the calendar year of 1983. Table 4 shows the percentage of population having access to different types of latrines and those without any latrine facility over the expenditure categories. It is noted that the percentage of people not having any latrine facility is very high in lower expenditure groups and the figure goes down with the increase in expenditure level. Accessibility to toilet facility is, thus, positively related with per capita monthly expenditure. In case of tap water also, a similar relationship was noted

but the disparity in the distribution and the gap between the lower and upper fractiles in terms of latrine facility is significantly higher than in the former. It is striking that in the lower fractiles (excepting the bottom fractile wherein the percentage of households is very small), only about 35 per cent of the population have latrine facilities, the figure becoming as high as 80 per cent in the top fractiles.

TABLE 4 : PERCENTAGE DISTRIBUTION OF HOUSEHOLDS OVER TYPE OF LATRINES BY MONTHLY PER CAPITA EXPENDITURE CLASSES

<i>Monthly Per Capita Exp. Class</i>	<i>No Latrine Facility</i>	<i>Latrine Type</i>			
		<i>Service</i>	<i>Septic Tank</i>	<i>Flush System</i>	<i>All Households</i>
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>
0-30	39.86	21.03	58.23	20.73	100.00
30-40	67.04	39.29	43.99	16.72	100.00
40-50	66.00	44.92	43.43	11.65	100.00
50-60	62.17	63.37	19.90	16.73	100.00
60-70	59.54	54.97	22.28	17.75	100.00
70-85	56.63	53.93	27.28	18.79	100.00
85-100	52.17	45.96	31.20	22.83	100.00
100-125	44.49	42.85	32.84	24.30	100.00
125-150	36.98	34.52	36.85	28.62	100.00
150-200	32.27	30.08	37.50	32.41	100.00
200-250	26.57	24.18	39.15	36.67	100.00
250-300	22.21	19.32	38.72	41.96	100.00
Above 300	16.27	14.22	34.06	51.73	100.00
All Classes	36.82	30.71	35.01	34.19	100.00

SOURCE : Based on NSSO (1987), Number 339,38th Round.

The distribution of population having latrines of different types in this table shows that poorer people are dependent more on service latrines than on septic tanks and minimally on flush latrines. Correspondingly, people in the higher expenditure categories are having more septic tanks and flush latrines. It is important that around 40 per cent of the population in the higher consumption fractiles are having flush latrines that are generally connected to sewerage system. These are managed and maintained by the local authorities for which in

some cases nominal user charge is levied on the households. One can, thus, argue that the subsidised system of toilet and sanitation facilities are available more to relatively well-off sections of the population.

TABLE 5 : PERCENTAGE DISTRIBUTION OF HOUSEHOLDS OVER FACILITY OF LATRINES BY MONTHLY PER CAPITA EXPENDITURE CLASSES

<i>Monthly Per Capita Exp. Class</i>	<i>Households with Latrines</i>	
	<i>Shared</i>	<i>Exclusive</i>
<i>1</i>	<i>3</i>	<i>4</i>
0-30	88.03	11.97
30-40	78.37	21.63
40-50	67.53	32.47
50-60	60.56	39.44
60-70	62.33	37.67
70-85	59.21	40.79
85-100	62.51	37.49
100-125	60.71	39.29
125-150	59.33	40.67
150-200	58.84	41.16
200-250	55.60	44.40
250-300	55.91	44.09
Above 300	55.91	48.47
All Classes	57.60	42.40

SOURCE : Based on NSSO (1987), Number 339,38th Round.

The figures in Table 5 show that among the persons having latrine facility, the incidence of shared latrines is extremely high at lower levels of consumption. There is a steady decline in the percentage of households dependent on shared latrines, as we move from lower to higher consumption fractiles. People with higher consumption, thus, not only have the privilege of a latrine facility but also have these for their exclusive use. The pattern for the poor households is just the opposite, as mentioned above. For household with monthly per capita expenditure below Rs. 85, less than 40 per cent have a toilet facility and about seventy per cent of those having it, share it with others. Only top three fractiles have percentage of households dependent on shared latrines less than the national average of 58 per cent.

In Table 6, the figures for roughly bottom 40 per cent households (with per capita expenditure up to Rs. 125) have been combined. The table presents the access of these households to latrine facilities in different states and union territories. It may be seen that the average figure for households not having any latrine facility for all expenditure groups is only 36.82 per cent. The corresponding figure for the bottom 40 per cent households is substantially higher viz. 51.82 per cent.

TABLE 6 : PERCENTAGE OF HOUSEHOLDS WITH LATRINE FACILITIES AMONG HOUSEHOLDS WITH CONSUMPTION EXPENDITURE UP TO RS. 125

<i>States/Union Territories</i>	<i>No Latrine Facility</i>	<i>Households with Latrines</i>	
		<i>Shared</i>	<i>Exclusive</i>
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
Andhra Pradesh	66.37	77.85	22.15
Assam	33.90	42.54	57.46
Bihar	65.97	71.67	28.33
Gujarat	43.72	54.44	45.56
Haryana	47.51	24.29	75.71
Himachal Pradesh	51.50	24.44	75.56
Jammu & Kashmir	26.63	67.00	33.00
Karnataka	61.60	60.81	39.19
Kerala	45.51	19.58	80.42
Madhya Pradesh	60.59	59.37	40.63
Maharashtra	48.58	80.03	19.97
Manipur	4.85	69.59	30.40
Nagaland	10.07	37.75	(52.25)
Orissa	79.75	42.52	57.48
Punjab	39.48	49.77	50.23
Rajasthan	60.33	57.15	42.85
Sikkim	32.10	63.22	36.78
Tamil Nadu	65.39	65.99	34.01
Uttar Pradesh	34.52	54.23	45.77
West Bengal	21.79	65.11	34.89
Andaman & Nicobar	52.72	73.10	26.90
Chandigarh	34.16	28.13	71.87
Delhi	47.61	50.22	49.78
Goa, Daman & Diu	81.43	24.88	75.12
Mizoram	16.99	38.42	61.58
Pondicherry	89.44	21.40	78.60
All India	51.82	61.41	38.59

SOURCE : Based on NSSO (1987), Number 339, 38th Round.

It is noted that accessibility to sanitation facility for the poor is worse in most of the states and union territories compared to water supply. Also, in several states like Andhra Pradesh, Bihar, Karnataka, Madhya Pradesh, Orissa, Rajasthan and Tamil Nadu, the percentage of households having no latrine facility is much higher than the all-India average. In the eastern states like Nagaland, Manipur, Mizoram and even West Bengal, the corresponding figures of no-latrine households are, however, much lower. In the discussion on interstate variation in the access of poor to water supply in the preceding section, it was observed that the access of the poor was directly related to the level of development and the average level of water supply facilities in the state. Similar pattern, however, does not emerge in case of sanitation facilities. The absence of latrine facilities for the poor can not be attributed to the backwardness of the state or its overall level of sanitation facilities. It is seen that a very high proportion of the poor households (belonging to the bottom 40 per cent category) in relatively developed states like Maharashtra, Gujarat, Punjab etc. are denied the latrine facilities.

Among the households having some sort of latrine facility, over 60 per cent among the poor are sharing it with others (Table 6). The states and UTs, where the percentages of population sharing the facility are higher than the national average are Andhra Pradesh, Bihar, Jammu and Kashmir, Maharashtra, Tamil Nadu, West Bengal, Andaman & Nicobar islands, Manipur and Sikkim. In Maharashtra, the figure is as high as 80 per cent and in states like Andhra Pradesh, Bihar, Andaman & Nicobar it is more than 70 per cent. But in small states and UTs like Assam, Orissa, Haryana, Himachal Pradesh, Goa, Daman and Diu, Pondicherry Mizoram etc., large segments among the poor households are having exclusive latrines, although overall population coverage through this facility is low. Chandigarh and Nagaland appear to be exceptional cases where a large percentage of poor have latrines and have them for their exclusive use. This is because these have new and well planned cities wherein the percentage of workers in the private sector and particularly in the unorganised units is very low.'

The foregoing analysis of the availability of toilet and sanitation facilities in urban India clearly brings out that the poor have a much lower share in them than the non-poor. It is indeed very alarming that more than one-third of the urban households are not having any latrine facility. Among those who have it, a high percentage depends on service latrine which is unhygienic and often becomes a threat to the micro environment. The provision of latrine facilities becomes more of an individual than a government effort as one goes from higher to lower income or consumption levels, as was also noted in water supply. Although sharing of latrines is quite common for poor households (over 60 per cent have shared latrines), this is extremely high for several states, the figure being as high as 80 per cent. The rich, on the other hand, are having more of individual flush latrines that are most efficient, convenient and highly subsidised by the state or local governments.

The above analysis corroborates the view of the National Commission on Urbanisation (1988) that, "If the water supply system is unequal in favour of the rich, the sewerage system is more unjust and even more biased in favour of the rich". Several studies at the town and state levels based on field surveys strengthen some of our results. The study conducted by TCPO, mentioned in the previous section on water supply, reveals that sewerage facilities exist in only 18 of the 30 towns/cities surveyed and here too a small proportion of well-to-do population is covered. The study by Operation Research Group (ORG, 1989) on Rajkot

shows that in the city, 40 per cent of the households do not have a private latrine, 28 per cent use open space for defecation and 20 per cent use public latrines. It was noted during the field survey in Delhi, and subsequently confirmed by the municipal authorities that, of the 44 resettlement colonies in the city only 9 are connected to the sewerage system. In others, either the sewerlines are partly laid or have not been laid at all. The conditions in *Jhuggi Jhopri* clusters in Delhi are much worse. Nearly 37 per cent of the households surveyed do not have an access to any type of latrine or sanitation facility. Another 26 per cent use community toilets, while only 2.4 per cent have individual toilets (Kundu, 1991).

The public authorities in different cities have tried to provide toilets with low cost sanitation facility which requires less water and no sewerage system. But these are, more often than not, very poorly maintained and the number of persons per toilet seat are several times the requisite maximum. As in case of water, the distance of the facility from the place of residence is the major problem in case of toilets as well. In Delhi, nearly 36 per cent of the households surveyed had complaints on this account. Long queues, dirty toilets and water shortages (in the toilets) are the three major factors identified by the slum dwellers for their not using the public system. Similar situations exist in other large cities like Calcutta, Bombay, Madras and Ahmedabad as well.

Concluding Observations

The public water supply system in urban areas is heavily subsidised through government grants, advanced from time to time to meet the capital as well as current expenditures. The system, however, does not show a significant bias in favour of the households in the lower consumption fractiles, as noted above. Among the people below the poverty line, about 66 per cent are covered by the piped water supply which is significantly below the figure for the total population namely, 72 per cent. The disparity comes out much more sharply when the per capita consumption of water by people in different consumption fractiles, estimated through micro level surveys, is considered. This is primarily because the existing organisational structure, pricing policy etc. have not been designed specifically to provide the minimum quantity of water to all sections of the people. There is no significant progressivity in the pricing of water in most of the states and cities and as a result, a large portion of this subsidised facility is used by the higher income population. This results in wastage and non-priority use of water (Kundu, 1991).

In a few states, Slum Clearance Boards have been set up that take up water supply projects in low income areas. The responsibility of distributing water to different localities and maintaining the system, however, lies primarily with the local bodies wherein the vested interests of the middle and upper classes predominate. It may be observed that the localities inhabited by the poor are mostly served by public standposts (PSP), hand pumps and tubewells. Water is available in these localities generally at a low pressure for a short duration. The number of persons dependent on standpost, handpump or tubewell is also very high.

Like other basic amenities, the sanitation and sewerage system organised by local governments have not benefited the poor as much as the other sections of urban population.

The percentage of households without latrines is very high among the bottom 40 per cent, A majority of the poor households, that report having a toilet, use community facilities.

Based on the above analysis, it can be argued that while attempts are being made to improve the macro environment in the large cities through investments in the formal water supply and sewerage systems, a substantial segment of the poor remains outside it. In their struggle for survival, they find informal solutions to their problems of access to basic amenities, largely through private initiative. The vertical inequality, which is often reflected in spatial disparity due to the concentration of urban poor in a few pockets, thus, poses a major threat to the micro level environment in the slums and low income colonies in these cities.

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