

Working Paper NO-26

# **Urban Governance for Sanitary Waste Management Services in Jabalpur**

**Gaurav V. Jain  
Dr. Darshini Mahadevia  
Dr. C.N.Ray**

**School of Planning  
CEPT  
Ahmedabad**

**January 2005**

## **Background**

Governance is defined as the exercise of authority to make decisions and implement those decisions by government (Subject) for the welfare of body politic (Object). It involves state and civil society as major stakeholders (UN-ESCAPE). Government is the subject of governance as it is a legitimate body with authority to make decisions. The citizens are the object of governance as they are directly or indirectly affected by the decisions of subject (Kooiman, 1993). The decisions taken by government are under the influence of many actors like media, business houses, academia, non-governmental agencies, foreign funding agencies etc. The purpose of governance is basically to provide services that develop human resources; improve productivity and raise the standard of living of urban population. In other words governance is aimed at solving the perceived problems of the society.

The provision of basic infrastructure services in a city is considered to be the primary objective of governance. These services, namely water, sewerage, drainage and solid waste management, have direct bearing upon the sustainability of human life in a city. They affect all forms of population irrespective of caste, class or gender. In urban areas these problems become more complicated due to high density, limited natural resources, and fast pace of growth. These basic services affect the productivity and hence economy of the city, negligence of which could severely hamper its development prospects. Recognising the need of water and its importance for existence of human life, the governments in India, at different levels, have always been concerned with making adequate provisions for water supply (NIUA, 1998). Nevertheless, the country today has at least managed to provide access to water to as much as 85 % urban population (Jagadanada, 2002). Contrary to this, the case of sanitation is miserable. The House Listing and Amenities Tables of Census of India (2001) shows that even after 50 years of independence, in urban India, 26.3 % population have no latrine, 29.4 % houses do not have in-house bathroom and 65.5 % houses do not have closed drainage which is responsible for several environmental problems.

In order to investigate the deficiencies in infrastructure to support sanitary waste management, it is essential to determine the institutions involved in making the provision for the same. As sanitation in urban India is a subject of the urban local bodies (ULBs), the municipal authorities and the urban development authorities are concerned with making adequate provisions for safe and hygienic disposal of waste. The state government departments, boards and corporations in some states also offer assistance to ULB's in development of projects concerning sanitation. Private sector is another actor involved in provision of selected services of sanitation, mostly in the areas where direct cost recovery is possible. There are also certain NGO's like Sulabh International involved in sanitation sector. They work as a link between government and the people.

Paucity of funds is one of the major problems affecting sanitary waste management services in India. The infrastructure required for sanitation like house toilets, sewerage system, sewage treatment facilities, sewage pumping stations, drainage networks, etc., requires huge expenditure. In light of other problems like water, roads and electricity, the sanitation sector often receives lesser attention of policy makers and planners. Thus, due to low

demand for sanitation services, the cost recovery becomes particularly different in this sector.

The technological issues related to sanitation are also responsible for sanitary waste management services in many urban areas. Conventionally, engineering measures like sewerage system have been considered to be the most effective solution to improve sanitation in a city. However, in India most of the cities are not in position to afford these systems of sanitation. Thus, there is large number of towns and cities in India where there is no sewerage system and the wastewater is not disposed hygienically, polluting environment and endangering the lives of people.

Jabalpur is one such city in India which does not have sewerage system and the wastewater is disposed of into rivers, ponds, open plots and agriculture field without any treatment. The network of open drains provide excellent breeding place for mosquitoes, insects, rodents etc. It is not the case that state and local government institutions are not interested in solving the problem. On the contrary, the city has already prepared number of proposals and got technical and administrative approvals from various government departments for a sewerage system and a sewage treatment plant. However, the city has yet not been able to avail finance for its projects. This leads us to identify alternative solutions and to improve existing institutions for better service delivery.

### **Aim**

The aim of this study is to study what are the governance mechanisms in a city and how can they be improved so as to promote efficiency, equity and accountability in the delivery of basic infrastructure services. Thus, the work investigates the political, administrative and management mechanisms of a city in delivery of basic services and the ways in which decisions are made at local government level. It will identify the various actors involved in governance and inter-relationships between them. The research will establish a relationship between sanitation and governance.

### **Objectives**

The study is aimed at understanding the system of governance and basic service delivery in Jabalpur with special emphasis on sanitation issues with an intention of improving the services to residents. Following objectives have been identified:

- a) To understand local government structures, legislative support and basic service delivery mechanisms in Jabalpur.
- b) To study existing sanitation scenario in the city of Jabalpur.
- c) To identify various actors involved in making provisions for sanitation and study their role and relations with local government.

## **Research Tools**

The available publications and documents about governance and service provision in the study area have been reviewed. This includes the study of reports, technical reports, local histories, budgets and accounts, newspaper articles, etc. of last few years depending upon the availability. This also includes the study of state and national legislations, regulations, policy documents and evaluations pertaining to urban governance and sanitation.

A reconnaissance survey of the study area assisted in identification of the problems and trouble-spots within the city. Interviews with local and state officials, eminent personalities and elected representatives helped in filling up the information gaps. This also helped in understanding their perception about the problems and their possible solutions. Focus group discussions (FGDs) with 'the people having no toilets' were conducted. The issues like accountability, participation in election, complaints and general perception of such people towards government etc, were identified using this technique. The FGDs were followed by detailed primary survey.

A structured questionnaire survey was conducted in a ward in the Jabalpur Municipal Corporation (JMC) with intention of drawing a profile of persons having no latrines, those with septic tanks and those in Jabalpur Development Authority (JDA) colony (30 samples were taken with 15 belonging to poor and low income families without toilets, 5 from residents of JDA colony and 10 from higher and middle income group staying in the JMC area with septic tank). The prime focus of the study has been to understand governance mechanisms in a city. However, this study on governance is limited to issues concerning sanitation alone. Geographically the study is limited to governance mechanisms within the JMC limits inclusive of areas developed by the JDA. The issues concerning liquid waste and excreta disposal were taken into consideration with respect to sanitary waste management only.

## **The City**

The city of Jabalpur is third largest city of Madhya Pradesh state. It is an important trade and commerce centre, industrial centre, educational centre and administrative centre of regional and national importance. At the time of the formation of Madhya Pradesh state, the city was being considered for the status of state capital, which eventually did not happen. The city is part of million plus urban agglomeration of Jabalpur. It has a population of 932,484 as per Census of India (2001). The city is governed by the Jabalpur Municipal Corporation constituted under Madhya Pradesh Municipal Corporation Act (Act 23 of 1956). The JMC has a Mayor-in-Council type of system and all basic infrastructure needs of the city are the responsibility of Municipal Corporation.

## **Transportation Links**

Jabalpur is well connected by roads, rails and airways. National Highway-7 passing through the city links it with important neighbouring cities like Nagpur, Raipur, Bhopal, Allahabad,

Sagar etc. The city being an important station on the Allahabad - Itarsi section of the Howrah -Mumbai main line, has direct railway route to important cities of national importance like Mumbai, Howrah, Delhi, Varanasi, Secunderabad, Patna, Cochin, Chennai, Lucknow, Rajkot, Ahmedabad, Surat and Guwahati. The city has recently been made the head office of central zone of Indian Railways. The city also has an airport with flights for Raipur and Delhi. The airport is however currently defunct.

The city is a big centre for trade and commerce of various commodities, mainly due to the good connectivity of Jabalpur city with places of regional and national importance by railways and roadways. Large *Mandis* (Markets) dealing in various commodities such as grain, cloth, hardware, glassware, timber, vegetable, and fruit exist in the city.

Jabalpur has been classified as 'Class A' city by Government of India which indicates a highly industrialized city. The main industrial sectors herein are defence establishments, garment industries, limestone extraction and allied industries. Bidi making and stone carving are two traditional industries which were once major source of employment in rural areas, are now in declining state. Other cottage industries based on forest produce are also in existence. The city has two industrial centres namely Richhal industrial area (1965 established, 11 km away from city centre) and Adhartal industrial area (1962 established, 6 km away from city centre) with 191.77 ha and 43.18 ha area respectively. Most of the industries in Ricchal industrial area are closed or sick. Currently, large scale dairy development is being initiated along Katni-Jabalpur road.

The city is an important centre for education as well. It has Rani Durgawati University and Jawaharlal Nehru Agriculture University, offering education in wide range of subjects. Further, it has a Telecommunication training centre of national importance. Jabalpur being the district headquarters of Jabalpur district has a Collector office with administrative officers at divisional and district level. The city of Jabalpur is headquarters of Madhya Pradesh Electricity Board and Central Railway. It also has the High Court of Madhya Pradesh State. This indicates the importance of city as an administrative centre.

### **City Growth and Evolution**

Tripuri is said to be the most ancient form of city that existed in this region. This city is believed to be located at the site where the Tewar village is presently located. The proximity to the river Narmada has been depicted as the cause for its choice as capital by the rulers of Tripura or Chedi country. Tripuri remained the centre of power till the uprising of Gonds in 14th century A.D. The Gonds established there capital at Garha-Katanga. The Gonds preferred this location of Gadha-Katanga for its physiographical features and fertile land. The region was easily defendable from invaders due to its scattered low hillocks as mentioned in some of the Mugal literature. However, the Moguls finally defeated Rani Durgavati, last and perhaps the most famous Gond Ruler, in 1564 A.D.

The British took the charge of the region by 1818 and made it there district headquarters in 1820 A.D. The Cantonment Board was established in 1826 with an area of 445 acres and was enlarged in 1837. The Cantonment Act was extended to the Cantonment of Jabalpur in

1864-65. Apart from that, the railway station in 1870 and the High Court in 1882 dictates the importance city received during British rule. The city therefore assumed a tri-nuclear urban form with old Millionigunj and Hanumantal localities, Garha and Cantonment. These localities have different characteristics, both social and economical. The Millionigunj and Hanumantal assumed the character of commercial centre habited by business community. The Cantonment area grew with military establishments and Garha was occupied by serfs. The horse shoe shaped railway line physically divided these areas. The establishment of Gun Carriage Factory in 1904, Madan Mahal railway station and narrow gauge rail line between Jabalpur and Gondia followed these developments during 1901-1920 A.D.

In the period 1920-41, the Millionigunj and Cantonment area link got strengthened with the establishment of many government offices in this area. The important of those are Municipal Council Office (1914) and Victoria Memorial Hospital (1933). During these decades the city grew at a faster rate. In 1941, Napier Town and Wright Town areas were planned and established. These well planned areas were controlled by specified rules of subdivision of lands and coverage restriction. They form the posh localities in the region. Later in 1943, the Telecom Workshop and the Ordinance Factory at Khamaria were established.

In post independence phase many remarkable events took place indicating the importance of the city in this region. Engineering College (1947), Vetenary College (1948), Medical College (1956), Shahid Smarak (1956), Madhya Pradesh Electricity Board Headquarters (1957) and the Home Science College (1960) are some of the institutions established in the city contributing towards the social, economical and cultural needs of the city.

The city got Municipal Corporation on 31st May 1950, under City of Jabalpur Corporation (Act III of 1948). The city had an area of 12 sq. miles and it had 30 wards. The jurisdiction of Corporation was enlarged in 1959 to cover an area of 52 sq. miles and 46 wards which later got raised to 53 wards. The Corporation was brought under Madhya Bharat Municipal Corporation Act of 1956 on 17th May 1961. The numbers of wards were raised to 60 in year 1994 by the notification of State Government.

## **Topography**

Jabalpur is surrounded by low, rocky and barren hillocks. The city has Kariya Pathar hills in north-east, Khandari hills and Sita Pahad in east, and Madan Mahal and Rampur hills in its south. This low hill terrain has resulted into formation of large number of small and large water bodies and tanks in the city. The western and north-west portions of city however have plane lands and these are the areas with dense population with future prospects for urban sprawl.

## **Natural Drainage**

The drainage is divided into two parts. In northern part of the town it gradually slopes from East to North-west while in Southern part of the town it slopes towards east to south west. The central ridge line is parallel to the railway line which begins from the dwarf hills in east and runs to the west. The storm water along with domestic wastewater of central city area is

conveyed mainly by Omti nalla and Moti nalla into the River Pariyat. The Pariyat River, which forms the northern boundary of planning area, merges into river Hiran which is a tributary of River Narmada. Similarly in southern part of the city, Khandari nalla and Shah Nalla drain into Narmada River.

### **Population Growth**

As mentioned before, Jabalpur is the third largest city of Madhya Pradesh. The population of the JMC area is 956,107 as per 2001 census recording a decadal growth rate of 25.05%. The average population density in Municipal Corporation area is 328 persons per ha. The sex ratio in the city is 909. The population of Schedule Caste and Scheduled Tribe form 12.92% and 4.05% of total population. It is observed that decadal growth rate of 25.68% for Jabalpur is higher as compared to Gwalior but lower than the Bhopal and Indore. The average population density in Municipal Corporation area is 328 persons per ha with minimum density of 12.9 in Ward no. 60 (Rani Lakshmibai ward) and maximum density of 1116.3 persons per ha in ward no 26 (Maulana Abdul Kallam ward).

The sex ratio in the JMC is better than Indore and Gwalior. Moreover, the juvenile sex ratio being higher than overall sex ratio, the chances of male in-migration are present. Bhopal being capital city is recording high level of variation between over-all sex ratio and juvenile sex ratio. The family size in Jabalpur is relatively low as compared to Gwalior and Indore. This again points out towards the possibilities of in-migration. The literacy rate in Jabalpur is much better as compared to that in other municipal Corporation areas. The male literacy rate is though higher than female literacy rate in all four Municipal Corporations, the difference in Jabalpur is relatively low.

### **Economy**

The percentage of non workers in Municipal Corporation area is 70% as against 72.99% in 1991. 47.22% male and 12.03% female population is engaged in work. The percentages of main, marginal and non workers for Jabalpur Municipal Corporation area are 27%, 3% and 70% respectively. The workforce engaged in primary, secondary and tertiary occupations are 4.46%, 32.32% and 63.31% respectively, on the basis of nine-fold classification for census year 1991.

### **Land Use**

First development plan for the city of Jabalpur was framed in August 1977 by Town and Country Planning Department, Madhya Pradesh. The plan was prepared for a population of 11 lakh by 1991. The proposed land use and land allocation for 1991 shows that only 45% of proposed land use could be implemented till 1994. The Jabalpur Development Plan 2005 was published in 1995 and was approved by state government in 1998. This plan has been prepared for a population of 12.0 lakh by 2005.

**Table-1 Land use from 1976 to 1991**

Land Use	Land use in 1976		Proposed Land use for 1991	
	Area in ha	%	Area in ha	%
<i>Residential</i>	1544	49.59	3960	40.0
<i>Commercial</i>	68	2.17	374	3.78
<i>Industrial</i>	264	8.45	1144	11.55
<i>Public and Semi-public utilities</i>	512	16.44	1353	13.67
<i>Recreational</i>	39	1.25	1287	13.00
<i>Transportation</i>	688	22.10	1782	18.00
<b>Total</b>	<b>3114</b>	<b>100.00</b>	<b>9900</b>	<b>100.00</b>

**Table-2 Existing and proposed Land use from 1994 to 2005**

Land Use	Land use in 1994		Proposed Land use for 2005	
	Area in ha	%	Area in ha	%
<i>Residential</i>	2328	51.50	3807	52.00
<i>Commercial</i>	124	2.70	445	6.10
<i>Industrial</i>	368	8.10	551	7.50
<i>Public and Semi-public utilities</i>	714	15.80	876	11.90
<i>Recreational</i>	139	3.10	540	7.40
<i>Transportation</i>	847	18.80	1107	15.10
<b>Total</b>	<b>4520</b>	<b>100.0</b>	<b>7326</b>	<b>100.00</b>

Following are the major issues in present landuse:

- Pressure of urban development around Damoh Road and areas lying between Patan Road and Narsipur Road.
- Haphazard and unplanned development along the Damoh road
- Limited growth in the eastern part of city
- Non-availability of land for future development
- Underutilized industrial area
- Existence of large number of water bodies
- Concentration of illegal colonies
- Large scale Dairy development along Katni road.

### **Local Self Government: Jabalpur Municipal Corporation**

The city of Jabalpur got the status of Municipal Corporation in year 1950 by Act no. 3 of 1948, 'City of Jabalpur Municipal Corporation Act' framed on the analogy of enactments governing the cities of Madras, Calcutta and Patna. However, in order to enact a unified law for the whole state, the Act no. 13 of 1961 repealed the 'City of Jabalpur Corporation Act', 1948 and extended the 'Madhya Pradesh Municipal Corporation Act' 1956 (23 of 1956).

Mayor-in-Council System of Municipal Corporation was introduced in Jabalpur in year 1998. The 74th Constitutional Amendment Act of 1992 led to major changes in municipal governance in Madhya Pradesh. The act led to introduction of reservations for Scheduled

Castes (SCs), Scheduled Tribes (ST) and women (1994); Constitution of Ward Committee (1995) and *Mohalla Samitis* (2001); Financial Powers to Authorities (1994) and Property tax norms (1997).

### **Organisation and Structure**

The city has Mayor-In-Council type of municipal Corporation. The Mayor of Municipal Corporation is directly elected by the citizens for a term of five years. Mayor constitutes a Mayor-In-Council from the elected Councilors. The Mayor-In-Council consists of the Mayor and ten members in every Corporation. Each member is made in-charge of one of the ten committees of the Corporation. Mayor is the Chairman of Mayor-in-Council and presides over the meetings of Mayor-in-Council. Advisory Committees are constituted for each of the departments of the Corporation amongst the elected Councilors to assist in the affairs of the departments concerned.

There are eleven major departments in the Municipal Corporation. These are Administration, General Administration, Revenue, Health and Hospital, Workshop, Waterworks, Light, Fire Extinguishing, Garden and Education.

The State legislation provides for constitution of Ward Committees and *Mohalla Samiti*. Ward Committees are to be constituted at the level of each zone for every 1 lakh population. *Mohalla Samitis* are to be constituted within each ward to represent 50 to 1000 households. The city has eight Ward Committees, but the constitution of *Mohalla Samitis* is under consideration. The Municipal Commissioner heads the executive wing and he is assisted by two Deputy Commissioners.

### **Decision Making Process**

The decision making process in Municipal Corporation can be divided into two stages. Firstly, the process of making strategic decisions like, prioritisation of services, preparation of budget, and other policy decisions. In democratic system, these decisions are made by the elected wing of the government. The decisions related to planning, designing, execution, and operation and maintenance are taken by the executive wing of government. *Mohalla Samitis* have yet to be formed in the city. Also the Ward Committees are not participating actively at present.

In the process of preparing budget, each of the Ward Committee is expected to send proposals for specific projects for their respective zones by the end of October. Simultaneously, the officers at Zonal office also send proposals for various works in respective departments in their zones. The Commissioner then prepares a budget and lays it before the Mayor-in-Council for further review.

After making necessary modifications and additions in the budget, the Mayor-in-Council submits the same to the Corporation by 15th January. The Corporation, after discussion on the budget, may refer the budget back to Mayor-in-Council for further considerations or adopt the budget estimates or submit any revised budget estimates to Mayor-in-Council by 15th February. In case no consensus is reached by 31st March, the budget of Mayor-in-Council is considered to be final.

## Municipal Finance

The total budget size for year 2000-2001 was reported to be Rs. 4,928.92 lakh. The share of capital income in total income of Corporation was found to be 8.8% in year 2001-02 as against 3.54% in 2000-01 (average of five years was 6.34%). In year 2000-01 the growth in income was recorded to be 18.86% while expenditure grew by 36.71%. However, the average of five year growth rate in income was recorded to be 13.5% while expenditures increased by 19% (at constant price). Operating ratio is decreasing while the Capital Utilization ratio is increasing. This indicates that there has been an increase in transfer of revenue surplus toward capital expenditure.

**Table-3 Composition of Income**

Year	Tax vs. Non-tax	Internal Vs External
	% Tax income in Total Internal Income	% External Income in Total Income
1992-93	68.86	50.05
1993-94	67.39	55.48
1994-95	60.16	52.02
1995-96	54.10	60.27
1996-97	57.57	59.65
<b>1997-98</b>	<b>65.33</b>	<b>65.13</b>
1998-99	72.31	59.15
1999-00	74.50	59.35
2000-01	71.23	60.36
2001-02	78.06	57.41
<b>Average</b>	<b>66.95</b>	<b>57.89</b>

Source: JMC, Budgets of respective years

The share of internal sources vs. external sources of income indicates that major share of income comes through external sources, mainly state government. In internal sources, tax income forms the major component. Evidently, the tax income increased by over 200% after introduction of area based Annual Letting Value determination and self assessment of property tax rules in 1997. The compound annual growth rates for tax income, non-tax income, external income and total income have been shown in table 3. The growth in non-tax-own source income for 2000-01 was recorded to be 39.83% while tax-own sources and external source have grown by 18.48% and 29.23% respectively.

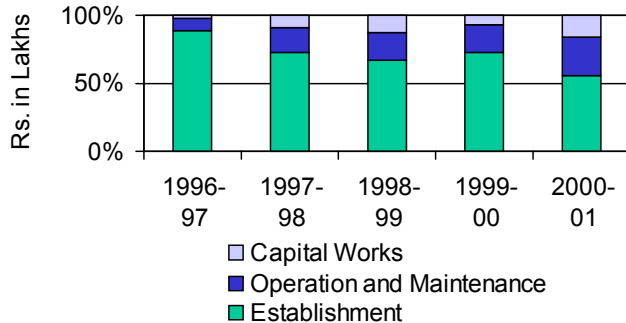
**Table-4 Compound Annual Growth Rate for Income**

Year	CAGR			
	Tax Income	Non Tax Income	External Income	Total Income
1992-93				
1993-94	2.30	9.48	30.00	17.28
1994-95	5.40	44.25	2.72	9.55
1995-96	-16.31	7.24	30.22	12.40
1996-97	6.73	-7.30	-2.29	-1.26
<b>1997-98</b>	<b>29.60</b>	<b>-6.68</b>	<b>44.34</b>	<b>32.18</b>
1998-99	38.56	-0.03	-2.95	6.86
<b>1999-00</b>	<b>22.85</b>	<b>9.82</b>	<b>20.23</b>	<b>19.83</b>
<b>2000-01</b>	<b>18.48</b>	<b>39.83</b>	<b>29.23</b>	<b>27.07</b>
2001-02	15.14	-19.90	-7.00	-2.22

Source: JMC, Budgets of respective years

The property tax collection in Jabalpur is merely 39%, while from consolidated tax (*Samakit Kar*) it is 47% and water charge/tax collection is 44%. The property tax coverage is only 80% at present while water user coverage is merely 29%. The stand post users do not pay any user charges. The average property tax per property is Rs. 400/- while property tax per tax payer is Rs. 950/-. The expenditure pattern of Municipal Corporation indicates that major portion of municipal funds is used for establishment expenditure. The proportion of establishment expenses is however declining after private sector involvement. (90% of Revenue Exp. in 1996-97 to 66% in 2000-01).

**Graph-1 Expenditure Pattern**



## Water Supply

The city is presently supplied with 115 MLD of water out of these 109 MLD (94.8%) water is supplied from surface water sources while ground water meets the remaining 6 MLD requirement. The surface water sources include Pariyat Dam (41 MLD), Khandari Dam (27 MLD) and Narmada River (41 MLD). The ground water is used for supplying 6.0 MLD of water through 320 motorized tube wells. Additionally, there are about 1180 privately owned hand pumps supplementing the water requirement of individuals. (ADB, 2002)

The water from **Pariyat tank** source is treated at Ranjhi. Only 27 MLD of water is being treated. The plant has a reserved capacity of 27 MLD. The water is pumped to three service reservoirs of total 9.7 ML Capacity. The water from **Khandari tank** is treated at Bhongadwar Water Treatment Plant and the clear water after treatment is stored in two service reservoirs of 5.4 ML capacity. The **Narmada water** is treated at Lalpur Water Treatment Plant. The clear water is pumped to 18 city service reservoirs of total 53.2 ML capacity. The distribution system comprise 229 km length pipeline with 23 service reservoirs of total 53 ML storage Capacity. The network comprises of cast iron pipelines of 80-100 mm.

Bulk water supply is made to various establishments directly from Ranjhi Treatment Plant. This includes Defence Vehicle Factory (6.8 MLD), SAF Battalion (0.9 MLD), Engineering College (2.0 MLD), Gun Carriage Factory (2.0 MLD) and Shoivapur, Lalmati, Dwarka Nagar and Sidhbaba Settlements (3.0 MLD). The city has about 186,000 households of which 51,000 have direct house connections (27%). 70% of the house connections are having water-meter. There are also about 16,000 community stand posts. The number of beneficiaries per stand post is about 50. There are around 15,000 unregistered connections in the distribution network. In addition to that there are 985 hand pumps.

The city is presently supplied with 104 litres water per person per day with intermittent water supply for 2 to 3 hours per day. Around 76 % of population in municipal area is served by the piped water supply in different wards through house connection or stand post. The ward-wise population with access to piped water supply has been shown in map. (ADB, 2002). The authorities estimate that roughly 50% of the water supplied is unaccounted due to wastage from public stand posts, leakages in pipelines in distribution network, losses in process and transmission, unauthorized connections etc.

## Sanitary Waste Management in Jabalpur

### Wastewater Conveyance

There is no underground sewerage system in the city and wastewater flows directly into the network of open surface drains. The city is devoid of sewerage system and sewage treatment facilities. The wastewater from city is discharged into the water bodies, without any treatment, by the network of open surface drains. Small open drains are used for conveying wastewater from houses, kitchens, bathrooms, septic tank outlets etc. to large drains. The city has around 1000 km length of small drains out of which 52% are *kutcha* drains (drains without lining) and 48% are *pucca* drains.

There are six large open drains passing through the city. These are Moti nalla, Omti nalla, Ukhari nalla, Khandari nalla, Shah nalla and Uldana nalla. Shah nalla and Khandari nalla collect wastewater from around 15% of the population residing in the southern outskirts of the city with population density less than 50 persons per ha. The water supply in these areas is poor and merely 40% population has access to piped water supply. Consequently the wastewater flow is very low and during dry period most of the wastewater gets lost by evaporation and seepage before entering river Narmada. Uldana nalla flows through thinly populated areas on the northern outskirts of the city. The contribution of this nalla to the pollution load on river Pariyat is negligible. Omti nalla, Ukhari nalla and Moti nalla receive wastewater from nearly 60% of the city's population. They pass through densely populated areas of the city having good piped water supply (80%-100%).

**Table-5 Zone-wise Open Drains**

Zone	Total no. of drains	Length of Open drains in m
Garha	25	66700
Gorakhpur	10	73400
Sanjay Gandhi Market	20	86296
Civil Lines	18	67600
Ghanta Ghar	37	58800
Bhantallaya	22	69566
Cherital	19	65735
Ranjhi	22	27000
<b>Total</b>	<b>173</b>	<b>515097</b>

Source: Municipal Corporation Jabalpur (2003)

Encroachments along the open drains are observed at many places. Atleast 800-1000 temporary encroachments are removed every year from Omti Nalla alone. These

encroachments result into increased afflux and hence the erosion of bed and bank, resulting into high silt charge in wastewater. Moreover, the cleaning of drains also becomes difficult.

The wastewater flowing in open drains contain high silt charge. 52% of open drains being unlined, bed and bank erosion of drains is inevitable. Apart from that the SWM in the city is also not proper. With only 60% collection efficiency, out of 380 tonnes per day solid waste generation, 150 tonnes of solid waste remains uncollected. Substantial part of this waste finds its way into these open drains. In addition to this, there are around 600 solid waste depots in the city, for temporarily storing the collected waste before transporting it to the site of disposal. Many of these are located close to open drains, and hence collected waste may also enter these drains.

The wastewater in drains becomes more dangerous with the discharge of night soil into them. In houses without latrines, the children normally defecate in these open drains. Moreover, there are few houses with *kutchi* latrines where the outlets from latrines are directly connected to open drains.

During monsoon, with storm water also flowing into the drains, capacity of these drains becomes inadequate resulting into flooding in many parts of the city. There are about 11 major flood prone areas in the town and occurrence of flooding in these areas is atleast three times a year. In addition to this, when the water is released from *Bergi* dam, backflow is observed in Omti and Moti Nalla resulting into flooding in certain low lying areas of the city.

About that 78% of the roads in the city have open drains along their sides. The distribution of drains is fairly unequal with areas like *Gadha* and *Ghanta Ghar* having only around 60% road length with open drains. This has resulted into problems like damage to surface of roads, dampness causing weak resistance of road surface to wear and tear, increased cost of construction of roads, accidents dues to open uncovered drains. Apart from that due to frequent overflow, pedestrian traffic also gets affected.

Overflowing of drains, contamination of drinking water, increased moisture and silt contents in solid waste, health problems, aesthetic pollution and urban environmental degradation are commonly observed problems.

**Table-6 Percentage road length with open drains**

<b>Zone</b>	<b>% Roads with drains</b>
<b>Garha</b>	<b>58.50</b>
Gorakhpur	86.60
Sanjay Gandhi Market	95.26
Civil Lines	79.90
<b>Ghanta Ghar</b>	<b>64.36</b>
Bhantallaya	91.45
Cheri tal	68.00
Ranjhi	83.30
<b>Average</b>	<b>78.00</b>

Source: JMC, 2003

## **Wastewater Disposal**

### River

Rivers Pariyat and Narmada are the receivers of sewage/wastewater flowing in all large major drains. Pariyat River receives wastewater from Omti Nalla, Moti Nalla, Uldana Nalla, Ukhari Nalla and Kathonda Nalla. Khandari Nalla and Shah Nalla flows into Narmada River. The wastewater water is directly discharged into these rivers without any prior treatment.

In case of Pariyat River, the dissolved oxygen is very less and the continual use of the river for disposing wastewater may severely affect aquatic life. In case of river Narmada, there are many Ghats on the downstream of point of confluence of Narmada River and Khandari Nalla. The volume of water in river is high, its width is large and the dissolved oxygen is high. But the continual usage of the river for disposal of wastewater shall not be favoured.

### Ponds/Lakes

There are 52 water bodies in the city spread over an area of 386.00 ha. Many of these water bodies are used for disposal of wastewater from surrounding areas. The development plan for Jabalpur has identified 24 major water bodies in the city, 12 of these 24 water bodies covering an area of 90.9 ha (i.e. 35%) out of 257.96 ha are classified as Eutrophic lakes. There are possibilities that they might be receiving wastewaters from surrounding areas apart from the seepage through the septic tanks from nearby localities.

The wastewater disposal is not restricted to these Eutrophic lakes alone. The Hanumantal Lake is an example of lake pollution in the city. The lake with an area of 7.0 ha, is located in densely populated area of the city. The depth of water varies from 1.0 to 3.5 meters. The water in lake is used for washing clothes, bathing of animals and discharge of domestic wastes. It is also used for immersion of more than 400 idols every year during festival seasons. (Jain, 2000)

## **Disposal of Wastewater Over Land**

### Effluent Irrigation

The water from Omti Nalla is used for lift irrigation. Numbers of centrifugal pumps have been observed on the Nalla. The Water from Moti Nalla too is spread into agriculture fields after passing through Gohalpur Thana. The available quality parameters for wastewater in Moti Nalla and Omti Nalla indicate that the water is sufficiently safe to be used for irrigation.

### Open plots

The disposal of wastewater into open plots was observed at few places. The small drains were connected directly to the open plots available near the house. These open plots have become major breeding place for mosquitoes. Such cases were more prominent in the areas of the JDA where few plots had remained unsold or there exist large grounds that have been taken away for such activity. It was observed that the sewers constructed by the private colonizers from the nearby colonies, were emptying on one such ground. The ground was once used by children as playground. In low income localities, it was observed that the

wastewater directly percolated into ground by means of pits dug in ground. This is not an acceptable practice as it may lead to ground water pollution

### **Storm water disposal in drains**

These open drains receive storm water during monsoon season. Due to insufficient capacity of these drains, certain low lying areas of the city experience flooding during high intensity rainfall. Areas experiencing the problems of flooding in the city are Wright Town, Napier Town and Madan Mahal area. In addition to this, when the water is released from Bargi dam, backflow is observed in Omti Nalla and Moti Nalla. The backflow in these drains causes stagnation of storm water and sewage into these drains posing serious threats to the property, public health and overall environment.

The reclamation of many shallow water bodies in the city as per development plan has resulted into aggravating the situation of storm water drainage. The colonies that have emerged in such reclaimed land have blocked the natural drainage system. In the absence of suitable measures to divert the storm water drainage flowing from surrounding areas to these reclaimed water bodies, flooding is experienced during peak monsoon season.

### **Solid waste dumping into drains**

The city generates about 380 tonnes of solid waste per day, out of which only 60% i.e. around 230 tonnes is presently being collected. The remaining 150 tonnes of uncollected solid waste is either getting accumulated into open plots, drains or roads. Roughly, 30% of this waste is entering the drains. The solid waste dumping in drains has resulted into many problems like choking of drains and resulting into overflow and flooding. It was observed that the drains receive solid wastes of all types from all sources.

The tendency of dumping house waste directly into drains is widespread in the city. The drains being the dirtiest of the places found in most of the localities are thought to be appropriate place for throwing solid waste in opinion of many people. Further, the city has around 600 open spaces called Kachra Ghar, provided to house solid waste till it gets picked by vehicles. These open spaces are mostly located along the drains. The solid waste stored at these open spaces often falls into the drains. Similarly, the solid waste removed from the drains by sweepers is often found to be dumped along the drains for hours or even days till it is collected by sweepers into wheel barrows to the point of temporary solid waste storage.

### **Contamination of Drinking Water**

The water supply pipelines were observed to be passing through these open drains. The roads being narrow, the space available for laying water supply pipelines is often very limited. Thus, the water supply pipelines at many places have to be accommodated in these open drains. It was also alarming to see that even the valves in main pipe lines had been provided in the drains. Though no case of rupture or leakage and consequent mixing of drinking water with wastewater were reported, this could in future endanger the lives of people. Similarly it was observed that many stand-posts had been provided near these drains causing hygiene problems.

### Collection and Disposal of Night Soil

The disposal of night soil is done by septic tanks, low cost leach pit type latrines, and dry latrines or by open defecation. Clear relationship between income group and the toilet facilities in a house was observed in the city. High and middle income group households have conventional septic tank; lower middle income groups have Balram septic tanks, while rest have dry latrines, low cost leach pit type latrines or else no latrines at all.

There are two types of septic tanks used in Jabalpur, conventional three chamber septic tanks and Balram septic tanks (1½ to 2 chambered). The design of septic tanks is governed by 'The Land Development Act' (1984). The conventional septic tanks are normally designed for 25 years age.

The outlet of septic tank discharges the wastewater from septic tank containing high organic contents directly into open drains. Thus present way of disposal of night soil is not hygienic. During monsoon season, when the open surface drains are blocked and are running full, the problems of mosquitoes, insects and other disease-carrying vectors trouble the citizens. Discussions with local plumber revealed that when the levels of adjoining drains increases, the life of septic tank gets reduced.

**Table-7 Public Toilets in Jabalpur**

Zone Name	Zone Number	Public Toilets	Toilets in Schools	Total
<i>Gadha</i>	1	9	9	18
<i>Gorakhpur</i>	2	21	6	27
<i>Sanjay Gandhi Market</i>	3	16	12	28
<i>Civilline</i>	4	17	3	20
<i>Ghantaghar</i>	5	15	6	21
<i>Mantallaia</i>	6	26	8	34
<i>Cherital</i>	7	14	6	20
<i>Ranjhi</i>	8	4	1	6
<b>Total</b>		<b>122</b>	<b>51</b>	<b>173</b>

Source: Jabalpur Municipal Corporation, 2004

The city has 123 public toilets maintained by Municipal Corporation and around 22 Sulabh Complexes. The toilets maintained by Corporation are not in very good conditions. Approximately 1,200 seats are available with nearly 12,000 people dependent on these. The use of dry latrines has been completely banned by state government. However, there are still few houses with such latrines. Low cost leach pit type latrines are found in few houses. These are potential threats to ground water. As the ground water levels are substantially low, no immediate problem exist.

The city is also having around 22 public toilets constructed and maintained by Sulabh International. These toilets are classified as Sulabh Complexes and Sulabh Sankul. The Sulabh Complexes are provided with 15 to 20 seats while Sulabh Sankuls have 4 to 6 seats. These toilets are constructed, operated and maintained by Sulabh International. The toilets have been provided with a care taker who collects charges for use of bathrooms and latrines provided in these complexes. The toilets are provided with bore well, under ground storage

tank, septic tank, soakage pit, and care-takers chamber apart from latrines, bathrooms and urinals. The monthly expenditure incurred for cleaning and salaries of staff are deducted from the total earning and the financial statement is sent to Bhopal. If the complex is running in loss, the Sulabh International will pay the deficit. There are also few toilets which are constructed operated and maintained by Sulabh International but no charge is being collected by Sulabh. For these toilets all expenses are borne by Municipal Corporation

Around 35% population does not have any latrine in their house. The major problems associated with these families are large family sizes, poor education, informal sector activities and frequent malaria occurrences. They spend around 30-45 minutes for defecation in open. The children below six normally defecate in open drains.

### Impacts of Poor Sanitation

The disposal into water bodies has resulted into pollution of water bodies. The water of Pariyat River is consequently not even suitable for bathing, swimming and recreation.

**Table-8 Wastewater Characteristics**

Parameter	Unit	Moti Nalla	Omti Nalla
pH		8.0	7.5
Chloride	Mg/l	580.0	310.0
Total Solids	Mg/l	1759.0	1357.0
Total Dissolved Solids	Mg/l	1314.0	1065.0
Total Suspended Solids	Mg/l	445.0	322.0
B.O.D. (3 days, 27 °C)	Mg/l	390.0	NA
C.O.D.	Mg/l	730.0	NA

Source: M.P. Pollution Control Board, 12-6-1998 for PHED

The PHE report of “Sewerage, Sewage Treatment and Disposal Project for Jabalpur City, Phase - I”, gives following results of the ‘Sample Analysis Report’ conducted by M.P. Pollution Control Board at Moti Nalla and Omti Nalla.

These results indicate that the strength of sewage is strong as shown by the values of Total Solids (>1200 mg/l), Total Suspended Solids (>350 mg/l), BOD (>400 mg/l) and COD (>600 mg/l) (Garg, 1999). The BOD/COD ratio here is 0.53 which is again less than 0.63 indicating that it contains non biodegradable organics making it unsuitable for biological treatment. It is however to be noted that BOD<sub>3</sub> has been considered in this case. The BOD<sub>5</sub> is likely to be less than this value.

**Table-9 Water Quality of Rivers**

Parameter	Narmada River		Pariyat River	
	u/s	d/s	u/s	d/s
pH	7.53	7.53	7.55	7.90
DO mg/l	7.00	8.30	5.00	<u>4.20</u>
Temp. o C	23.8	26.3	29.0	29.0
Total Coliform MPN/100 ml	13.00	14.00	94.00	<u>110.0</u>
COD mg/l	16.00	16.00	64.00	96.0
Total Nitrogen mg/l	–	–	0.009	0.017
BOD mg/l	0.70	1.40	12.00	<u>27.00</u>

Source: M.P. P.C.B., Jabalpur, 1998

The wastewater disposal into lakes and ponds has resulted into Eutrophication of many lakes in the city. Twelve out of twenty-four lakes covering an area of 90 ha are declared Eutrophic lakes in Jabalpur Development Plan. This land is being used for various purposes. The inadequate provisions of drainage in most of these drains results into frequent flooding during monsoon seasons.

The frequent occurrences of diarrhea and malaria to the residents indicate possibility of health problems due to poor sanitary arrangements in the city. ADB draft report states that 12.8% households in Jabalpur reported the occurrence of Diarrhea in past once year. Similarly, the primary survey result indicates that at least 40% households in a slum had a case of malaria at least once in every month.

### **Governance for Sanitation**

Poor governance is one of the major causes for poor sanitation. It includes various issues related to institutions, finance and socio-economic aspects. Important governance issues specific to Jabalpur for poor state of sanitary waste management have been identified through this study

**Table-10 Departments of JMC engaged in Sanitary Waste Management Services**

Department	Functions
Health Department	<ul style="list-style-type: none"> <li>▪ Cleaning of open drains, public conveniences, waste depots etc.</li> <li>▪ Demolition of dry latrines.</li> <li>▪ Solid Waste Management</li> <li>▪ Awareness for Sanitation</li> <li>▪ Prevention from diseases (Malaria etc.)</li> </ul>
Public Works Department	<ul style="list-style-type: none"> <li>▪ Construction and maintenance of open drains, public conveniences, waste depots, Landfill site etc.</li> </ul>
Planning Department	<ul style="list-style-type: none"> <li>▪ Dry latrine conversion</li> <li>▪ Sulabh Toilet planning, designing and construction.</li> <li>▪ Storm water drainage</li> </ul>
Building sanction	<ul style="list-style-type: none"> <li>▪ Checking for house sanitation as per Land Development Act (1984) and Development Plan.</li> </ul>
Encroachment Cell	<ul style="list-style-type: none"> <li>▪ Removal of Encroachments along drains, public lands, roads etc.</li> </ul>
Waterworks Department	<ul style="list-style-type: none"> <li>▪ Measures to prevent contamination of water</li> <li>▪ Operation of Sewerage</li> </ul>

In Jabalpur, Municipal Corporation is the prime agency, which is responsible for making adequate provisions for various services. However, there are many state government agencies like Public Health Engineering Department, M.P. Pollution Control Board and Water Resource Department which are also involved in sanitary waste management, partly or fully. In addition to these, there are housing and land development agencies which are involved in preparing layouts by dividing lands into suitable sized plots. Jabalpur Development Authority, M.P. Housing Board and few private colonizers involved in these activities make provisions for services in areas developed by them. There is limited involvement of private sector and non-governmental organisations in sanitation sector in Jabalpur. The solid waste management service in two zones has been contracted out to private contractor. The participation of NGOs is limited to awareness programmes and project monitoring.

### **Services in Colonies**

The sanitary arrangements in a land developed by colonizers are the responsibility of the colonizer until the colony is transferred to Corporation. The colonizer is expected to make sufficient provision for development works like roads, surface water drains, septic tank, water supply and distribution etc. The relations of colonisers with Municipal Corporation are governed by the provisions in Act of 1998, “Municipal Corporation, (Registration of Colonisers, Terms and Conditions)”.

The colonies developed by colonisers are transferred to Municipal Corporation after the colonies are fully developed. However, as long as these colonies are not transferred to Corporation, the colonizer shall make provisions for services. In case colonizers fail to provide sufficient infrastructure, the Corporation shall make suitable arrangements.

The city has 48 registered colonisers who have developed around 50 colonies. Apart from that 21 new colonies have received permissions from Corporation for development. The Corporation charges development charge/fees from these colonisers which is utilised for making provisions for infrastructure in these colonies in case the coloniser fails to provide for them.

### **Municipal Departments for Sanitation**

The provisions for sanitary waste management in Jabalpur are distributed mainly between two departments. These are Health department and Public Works department. In addition to these, there are few functions that are performed with the help of other departments like Planning department, Waterworks department, Building Permission and Encroachment department etc. The functional jurisdiction of each of the departments has been discussed below.

#### **Health department**

The health department is concerned with solid waste management, public health and medical care, sanitation, birth and death registry. The cleaning of open surface drains, operation and cleaning of public toilets, control and regulation of dry latrines, measures for control of malaria and diseases and solid waste management are the major functions related to sanitation that the Health department of the Corporation is required to perform.

Health officer is the executive head of Health department. At Zonal level, there is a Zonal Officer for Health department. He manages the day to day operations related to solid waste management and cleaning of drains with the help of Sanitary Supervisors, Sanitary Inspectors, Ward Supervisors and the Sweepers. He also allocates vehicles for collection of solid waste.

### **Public Works Department**

The Public Works department's main responsibilities include roads and storm water drain construction, fire services, stores and workshop. The department is engaged in the construction and maintenance of roads, public toilets and urinals, *nalla/nalli*, bridges and culverts, shops, stadium, building etc. An Executive Engineer is the head of PWD department. At Zonal level, an Assistant Engineer support various construction works sanctioned by the department.

### **Other departments**

There are certain departments like General Administration, Revenue Department, and Workshop Department which are indirectly involved in general functioning of Municipal Corporation. Planning department is mainly concerned with implementation of state and central government schemes, works under MP and MLA funds and planning for various development works. For sanitation, the department is concerned with implementation of Low Cost Sanitation Programme of Central Government, construction of Sulabh Complexes, storm water drainage proposals, design of roads etc.

Building Sanction and Encroachment Cell is granting permissions for construction of buildings and clearing of encroachments are major functions of this department. The department checks the provisions of house sanitation like septic tank construction and design, arrangements for disposal of wastewater etc.

### **Waterworks Department**

This department is concerned with operation and maintenance of head works, treatment and distribution. The capital works are undertaken by Public Health Engineering department. The Municipal Corporation Act of 1956 confers the responsibility of underground drainage to this department. It can therefore be observed that the provisions for sanitation in Jabalpur are distributed amongst many departments.

### **State Government Agencies involved in Sanitation**

The departments of state government involved in sanitary waste management services are given in Table 11. The relations between Municipal Corporation and PHED dept. are not encouraging. Municipal Corporation is not involved in planning, design and construction phase by PHED. Inadequate maintenance of capital works transferred by PHED to Municipal Corporation due to lack of resources, lack of details about these projects and due to lack of trained staff has resulted into inadequate capacity utilisation of these assets.

Municipal Corporation-JDA relations is also not good. There is often no consultation by JDA with Corporation at any time during the preparation of scheme. The infrastructure services provided by JDA do not integrate with the infrastructure services provided by Corporation.

**Table-11 State Government Agencies involved in Sanitation**

<b>Department</b>	<b>Functions</b>	<b>Projects for JMC</b>
<u>Public Health Engineering Department</u>	<ul style="list-style-type: none"> <li>▪ Survey, investigation, preparation and execution of sewerage and sewage disposal schemes for towns</li> </ul>	<ul style="list-style-type: none"> <li>▪ Sewerage System and Sewage Treatment</li> </ul>
Pollution Control Board	<ul style="list-style-type: none"> <li>▪ Prepare proposals for cleaning and upgrading environment of polluted rivers.</li> </ul>	<ul style="list-style-type: none"> <li>▪ National River Conservation Plan for Narmada River</li> </ul>
<u>Water Resources Department</u>	<ul style="list-style-type: none"> <li>▪ Preparation of Flood Protection Schemes</li> </ul>	<ul style="list-style-type: none"> <li>▪ Flood protection schemes for Omti and Moti nalla.</li> </ul>
<u>Urban Administration Department</u>	<ul style="list-style-type: none"> <li>▪ Supervision of Municipal Corporation for implementation of M. P. Municipal Corporation Act, 1956</li> </ul>	<ul style="list-style-type: none"> <li>▪ Obtained loan from ADB for Urban Infrastructure Improvement for Jabalpur</li> </ul>
<u>Town and Country Planning Office</u>	<ul style="list-style-type: none"> <li>▪ Preparation and implementation of Zonal Plans, Development Plan, and Regional Plans.</li> <li>▪ Planning and development of use of land.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Development Plan for 1991 and 2005 prepared.</li> <li>▪ Approves TP Schemes and Zonal Plans by JMC and JDA.</li> </ul>
Jabalpur Development Authority	<ul style="list-style-type: none"> <li>▪ To prepare plans and proposals for developing land as per development plan.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Developed Colonies with basic infrastructure services</li> </ul>

### **Decentralisation**

Municipal Corporation acts as an agent for implementation of central and state government projects and programmes. The recommendations of State Finance Commission have not been adopted resulting into transfer of only 0.514% of state revenue instead of 8.69% by state government. State Government often deducts the dues payable to MPSEB by JMC from the assigned revenues. JMC finds it difficult to collect property tax from state/central govt. properties. The 1998-99 budget states Rs. 1 crore to be collected from 250 such properties.

The decentralisation from City to Zones started in year 2001-02. The computers were introduced at Zonal offices in 2002-03 for tax payment. The coordination between Zonal level officers and City level officers is still poor. The field staffs receive instructions from both Zonal officer and Departmental Head. The Ward Committees are yet not fully functional. There is a need to smoothen the relations between Ward Committees and Zonal Officers. Constitution of *Mohalla Samitis* is under consideration.

### **Private Sector Participation**

There is very little participation in service delivery by private sector. The solid waste management services in two zones have been given on contract to private contractors. There are few Large Private Contractors which are involved in Solid Waste Management services in zone no 3 and 6. The major issues with regard to private sector involvement are poor competition resulting into monopoly, low wages paid to sweepers and improper method of evaluation of work. There is low level of transparency with regard to evaluation of work done by councilors, Ward committee, MIC and Health Officer. Local NGO alleges the presence of corruption involving private contractors, elected and executive members. Contractor also admits that the role of people in evaluation of work is completely absent.

### NGOs

Non-Governmental Organizations namely, Hamara Jabalpur, Samvad and Praktuti Mitra Samiti are engaged mainly in public awareness. Hamara Jabalpur had been involved in monitoring of services by private contractors for few areas for some times. Later it started service delivery on its own at nominal charges in few areas. Samvad is an NGO Engaged in Advocacy. It had filed few Public Interest Litigations against the role of JDA and decisions concerning reclamation of ponds.

### Summary of Governance for Sanitation in Jabalpur

Governance Characteristic	Present Condition in Jabalpur
Participation	<ul style="list-style-type: none"> <li>▪ Private Sector involved in two Zones for SWM resulting into improved services</li> <li>▪ NGO involved in Awareness programme</li> <li>▪ No separate expenditure for awareness on sanitary issues</li> </ul>
Strategic Vision	<ul style="list-style-type: none"> <li>▪ Budget Document acts as a Vision Doc.</li> <li>▪ Proposals for Sewerage System and Sewage Treatment are present</li> <li>▪ Proposal for SWM improvement also exist</li> </ul>
Rule of Law	<ul style="list-style-type: none"> <li>▪ Water supply lines passing through open drains.</li> <li>▪ No consideration for distancing of septic tank and stand posts.</li> <li>▪ Many provisions in MP Municipal Corporation Act 1956 and Land Development Act, 1984 are violated</li> </ul>
Transparency	<ul style="list-style-type: none"> <li>▪ No new recruitments since 1994</li> <li>▪ Around 30 Supervisory staff vacancies in health department</li> <li>▪ Contract sweepers completely eliminated due to cases of corruption</li> <li>▪ Fake sweeper names</li> <li>▪ Process of Recruitment and promotion of staff not transparent</li> <li>▪ Transparency in Payment to private contractor</li> </ul>

<b>Responsiveness</b>	<ul style="list-style-type: none"> <li>▪ Merely 1 % increase in budgetary allocation in previous year.</li> <li>▪ Finance for sewerage system could not be availed since 1991.</li> </ul>
<b>Consensus Orientation</b>	<ul style="list-style-type: none"> <li>▪ Only one Public Consultation Programme held in past few years (1997)</li> <li>▪ Meetings of Ward Committee are irregular</li> <li>▪ <i>Mohalla Samitis</i> not formed</li> </ul>
<b>Equity</b>	<ul style="list-style-type: none"> <li>▪ 35% population still defecates in open</li> <li>▪ Wide range of regional disparities between central and peripheral wards.</li> </ul>
<b>Effectiveness and Efficiency</b>	<ul style="list-style-type: none"> <li>▪ 32.6% of total cost of water supply is recovered by water charges/taxes</li> <li>▪ 42.6% of O&amp;M cost recovered</li> <li>▪ Property tax (39%), Conservancy tax (47%) and Water tax (41%) recovered</li> <li>▪ Only 29% houses have water connection. 70% of these are metered.</li> </ul>
<b>Accountability</b>	<ul style="list-style-type: none"> <li>▪ No such practice present</li> <li>▪ Statistical outline not present</li> <li>▪ Compliant redressal system not sufficient</li> <li>▪ Citizens Charter not adopted</li> </ul>

## Conclusions and Recommendations

It has been established through the study of sanitary waste management services in Jabalpur that the overall situation has resulted in unhygienic sanitary waste management endangering human health and environment. An organised sewerage system is needed urgently for the city. It will act as a permanent solution to the problems of sanitation in the city. Poor governance is one of the major causes for poor sanitation. It includes various issues related to institutions, finance and socio-economic aspects. Major issues concerning sanitation are: low expenditure on technological upgradation in health department; poor resource mobilisation; improper utilisation of funds; and high dependence on external sources of income delaying the sewerage system for the city since past 15 years

Following actions could be helpful in improving urban governance in the city:

The existing networks of open drains to be improved as a short term measure for wastewater conveyance. This could be converted into effective storm water drainage system after the completion of Sewerage System. The option of low cost sewerage system can be studied for determining the feasibility of connecting the outlets of septic tank with shallow depth sewers of low capacity to convey wastewater containing high organic load. This can be considered in newly constructed colonies or in dense areas where lying of sewers will be very difficult and costly.

Sufficient number of public toilets should be provided and maintained may be on Sulabh model. As far as possible the care-taker of these toilets must be selected from the catchment area of respective toilet. Subsidized latrines can be provided by taking into account the characteristics of poor households without latrines. Social Marketing should be used to address the issues of large family size, low cost, simple construction and operation, small space, absence of open drains, low water supply, flooding in monsoon, black cotton soil. Contribution of labour could be expected from these households.

The areas of JDA being built upon reclaimed lands to have adequate drainage arrangements. Measures to ensure good quality septic tanks with low infiltration shall be taken. Periodic cleaning of lakes and other such water bodies shall be done. Municipal Corporation should frame a policy for addressing the issues in sanitation. The sector policy should establish the goals for sanitation and prepare guidelines that explain the approach to be taken to achieve the goals. It should cover both long term and short term goals.

For the proper management of services the functions and responsibilities of each of the departments should be clearly defined. It is advisable if a SWOT analysis of each of the departments be conducted prior to allocation of functions and responsibilities to them. The distribution of works between head office and zone office needs to be clearly defined. The roles of central office and zone offices needs to be properly defined and accordingly the Zonal offices send reports to central offices periodically. To bring all such changes the information system of Municipal Corporation should be improved. The horizontal flow of information shall be increased. Formation of a committee of officers of different departments engaged in sanitation may prove to be quite useful. These committees can meet periodically to discuss various issues concerning sanitation.

Municipal staffing should be related to their organisational needs and financial capacity, and should ensure local accountability, market driven compensation and result orientation. Certain measures like effective delegation of will help in achieving these goals. It will also relieve the Commissioner and other higher level staff like Health Officer, Executive Engineers etc. from overburden. The capacity at Zonal requires to be strengthened so that the decisions could be made on various issues at the level of zone itself.

The municipal staff can be trained to plan, design and implement large capital infrastructure project. The Ministry of Urban Affairs has identified few institutes in Madhya Pradesh where such training could be imparted. Training will also ensure better operation and maintenance of capital assets transferred to it from other government bodies. Behavioural training should be provided to ensure that the technical training be actually used to achieve the goals of Municipal Corporation.

Following the existing legal framework ward Committees should be constituted at each ward and regular meetings of each such committee shall be held to discuss the development aspects. The role of Ward Committees should be clearly defined in the context of the city of Jabalpur. Ward Committees shall also act as a monitoring and evaluating agency for the projects undertaken within its territory. As each ward is divided into many *Mohallas*,

*Mohalla Samitis* to be formed in each. The Ward Councilors are expected to identify the problems faced by residents of ward through these *Mohalla Samitis*.

The works recommended by Councilors should be approved by ward committee and those recommended by Ward Committee should be atleast reviewed by Mayor-in-Council member of concerned department. This will ensure integration of works at various levels.

Councilors should act as a link between people and government and vice-versa. They can help in restoring faith of people in government. They can be part of various awareness programmes of Municipal Corporation.

The Municipal Corporation of Jabalpur will be required to mobilise Rs.1,371.63 lakh per year after 2009 for next 20 years to finance Sewerage system for the city. The coverage of property tax shall be increased through GIS mapping, surveys and inspection. The property tax collection efficiency should be improved. The property tax can be revised from time to time. The coverage of water supply needs to be increased from present 29% and the 16,000 illegal connections shall be regularised. Measures should be taken to recover the user charges from stand post users of drinking water.

The rates of combined tax (*Samekit kar*) can be increased to cover maximum proportion of expenditure incurred on lighting, fire services and conservancy. The capital expenditure on sewerage system shall be recovered from sanitation cess which should be payable at the time of connection of house outlets to municipal sewers. The operation and maintenance cost of sewerage system could be recovered from an additional surcharge to be levied on water user charges.

There is also a need to mobilise funds from Financial Institutions, Capital Market and International Donors for the capital projects like sewerage system and drainage network. All capital projects can be phased appropriately to meet the receipt of finance for those projects. The Financial Institutions offering loan and the state government grants received by Municipal Corporation shall match the phasing schedule for sewerage system as given in previous section.

Municipal Corporation should be held fully responsible for water supply, sewerage and drainage within its territory. PHED should step into the matters only when it is being asked by the Corporation. The PHED should treat Municipal Corporation as a client and should act like a consultant to Municipal Corporation. This will bring professionalism in working of PHED. It will ensure that the needs and problems of citizens are identified correctly and Municipal Corporation will intimidate the PHED officials about the local constraints in the area. PHED may handover a copy of all technical and financial details to Municipal Corporation before starting execution of project. The project should be sent to higher level government for approval only after getting sanction by Municipal Corporation.

While the project is being executed, Municipal Corporation may make provisions to train its employees and employ additional staff as may be required. In case staff with corporation is not enough, PHED may be requested to depute few officials for a fixed duration of time.

The JDA shall ensure proper drainage in its colonies, specifically those colonies that are constructed in low lying areas, reclaimed lakes etc. The schemes prepared by JDA should be integrated with the infrastructure provided by Municipal Corporation. JDA shall approach City Planner at Municipal Corporation for approval of schemes and integrating them with city infrastructure. The areas planned by JDA shall, as far as possible, remain out of the city but within the territory of Jabalpur Planning Area. Municipal Corporation should be encouraged to prepare zoning plans within its limits.

All agencies working within the Municipal Corporation should submit all their plans and proposals to Municipal Corporation also. Municipal Corporation shall act as a facilitator for each of them in preparing proposals and should take measures to prevent the duplication of works. Also, these state government agencies shall intimidate the Municipal Corporation before starting any new project or local or regional level. It should be ensured that Municipal Corporation remains the actual implementer of projects within its territory.

Formation of a Working Group for enabling participatory decision making process at the city level will help in improving the performance of the local government. Such a group should have representatives from different institutions and groups like the eminent citizens (MLA, past Mayor and Councilors, media personnel, etc.), people's representatives (Mayor, Mayor-In-Council and Councilors), executive members of corporation with experience in sanitation (PWD, Health and Planning dept.), persons with experience in participatory decision making process (Public Relations Officer, NGOs etc.) and representatives of the citizen groups.

Participatory Decision Making Process can be used to prepare a Vision document for the city. This will also assist in formation of *Mohalla Samitis*. The role of *Mohalla Samiti*, Ward Committee, Mayor-in-Council and Council should be enhanced. The decisions made at each level should be publicly declared and full transparency should be practiced.

The small service providers to be mobilised for better delivery of services. Municipal Corporation should maintain an inventory of such persons engaged in sanitary services and take actions to train them and improve their efficiency. The prospects of developing micro-enterprises should be looked into. The options of providing contract for smaller areas should be considered. The labour welfare department should ensure that the wages are paid as per the law. The duration of contract and means of evaluation of work shall be revised. The duration of contract could be decided on the basis of cost recovery of heavy equipments which have been utilised for SWM. The evaluation can be done on the basis of objectively verifiable indicators. The complaint mechanism system of Municipal Corporation could be used for evaluation of services. However, the level of services shall be compared on the bases of level of services provided by Municipal Corporation so as to introduce competition between the two.

The role of NGO's involved in advocacy should be encouraged. The projects and programmes of the Municipal Corporation should be monitored and evaluated by NGOs, CBOs and other independent organisations to ensure accountability. The citizen's charter would also include information on officers to be consulted with their name, address and

phone numbers for each service. A standard formats for registering complaints should be developed. The complaint redressal system can be computerised and it should be networked with Zonal offices and departmental offices to promote efficient transfer of complaints to respective departments. Feedback mechanism shall be incorporated in existing mechanism.

The corporation should attempt to organise city wide special discussions of city councils with citizens to discuss sanitation and related issues more frequently. (Popularly know as *Jan Sampark Abhiyan*). The awareness programmes should be well planned with focus upon the problems to be addressed. These programmes need to have well-defined objectives and shall be based upon Participatory Rapid Appraisal (PRA) techniques as far as possible. The evaluation and success of such programmes shall be documented for future reference. Services of Civil Society Organisations and Non-governmental Agencies can be utilised for creating awareness. Involvement of Councilors for awareness programmes will be also be helpful.

**\* This paper is the out come of research carried under SHARP Research Project funded by the SICI.**

## **References**

1. Asian Development Bank, (2002), Integrated Urban Development in Madhya Pradesh (IUDMP): Draft Final Report, Volume II, City Report- Jabalpur, ADB, Manila.
2. Colebatch (2002): "Good Governance and Urban Planning", International Conference on Good Governance: perspectives and practices, Darussalam.
3. Dhamija S.K. and Jain, Yatish (2000), "Studies on a Polluted Lentic Water Body of Jabalpur with Special Reference to its Physico Chemical and Biological Parameters", Technoscience Publications, Journal of Environment & Pollution 7(2), 2000 pp 83-87
4. ESCAP and IULA- ASPAC (n.d.), 'Country Paper: India', Local Government in Asia and the Pacific' [www.unescap.org](http://www.unescap.org)
5. Financial Institutions Reforms and Expansion (FIRE) (2001), Technical Assistance to Municipal Corporation of Jabalpur, FIRE, New Delhi.
6. Human Settlements (n.d.), United Nations Economic and Social Commission for Asia and the Pacific, <http://www.unescap.org/huset/governance.html>
7. IIAS (1996), Governance Working Group, International Institute of Administrative Sciences as cited by GDRC in its website: <http://www.gdrc.org/u-gov/ugov-define.html>
8. Jagadananda, Sundar N. Mishra and R. Gopa Kumar (2002), India Report, Centre for Youth and Social Development Voluntary Action Network, India.
9. Kooiman, (1993): 'Social-Political Governance: Introduction' in Kooiman, Jan, Modern Governance, SAGE Publications, London.
10. Management Development and Governance Division (1998): Decentralized Governance: Country Thematic Assessment: Framework and Guidelines, UNDP.
- 11.\_\_\_\_, (1997), Decentralised Governance Programme: Strengthening Capacity for People-Centre Development, UNDP.
12. Mathur, O P (2000): 'The crisis of Urban Governance' in A Kundu (ed), Inequality, Mobility and Urbanisation, Indian Council of Social science research and Manak Publications, New Delhi

13. NIUA (1998), India's Urban Sector Profile, Research Study Series No. 60, National Institute of Urban Affairs, New Delhi
- 14.\_\_\_\_, Department of Urban Development, Ministry of Urban Affairs and Employment, Government of India (1998): 'The Framework of Urban Government in India', Strategy for Capacity building of Urban Government institutions in India, Research Study Series, Number 62, National Institute of Urban Affairs, New Delhi
15. Njau, Frederic Z. (1980), "Sewerage and low-cost sanitation: a solution t sanitation problems in developing countries", IDRC, Sanitation in Developing Countries, CIDA, Botswana.
16. Postnote, December, (2002), Number 190, Access to sanitation in Developing Countries, Parliamentary Office of Science and Technology, London, Available: [www.parliament.uk/post/home.htm](http://www.parliament.uk/post/home.htm)
17. Public Health Engineering (PHE) Department (1991), Augmentation of Water Supply Project: Phase III, Part I, Government of Madhya Pradesh, Bhopal
- 18.\_\_\_\_, (2001-02), Sewerage, Sewage Treatment and Disposal Project, Jabalpur City, Zone-I, Volume 1, Project Report, Government of Madhya Pradesh, Bhopal
- 19.\_\_\_\_, (2001-02), Sewerage, Sewage Disposal Project, Jabalpur, Phase II, Volume One, Project Report, Government of Madhya Pradesh, Bhopal
20. Regional Centre, Jabalpur, Madhya Pradesh Pollution Control Board (1993), National River Action Plan, Government of Madhya Pradesh, Bhopal
21. Sanitation Connection (2002), Available: [www.sanicon.net](http://www.sanicon.net)
22. Singh, Kulwant, (n.d.), 'Trends and Issues in Decentralization and Urban Governance in India'
23. UNCHS (Habitat) (1986), Delivery of basic infrastructure to low income settlements: Issues and Options, United Nations Centre for Human Settlements (Habitat).
24. UNCHS Expert Group Meeting on Urban Poverty and Governance Indicators, 29 April to 1 May 1999, Nairobi, Kenya.
- 25.UNCHS (Habitat) (2001), Tools to Support Participatory Urban Decision Making, Urban Governance Toolkit Series, United Nations.
26. UNESCO, Institute of Water Education, (2003), Issues concerning institutional options in wastewater and sanitation. Institutional and Management Working Group, Water Supply and Collaborative Council
27. UNICEF, (1997): Towards Better Programming: A Sanitation Handbook, Joint publication of UNICEF's Water, Environment and Sanitation Section and USAID's Environmental Health Project. Washington DC.
28. Water Resources Department (1991), Flood Protection Scheme for Moti Nalla in Jabalpur Town, Government of Madhya Pradesh, Bhopal
29. WHO (1987), Technology for Water Supply and Sanitation in Developing Countries: A report of a WHO study Group, (WHO Technical Report Series, No. 749)

## The School of Planning Working Paper Series

1. **"Compressed Natural Gas Plan for Public Transport in Ahmedabad"**, by Shivanand Swamy H.M., Chittranjan K.V. and Naidu Pasala S.S.
2. **"Towards Improved Protection of Housing Consumers: Need for Amending the Consumer Act?"** by Sangvan Sharmishtha and Mahadevia Darshini.
3. **"Comparative Environmental Risk Assessment of Ahmedabad City"**, by Ray C.N., June 1996.
4. **"The Process of Environmental Management Plan Development in Ahmedabad:"**, by Ray C.N. and Moga Josh, December 1996.
5. **"Urban Poor: The case of the rickshaw Pullers of Dhaka, Bangladesh"**, by Ray C.N. and Jalal Jennifer, January 1997.
6. **"The Auto rickshaw Service in Ahmedabad"**, by Patel Vatsal and Ray C.N. February 1997.
7. **"Health Care System for Urban Poor in Ahmedabad"**, by Harode Dinesh, Ray C.N. and Mehta Rajesh, June 1997.
8. **"Liberalisation and Urban Real Estate: Case of Mumbai"**, by Mahadevia Darshini and Singh Charanjeet, July 1998.
9. **"Strategy for Hospital Waste Management A Case Study of Ahmedabad"**, by Dr. C.N. Ray, Dr.Bashir Ahmadi and Mr. Arvind Kumar Singh, July 1998.
10. **"Citizens Charter in India: An Overview"** by Dr. C.N.Ray, 1999.
11. **"Forest Management Strategy: The issue of Joint Forest Management in India"**, by Dr. C.N. Ray, Nov -1998
12. **"Investment Climate in Orissa and Policy Guidelines for Development"**, by Rout, Piyush Ranajn, Mehta, S.S, June 1999
13. **"Natural Disaster in Eastern Coast of India the Super Cyclone in Orissa"**, by Dr. C.N.Ray, Rout. Piyush Ranjan, Dec, 1999
14. **"Management of Municipal Solid Waste Issues and Emerging Options for Urban Environment Managers in Developing Countries"**, by C.N.Ray, S. Bandyopadhyay, Piyush Ranjan Rout, February, 2000
15. **"An Enquiry in to Environmental Quality Assessment: A case Study of Ankleswar Industrial Estate,"** by Mona Vyas, Anjana Vyas, March, 2000
16. **"Factors Affecting Utilisation of Primary Health Care Centres in Rural areas: A micro level study of PHC Por, Taluka Vadodara"**, By Preeti Shroff, Dr.Shrawan Acharya, April, 2000
17. **"Strategic Plan for the Privatisation of Public Transport in Thruvananthapuram City"**, by Talat Munshi, Deepti Vijayan, 2000
18. **"Development Control, Building Regulation and Judicial Activism in Gujarat"**, by Dr.C.N.Ray, January, 2001
19. **Earthquake relief and rehabilitation in Gujarat: Issues in Disaster Management**, by Dr.C.N.Ray, June 2001
20. **The Changing Scenario in the Garment Industry of India: Case Study of Ahmedabad**, by Ms.Ruchi Khurana, Dr.C.N. Ray, Dr.Jeemol Unni, June,2002
21. **Solid Waste Management in Ahmedabad**, By Dr.C.N.Ray, August,2002

- 22. Sustainability of innovative financing of urban infrastructure: Case study of Ahmedabad and Vadodara**, by Ms. Arunima Mukherjee and Dr. Darshini Mahadevia, October, 2002
- 23. Autonomous Development Council as a Spatial Planning Unit in India: A case study of the Darjeeling Gorkha Hill Council**, by Vimal Khawas and Shrawan Kr. Acharya, April 2003
- 24. Structure and Recent Changes in Health Care System in India**, by Dr.C.N.Ray, June,2003
- 25. Trend of Urbanization and Its Impact On the Riverine and Riparian Environment : A Case of Pune City**, by Mr. Subhrangsu Goswami and Dr. C.N.Ray, August 2003