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# Situation Analysis

# SANITATION SCENARIO IN HOSHANGABAD

## Madhya Pradesh

- Pravin More

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**ABBREVIATIONS**

| | |
|---|---|
| AAY | Antyodaya Annapurna Yojana |
| ADB | Asian Development Bank |
| APL | Above Poverty Line |
| BPL | Below Poverty Line |
| CES | Consulting Engineering Services |
| CMO | Chief Municipal Officer |
| CPCB | Central Pollution Control Board |
| CSP | City Wide Sanitation Plan |
| DfID | Department for International Development |
| DPR | Detailed Project Report |
| EPCO | Environmental Planning and Control Organisation |
| GoI | Government of India |
| GoMP | Government of Madhya Pradesh |
| HDR | Human Development Report |
| HNPP | Hoshangabad Nagar Palika Parishad |
| JMP | Joint Monitoring Programme |
| JNNURM | Jawaharlal Nehru Urban Renewal Mission |
| lpcd | Litres per capita per day |
| MDG | Millennium Development Goal |
| MP | Madhya Pradesh |
| MPPCB | Madhya Pradesh Pollution Control Board |
| MPUSP | Madhya Pradesh Urban Services for the Poor |
| MT | Metric Tonne |
| NFHS | National Family Health Survey |
| NGOs | Non-Government Organisations |
| NRCP | National River Conservation Plan |
| NUSP | National Urban Sanitation Policy |
| PSC | Public Sanitary Convenience (Public Toilet) |
| SC | Scheduled Caste |
| SPM | Security Paper Mill |
| ST | Scheduled Tribe |
| STP | Sewage Treatment Plant |
| UADD | Urban Administration and Development Department |
| UIDSSMT | Urban Infrastructure Development Scheme for Small and Medium Towns |
| UNICEF | United Nations Children's Fund |
| UWSEIMP | Urban Water Supply and Environmental Improvement Project |
| WAC | Water for Asian Cities |
| WC | Water Closet |
| WHO | World Health Organisation |
| WSP-SA | Water and Sanitation Programme-South Asia |

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## DEFINITIONS

**Slum Area**: where the competent authority is satisfied in respect of buildings in an area 'the buildings in that area are in any respect unfit for human habitation; or are by any reason of dilapidation, overcrowding, faulty arrangement of streets, lack of ventilation, light or sanitation facilities or any combination of these factors, are detrimental to safety, health or morals may, by notification, declare such area to be a slum area (MP Slum Area Improvement and Relocation Act, 1976)

**Septage**: Septage is the liquid and solid material pumped from a septic tank, cesspool, or other primary treatment source

**Domestic Sewage**: Wastewater generated as a result of household human activities – bathing, cloth washing, excreta flushing, etc.

**Sewer**: A pipe or conduit that carries wastewater or drainage water

**Sewerage**: A complete system of piping, pumps, basins, tanks, unit processes and infrastructure for the collection, transporting, treating and discharging of wastewater

***Definitions of Household Sanitation Arrangements according to Census 2001***

**Water closet latrine (WC)**: The sanitary water flush latrines are those latrines that have water closets fitted with flushing cistern. Such latrines that may be connected to a septic tank or an underground sewerage system will also be recorded as water closet latrines. The faecal matter from these types of latrines is removed without the need for scavenging

**Pit latrine**: The latrines attached to the pit that is dug into the ground for the reception of night soil are reckoned as pit latrines

**Other latrine**: This category includes service latrines; latrines serviced by animals such as pigs, etc. and all latrines other than the pit and the water closet types of latrine

*Note: the definitions adopted for baseline sanitation survey tally with above definitions.*

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# CHAPTER 1: BACKGROUND

## 1.1 Background

Excreta and wastewater contain high concentrations of pathogens. Poor excreta and wastewater handling and disposal leads to excreted pathogens entering the environment. This coupled with lack of adequate personal and domestic hygiene; in-sanitary conditions at community level and discharge of untreated wastewater pose high risk to human health. The World Health Organization (WHO) estimates that 2.2 million people die annually from diarrhoeal diseases and that 10% of the population of the developing world are severely infected with intestinal worms related to improper waste and excreta management (WHO 2000).

Recent WHO / Unicef Joint Monitoring Programme (JMP) report (2006) indicates that '...To reach the MDG water and sanitation target presents a huge challenge. ...nearly 2.6 billion need to gain access from 2005 to 2015 to reach sanitation target ....' Nearly 0.6 billion of the un-served reside in urban areas. Though this is less than a third of the un-served population in rural areas, the problem of urban sanitation is much more complex. It is exacerbated by high population densities in slums, poor urban infrastructure, lack of secure tenure and poverty.

Improving access to sanitation facilities and management of liquid waste continues to be a major challenge for all ULBs in India. According to census 2001, about 285 million people (54.79 million households) lived in urban areas. Nearly 26 percent of these households lacked access to sanitation facilities (and most were forced to defecate in the open). In the same year, 32 percent of 2.79 million urban households in Madhya Pradesh lacked access to sanitation facilities.

At the beginning of 'Water for Life' decade (2005-2015), National Family Health Survey (NFHS) **Round 3** reports that nearly 17 percent urban households, in India, lack access to any kind of sanitation facilities. The coverage at 83 percent however, conceals unpleasant statistics, as it includes nearly 5 percent households accessing 'other' sanitation facilities and about 24 percent households accessing 'shared facility'. The situation on wastewater collection and disposal front is equally critical. A recent Central Pollution Control Board (CPCB, n.d.) report presents a grim picture- 903 Class I and II towns are reported to generate about 29,130 *mld* wastewater; of this merely 21 percent is treated.

Madhya Pradesh, popularly referred as the heartland of India, has 338 urban centres (GOMP, 2007). In 2001, the level of urbanization (at about 27 percent ) in the state was comparable with the national urbanisation level (28 percent). More than a third of the state's urban population lives in 9 major cities of the state. According to GOMP (2007), in 1991, only about 45 percent urban households had access to all three facilities of water, sanitation and electricity. By 2001, this proportion went up to about 62 percent. Though this is a significant progress, there is still a long way to achieve universal access. Nearly 12 percent urban households lack access to safe drinking water. The status of urban sanitation is abysmal with only about 53 percent households reporting access to improved sanitation facilities. Among the rest, 15 percent access 'other' latrines and a large proportion of households (32 percent) lacked access to sanitation facilities. Thus, improving access to improved sanitation facilities continues to be a major challenge despite more than two decades of focus and attention to the sector.

The governments of developing countries and donor community have been approaching the challenge with renewed vigour to achieve the Millennium Development Goals (MDG). The year 2008 was declared by the United Nations as the International Year of Sanitation.

For Government of India, this is a watershed year marked by the adoption of 'National Urban Sanitation Policy' with a vision – 'All Indian cities and towns become totally sanitised, healthy and liveable and ensure and sustain good public health and environmental outcomes for all their citizens with a special focus on hygienic and affordable sanitation facilities for the urban poor and women.'

**Box 1.1 National Urban Sanitation Policy: Key Goals**

- Awareness generation and behavioural change
- Open defecation free cities
- Integrated city-wide sanitation
- Sanitary and safe disposal
- Proper operation and maintenance of all sanitary installations

*Source*: NUSP, GoI

Ongoing centrally sponsored programmes that contribute substantially to urban infrastructure (including water supply and sanitation) development include:

- Jawaharlal Nehru National Urban Renewal Mission (JNNURM): Focuses on state-wide municipal reforms and infrastructure development in 63 mission towns/ cities[1]. The JNNURM comprises of two sub-missions on Urban Infrastructure and Governance and Basic Services for the Poor
- Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSSMT): Cities not covered under the JNNURM are covered under the UIDSSMT. Started around the same time as the JNNURM, this scheme subsumes the earlier schemes of Integrated Development of Small and Medium Towns (IDSSMT) and Accelerated Urban Water Supply Programme (AUWSP). This scheme is almost similar to JNNURM in terms of admissible components and funding mechanisms.
- National River Action Plan (NRAP): This is GoI's largest wastewater management programme aimed at reduction/ control of pollution in rivers (and water bodies). The programme launched in 1986 as Ganga Action Plan was later on expanded nationally.
- Integrated Low Cost Sanitation (ILCS): The Centrally Sponsored Scheme of Low Cost Sanitation for Liberation of Scavengers started from 1980-81 initially through the Ministry of Home Affairs and later on through the Ministry of Welfare. From 1989-90, it came to be operated through the Ministry of Urban Development and later on through Ministry of Urban Employment and Poverty Alleviation now titled Ministry of Housing & Urban Poverty Alleviation.

  In 2008, the GoI has revised the guidelines of the scheme. Accordingly, the objective of the Scheme is to convert/ construct low cost sanitation units through sanitary two pit pour flush latrines with superstructures and appropriate variations to suit local conditions (area specific latrines) and construct new latrines where EWS household have no latrines and follow the in-human practice of defecating in the open in urban areas.
- Integrated Housing & Slum Development Programme (IHSDP): aims at combining the existing schemes of VAMBAY and NSDPunder the new IHSDP Scheme for having an integrated approach in ameliorating the conditions of the urban slum dwellers who do not possess adequate shelter and reside in dilapidated conditions. The scheme is applicable to all cities and towns as per 2001 Census except cities\towns covered under Jawahar Lal Nehru Urban Development Renewal mission (JNNURM).

## 1.2 MP State Programmes

The state government, for past few years, has been focussing on urban infrastructure through various projects. Key projects include:

[1] Cities with over a 1 million population, state capitals, places of tourist importance

a. Project *Uday* (Urban Water Supply and Environmental Improvement Project in MP - UWSEIMP) is being implemented with financial assistance from Asian Development Bank (ADB). The project aims at promoting sustainable growth and reducing poverty in the project cities of Bhopal, Gwalior, Indore, and Jabalpur.

b. Water for Asian Cities (WAC) has been initiated with financial assistance from UN Habitat in four major cities of Bhopal, Indore, Jabalpur and Gwalior. Under the project, poverty pocket situational analysis has been completed; it has identified about 20,000 poor households for interventions through NGOs.

c. Jawaharlal Nehru Urban Renewal Mission (JNNURM) and Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSSMT): Launched by Government of India in 2005, four cities (Bhopal, Indore, Jabalpur and Ujjain) are covered under JNNURM and remaining towns are covered under UIDSSMT. These programmes aim at integrated development of infrastructure services in the cities covered, securing effective linkages between asset creation and asset management so that the infrastructure-related services created in the cities are not only maintained efficiently but also become self-sustaining over time.

d. MP Urban Services for the Poor (MPUSP): Madhya Pradesh Urban Services for the Poor is a five-year (2006-11) programme working with the Government of Madhya Pradesh and selected urban local bodies (ULBs) to build their capacity to deliver better services for the poor. Key project components include – i) helping cities and state government to bring about reform; ii) improving the ways in which urban local bodies and their staff work; and iii) develop community capacity to improve their access to services. The programme was initially focusing on four ULBs (Bhopal, Gwalior, Indore and Jabalpur); 10 more ULBs have been recently added for intervention.

**Municipal Reforms**

The State has initiated reforms by suitably amending municipal act by incorporating the provisions of 74$^{th}$ Constitutional Amendment Act *[Functions of ULBs are presented in Annex 6]*. Several initiatives such as accounting reforms, empowering ULBs by reducing the role of parastatals have already been implemented. A system for self-assessment of property tax has been introduced as early as 1996.

**Planning for Total Sanitation in Cities**

On the sanitation front the Government of Madhya Pradesh is in the process of launching Urban Sanitation Mission with the overall goal of improving the quality of life of the urban poor by enhancing access to better sanitation facilities, ensuring sustainability with a holistic approach. The objectives of the mission are:

- Making cities free from open defecation
- Create awareness about sanitation and its impact on health and environment and bring it to centre-stage of policy debate
- Increasing household coverage by individual toilets, especially for the urban poor and un-served households on demand basis
- Safe collection, treatment and disposal of toilet and kitchen wastewater
- 100 percent collection, treatment and disposal of solid wastes
- Research and extension on low cost solutions
- Develop appropriate legal and institutional mechanism for ensure lasting benefits for urban areas
- Regulation of health and environmental outcomes and
- Monitoring and evaluation on a sector wide and citywide basis

The Mission's strategy will be to focus on each town/ city as a basic unit. Key implementation phases identified are- i) start-up activities, ii) IEC activities, iii) providing public facilities, school & public offices' sanitation, putting SWM systems in place, iv) on-site coverage for sanitation, v) major infrastructure creation, and benefit monitoring and evaluation.

The State is in the process of formulating urban sanitation policy. It is expected to give further impetus to improving urban sanitation scenario across the state. GoMP has already initiated a state-wide survey, to assess baseline sanitation situation, across all the urban centres of the state. Simultaneously, the Urban Administration and Development Department (UADD) has proposed to pilot development of city wide sanitation plans. The Water and Sanitation Programme-South Asia (WSP-SA) and Department for International Development (DfID) have agreed to support the initiative. City of Hoshangabad and one zone in Gwalior Municipal Corporation area have been selected to pilot the preparation of City Wide Sanitation Plans.

**City Wide Sanitation Plan (CSP)**: The National Urban Sanitation Policy provides a framework for City Wide Sanitation Plan. The framework has outlined elements (presented in Chapter 6) of planning, implementation and M&E of city wide sanitation. These are generic and presented to assist in thinking through the challenge. The framework also cautions that though some of these appear to be linear, the process needs to be highly iterative.

The CSP preparation process is expected to evolve over time. The data collection for Hoshangabad town is complete. This report analyses the baseline data and presents situational analysis for the town.

A TARU study (2008) on 'Sewerage and Sanitation Interventions in India' presents guiding principles of a City-wide Sanitation Plan; these are summarised in Box 1.1 below.

**Box 1.2: City-wide Sanitation Plan: Guiding Principles**

**Comprehensive, Long-Term and Holistic:** The CSP must be comprehensive and holistic to account for the entire population, especially the poor and those who are forced to defecate in the open. Cover a spectrum of sanitation arrangement including household sanitation arrangements, wastewater collection, treatment and disposal arrangements

**Specific and Localised:** The CSP should respond to specific condition of the city (rather than adopting one size fit all approach)

**Additive and Consolidating the Existing Infrastructure:** Reversing the current trend of exclusive focus on new infrastructure creation, the CSP should aim at first consolidating the existing infrastructure, and then on new infrastructure connections and improving services levels

**Participatory:** The process of CSP formulation should involve a wide range of public consultation with various stakeholders, especially with the poor and vulnerable and women

**Aiming at Financial Sustainability:** The CSP should aim at financial sustainability and independence including raising the resources for capital investments in the medium to long run

**Environmentally Sustainable:** The CSP should be environmentally sustainable. It must promote and provide incentives for green and clean technologies. It should explore ways by which environmental sustainability can be achieved through reduce, recycle and reuse technologies

*Source*: TARU 2008

## 1.3 Methodology, Constraints and Limitations

### Methodology

This report is primarily based on review of secondary literature, analysis of census 2001 data, baseline sanitation survey (2008) data, discussions with key informants and a quick reconnaissance visit (WSP-SA team) to Hoshangabad. Key informants included- Deputy Mayor, the Chief Municipal Officer and other municipal staff, representative of consultant

(CES[2]) who prepared the sewerage and sewage treatment scheme for Hoshangabad town. During the city visit, the team visited different pockets of the town including market areas, residential colonies, slum pockets, slum pockets, bathing *ghats* (along River Narmada), public sanitary conveniences and proposed sewage treatment plant site.

Census 2001 housing data on access to basic amenities was analysed to estimate household coverage by various sanitation arrangements. Data collected from recent baseline sanitation survey was analysed to estimate the household coverage by various sanitation arrangement. The two datasets were compared to understand the trends, during past 8 years, in coverage and access. The report also draws from detailed report on proposed scheme for collection and treatment of wastewater.

**Constraints and Limitations**

Major constraint identified as of now is the limited information on river water quality. As a result, it is difficult to analyse the extent and pattern of river pollution resulting from disposal of untreated domestic wastewater.

Another constraint is that the sanitation survey has not captured some of the critical aspects of urban sanitation such as sanitation arrangement used by households currently lacking the facility, lack of preference for either individual or community sanitation facility, and segregation of slum households. As a result these issues could not be analysed further.

- Sanitation arrangements used by households currently lacking individual facilities: This information is critical to determine extent of open defecation and also to quantify the proportion of households using community sanitation facilities.
- Sanitation arrangements in public institutions: The survey has not covered the status of sanitation in public institutions. Most critical among these are the educational institutes- both private and government
- Lack of preference by households (currently lacking sanitation facilities) to either individual or common facilities: The survey identified 2,215 households that lack access to individual sanitation arrangements. 21 percent of these households have indicated preference for individual household latrine and 35 percent have indicated preference for community sanitation facilities. *However, nearly 44 percent households have not indicated any preference.* The survey fails to capture reasons for not selecting either of the option.

Nevertheless, the baseline sanitation survey serves as a good starting point.

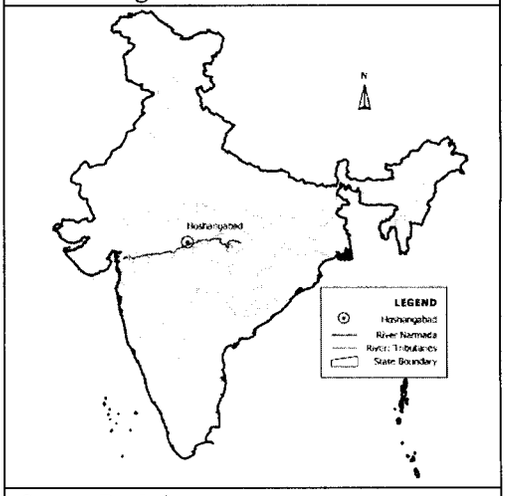
[2] Consulting Engineering Services, New Delhi

# CHAPTER 2: HOSHANGABAD – A BRIEF PROFILE

Hoshangabad, located at 22° 46' N and 77° 44' E, is picturesquely placed along the southern bank of Narmada River, while north of the river stretch the Vindhyan hills. The name of the place is derived from Hoshangshah Ghori, Sultan of Malwa, who is said to have founded Hoshangabad in 15th century [3].

Hoshangabad is well connected from Bhopal, the state capital, by both – road and railway. The town is about 70 km south of Bhopal. Itarsi, a major railway junction, that connects major towns across the country, is only about 18 km away from Hoshangabad. Located at about 330 m above mean sea level, the average minimum and maximum temperatures are 11°C and 41°C respectively. Average annual precipitation is reported to be about 1,340 mm.

**Figure (2.1): India Map showing location of Hoshangabad**




*Source*: DevInfo

The town has religious importance. Narmada being Holy River, thousands of pilgrims take bath in it. Several bathing *ghats* have been built along the riverbank for the convenience of pilgrims. Rough estimates suggest that almost 0.10 to 0.15 million pilgrims visit on festive occasions. Such occasions are reported to be almost once every month. Hoshangabad is district and Tehsil headquarter and important agriculture trade centre in the region. Hoshangabad is also nearest big town from two important locations of tourist attraction – Panchmarhi[4] and Bhimbetika[5]. It is reported that even on ordinary days about 10,000 to 15,000 visitors arrive in Hoshangabad.

## 2.1 Demography

In 1961, the town had a population of 19,284, which has grown more than 5 times in 40 years. Over 1961-1991 period, town population increased at more than 50 percent; however, 1991-2001 decade saw a considerable decline in growth rate with an increase of only about 37 percent.

**Table (2.1): Population Growth (1961-2001)**

| Sl # | Year | Population | Decennial Growth (percentage) |
|---|---|---|---|
| 1 | 1961 | 19,284 | |
| 2 | 1971 | 29,434 | 52.63% |
| 3 | 1981 | 46,300 | 57.30% |
| 4 | 1991 | 70,914 | 53.16% |
| 5 | 2001 | 97,424 | 37.38% |

*Source*: Census of India

According to census 2001, Hoshangabad had a population of 97,424. This comprised of 52 percent Male population and 48 percent Female population. Scheduled Cast (SC) and Scheduled Tribe (ST) population comprised about 15 percent and 6 percent respectively.

[3] Imperial Gazetteer of India available at <http://dsal.uchicago.edu/reference/gazetteer/pager.html?objectid=DS405.1.I34_V13_197.gif>

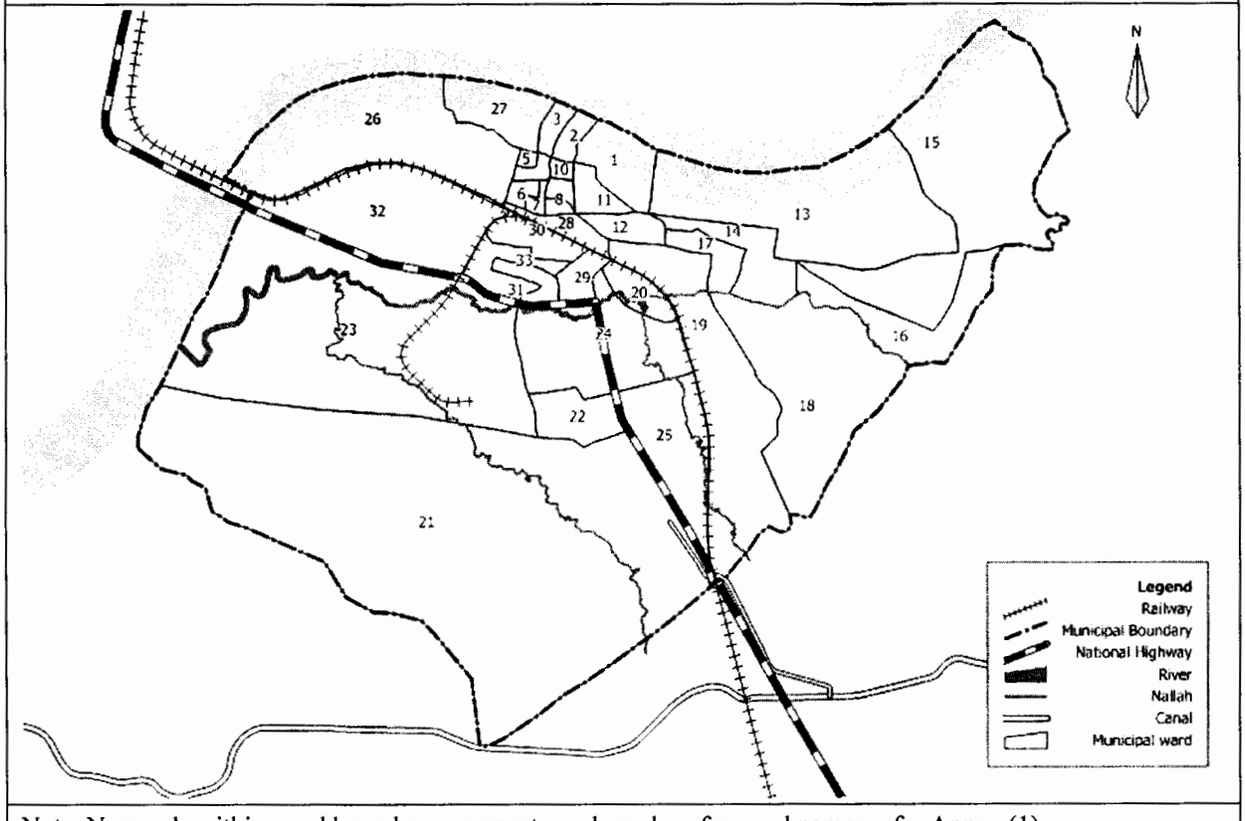
[4] Hill station

[5] Famous for cave paintings

## 2.2 City Governance

The Hoshangabad Nagar Palika Parishad (HNPP) was established in 1869[6]. Hoshangabad is classified as a Class II town and has a municipal council in place. The territorial jurisdiction of the municipality extends over an area of 24 sq km.

**Figure (2.2): Hoshangabad – Ward Map**




Note: Numerals within ward boundary represent ward number; for ward names refer Annex (1).
*Source*: Prepared using Hoshangabad municipal ward map and Google Earth Image

The municipality has 33 wards as shown in Figure (2.2) above. The 33 member municipal council is led by a Chairperson (Mayor), directly elected by the people. Day-to-day business administration is led by Chief Municipal Officer (CMO) – an officer from State Municipal Services (Executive cadre). The CMO is also responsible for implementation of municipal council's decisions. The Chief Municipal Officer is supported by officers leading various departments; key municipal departments include – Health, Engineering, Revenue and Accounts. Health and Engineering departments are led by staff belonging to State Municipal Services – health and engineering cadre respectively. Hoshangabad Municipality has a sanctioned strength of 357 employees. It is interesting to note that all the staff positions are filled.

The municipality is responsible for provision of basic services – water supply, sanitation, street-lighting and maintenance of roads, parks and recreational facilities. The municipality is also responsible for planning and sanctioning housing plans and layouts. With the incorporation of provisions of 74th amendment, the role of parastatals such as Public Health Engineering Department (PHED) has been reduced substantially. Responsibility for planning, extension and day-to-day service provision within municipal limits now rests with the municipal staff.

[6] Imperial Gazetteer of India available at <http://dsal.uchicago.edu/reference/gazetteer/pager.html?objectid=DS405.1.I34_V13_197.gif>

Main municipal revenue sources include- property, license fees and rent from market buildings. Separately Municipality receives development grants from State and Central governments for implementation of various schemes.

## 2.3 Assets of Hoshangabad Nagar Palika Parishad

Hoshangabad municipality currently maintenance nearly 106 km roads; 154 km drains (94 km *pucca* and 60 km *kutcha*); nearly 58 tube-wells and 71 hand-pumps; and 6 public sanitary conveniences (PSC) and 20 public urinals. The municipality also has mechanical equipment – one vacuum emptier truck used for septage clearance and 2 Lorries and 6 tractor trailers for garbage clearance. The municipality also owns shops (that are rented out). Breakdown of assets owned and maintained by is presented in Annex 4.

## 2.4 Slums and Squatter Settlements

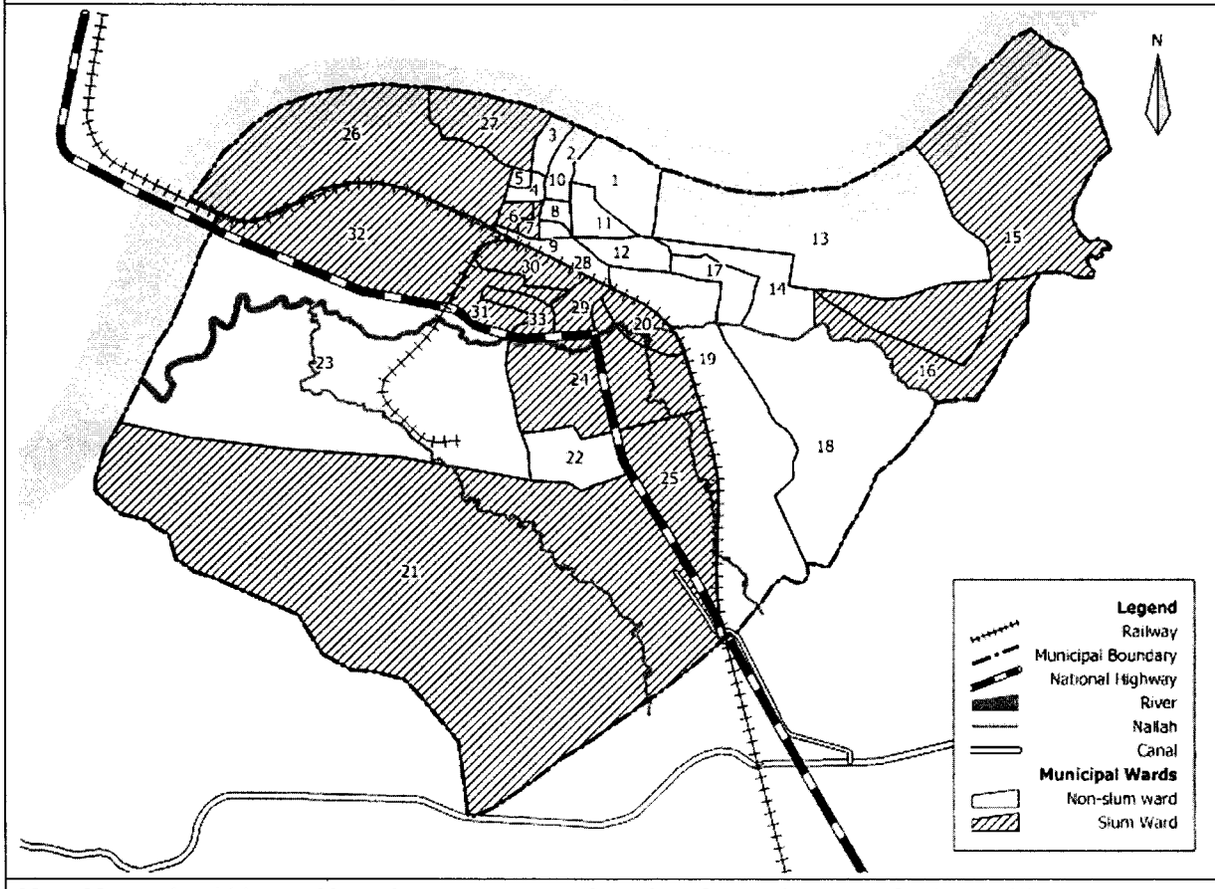
The MP *Gandi Basti Kshetra (Sudhar Tatha Nirmulan)* Act 1976 (MP Slum Area-improvement and Relocation Act) specifies that – *where the competent authority is satisfied in respect of buildings in an area 'the buildings in that area are in any respect unfit for human habitation; or are by any reason of dilapidation, overcrowding, faulty arrangement of streets, lack of ventilation, light or sanitation facilities or any combination of these factors, are detrimental to safety, health or morals may, by notification, declare such area to be a slum area.' Further to specify that a building is unfit for human habitation, the criteria to be considered are 'repair, stability, freedom from damp, natural light and air, water supply, drainage and sanitary conveniences, facilities for storage, preparation and cooking of food and for the disposal of wastewater.*

Discussions with officials on the process of delineating slums indicated that – owing to difficulties in exactly delineating such pockets, entire ward is declared as slum ward. Thus everyone in a declared ward is counted under slum population. As a result reported slum population is much higher at 48,111. This is nearly half the town population. The proportion is more than thrice the state average, wherein the proportion of slum population is reported at 15 percent.

According to municipal records, currently there are a total of 17,833 Above Poverty Line (APL) families and 9,360 Below Poverty Line (BPL) families. Further 1,000 families are listed as beneficiaries under Antyodaya Annapurna Yojana (AAY). BPL and AAY families together add up to 10,360 and constitute 37 percent of the total 28,193 (17,833 APL, 9,360 BPL and 1,000 AAY) families[7]. There are a total of 15 slum wards in Hoshangabad as presented in Figure (2.3) below.

[7] The total number of households as per sanitation survey-2008 is only 15,515.

**Figure (2.3): Hoshangabad – Slum Wards**




Note: Numerals within ward boundary represent ward number; for ward names refer Annex (1).
*Source*: Prepared using Hoshangabad municipal ward map and Google Earth imagery

# CHAPTER 3: URBAN BASIC SERVICES

GOMP (2007) presents a snapshot on the status of basic amenities in the urban MP. *'Drinking water, however, continues to be a critical area for the state as demonstrated in recurring droughts in some part of the state over the last four years. The state government, in its submission to the Vidhan Sabha, stated that water supply crisis was apprehended in 279 urban areas in 37 drought affected districts of the state. The problem was also envisaged in the remaining 55 towns of the state where the existing water schemes had become obsolete.*

*In addition to water, sewerage, drainage, and solid waste disposal facilities are the most critical problems in urban settlements of MP as they are grievously affecting the environment, apart from emerging as urban eyesores.'*

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**Household Count: 2001** *(Census)* → **2008** *(Baseline Sanitation Survey)*

As discussed earlier, the GoMP has initiated a state-wide survey, to assess baseline sanitation situation, across all the urban centres of the state. The data collected from the survey in Hoshangabad town is used for analysing the sanitation situation presented in this report.

According to census 2001, there were a total of 13,739 households. The household tally, according to sanitation survey (2008) has registered an overall increase of 1,776 households (13 percent). Logically, there should be an increase in number of households in all wards; however, a decrease is registered in 12 wards as presented in Table (3.1) below. Highest decrease is registered in SPM East ward (75 percent). Other wards registering more than 25 percent decrease are- Adamgarh ward (54 percent), Subhashganj ward (52 percent), SPM west (33 percent) and Govindpura ward (31 percent), Ganeshganj (29 percent) and Shanichara ward (28 percent).

**Table (3.1): Ward-wise Change in Household Count – Census 2001 to Sanitation Survey 2008**

| Ward No | Name | Slum Ward | No of HH | | | |
|---|---|---|---|---|---|---|
| | | | Census 2001 | Sanitation Survey (2008) | Change Over 2001 HH Count | |
| | | | | | (+/-) Nos | Percentage |
| 1 | Shashri Ward | - | 372 | 347 | -25 | -7% |
| 2 | Shanichara Ward | - | 312 | 224 | -88 | -28% |
| 3 | Jagdishpura Ward | - | 217 | 401 | 184 | 85% |
| 4 | Mangalwara Ward | - | 219 | 237 | 18 | 8% |
| 5 | Narayanganj Ward | - | 144 | 200 | 56 | 39% |
| 6 | Ramganj Ward | Yes | 214 | 330 | 116 | 54% |
| 7 | Azad Ward | Yes | 241 | 249 | 8 | 3% |
| 8 | Subhash Ward | - | 341 | 162 | -179 | -52% |
| 9 | Balaganj Ward | - | 180 | 212 | 32 | 18% |
| 10 | Ganeshganj Ward | - | 181 | 128 | -53 | -29% |
| 11 | Janakpuri Ward | - | 288 | 293 | 5 | 2% |
| 12 | Sadar Bazar Ward | - | 403 | 371 | -32 | -8% |
| 13 | Kothi Bazar Ward | - | 462 | 692 | 230 | 50% |
| 14 | Tilak Ward | - | 239 | 510 | 271 | 113% |
| 15 | Malakhedi Ward (North) | Yes | 569 | 762 | 193 | 34% |
| 16 | Malakhedi Ward (South) | Yes | 728 | 805 | 77 | 11% |
| 17 | Civil Line Ward | - | 445 | 609 | 164 | 37% |
| 18 | Housing Board Ward | - | 1,577 | 1531 | (-46) | -3% |
| 19 | Anand Nagar Ward | - | 985 | 1418 | 433 | 44% |
| 20 | Adamgarh Ward | Yes | 606 | 276 | (-330) | -54% |
| 21 | Phephartaal Ward | Yes | 347 | 284 | (-63) | -18% |

| Table (3.1): Ward-wise Change in Household Count – Census 2001 to Sanitation Survey 2008 | | | | | | |
|---|---|---|---|---|---|---|
| Ward No | Name | Slum Ward | No of HH | | | |
| | | | Census 2001 | Sanitation Survey (2008) | Change Over 2001 HH Count | |
| | | | | | (+/-) Nos | Percentage |
| 22 | SPM Ward (East) | - | 444 | 112 | (-332) | -75% |
| 23 | SPM Ward (West) | - | 413 | 277 | (-136) | -33% |
| 24 | Rasooliya Ward | Yes | 290 | 398 | 108 | 37% |
| 25 | Rajendra Ward | Yes | 660 | 1221 | 561 | 85% |
| 26 | Rewaganj Ward | Yes | 345 | 349 | 4 | 1% |
| 27 | Bheelpura Ward | Yes | 284 | 358 | 74 | 26% |
| 28 | Krishnapuri Ward | - | 282 | 233 | (-49) | -17% |
| 29 | Gokulpuri Ward | Yes | 354 | 503 | 149 | 42% |
| 30 | Gwaltoli Ward | Yes | 265 | 371 | 106 | 40% |
| 31 | Govindpura Ward | Yes | 380 | 262 | (-118) | -31% |
| 32 | Gandhi Ward | Yes | 419 | 622 | 203 | 48% |
| 33 | Tagore Ward | Yes | 533 | 768 | 235 | 44% |
| Total | | | 13,739[8] | 15,515 | 1,776 | 13% |
| *Source: Census 2001- quoted in EPCO[9]/ CES (2006), Sanitation Survey 2008* | | | | | | |

Other 21 wards have registered an increase in number of households. Wards with more than 50 percent increase are- Tilak ward (113 percent), Jagdishpura and Rajendrapura (85 percent each), Ramganj (54 percent) and Kothi bazaar ward (50 percent).

## 3.1. Household Sanitation

**Box 3.1 Household Latrine Typology**

**Water closet latrine (WC)**: The sanitary water flush latrines are those latrines that have water closets fitted with flushing cistern. Such latrines that may be connected to a septic tank or an underground sewerage system will also be recorded as water closet latrines. The faecal matter from these types of latrines is removed without the need for scavenging

**Pit latrine**: The latrines attached to the pit that is dug into the ground for the reception of night soil are reckoned as pit latrines

**Other latrine**: This category includes service latrines; latrines serviced by animals such as pigs, etc. and all latrines other than the pit and the water closet types of latrine

*Source*: Census 2001 (Definitions adopted by Baseline Sanitation Survey 2008 match with these definitions.)

According to census 2001, nearly three quarters of households had access to sanitation facilities. This included – 51 percent households with 'WC' type latrines, 10 percent households with 'pit latrines' and 14 percent households with 'other' type latrines. Nearly 25 percent households lacked access to household sanitation facility.

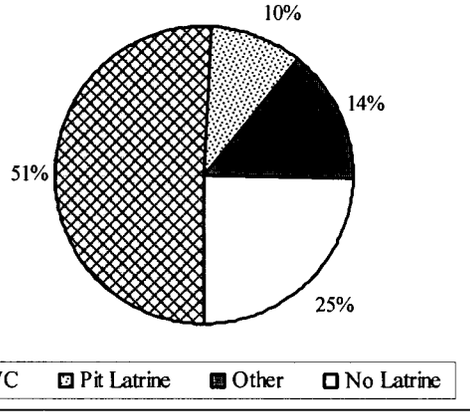
Analysis of recent household sanitation survey covering 15,515 households (within HNPP area) indicates that nearly 85 percent of the households access individual sanitation facilities. This includes 74 percent households accessing WC type latrines, a little less than 11 percent households accessing pit type latrines and less than one percent households accessing 'other' latrines.

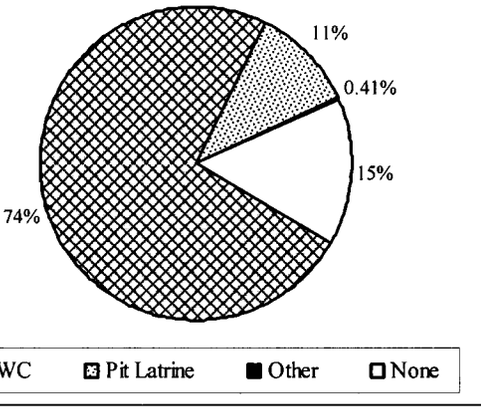
[8] This information needs to be cross checked, census Household series data indicates a total of 17,424 households

[9] Environmental Planning and Control Organisation, Bhopal

There has been about 10 percent reduction in the proportion of households without latrines. Proportion of household with 'other[10]' type latrines has also reduced from 14 percent in 2001 to less than 1 percent (64 households) in 2008 as presented in Figure (3.1) below.

**Figure (3.1): Household Sanitation Arrangements (2001 and 2008)**




*Source*: Census 2001 Base: 17,420 | *Source*: HH Sanitation Survey Base: 15,515

Notes: WC- Water closet type latrine connected to septic tank or sewerage

Over the same period, proportion households accessing 'WC' (connected to septic tanks) and 'pit latrines' has increased by 23 percent and 1 percent respectively. Substantial decrease in proportion of 'other' latrines indicates a shift in urban user's preference towards improved sanitation facilities. *[In case of households without sanitation facilities, the survey does not capture current sanitation arrangements – share with others/ community toilet or practice open defecation].*

The change in proportion of latrine types (with reference to 2001) also shows that latrine upgrading has happened at faster rate compared to new addition. Though it is not clear, new addition may have been constrained by space or tenure related issues for poor households. Higher proportion of pit latrines are reported from Adamgarh, Phephartaal, Bheelpura and Tagore ward, where the ratio of *pit latrine* to *WC* is 71:61, 230:2, 161:158 and 409:164 respectively. All these are categorised as slum wards. In most other wards, WC type latrines are most common. Ward wise household sanitation arrangements are presented in Annex 5.

**Figure (3.2): Pit Latrine with *pucca* Superstructure Built Under ILCS Scheme**

Ward-wise analysis of survey results indicate following:

- 100 percent sanitation coverage is reported from 9 wards: Shashri ward, Narayanganj ward, Balaganj, Janakpuri, Sadar Bazar, Malakhedi South, SPM (East and West) and Rajendra Ward
- More than 25 percent households each in 9 wards report lack of access to sanitation facilities: Ramganj (41 percent), Azad ward (31 percent) and Subhashganj (32 percent),

[10] 'Other' type includes latrines where night soil is- lifted by scavengers, serviced by animals or disposed to open drainage

Housing board ward (41 percent), Azamgarh ward (51 percent), Rasooliya (39 percent), Rewaganj (41 percent), Gokulpuri (30 percent) and Tagore ward (25 percent).

- 27 percent of all households lacking access to sanitation facilities are concentrated in Housing board ward (No 18). This indicates presence of large slum population. However, this is not declared as a slum ward.

The sanitation survey reports that there are only 64 households that use 'other' type latrines. This includes – 26 latrines where night soil is disposed in open drainage and 19 latrines each where night soil is lifted by scavengers and serviced by animals. All manually scavenged service latrines are located in Subhashganj (ward 8). A detailed ward-wise breakdown 'Other' type latrine user households is presented in Annex (3).

A total of 2,311 households reported lack of access to sanitation facilities. Out of this, 96 records are not considered for further analysis, as there are contradictions[11] in reported sanitation arrangements for these households (*list of these households is presented in Annex 6*).

During the survey, 2,215 households currently lacking sanitation facility were asked for their preference for sanitation facility (from - *individual household latrine/ community toilet/ none*). About 21 percent households expressed preference for individual facilities and little more than a third (35 percent) expressed preference for common facilities. However, nearly 44 percent households expressed preference for neither individual household latrine nor community toilet. *As the survey does not probe further, reasons for household choice remain unanswered.* Ward level analysis indicates following:

- Out of 26 wards, where households have expressed preference for community toilet, 11 are slum wards
- All households (currently lacking access to sanitation) in ward 17 and 18 (Civil lines and Housing board ward respectively) have rejected both options- individual and community toilet
- All households in ward no 29 and 33 (Gokulpuri and Tagore ward respectively) have expressed preference for individual latrines.

**Table (3.2): Preferred Sanitation Option by Households Currently Lacking Access to Individual Sanitation Facilities**

| Ward No | Ward Name | No of Households | | | | |
|---|---|---|---|---|---|---|
| | | Ward Total | Household Lacking Access to Individual Sanitation Facility | | | |
| | | | Total | Sanitation Option Preference | | |
| | | | | Individual Latrine | Community Toilet | None |
| 2 | Shanichara Ward | 224 | 5 | | 3 | 2 |
| 3 | Jagdishpura Ward | 401 | 23 | 1 | 19 | 3 |
| 4 | Mangalwara Ward | 237 | 9 | 7 | | 2 |
| 5 | Narayanganj Ward | 200 | 1 | 1 | | |
| 6 | Ramganj Ward | 330 | 134 | 5 | 116 | 13 |
| 7 | Azad Ward | 249 | 75 | | 42 | 33 |
| 8 | Subhashganj Ward | 162 | 52 | 41 | 11 | |
| 10 | Ganeshganj Ward | 128 | 1 | | 1 | |
| 13 | Kothi Bazar Ward | 692 | 69 | 1 | 4 | 28 |

[11] These households do not have individual household sanitation facilities and are reported to use either community toilet blocks or practice open defecation.

| Table (3.2): Preferred Sanitation Option by Households Currently Lacking Access to Individual Sanitation Facilities | | | | | | |
|---|---|---|---|---|---|---|
| Ward No | Ward Name | No of Households | | | | |
| | | Ward Total | Household Lacking Access to Individual Sanitation Facility | | | |
| | | | Total | Sanitation Option Preference | | |
| | | | | Individual Latrine | Community Toilet | None |
| 14 | Tilak Ward | 510 | 7 | | 7 | |
| 15 | Malakhedi Ward (North) | 762 | 89 | | 5 | 84 |
| 17 | Civil Line Ward | 609 | 12 | | | 12 |
| 18 | Housing Board Ward | 1,531 | 624 | | | 624 |
| 19 | Anand Nagar Ward | 1,418 | 94 | 48 | 34 | 12 |
| 20 | Adamgarh Ward | 276 | 140 | 1 | 6 | 133 |
| 21 | Phephartaal Ward | 284 | 41 | 2 | 39 | |
| 24 | Rasooliya Ward | 398 | 154 | | 146 | 7 |
| 25 | Rajendra Ward | 1,221 | 4 | 2 | 2 | |
| 26 | Rewaganj Ward | 349 | 137 | | 137 | |
| 27 | Bheelpura Ward | 358 | 4 | 1 | | 3 |
| 28 | Krishnapuri Ward | 233 | 29 | 4 | 25 | |
| 29 | Gokulpuri Ward | 503 | 151 | 151 | | |
| 30 | Gwaltoli Ward | 371 | 11 | | 7 | 4 |
| 31 | Govindpura Ward | 262 | 23 | | 2 | 3 |
| 32 | Gandhi Ward | 622 | 140 | 2 | 114 | 24 |
| 33 | Tagore Ward | 768 | 186 | 186 | | |
| **Hoshangabad** | | **15,515** | **2,215** | 453 (21%) | 774 (35 %) | 987 (44 %) |
| Notes: Slum ward are highlighted.<br>*Source*: HNPP Sanitation Survey 2008 | | | | | | |

## 3.2 Public Sanitary Conveniences

As discussed earlier, Hoshangabad is a town of religious importance. Thousands of pilgrims visit the town to take dip in holy Narmada. Rough estimations suggest that almost 0.10 to 0.15 million pilgrims visit on festive occasions. Such occasions are reported to be almost once every month. Hoshangabad is district and Tehsil headquarter and important agriculture trade centre in the region. Hoshangabad is also nearest big town from two important locations of tourist attraction – Panchmarhi[12] and Bhimbetika[13]. It is reported that even on ordinary days about 10,000 to 15,000 visitors arrive in Hoshangabad. Thus, adequate public sanitary conveniences are vital for maintaining overall sanitation levels in the town.

There are 6 existing public sanitary conveniences. Additionally, 6 public sanitary conveniences are proposed under sewerage scheme proposed under National River Action Plan (NRAP) as presented in Table (3.3) below.

| Table (3.3): Location of Existing and Proposed Public Sanitary Conveniences (PSC) | | |
|---|---|---|
| **Sl No** | **Location** | **Remarks** |
| | **Existing PSC** | |
| 1 | Sethani Ghat | 25 seated deluxe toilet block maintained by Sulabh International |
| 2 | Kori Ghat | Maintained by Sulabh International |

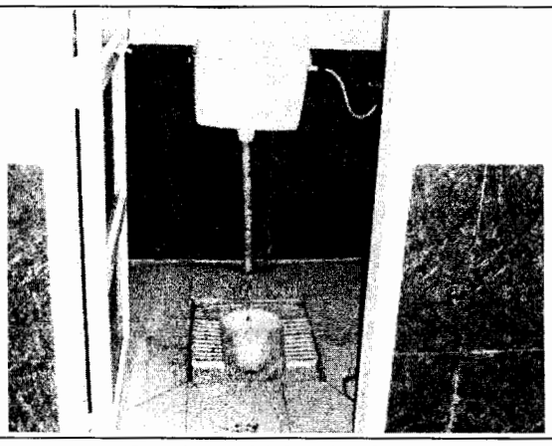
[12] Hill station
[13] Famous for cave paintings

| Table (3.3): Location of Existing and Proposed Public Sanitary Conveniences (PSC) | | |
|---|---|---|
| **Sl No** | **Location** | **Remarks** |
| 3 | Private Bus Stand | Maintained by HNPP, currently free; these blocks are currently being reconstructed by the HNPP. |
| 4 | Machhali Bazar | |
| 5 | Balaganj | |
| 6 | Government Bus Stand | |
| | **Proposed** | |
| 1 | Government Bus Stand | All blocks proposed to have 15 seats; |
| 2 | Gupta Ground | |
| 3 | Chhoti Bajariya | |
| 4 | Putlibai school (near Post Office) | |
| 5 | Raj Ghat | |
| 6 | Meenaxi | |
| *Source*: Hoshangabad Nagar Palika Parishad (2008) | | |

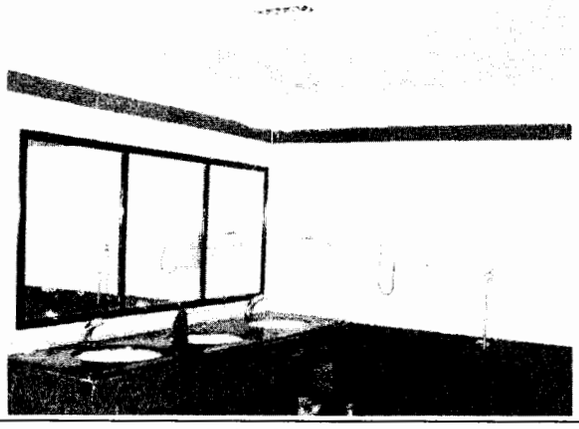
PSCs at Sethani Ghat and Kori Ghat are newly constructed. Other existing blocks are being reconstructed. Once reconstructed, HNPP proposes to hand these over to private agency for operation and maintenance (O&M). According to prevailing policy of the municipality, the O&M agency will operate these on pay-and-use basis. The PSCs at Sethani *ghat* and Kori Ghat are currently operated and maintained by Sulabh International. Visitors are charged at the rate of Rs 2 for toilet use and Rs 5 for bathing. There is no system of monthly family pass (as is commonly observed in many other towns). The deluxe toilet block at Sethani *ghat* was constructed using MPLAD funds and the HNPP pays for water and electricity charges.

**Figure (3.3): Deluxe toilet block at Sethani Ghat**

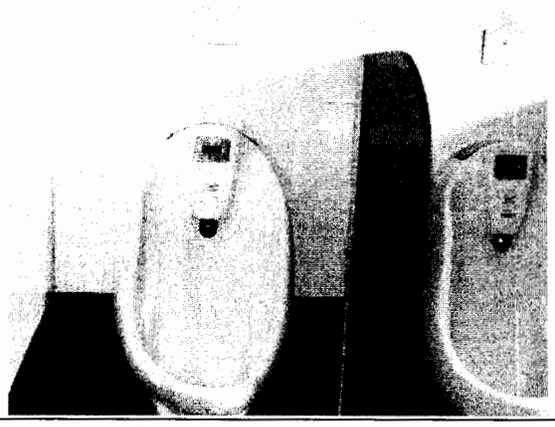
**Front view**



**Latrine cubicle with flush**



**Refreshing area**



**Urinals fitted with auto-flush mechanism**

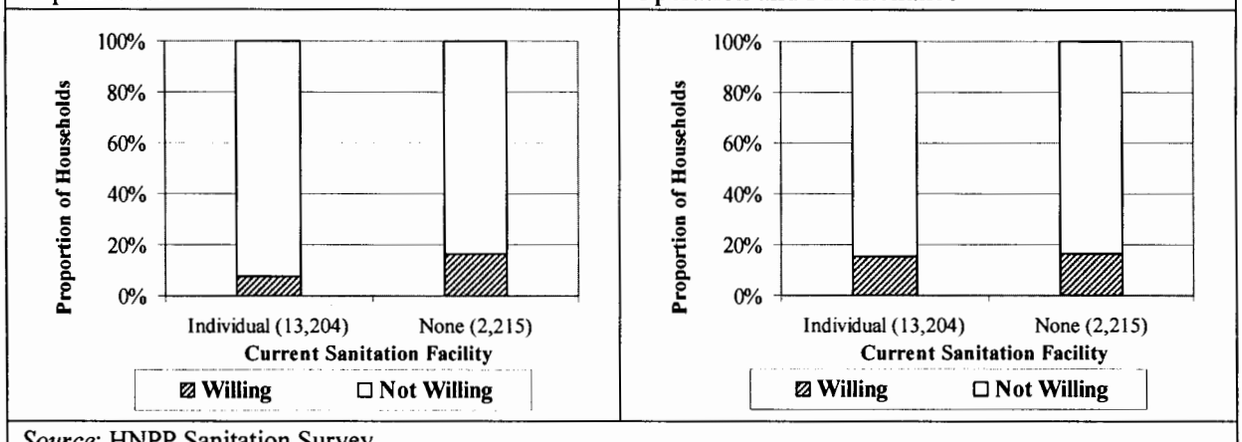
Existing public/ community toilet capacity is extremely inadequate to cater to the need for both – floating as well as resident population. Moreover, since there is no system of monthly family pass in above two PSCs maintained by Sulabh; local residents will be discouraged to use these on a pay-and-use basis as the expenditure (especially for poor family) will be prohibitive.

The baseline sanitation survey elicited response from households on adequacy of public/ community sanitation facilities. (*'Whether adequate public sanitation facilities (toilets/ Urinals) exist in the locality?'*) Nearly 94 percent of the 15,419 households responded that adequate toilet/urinal facilities do not exist in their locality. Similar proportion of the households having access to individual sanitation facility agreed with this.

Only in Mangalwara (76 percent), Ganeshganj (84 percent) and Phephartaal (98 percent) majority of the interviewed households agreed that adequate toilet/urinal facilities exist in their locality. The responses of Phephartaal residents may need to be verified; mainly since no PSC is located within the ward and household sanitation coverage also stands at about 85 percent.

While most residents across town agree that public sanitation conveniences are inadequate in their locality, majority is reluctant to contribute towards *capital* as well as *operation and maintenance cost* of public facilities as presented in Figure (3.4).

**Figure (3.4): Willingness to Contribute Towards Capital Cost and Maintenance of Common Sanitation Facility**




*Source*: HNPP Sanitation Survey

Among 2,215 households currently lacking sanitation facility, only 16 percent have expressed willingness to contribute towards both – capital and maintenance expenditure. Only in – Azad, Subhashganj, Phephartaal and Rasooliya wards, major proportion of households (currently lacking sanitation facility) have expressed willingness to contribute towards capital contribution.

Among the 13,204 households, currently having access to individual sanitation facilities, only 7 percent households have expressed willingness to contribute towards capital cost and about 15 percent are willing to contribute towards operation and maintenance expenditure.

Overall sanitation situation of Hoshangabad town can be briefly summarised as below:

- Nearly 85 percent households have access to individual sanitation facilities; remaining about 15 percent households lack access to individual sanitation facilities
- Over 2001- 2008 period, proportion of households having individual sanitation facilities has increased by 10 percent

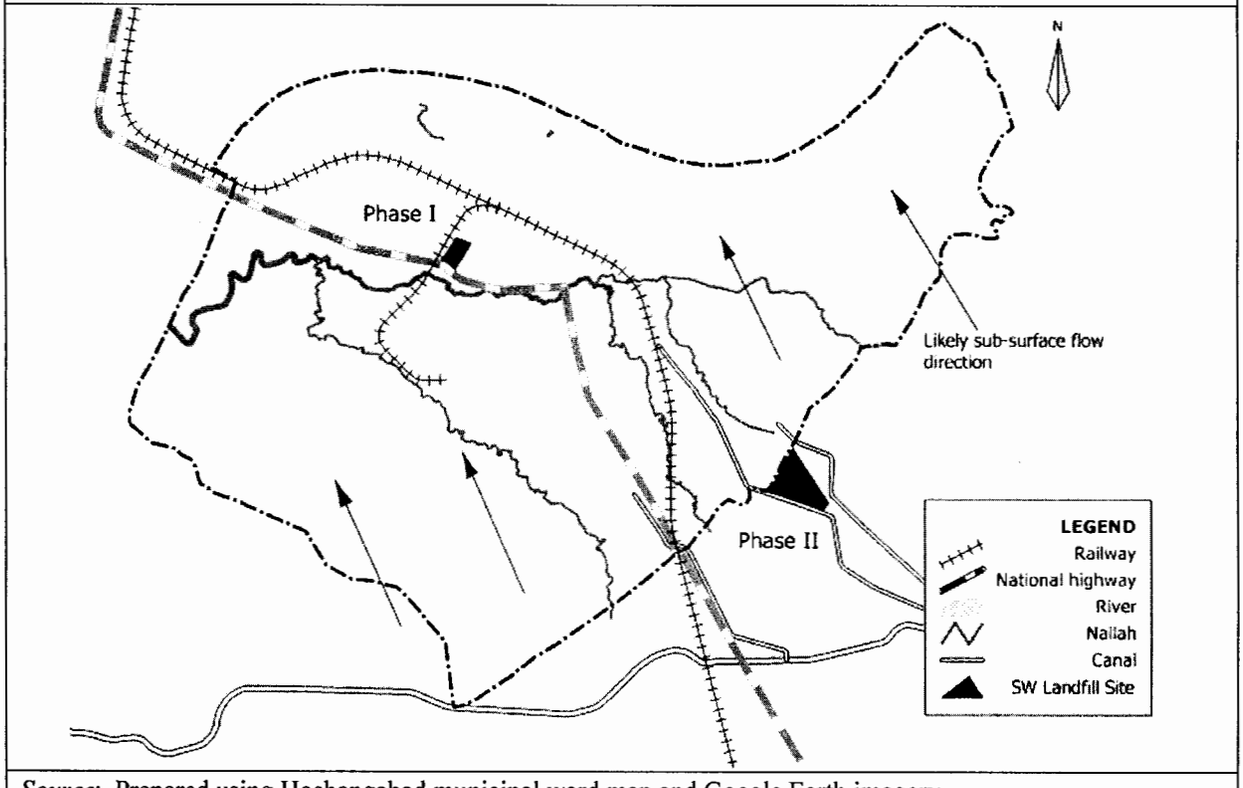
- A considerable proportion of households have upgraded 'other' type latrines to improved sanitation facilities, during last 8 years
- Majority of households, currently lacking sanitation have declined preference for both – individual or community sanitation facilities (tenure may be an issue)
- Most households are unwilling to contribute towards both – capital as well as O&M cost of common sanitation facilities
- Recent sanitation survey does not capture information on following:
  - Sanitation arrangements used by households currently lacking individual facilities
  - Reason for lack of preference by households (currently lacking sanitation facilities) to either individual or common facilities
  - Reason for lack of willingness to contribute towards capital and O&M of common sanitation facilities (especially in case of households currently lacking sanitation facilities)
  - Sanitation arrangements in public / private institutions (especially educational institutions)

### 3.3. Solid Waste Collection and Disposal

**Domestic solid waste (excluding cattle waste)**

According to the health department of HNPP, 50 metric tonnes (MT) domestic solid waste is generated daily. This includes 44 MT garbage from households, 4 MT garbage from vegetable markets and 2 MT garbage from other areas. There is no system of door to door collections. Households are responsible for disposing the waste at designated solid waste collection points. HNPP reports that there are 74 designated collection points; 54 of which are masonry bins and 20 are open collection points. The municipality clears these with the help of 2 Lorries and 4 tractor trailers. The garbage is then dumped at designated site. HNPP practices uncontrolled dumping. There are two solid waste dumping grounds. The old dumping site was located fairly near the river as shown in Figure (3.5). According to HNPP, dumping at the old site has been discontinued. The new dumping site is located at south eastern edge of the town. This site is away from the river. However, uncontrolled dumping may turn out to be riskier than before.

**Figure (3.5): Location of Municipal SW landfill sites and Likely Direction of Subsurface Water Flow**

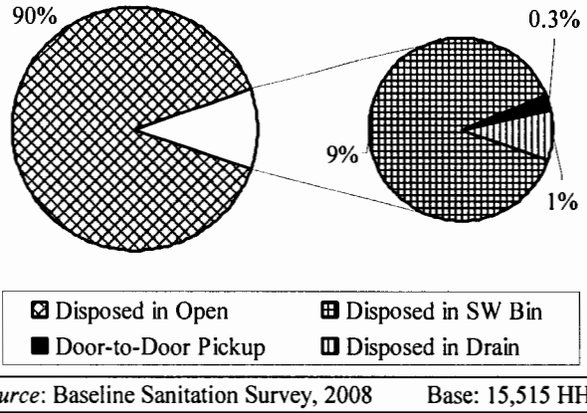



*Source*: Prepared using Hoshangabad municipal ward map and Google Earth imagery

*Preliminary observations, based on ground slopes and surface flow directions, indicate that groundwater flow direction is likely to be north-westerly as shown in figure (3.5) above. Leachate, from Phase II dumping site may seep into the ground and contaminate groundwater in the near vicinity, especially the western half of the town area. This is particularly worrisome, since HNPP water supply depends on groundwater pumped from bore-wells located in different parts of the town.*

It may therefore be necessary for the HNPP to conduct detailed geotechnical investigations to understand the implications.

**Figure (3.6): Solid Waste Disposal Practices Adopted by Households**




*Source*: Baseline Sanitation Survey, 2008 Base: 15,515 HH

## Primary Collection

A recent household survey presents a bleak picture at primary collection and transfer end of the SWM chain. Analysis of responses from 15,515 households (in all 33 wards) indicates that a bulk (91 percent) of the households dispose garbage in the open (90 percent) or in drains (1 percent) as presented in Figure (3.6). Only a small proportion of households (about 9 percent) practice proper disposal – disposing in solid waste bins (a little over 8 percent) or door-to-door pick up (less than a percent).

Ward wise data analysis indicates that the use of *solid waste bin* for garbage disposal is well practiced only in four municipal wards (*Janakpuri, Sadar Bazar, SPM East and SPM West*), where more than two-thirds of the households reported to use municipal solid waste bin. Among these, all household in SPM East ward use municipal solid waste bin. In contrast, nearly 22 percent households in *Rasooliya* ward dispose garbage in *drains*. Similar practice is adopted by about 8 percent households in Ramganj ward.

**Table (3.4): Ward wise breakdown of Solid Waste Disposal Practices Adopted by Households**

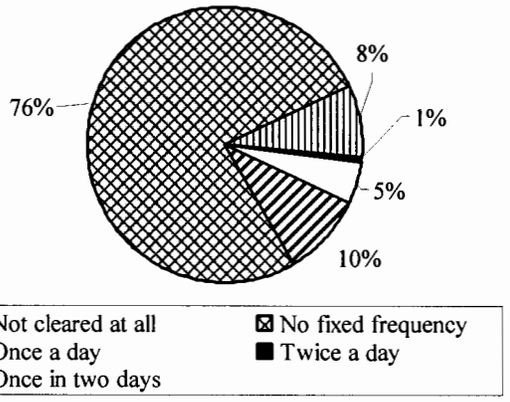
| Ward No | Ward Name | Proportion of Households | | | | Total Households |
|---|---|---|---|---|---|---|
| | | Door to door collection | Disposed in Municipal Solid Waste Bin | Disposed in Open | Disposed in Drain | |
| 1 | Shashri Ward | | 3% | 97% | | 347 |
| 2 | Shanichara Ward | | 18% | 82% | | 224 |
| 3 | Jagdishpura Ward | | 28% | 71% | | 401 |
| 4 | Mangalwara Ward | | 3% | 97% | | 237 |
| 5 | Narayanganj Ward | | 23% | 78% | | 200 |
| 6 | Ramganj Ward | 4% | 10% | 78% | 8% | 330 |
| 7 | Azad Ward | | | 100% | | 249 |
| 8 | Subhashganj Ward | 7% | 53% | 37% | 3% | 162 |
| 9 | Balaganj Ward | | | 100% | | 212 |
| 10 | Ganeshganj Ward | | 71% | 29% | | 128 |
| 11 | Janakpuri Ward | | 100% | | | 293 |
| 12 | Sadar Bazar Ward | | | 100% | | 371 |
| 13 | Kothi Bazar Ward | | 11% | 89% | 1% | 692 |
| 14 | Tilak Ward | | | 100% | | 510 |
| 15 | Malakhedi Ward (North) | | | 100% | | 762 |
| 16 | Malakhedi Ward (South) | | | 100% | | 805 |
| 17 | Civil Line Ward | | 7% | 92% | | 609 |
| 18 | Housing Board Ward | | | 100% | | 1,531 |
| 19 | Anand Nagar Ward | | 1% | 99% | | 1,418 |
| 20 | Adamgarh Ward | | | 100% | | 276 |
| 21 | Phephartaal Ward | | | 99% | 1% | 284 |
| 22 | SPM Ward (East) | | 100% | | | 112 |
| 23 | SPM Ward (West) | | 88% | 12% | | 277 |
| 24 | Rasooliya Ward | | 1% | 78% | 22% | 398 |
| 25 | Rajendra Ward | | | 100% | | 1,221 |
| 26 | Rewaganj Ward | | 1% | 99% | | 349 |
| 27 | Bheelpura Ward | | | 100% | | 358 |
| 28 | Krishnapuri Ward | | 4% | 96% | | 233 |
| 29 | Gokulpuri Ward | | | 100% | | 503 |
| 30 | Gwaltoli Ward | 2% | 8% | 91% | | 371 |
| 31 | Govindpura Ward | | 26% | 69% | 5% | 262 |
| 32 | Gandhi Ward | 1% | 5% | 94% | | 622 |
| 33 | Tagore Ward | | 12% | 88% | | 768 |
| **All Wards** | | | **9%** | **90%** | **1%** | **1,5515** |

*Source*: Sanitation Survey 2008, Hoshangabad Nagar Palika Parishad

To a question '*whether there is a fixed place for dust bin?*' majority (85 percent) of the respondent households replied negatively. Even among 1,442 regular dust bin user households, about 43 percent (627) agreed with this.

While 90 percent respondents agreed that the municipality clears the solid waste bins/ local dumping depot, a significant majority of 76 percent complained that the frequency of clearance is not fixed. About 9 percent respondents agreed that the bins are cleared daily. This included 8 percent households reporting clearance frequency of once a day and 1 percent households reporting a clearance frequency of twice a day. Remaining 5 percent households reported a solid waste frequency of once in two days as presented in Figure (3.7).

**Figure 3.7: Citizen perception: Solid Waste Bin/ depot Clearance Frequency**

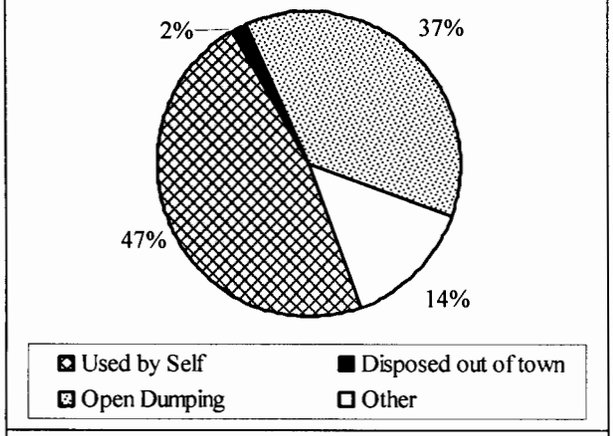



*Source*: Sanitation Survey 2008 Base: 15,515 HH

### Cattle waste disposal

A total of 957 households within HNPP area are reported to own cattle. The sanitation survey enquired these households about cattle waste disposal practices adopted. Nearly 47 percent households reported that they use the cattle waste (mainly cow dung) for their own purposes. About 37 percent reported disposal in the open and 2 percent mentioned that they have made arrangements to dispose it outside the town. Remaining 14 percent households did not make any specific arrangements as presented in Figure (3.8) below.

**Figure (3.8): Cattle Waste Disposal Practice Adopted by Cattle Owning Households**




*Source*: Sanitation Survey 2008 Base: 957 HH

Nearly half the cattle owning households are located in Malakhedi North (35 percent) and Phephartal (15 percent) wards. Both these wards are located in the periphery (proximate to agricultural land) of the town. Considerable proportions (100 percent in Malakhedi and 32 percent in Phephartal) of cattle owning households in these wards themselves use cattle waste. Ward-wise details are presented in Annex (2).

Thus, overall solid waste management is very poor in the town – both at primary collection as well as disposal end. The municipality will need to do a lot to improve garbage disposal *and* in extending reliable primary collection services to the households.

## 3.4. Water Supply

Hoshangabad is well endowed with water resources – both surface and groundwater. Average annual precipitation in the region is about 1,340 mm. The town is located on south bank of river Narmada – one of the perennial rivers of India. Another large river – Tawa – of the region joins river Narmada upstream of Hoshangabad. About 30 kms upstream of the confluence, a large dam is constructed on Tawa River. Left bank canal of this dam flows south of Hoshangabad town. Upstream of Hoshangabad, there are only a few large towns

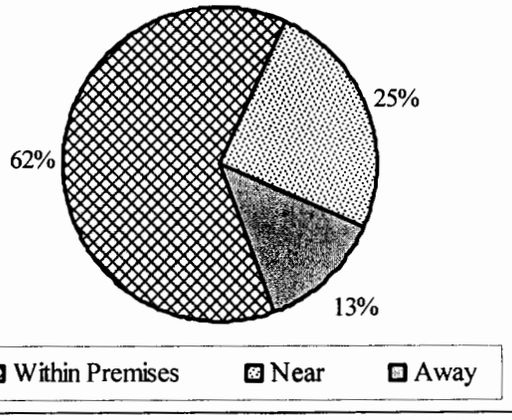
(e.g. Jabalpur and Mandla) located upstream of Hoshangabad. Moreover, there are no major industrial zones; the economy of the region is largely agriculture based.

Drinking water need of the Hoshangabad population is met from groundwater pumped using deep tube-wells. According to Census 2001, nearly 84 percent households in Hoshangabad accessed water from taps. This was followed by 12 percent households accessing water from hand-pump or tube-well. About 4 percent households depended on open wells and a miniscule (less than a percent) depended on other sources (including Tank, Pond, lake, river, canal or spring).

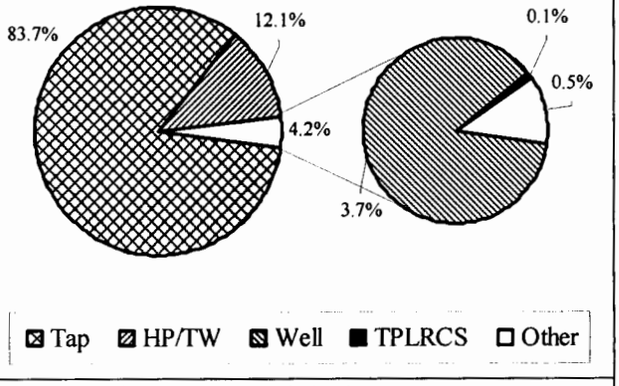
In terms of location of source: nearly, two thirds of the households had access to source located within premises; for a quarter of the households, it was located near the premises. And in case of a little less than seventh (13 percent) of the households, the drinking water source was located away from premises as presented in Figure (3.9) below.

**Figure (3.9): Drinking Water Supply, Hoshangabad**

**Proportion of households by location of water source**




**Proportion of households by source**




Note: HP/TW – Hand pump/ Tube well; TPLRCS – Tank, Pond, Lake, River, Canal, Spring

*Source*: Census 2001 Base: 17,420 HH

As of now, there are a 58 deep tube wells that are used to access groundwater. The groundwater is pumped and stored in 5 overhead reservoirs. It is then distributed through nearly 7,800 house service connections and more than 1,500 public stand posts. The piped water supply system is backed by about 71 hand pumps. Discussions with the households indicated that water is supplied twice a day for about 'one' to 'one and half' hour each.

Municipal sources report that drinking water is supplied at an average of 90 litres per person per day. It is however interesting to note that the Detailed Project Report for sewerage scheme reports the same to be about 131 litres per capita per day (lpcd) (EPCO/ CES 2006). This is calculated on the basis of dry whether flow measurements recorded for main wastewater drains in 2005. *[It may be necessary to appropriately determine the water supply level. This is important as the city is planning to implement water carriage based underground sewerage scheme in immediate future.]*

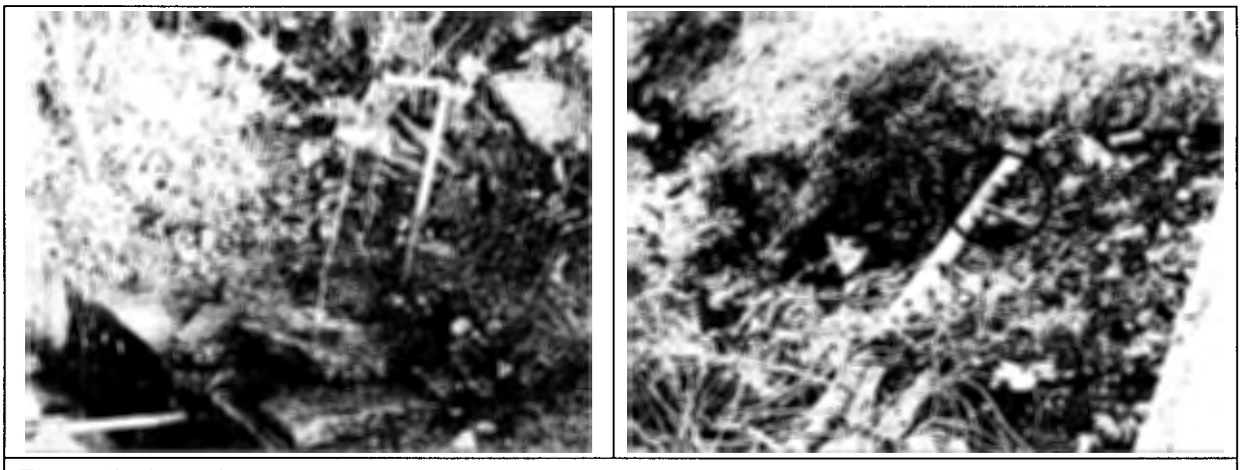


**Figure (3.10): Left- Flowing yard tap – a common sight; Right- Water pipe crossing Khojanpur Nallah. Pipe leakage is visible at circled spot**

The overall condition of the distribution network and the system maintenance appears to be poor. During field visits, it was observed that a number of stand posts did not have bib cocks. Even in case of some house service connections, flowing yard taps were common sight. Limited observations hinted that the condition of distribution network also may not be very good. Wastage of water observed at the delivery points may be a consequence of – 1) fixed user charge and 2) free supply through public stand posts. In Hoshangabad, house service connection users pay a fixed monthly charge of Rs 40 and water collection from public stand posts is free.

# CHAPTER 4: WASTEWATER COLLECTION, CONVEYANCE AND DISPOSAL

This chapter presents a broad estimate of wastewater generated in the town; wastewater collection, conveyance and disposal arrangements. This is followed by a brief description of sewage collection and treatment scheme (prepared by CES) proposed under National River Conservation Plan.

## 4.1. Wastewater Generation and Collection

HNP reports daily water supply level of 90 litres per person. In 2001, the population of Hoshangabad was 97,424. Considering annual growth of 4 percent (observed in 1991-2001 decade), current population is expected to be about- 128,000. Assuming a sewage return factor of 0.80 (80 percent), the current wastewater generated can be estimated at 9.22 *mld [128,000 persons x 90 lpcd x 0.80 return factor x 1/1,000,000].*

EPCO/ CES (2006) report on proposed sewerage on sewage treatment scheme estimates a flow of 10.69 mld for a population of 98,999 in 2008. Future population projections and wastewater generation estimates by EPCO/ CES (2006) are presented in Table (4.1) below. The wastewater generation estimates assumes a water supply level of 131 litres per capita per day and a sewage return factor of 0.80.

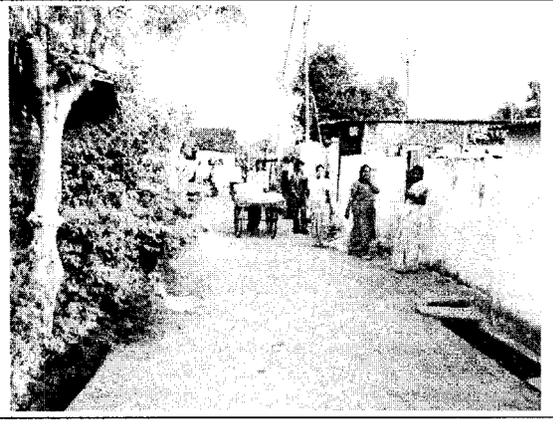
**Table (4.1): Wastewater Flow Estimation**

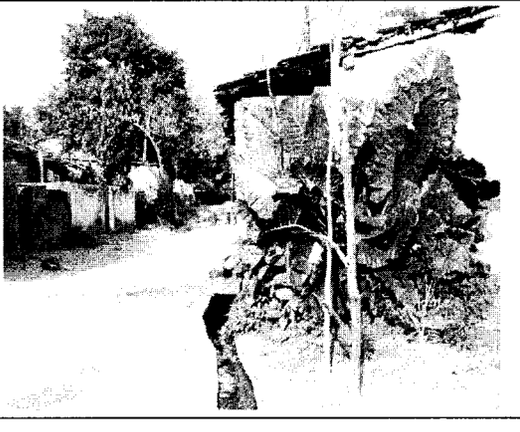
| Sewerage Zone | | Population Coverage* | | | Estimated wastewater Flow | | |
|---|---|---|---|---|---|---|---|
| **No** | **Name** | **2008** | **2023** | **2038** | **2008** | **2023** | **2038** |
| 1 | Korighat | 6,169 | 6,722 | 7,425 | 0.666 | 0.726 | 0.802 |
| 2 | Old Town | 22,098 | 24,498 | 27,546 | 2.387 | 2.646 | 2.975 |
| 3 | Gwaltoli | 15,533 | 20,528 | 26,874 | 1.678 | 2.217 | 2.902 |
| 4 | Civil Lines | 14,343 | 19,335 | 25,678 | 1.549 | 2.088 | 2.773 |
| 5 | Rasooliya | 15,310 | 25,693 | 38,886 | 1.654 | 2.775 | 4.200 |
| 6 | New Area | 25,544 | 44,109 | 67,697 | 2.759 | 4.764 | 7.311 |
| | **Total** | **98,999** | **104,886** | **194,106** | **10.692** | **15.216** | **20.963** |

Note:
* - excluding wards 22 and 23
*Source*: EPCO/ CES (2006)

Hoshangabad town does not have underground sewerage system. Sullage is mainly disposed through roadside box drains – of which some sections are covered. Overflow of septic tanks is also discharged into the drains. In few cases, latrines directly discharge into the drainage. The drainage system serves a dual purpose of carrying sullage as well as storm runoff.

**Figure (4.1): Typical Box Type Sullage and Storm Water Drains**



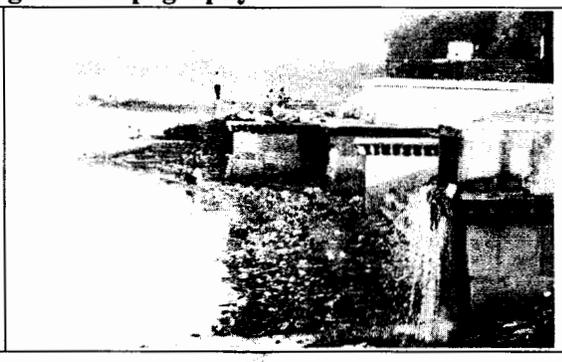


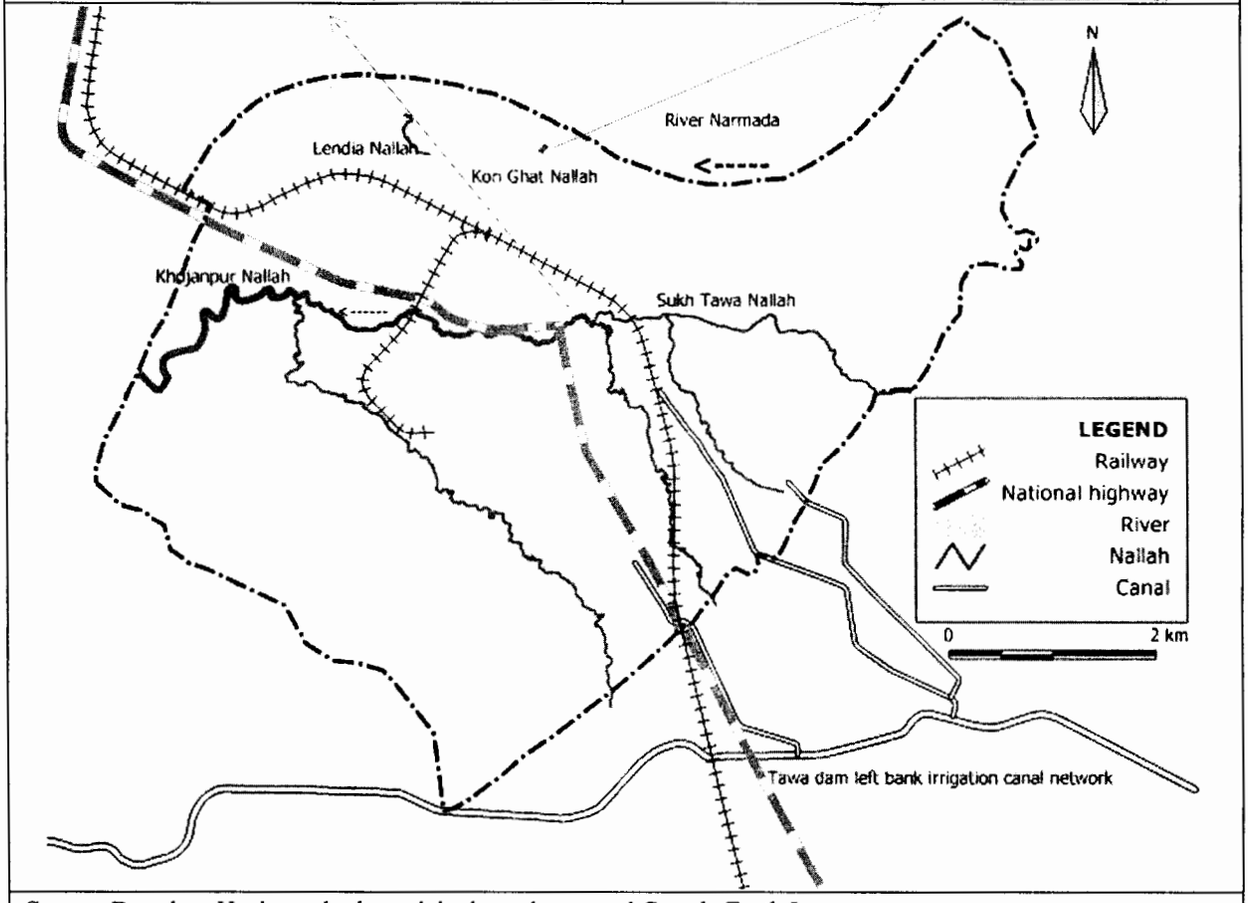
## 4.2 Wastewater Disposal

### Topography and Drainage

The topography of Hoshangabad town and the surroundings is such that the natural drainage system generally slopes towards north-west as shown in figure (4.2) below. There are four major natural drains – Kori Ghat nallah, Lendia Nallah, Sukh Tawa Nallah and Khojanpur nallah (Sukh Tawa Nallah discharges into Khojanpur nallah.) – that carry the wastewater for ultimate disposal into River Narmada. The point where Kori Ghat nallah discharges into Narmada River is located fairly upstream. Lendia Nallah and Khojanpur Nallahs on the other hand join the river down stream of town. Of these two nallahs, Khojanpur nallah travels nearly 3 km (through agricultural fields) after leaving the habited areas of the town and before meeting River Narmada.

**Figure (4.2): Drainage and Topography**






*Source*: Based on Hoshangabad municipal ward map and Google Earth Image

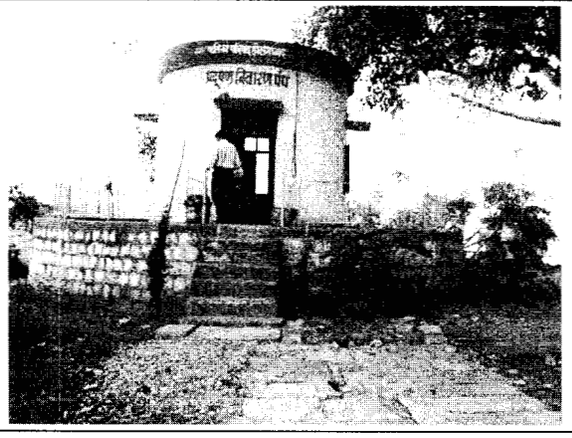
### Disposal of Septage from Septic Tanks

The Hoshangabad Municipality has one vacuum emptying tank. The municipality charges Rs. 500 per tank cleaning. It is reported that on an average there are ten to fifteen calls every month. At this rate the municipality cleans less than 200 septic tanks a year. This is less than 2 percent of the existing septic tanks. Information on manual cleaning of septic tanks, by the households themselves, is currently not available. The septage collected from the tanks is disposed into Khojanpur nallah, without any treatment.

### Kori ghat Nallah Diversion: An Existing River Pollution Control Scheme

As discussed earlier, Hoshangabad does not have formal sewerage system. However, flow from Korighat nallah, which disposes fairly upstream of the town, has been tapped and diverted to Lendia Nallah. The Kori Ghat wastewater flow diversion scheme was implemented by Public Health Engineering Department. It was commissioned in late 1980s and handed over to HNPP for operation and maintenance. The main aim of the scheme was to avoid the discharge of domestic wastewater upstream of bathing *ghats* on Narmada.

**Figure (4.3): Korighat Pumping Station**



**Pump House**

**Circular wet well**

**Figure (4.4): Existing Oxidation Ponds at Bheelpura**

*Source:* Google Earth Satellite Imagery

The nallah is reported to collect wastewater flow from densely populated area of the town (ward 1 (partly), 2, 3 and 27). The wastewater is transferred to oxidation pond (located near Bheelpura) through a combination of pressure main (about 300 m) and gravity sewer (about 1,400 m). The treated sewage is then discharged into Lendia nallah. EPCO/ CES (2006) estimates that Kori Ghat nallah discharges about 3 to 8 percent of the total wastewater (about 10 mld) generated in the town. The scheme is reported to be operated seasonally; i.e. only dry weather wastewater flow is tapped and diverted to Lendia nallah. EPCO/ CES (2006) reports that the infrastructure is partly damaged – *'pumps are old and do not work properly, civil structure is damaged and needs immediate repairing, roads/ houses have been built over the transmission line (making it inaccessible over some stretches, a number of manholes have been buried under the road... The ponds are now virtually non-existent. Only the inlet structure of the STP can be seen and the rest of the plant area has either been encroached by the local slum population or covered with shrubs or bushes.'*

## 4.3 River Water Quality

Based on the water quality, the Central Pollution Control Board has classed the water and designated best possible use. Water, based on chemical and biological criteria has been classed into 6 categories – A to E and below E – as presented in table (4.2) below.

**Table (4.2): Criteria for Classification of Water Quality**

| Class of water | Criteria | Designated-Best-Use |
|---|---|---|
| A | - Total Coliform Organism: *MPN/100ml shall be 50 or less*<br>- pH: *between 6.5 and 8.5*<br>- Dissolved Oxygen: *6mg/l or more*<br>- Biochemical Oxygen Demand 5 days 20°C: *2mg/l or less* | Drinking Water Source without conventional treatment but after disinfection |
| B | - Total Coliform Organism: *MPN/100ml shall be 500 or less*<br>- pH: *between 6.5 and 8.5*<br>- Dissolved Oxygen: *5 mg/l or more*<br>- Biochemical Oxygen Demand 5 days 20°C: *3 mg/l or less* | Outdoor bathing (Organised) |
| C | - Total Coliform Organism: *MPN/100ml shall be 5000 or less*<br>- pH: *between 6 to 9*<br>- Dissolved Oxygen: *4mg/l or more*<br>- Biochemical Oxygen Demand 5 days 20°C: *3mg/l or less* | Drinking water source after conventional treatment and disinfection |
| D | - pH: *between 6.5 to 8.5*<br>- Dissolved Oxygen: *4mg/l or more*<br>- Free Ammonia (as N): *1.2 mg/l or less* | Propagation of Wild life and Fisheries |
| E | - pH: *between 6.0 to 8.5*<br>- Electrical Conductivity at 25°C micro mhos/cm: *Max.2250*<br>- Sodium absorption Ratio: *Max. 26*<br>- Boron: *Max. 2mg/l* | Irrigation, Industrial Cooling, Controlled Waste disposal |
| *Source*: http://www.cpcb.nic.in/ (accessed on 19 November 2008) | | |

Pollution of River Narmada at Hoshangabad can be attributed only to discharge of domestic wastewater, since there is no wastewater producing major industry in or around the town. Currently, limited information is available on the water quality of River Narmada at Hoshangabad. Results of 2 water sample tests available from Madhya Pradesh Pollution control Board (MPPCB) and Agriculture Department, GoMP are presented in Table (4.3) below.

**Table (4.3): Narmada River Water Quality at Hoshangabad**

| Parameter | Sample 1 | Sample 2 |
|---|---|---|
| *Date* | *21 October 2005* | *7 September 2007* |
| *Location* | *Downstream of Lendia Nallah* | *Not known* |
| pH | | 7.8 |
| Dissolved Oxygen *(mg/l)* | 6.8 | 7.5 |
| BOD *(mg/l)* | 2.2 | |
| COD *(mg/l)* | - | 40 |
| Total Coliform *(MPN/ 100 ml)* | 2,400 | |
| *Source*: Sample 1: MPPCB, quoted in EPCO/ CES (2006); Sample 2: Dept of Agriculture | | |

The information is too little to confidently remark on river water quality; however, results of tested samples indicate that the water quality ranges between Class A and C. In case of sample 1, the DO and the BOD are within range for 'Class B', whereas total Coliform count is more than 2,400 MPN/100 ml, which indicates that water quality is 'Class C' (*Drinking water source after conventional treatment and disinfection*).

Sample 2 is collected in first half of September, when monsoon is still active (though in its last phases) over the region and the river is expected to be at an annual peak. Sample 1 is collected in second half of October, when monsoon is not active, however, the quantity of river flow generally better, which allows for dilution.

*[In order to understand the water quality trend, it would be useful to analyse results of samples collected in summer months and over a longer period of time.]*

## 4.4 Wastewater Reuse: Current Practice and Future Potential

Currently the wastewater generated in Hoshangabad is not reused. The town is located on the down stream of confluence point of River Tawa and River Narmada. About 30 kms upstream of the confluence point, a large dam is constructed on river Tawa. Left bank canal of the dam flows south of Hoshangabad. In fact, some of the branches of the canal network end in Hoshangabad municipal boundary. The region is well endowed with both- surface and groundwater resources.

Phephartaal ward (mostly a rural area dependent on agricultural economy) has substantial agricultural land, which is irrigated using the canal and ground water. The ward is located on the west of the town. Khojanpur Nallah (which carries most of the wastewater generated from Hoshangabad town) passes through the agricultural fields in this region. This area presents potential for reuse of wastewater generated from Hoshangabad.

**Box 4.1: Potential agricultural land for wastewater reuse**

According to Agriculture department, geographical area of Phephartaal (village) is about 564 Hectare. Out of this, nearly 440 hectare is arable land. Net sown area is reported to about 435 hectare. The area of *Kharif* crops is reported to be about 435 hectare and that under rabbi crops is reported to be 440 hectare (crop density is 199 percent). Total irrigated area is 436 hectare. Important sources of irrigation include canal (405 hectare – 93 percent), groundwater – tube-well/ well – (25 hectare - 6 percent).

*Source*: Agriculture Department, GoMP

During field visit, quick interaction with the farmers indicated that the cropping density is about 150 percent (100 percent in *Kharif* and 50 percent in *Rabbi*). The cropping density in rabbi is reported to vary, depending on the forecast of water release from dam on river Tawa. Major crops in the area reported to be Soybean (*Kharif*) and wheat and gram (*Rabbi*). Vegetable cultivation is rare despite marketing opportunity in nearby Hoshangabad town. Treated effluent from Hoshangabad (if channelled properly and its potential discussed with farmers) can become perennial water source for these farmers. Use of nutrient rich treated effluent can provide multiple benefits – a) possible reduction in use of fertilizers (nutrient requirement offset by nutrients in treated effluent), b) perennial source means that crops can be grown even in summer months (further crop density increase in covered area), c) save on electricity used for pumping groundwater, and d) avoid direct wastewater discharge into the river.

## 4.5 Proposed Sewage Collection and Treatment Schemes

### Trunk Sewerage and Sewage Treatment Scheme (NRCP)

Hoshangabad is one of the towns taken up under Government of India's ambitious National River Conservation Plan (NRCP). Under the programme, a wastewater collection and treatment scheme is proposed for Hoshangabad town. A detailed project report for the scheme has been prepared by Consulting Engineering Services (CES) on behalf of Environmental Planning & Coordination Organisation, GoMP. The scheme was submitted to

National River Conservation Directorate in 2006 and has been approved. The scheme broadly comprises of – trunk sewerage network, sewage pumping station and 2 sewage treatment plants (4 mld and 11 mld). Proposed wastewater treatment system consists of facultative pond followed by maturation pond. The scheme is estimated to cost about Rs 103 million; component-wise breakdown of costs are presented in Table (4.2) below.

**Table (4.4): Components of proposed trunk sewerage and sewage treatment scheme for Hoshangabad**

| Sl No | Component | Estimated Cost (Rs in Million) |
|---|---|---|
| 1 | Sewerage system including trunk sewerage network (15.54 km), pumping stations, pumping main and nallah tapping | 54.76 |
| 2 | Sewage Treatment Plants (2 Nos - 4 mld and 12 mld) | 14.25 |
| 3 | Low cost sanitation (community toilets – 2 Nos 10 seated ) | 1.34 |
| 4 | Catchment Area Treatment | 0.56 |
| 5 | Land Acquisition | 8.51 |
| 6 | Public Participation | 0.50 |
| | **Sub-total (@ 2002 Prices)** | **79.92** |
| | Escalation up to 2006 excluding land cost | 11.43 |
| | Escalation up to 2008 excluding land cost | 49.98 |
| | **Base cost (Excluding land cost)** | **96.34** |
| | Centage (8%) | 0.70 |
| | **Total Cost** | **103.37** |

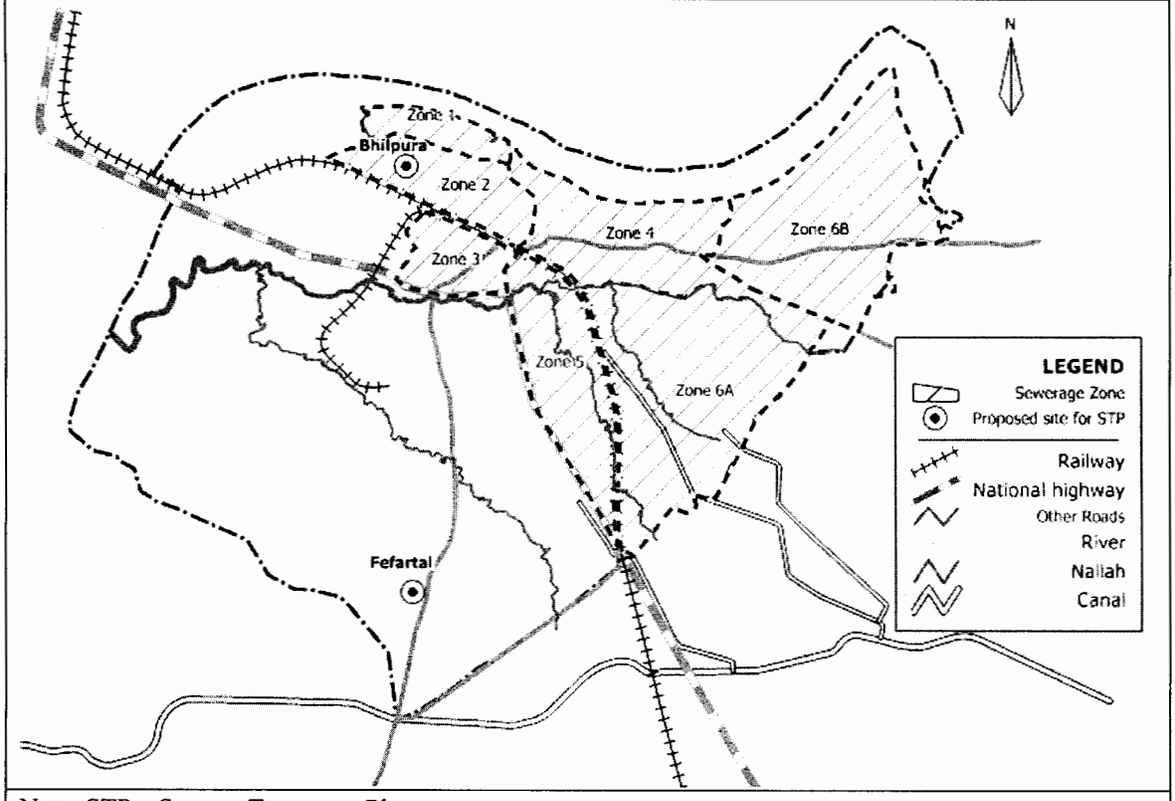
*Source*: Hoshangabad Nagar Palika Parishad

For slum communities, low cost sanitation has been proposed under the scheme. A provision of Rs 1.34 million has been made for the same. Only 2 toilet blocks are proposed under the scheme.

For the purpose of wastewater collection, the town has been divided in 6 sewerage zones based on drainage catchment. Wastewater from zone 1 and 2 is diverted to Bheelpura STP site, whereas, wastewater from remaining zones is diverted to Phephartaal STP site. Locations of the STP sites and sewage zones are shown in Figure (4.4) below. The sewerage network does not cover wards Phephartaal, SPM (East), SPM (West) and part of Rasooliya ward

Recently HNPP has issued notice inviting tenders for implementation of trunk sewerage network, construction of sewage pumping stations and 2 sewage treatment plants. HNPP on the other hand has initiated process of land acquisition near Phephartaal. *[However, the farmer owning the land has reportedly appealed in the Court against the land acquisition.]*

**Figure (4.5): Hoshangabad: Sewerage Zones and proposed Sewage Treatment Plant Sites**




Note: STP – Sewage Treatment Plant

*Source*: Based on Hoshangabad municipal ward map, EPCO/ CES (2006) and Google Earth satellite Image

Once constructed, the O&M of the system (trunk sewerage network, pumping stations, and STPs) is estimated to cost Rs 12.05 million annually, starting from 2007. The O&M cost is estimated to increase at the rate of 2 percent per annum.

**Branch and Lateral Sewerage Network (under UIDSSMT)**

Under the NRCP scheme, trunk sewerage laying is proposed. To complete this, a separate scheme for laying branch and lateral sewerage network is proposed under UIDSSMT. Separate consultant has been engaged to prepare a Detailed Project Report (DPR). The Consultant has submitted the report. Reportedly, since the Consultant did not take into account for technical details proposed under NRCP scheme. The scheme is currently being revised.

The implementation of both the schemes can be expected to severely disrupt town-wide communication, especially since most streets (in the dense core of the town) are narrow.

*[In order to take benefit of above two schemes, the HNPP will now need to plan for house sewer connection. This is most critical for success of above two schemes.]*

# CHAPTER 5: MUNICIPAL FINANCES

## 5.1 Trends in Revenue and Expenditure

This section presents a broad-brush appraisal on finances of Hoshangabad Nagar Palika Parishad. Starting from 2001-02, revenues of HNPP have registered improvements. Nevertheless there is no consistency in the improvements. Considering 2001-02 as a base year, Revenues have increased by about 110 percent in 2006-07.

**Table (5.1): Hoshangabad Nagar Palika Parishad: Revenue and Expenditure (Rs in Million)**

| Sl # | Account Heads | 2001-02 | 2002-03 | 2003-04 | 2004-05 | 2005-06 | 2006-07 | 2007-08 Revised |
|---|---|---|---|---|---|---|---|---|
| | **Heads of Revenue** | | | | | | | |
| 1 | Municipal Tax | 21.811 | 16.044 | 15.758 | 18.850 | 17.354 | 36.996 | 31.295 |
| 2 | Revenue from Municipal property and powers | 10.817 | 10.259 | 11.729 | 11.912 | 8.437 | 15.403 | 25.962 |
| 3 | Water tax | 2.434 | 2.327 | 1.857 | 2.347 | 2.299 | 2.236 | 2.538 |
| 4 | realisations under special acts | 0.025 | 0.052 | 0.041 | 0.041 | 0.075 | 0.083 | 0.022 |
| 5 | Receipts from Electricity | 0.016 | 0.009 | 0.037 | 0.392 | 0.152 | 0.175 | 0.196 |
| 6 | Grants and Contributions (Gen & Spec Purposes) | 1.788 | 12.153 | 20.088 | 20.313 | 26.333 | 24.960 | 43.856 |
| 7 | Miscellaneous | 1.071 | 0.373 | 0.303 | 0.457 | 0.973 | 0.826 | 2.052 |
| 8 | Extraordinary and Debt | 1.212 | 1.057 | 2.039 | 1.216 | 2.869 | 1.302 | 8.042 |
| | **Total** | **39.173** | **42.275** | **51.851** | **55.529** | **58.492** | **81.981** | **113.963** |
| 9 | *Opening Balance* | *0.869* | *1.335* | *1.482* | *3.908* | *5.315* | *6.914* | *6.906* |
| | **Grand Total** | **40.042** | **43.610** | **53.332** | **59.437** | **63.807** | **88.895** | **120.869** |
| | **Heads of Expenditure** | | | | | | | |
| 10 | General Administration and Collection Charges | 5.569 | 6.286 | 5.745 | 6.703 | 8.272 | 9.335 | 10.564 |
| 11 | Public Safety | 4.360 | 6.905 | 6.183 | 5.409 | 5.945 | 8.989 | 10.111 |
| 12 | Public Health and convenience | 13.028 | 14.276 | 14.342 | 15.327 | 21.005 | 24.880 | 25.213 |
| 13 | Public Instruction | 0.627 | 0.592 | 0.570 | 0.579 | 0.732 | 0.681 | 0.651 |
| 14 | Energy Charges | 0.000 | 0.000 | 0.000 | 0.034 | 0.000 | 0.000 | 0.020 |
| 15 | Public Works | 6.299 | 9.510 | 16.830 | 18.179 | 14.145 | 32.200 | 46.689 |
| 16 | Contributions (for General Purposes) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 17 | Miscellaneous | 2.019 | 3.110 | 3.718 | 4.959 | 2.934 | 3.343 | 3.718 |
| 18 | Extraordinary and Debt | 6.805 | 1.450 | 2.035 | 2.522 | 3.860 | 2.562 | 4.396 |
| | **Total** | **38.707** | **42.128** | **49.424** | **53.711** | **56.893** | **81.989** | **101.362** |
| 19 | *Closing Balance* | *1.335* | *1.482* | *3.908* | *5.315* | *6.914* | *6.906* | *19.507* |
| | **Grand Total** | **40.042** | **43.610** | **53.332** | **59.026** | **63.807** | **88.895** | **120.869** |

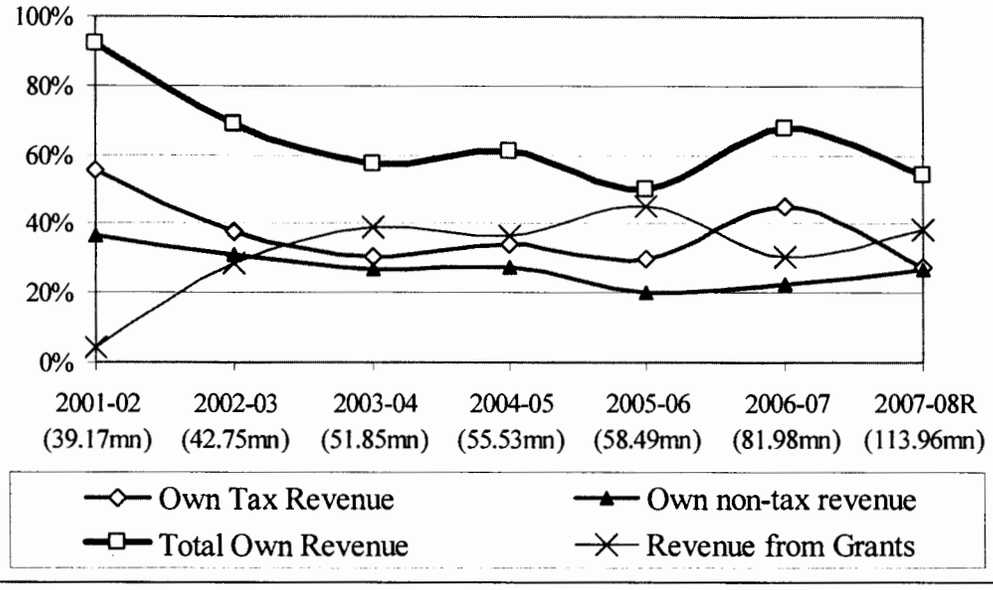
*Source*: Revenue and Expenditure statements, Hoshangabad Nagar Palika Parishad

In 2002-03, the municipality registered a sharp decline (about 26 percent over 2001-02 level) in the municipal tax (which forms main component of own revenue). The decline continued even in next year, however it was negligible. The decline was however, compensated by sharp increase in 'Grants and Contributions', which increased from about 1.78 million to 12.15 million. Thereafter the HNPP has registered a continuous growth in its revenues- both from own sources and government grants.

The expenditure on the other side also shows simultaneous increase, which has gone up from 38.70 million in 2001-02 to about 82 million in 2006-07 as presented in Table (5.1) above.

Over the period, the expenditure registered an increase of 112 percent. During the same period, expenditure on core services has increased by 91 percent.

**Figure (5.1): HNPP Revenue from Own Sources as Percentage of Total Revenue**




Note:
1. Number in (39.17 mn) represent total revenues of the municipality for the year in million Rupees
2. In case of FY 2007-08, actual revenues and expenditure were not available; calculations are based on 'Revised' estimate.
*Source*: HNPP

HNPP's income from own tax revenues forms biggest chunk; it constituted nearly 60 percent in 2001-02; however over time, it has reduced in percentage terms, as the revenues from government grants increased. The income from 'own tax revenue' has not registered a gradual increase, there have been fluctuations.

**Table (5.2): Profile of Revenue and Expenditure (Amount in Rs Million)**

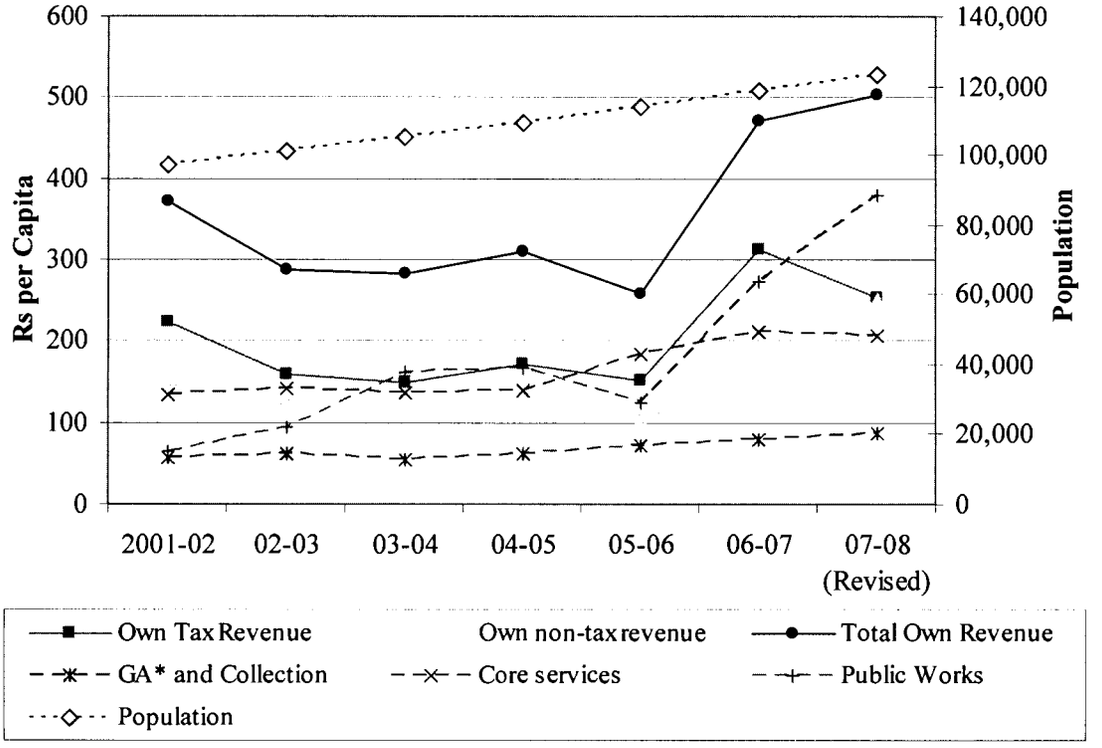
| Revenue/ Expenditure | 2001-02 | | 2002-03 | | 2003-04 | | 2004-05 | | 2005-06 | | 2006-07 | | 2007-08 Revised | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Amount | % | Amount | % | Amount | % | Amount | % | Amount | % | Amount | % | Amount | % |
| **Revenue** | 39.17 | | 42.28 | | 51.85 | | 55.53 | | 58.49 | | 81.98 | | 113.96 | |
| Own Tax Revenue[14] | 21.81 | *56* | 16.04 | *38* | 15.76 | *30* | 18.85 | *34* | 17.35 | *30* | 37.00 | *45* | 31.30 | *27* |
| Own non-tax revenue[15] | 14.36 | *37* | 13.02 | *31* | 13.97 | *27* | 15.15 | *27* | 11.94 | *20* | 18.72 | *23* | 30.77 | *27* |
| Revenue from Grants | 1.79 | *5* | 12.15 | *29* | 20.09 | *39* | 20.31 | *37* | 26.33 | *45* | 24.96 | *30* | 43.86 | *38* |
| Total Own Revenue | 36.17 | *92* | 29.06 | *69* | 29.72 | *57* | 34.00 | *61* | 29.29 | *50* | 55.72 | *68* | 62.06 | *54* |
| **Expenditure** | 38.71 | | 42.13 | | 49.42 | | 53.71 | | 56.89 | | 81.99 | | 101.36 | |
| GA and Collection | 5.57 | *14* | 6.29 | *15* | 5.75 | *12* | 6.70 | *12* | 8.27 | *15* | 9.34 | *11* | 10.56 | *10* |
| Core services | 13.03 | *34* | 14.28 | *34* | 14.34 | *29* | 15.33 | *29* | 21.00 | *37* | 24.88 | *30* | 25.21 | *25* |
| Public Works | 6.30 | *16* | 9.51 | *23* | 16.83 | *34* | 18.18 | *34* | 14.14 | *25* | 32.20 | *39* | 46.69 | *46* |

*Source*: HNPP 2008

[14] Own tax revenue includes revenues from Property tax
[15] Own non-tax revenue includes revenues from non-tax sources such as – realizations under special acts, municipal property, receipts from water rate and miscellaneous.

The expenditure on core services has nearly doubled over 2001 – 2006. However, in percentage terms it has declined from 34 percent (FY 01-02) to 30 percent (FY 06-07). Over the same period, the expenditure on public works has registered substantial increase from 16 percent 39 percent as presented in Table (5.2) above. This indicates a gradual shift in the focus of the municipality towards creating new assets. While the need for the same can not be denied, the expenditure on core services should have logically increased with the addition of new assets. The trend also points towards deterioration in asset maintenance.

**Figure (5.2): Per Capita Revenue and Expenditure of Municipal Revenues**




Notes:

1. Own tax revenue includes revenues from Property tax
2. Own non-tax Revenues includes revenues from non-tax sources such as – realizations under special acts, municipal property, receipts from water rate and miscellaneous

* GA - General Administration

*Source*: Analysis based on financial data from HNPP 2008, Census 2001 population and population estimates for 2002-08 period based on annual growth at 4 percent

Over FY 2001-02 – FY 06-07 period, annual per capita income of HNPP from own tax revenue has increased from Rs 224 to Rs 312. In FY 07-08 the municipality estimates a sharp decline of about Rs 58 as presented in Figure (5.2) above. Annual per capita expenditure on 'public works' has sharply increased by more than 300 percent in a span of 5 years, starting from 2001-02. Annual per capita expenditure on 'core services' has increased from Rs 134 (FY 01-02) to Rs 210) (FY 06-07), registering an increase of 54 percent.

Further addition of assets in terms of sewerage network and sewage treatment plant will increase expenditure on core services by about 12 million per year. At 2008 prices and population, this translates to an additional burden of about Rs 97 per capita per annum. *The municipality therefore will have to make sure that all households connect to the sewerage network and cost recovery is implemented rigorously.*

## 5.2 Trends in Recovery of Municipal Taxes and Other Revenues

74th Constitutional Amendment Act (CAA) initiated the process of decentralisation of powers and functions and strengthening of local-self governments in urban areas. This also meant that the municipalities have to focus more and more on their own sources of revenue and depend less on transfers from State or Centre. Further with the abolition of Octroi, property tax remained the most important source of revenue. Drying up of resources from Centre and State also meant the municipalities had to begin charging the consumers for services provision of municipal services. Traditionally, tax recovery rates were poor, however, as the responsibility increased, there has been gradual improvement in recovery rates.

In case of Hoshangabad, recovery rates of three key taxes and rents for buildings and shops are presented in Table (5.3) below. Recovery rate of property tax have increased from 80 percent in 2005-06 to about 86 percent in FY 2007-08. Over the same period, recovery rate for unified tax has increased from 26 percent to 52 percent. The increase he is, however, not consistent. Recovery rates for water tax are generally very poor. During last year, only 40 percent recovery is registered. Though the demand for building and shop rent increased substantially; recovery rate reduced by about 20 percent.

**Table (5.3): Trend in Recovery of Municipal Taxes**

| Sl # | Component | FY 05-06 | | FY 06-07 | | FY 06-07 | |
|---|---|---|---|---|---|---|---|
| | | Demand | RoR* | Demand | RoR | Demand | RoR |
| 1 | Property Tax | 1,485,232 | 80% | 1,883,267 | 84% | 2,197,145 | 86% |
| 2 | Unified Tax | 1,388,591 | 26% | 1,691,187 | 55% | 1,691,187 | 52% |
| 3 | Water Tax | 2,909,280 | 34% | 3,413,544 | 40% | 3,467,304 | 41% |
| 4 | Rent for shops and buildings | 2,260,712 | 76% | 2,512,062 | 38% | 2,922,768 | 56% |
| 5 | Education Cess | | | 313,878 | 72% | 313,878 | 88% |

Notes:
* - Rate of Recovery
*Source*: HNPP 2008

From 2006-07, the HNPP introduced Education Cess. Recovery rate for the same has been much better at 88 percent; however, this constitutes a miniscule (3 percent) of the total demand for FY 06-07

Poor recovery rate (41 percent in FY 06-07) for water tax is a matter of concern, especially from the point of proposed addition in asset base (sewerage and swage treatment) and expected increase in O&M burden of sanitation services thereafter.

Discussion with municipal staff indicates that about Rs 1,500 will be collected from the households towards connection charge. Additionally, the municipality aims at pegging the monthly O&M charges at Rs. 30 for domestic connection. Though the municipal staff realises that it will not sufficient to meet the expenses; however, current tariff for water supply at Rs 40 per month is seen as the limiting factor.

# CHAPTER 6: EMERGING ISSUES AND OPPORTUNITY

This chapter briefly recapitulates the status of core municipal services and lists emerging issues for consideration during CSP development process.

## 6.1 Status of Municipal Services: a Brief Summary

**Sanitation**: Sanitation survey covered 15,515 households located within HNPP area. Nearly 85 percent of these households access individual sanitation facility. Nearly all households having sanitation arrangements have improved sanitation facility – WC connected to septic tank or pit latrines. There are a very few unimproved latrines – latrines discharging into drains or service latrines. Analysis of census 2001 and sanitation survey (2008) data indicates that majority of the households having service latrines have upgraded to latrines. Nearly 15 percent households currently lack access to sanitation facilities.

Hoshangabad town is important pilgrimage centre and district headquarter. The town is, hence, visited by considerable floating population. However, public sanitary conveniences are grossly inadequate. Few operational PSCs are maintained by Sulabh. Per use charging system followed in these blocks discourages poor households lacking individual sanitation facility. Most households currently lacking sanitation facilities have declined preference for either individual or community sanitation facilities. Sanitation survey results show an interesting trend that most households are not willing to contribute towards capital or maintenance expenditure of community sanitation facilities.

The town does not have formal sewerage. City drainage consists of open drainage system that serves dual purpose of collecting and disposing both – storm water as well as sullage. Septic tank effluent is also discharged into drains. Street drainage consists of box type drains. Major drainage system of the town consists of three natural drains – Kori ghat nallah, Lendia Nallah and Khojanpur nallah. All three nallahs ultimately discharge into River Narmada. Kori ghat nallah discharges fairly upstream of the town; Lendia nallah discharges midways and Khojanpur nallah meanders through agricultural fields for about 3 km after leaving the town and before joining River Narmada. To prevent pollution of River Narmada, HNPP built a flow diversion and treatment scheme for Kori ghat nallah. The scheme is reportedly operated only during dry weather. Oxidation ponds built as part of the scheme are reported to be defunct.

Current wastewater generation from the town is estimated to be about 10 mld. Under NRCP, a scheme for river pollution control is approved for the town. The scheme comprises trunk sewerage network, sewage pumping stations and sewage treatment plant. The scheme excludes branch and collector sewer networks and house service connections. HNPP is preparing a scheme to construct branch and collector sewer network. The scheme is proposed under UIDSSMT.

There is lack of information on septage removal from septic tanks. The municipality has only one vacuum truck that attends about three to four calls a month.

**Solid Waste Collection and Disposal**: Daily solid waste generation from the town is reported to be 50 MT. HNPP collects the waste from 74 designated collection points. The waste is transferred to a landfill site located on south-eastern edge of the town. HNPP practices uncontrolled dumping. There is no organised primary solid waste collection system. About a ninety percent of the surveyed households reported to practice dumping in open; only about a tenth practice dumping in municipal bins. About a percent of the households dispose solid waste in drains. Most households reported that there is no fixed place of

dustbin. Majority of the households agreed that the municipality solid waste from collection points; most however, complained that the clearance frequency is not fixed.

**Water Supply**: Groundwater is the main source of drinking water. Most households access piped water supply. An average supply level of 90 lpcd is reported. Water tax is charged at the rate of Rs 40 per connection per month. Overall condition of distribution network is poor. Water supply is intermittent. Water wastage, during supply hours, is a common sight.

## 6.2. Emerging Issues

### Expanding (Universalising) Sanitation Coverage

Current household sanitation coverage stands at about 85 percent. Expanding coverage beyond this will be a major challenge mainly since most of the remaining households could be from slums and squatter settlements – i.e. households that lack finances, space, tenure or simply awareness is an issue. *As guided by the NUSP, the HNPP will need to develop a detailed strategy for city-wide sanitation strategy that addresses these issues.*

### Proposed Sewerage and Sewage Treatment Scheme

Narrow Streets: Most of the streets in core town area are narrow. Moreover, most of these streets have shops on both sides. Laying sewerage network in narrow lanes is expected to pose major challenges during construction. *The HNPP may have to consider other options such as shallow sewerage or small bore sewers or a combination of both. Use of small bore sewers will be ideal for areas already saturated with septic tanks. Maintenance of these sewers is much less compared to conventional sewerage; however, septage removal mechanisms need to be continued.*

Water Supply: Current water supply level is reported to be 90 lpcd. At this supply rate, sewage flow will be merely about 70 lpcd. Under such low sewage flow condition, the conventional sewerage network may often experience blockage. The HNPP may need to consider small bore sewers that function better even under low flow conditions.

Upgrading from Septic Tanks to Sewerage System: Most households already use septic tanks for excreta disposal. Getting these households to connect to the proposed sewerage scheme will be a formidable task since it involves payment of Rs. 1,500 towards connection charges and about Rs. 3,000 in laying the connection pipe. Mobilising more than 10,000 households in support of the scheme will require well crafted communication strategy and a strong political commitment.

HNPP will have to meticulously tackle issues such as sewerage connection charges and/or connection costs (which may turn out to be prohibitive). As of now, the people of Hoshangabad seem to be unaware of proposed scheme(s). The municipality will need to develop a communication strategy to create awareness among the residents on benefits of sewerage schemes.

Coordinating planning and implementation of three distinct tasks: Complete sewerage and sewage treatment package has three distinct components:

1. Construction of trunk sewers and sewage treatment plant (proposed under NRCP, already approved)
2. Construction of branch and collector sewers (proposed under UIDSSMT, DPR preparation)
3. Providing house sewer connections

Out of this, the third component is to be executed by the HNPP, once first two components are implemented. Of the remaining two, first component is already designed and approved;

whereas the DPR for the second component is recently submitted by the consultants to HNPP.

HNPP reports that the detailed sewer network designs for the second component did not take account of trunk sewer designs. Hence, HNPP has asked the consultant to revise the designs. Once approved a separate contract would be issued for implementation of the second component. Beyond this, the municipality will have to make its own arrangements to implement the third component (house service connections), which may again be carried out by third agency.

As the implementation of these schemes begins, several coordination issues may crop up. The HNPP will have challenging times in resolving issues arising due to non-coordinated planning and implementation of these schemes.

**Solid Waste Management**

Solid waste management is the town needs a complete overhaul – starting from primary collection, transportation to disposal. Concerns on two fronts are critical – 1) reliable primary collection service to users; and 2) appropriate disposal of solid waste.

1. Primary Collection: most residents currently dispose the garbage in the open. Upgrading directly to door-to-door collection is will be a difficult task. The HNPP may plan gradual upgrading – starting with provision of communal storage bins and timely clearance (and transportation), street sweeping, conservancy and then gradually switching to door-to-door collection. Littered waste is also known to block flow in sewers. It would be therefore ideal to start improving primary collection of solid waste, before the sewerage network is laid and commissioned.

The town being a district headquarter and an important religious centre, the floating population is reported to be high. The HNPP will have to develop strategies for solid waste collection from public places such as bus terminals, railway station, bathing *ghats* and market areas. The HNPP will have to also substantially improve street sweeping and conservancy.

2. Storage and transfer: clearance of communal storage bins is currently reported to be a major issue. Currently, the municipality clears about 50 MT solid waste everyday. The HNPP will have to develop ways that promote recycling and reuse to reduce the quantum of waste to be transferred and processed for final disposal.

2. Solid Waste Disposal: Currently, HNPP practices uncontrolled dumping. The landfill site is located on the south eastern edge of the town. Uncontrolled dumping poses serious threat of groundwater (main drinking water source) contamination. The HNPP needs to conduct detailed investigation to understand the implications. The HNPP should also plan to move toward controlled deposition (sanitary landfill) of solid waste.

Cattle Waste: Only about half of the 957 cattle owning households practice better disposal methods for cattle waste; remaining half practice open dumping or other disposal methods.

**Wastewater Reuse**

Currently, wastewater generated from the town is disposed into River Narmada. The location of the proposed sewage treatment plant is such that the treated wastewater can be channelled for agricultural use. The nutrient rich wastewater can be safely used for agriculture, as the town does not have industrial units, thus negating the possibility of chemical contamination.

### O&M Cost Recovery

The completion of sewerage and sewage treatment scheme is expected increase expenditure on core services by about 12 million per year. At 2008 prices and population, this translates to an additional burden of about Rs 97 per capita per annum (or Rs 500 per household per annum). This will constitute substantial proportion of household expenditure for poor households. Current recovery rates of water charge itself is poor, recovering user fees for wastewater will be further challenging. Hence getting town residence on-board will be critical factor in success of the scheme.

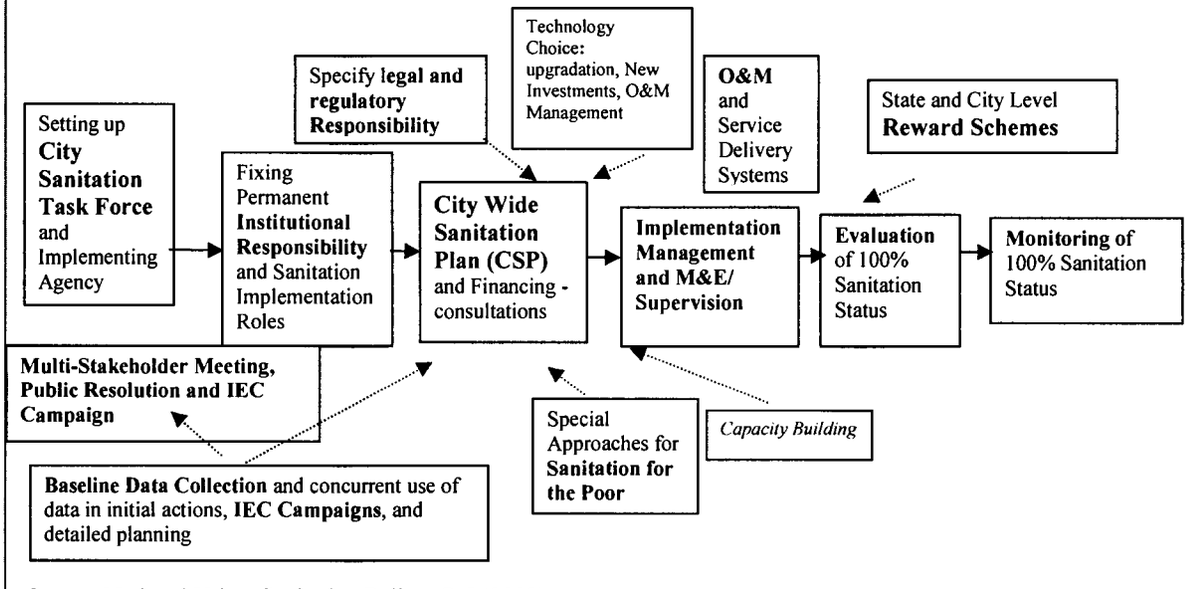
*The municipality will have to make sure that all households connect to the sewerage network and cost recovery is implemented rigorously.*

## 6.3 The Opportunity

Emerging issues listed above pose a serious public health challenge. Nevertheless – already approved wastewater collection and treatment scheme (under NRAP), recently launched NUSP and the selection of Hoshangabad (by GoMP) to transform it into sanitised city – together offer twin opportunities of becoming sanitised city and also the torchbearer for other towns.

As suggested in the NUSP, a City-wide Sanitation Plan can bring all elements together to resolve the challenge. The CSP framework presented in the NUSP outlines generic elements of planning, implementation and M&E of city-wide sanitation as presented in Figure 6.1 below.

**Fig (6.1): Generic Elements of Planning, Implementation and M&E of City-wide Sanitation**




*Source*: National Urban Sanitation Policy, GoI (2008)

Based on the *guidelines presented in the City-wide Sanitation Framework* and *challenges emerging from situation analysis*, HNPP can plan and achieve the goal of city-wide sanitation. Key generic steps (based on City-wide Sanitation Framework adapted to Hoshangabad situation), for HNPP to achieve city-wide sanitation are outlined below.

1. Constitute City Sanitation Task Force to elevate the consciousness about sanitation;
2. Develop and implement communication strategy to create awareness among the residents on benefits of sanitation and hygiene. The strategy should aim at mobilising support of the residents towards proposed sewerage and sewage treatment scheme.

3. Develop a detailed GIS database- based on recent baseline sanitation survey
4. Develop designs and lay branch and lateral sewerage network that complements both- *sewerage scheme* already approved under NRAP and *existing household sanitation arrangements* (Nearly three-fourth of the households use septic tanks to dispose night soil.) *Sewerage network designs should be developed considering current water supply levels.*
5. Explore options for reuse of treated wastewater for agriculture.
6. Plan for un-served areas: issues in un-served areas/ households could include affordability, tenure and/ or space. Develop mechanisms to assist these households by adopting appropriate tenure policy, creating financing mechanisms, providing technical support for latrine construction and planning for community toilets to serve in the interim period (from now till all households could migrate to individual sanitation facilities).
7. Plan for sanitation arrangements for floating population: this is a critical element for Hoshangabad as the town is visited by numerous tourists all through the year.
8. Specify rules and regulations- safe sanitary arrangements at unit level (household, establishment), norms for wastewater conveyance, treatment and final disposal
9. Develop Institutional mechanisms for coordination between various agencies that will be responsible for implementation of various components (house connections, sewerage, wastewater treatment, reuse and final disposal)
10. Define – sewerage connection charges, sewerage tariff and collection mechanisms (e.g. system of instalments for poor households)
11. Identify capacity building needs of the municipal staff, other agencies that will be involved in implementation.
12. Develop mechanisms for Monitoring and Evaluation of the programme.

Though these steps appear linear, the process will be iterative in nature. It is important that the HNPP and all the people of Hoshangabad join together to make this a success and achieve the goal on citywide sanitation.

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| Annex 1: List of Municipal Wards, Hoshangabad | | |
|---|---|---|
| **Ward No** | **Name** | **Slum Ward** |
| 1 | Shashri Ward | No |
| 2 | Shanichara Ward | No |
| 3 | Jagdishpura Ward | No |
| 4 | Mangalwara Ward | No |
| 5 | Narayanganj Ward | No |
| 6 | Ramganj Ward | Yes |
| 7 | Azad Ward | Yes |
| 8 | Subhashganj Ward | No |
| 9 | Balaganj Ward | No |
| 10 | Ganeshganj Ward | No |
| 11 | Janakpuri Ward | No |
| 12 | Sadar Bazar Ward | No |
| 13 | Kothi Bazar Ward | No |
| 14 | Tilak Ward | No |
| 15 | Malakhedi Ward (North) | Yes |
| 16 | Malakhedi Ward (South) | Yes |
| 17 | Civil Line Ward | No |
| 18 | Housing Board Ward | No |
| 19 | Anand Nagar Ward | No |
| 20 | Adamgarh Ward | Yes |
| 21 | Phephartal Ward | Yes |
| 22 | SPM Ward (East) | No |
| 23 | SPM Ward (West) | No |
| 24 | Rasooliya Ward | Yes |
| 25 | Rajendra Ward | Yes |
| 26 | Rewaganj Ward | Yes |
| 27 | Bheelpura Ward | Yes |
| 28 | Krishnapuri Ward | No |
| 29 | Gokulpuri Ward | Yes |
| 30 | Gwaltoli Ward | Yes |
| 31 | Govindpura Ward | Yes |
| 32 | Gandhi Ward | Yes |
| 33 | Tagore Ward | Yes |
| *Source*: Hoshangabad Nagar Palika Parishad | | |

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| Annex 2: Ward-wise Distribution of Cattle owning Households and Cattle Waste Disposal Practice Adopted | | | | | | |
|---|---|---|---|---|---|---|
| **Ward No** | **Ward Name** | **Used by Self** | **Arrangement to dispose out of town** | **Disposed in Open** | **Other** | **Total** |
| 1 | Shashri Ward | | | 3 | | 3 |
| 2 | Shanichara Ward | | | 15 | 1 | 16 |
| 3 | Jagdishpura Ward | 1 | | 28 | 6 | 35 |
| 5 | Narayanganj Ward | | | 12 | | 12 |
| 6 | Ramganj Ward | | | 24 | | 24 |
| 8 | Subhashganj Ward | | 6 | | 10 | 16 |
| 9 | Balaganj Ward | | | 24 | | 24 |
| 10 | Ganeshganj Ward | 1 | | 1 | | 2 |
| 11 | Janakpuri Ward | 6 | 7 | 3 | 1 | 17 |
| 13 | Kothi Bazar Ward | 7 | | 40 | | 47 |
| 14 | Tilak Ward | | | 2 | 2 | 4 |
| 15 | Malakhedi Ward (North) | 335 | | | | 335 |
| 16 | Malakhedi Ward (South) | 6 | | 9 | 22 | 37 |
| 17 | Civil Line Ward | 10 | | 2 | 1 | 13 |
| 18 | Housing Board Ward | | | 2 | 1 | 3 |
| 19 | Anand Nagar Ward | 3 | | 6 | | 9 |
| 20 | Adamgarh Ward | | | 5 | | 5 |
| 21 | Phephartal Ward | 45 | 1 | 3 | 90 | 139 |
| 23 | SPM Ward (West) | | | 1 | | 1 |
| 24 | Rasooliya Ward | 8 | | 1 | | 9 |
| 25 | Rajendra Ward | | | 19 | | 19 |
| 26 | Rewaganj Ward | | | 33 | | 33 |
| 27 | Bheelpura Ward | | 1 | 30 | | 31 |
| 28 | Krishnapuri Ward | | | 56 | | 56 |
| 30 | Gwaltoli Ward | 6 | | 3 | | 9 |
| 31 | Govindpura Ward | 2 | | 29 | | 31 |
| 32 | Gandhi Ward | 23 | | 4 | | 27 |
| All Wards | | 453 | 15 | 355 | 134 | 957 |
| *Source:* Sanitation Survey 2008 | | | | | | |

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| Annex 3: Ward-wise Distribution of Households with 'Other' Latrines | | | | | |
|---|---|---|---|---|---|
| **Ward No** | **Ward Name** | **Night Soil Lifted by Scavengers** | **Night Soil Disposed to Open Drainage** | **Night Soil Serviced by Animals** | **All Types** |
| 3 | Jagdishpura Ward | | 11 | | 11 |
| 6 | Ramganj Ward | | 1 | 1 | 2 |
| 8 | Subhashganj Ward | 19 | | 2 | 21 |
| 12 | Sadar Bazar Ward | | | 1 | 1 |
| 13 | Kothi Bazar Ward | | 1 | | 1 |
| 19 | Anand Nagar Ward | | 4 | | 4 |
| 20 | Adamgarh Ward | | 3 | | 3 |
| 21 | Phefartal Ward | | | 10 | 10 |
| 24 | Rasooliya Ward | | 3 | | 3 |
| 25 | Rajendra Ward | | | 3 | 3 |
| 28 | Krishnapuri Ward | | 1 | | 1 |
| 30 | Gwaltoli Ward | | | 1 | 1 |
| 31 | Govindpura Ward | | | 1 | 1 |
| 32 | Gandhi Ward | | 2 | | 2 |
| **All Wards** | | **19** | **26** | **19** | **64** |
| *Source*: Sanitation Survey 2008 | | | | | |

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| Annex 4: Assets and infrastructure | | | | |
|---|---|---|---|---|
| **Sl #** | **Asset** | **Unit** | **Quantity** | **Remark** |
| **Assets Owned / Maintained by Hoshangabad Municipality** | | | | |
| **A** | **Water Supply** | | | |
| 1 | Tube-wells | Nos | 58 | Drinking water source, connected to distribution network |
| 2 | Overhead Water Tanks | Nos | 5 | |
| 3 | Hand pumps | Nos | 71 | Manually operated |
| 4 | Public Stand Posts | Nos | 1,530 | |
| 5 | House Service Connections | Nos | 7,802 | |
| 6 | Commercial connections | Nos | 424 | |
| **B** | **Sanitation** | | | |
| 1 | Public Sanitary Conveniences | Nos | 6 | Average capacity: 20 seats |
| 2 | Public urinals | Nos | 20 | |
| 3 | Vacuum cleaning truck | Nos | 1 | For septage clearance from septic tanks |
| **C** | **Solid Waste Management** | | | |
| 1 | Lorries | Nos | 2 | |
| 2 | Tractor Trailers | Nos | 6 | |
| **D** | **Roads** | | | |
| 1 | Tar Roads | Km | 24.26 | |
| 2 | Cement Concrete Roads | Km | 34.40 | |
| 3 | WBM Roads | Km | 14.05 | |
| 4 | *Katcha* Roads | Km | 34.54 | |
| **D** | **Shops and Market Buildings** | | | Owned by municipality |

| **Social Infrastructure: Hoshangabad** | | | |
|---|---|---|---|
| **Sl #** | **Infrastructure** | **Nos** | **Remarks** |
| A | **Educational Institutions (Government)** | | |
| 1 | Pre-primary schools | 4 | |
| 2 | Primary Schools | 24 | |
| 3 | Middle Schools | 11 | |
| 4 | High Schools | 4 | |
| 5 | Government College | 2 | |
| **B** | **Educational Institutions (Private)** | | |
| 1 | Primary/ Middle schools | 12 | |
| 2 | Higher Secondary | 15 | |
| 3 | Mahila Poly-technical College | 1 | |
| | Industrial Training Institute | 1 | |
| **C** | **Medical Institutions** | | |
| | Government Hospital | 1 | |
| | Private Hospitals | 5 | |
| *Source*: Hoshangabad Municipality | | | |

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| Annex 5: Ward wise Breakdown of Household Sanitation Arrangements | | | | | | | |
|---|---|---|---|---|---|---|---|
| Ward No | Name | Slum Ward | Total Households | Sanitation Arrangement | | | |
| | | | | WC | Pit Latrine | Other | None |
| 1 | Shashri Ward | No | 347 | 347 | | | |
| 2 | Shanichara Ward | No | 224 | 207 | 12 | | 5 |
| 3 | Jagdishpura Ward | No | 401 | 278 | 89 | 11 | 23 |
| 4 | Mangalwara Ward | No | 237 | 228 | | | 9 |
| 5 | Narayanganj Ward | No | 200 | 199 | | | 1 |
| 6 | Ramganj Ward | Yes | 330 | 157 | 36 | 2 | 135 |
| 7 | Azad Ward | Yes | 249 | 88 | 84 | | 77 |
| 8 | Subhashganj Ward | No | 162 | 79 | 10 | 21 | 52 |
| 9 | Balaganj Ward | No | 212 | 178 | 34 | | |
| 10 | Ganeshganj Ward | No | 128 | 119 | 8 | | 1 |
| 11 | Janakpuri Ward | No | 293 | 293 | | | |
| 12 | Sadar Bazar Ward | No | 371 | 370 | | 1 | |
| 13 | Kothi Bazar Ward | No | 692 | 557 | 64 | 1 | 70 |
| 14 | Tilak Ward | No | 510 | 503 | | | 7 |
| 15 | Malakhedi Ward (North) | Yes | 762 | 614 | 46 | | 102 |
| 16 | Malakhedi Ward (South) | Yes | 805 | 680 | 124 | | 1 |
| 17 | Civil Line Ward | No | 609 | 535 | 60 | | 14 |
| 18 | Housing Board Ward | No | 1531 | 899 | 8 | | 624 |
| 19 | Anand Nagar Ward | No | 1418 | 1187 | 115 | 4 | 112 |
| 20 | Adamgarh Ward | Yes | 276 | 61 | 71 | 3 | 141 |
| 21 | Phephartal Ward | Yes | 284 | 2 | 230 | 10 | 42 |
| 22 | SPM Ward (East) | No | 112 | 112 | | | |
| 23 | SPM Ward (West) | No | 277 | 277 | | | |
| 24 | Rasooliya Ward | Yes | 398 | 213 | 28 | 3 | 154 |
| 25 | Rajendra Ward | Yes | 1221 | 1208 | 6 | 3 | 4 |
| 26 | Rewaganj Ward | Yes | 349 | 206 | | | 143 |
| 27 | Bheelpura Ward | Yes | 358 | 158 | 161 | | 39 |
| 28 | Krishnapuri Ward | No | 233 | 190 | 13 | 1 | 29 |
| 29 | Gokulpuri Ward | Yes | 503 | 352 | | | 151 |
| 30 | Gwaltoli Ward | Yes | 371 | 351 | 7 | 1 | 12 |
| 31 | Govindpura Ward | Yes | 262 | 237 | 1 | 1 | 23 |
| 32 | Gandhi Ward | Yes | 622 | 403 | 72 | 2 | 145 |
| 33 | Tagore Ward | Yes | 768 | 164 | 409 | | 195 |
| | All Wards | | 15,515 | 11,452 | 1,688 | 64 | 2,311 |
| *Source*: Sanitation Survey 2008 | | | | | | | |

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| Annex 6: List of Surveyed Households, where Information on Sanitation Arrangements is Contradictory | | | | |
|---|---|---|---|---|
| **Sl #** | **Wards** | **Head_Name** | **On Plot Facility Available** | **Facility Type** |
| 1 | 6 | किसन आसरे | Yes | Open Defecation |
| 2 | 7 | कुतबुद्धीन | Yes | Community toilet |
| 3 | 7 | बुद्धु सुंदर शंकरलाल | Yes | Community toilet |
| 4 | 13 | रमेश सराठे | Yes | Open Defecation |
| 5 | 15 | चमरू राम | Yes | Open Defecation |
| 6 | 15 | रामभरोस | Yes | Open Defecation |
| 7 | 15 | शम्भूदयाल | Yes | Open Defecation |
| 8 | 15 | मीराबाई | Yes | Open Defecation |
| 9 | 15 | माधोप्रसाद | Yes | Open Defecation |
| 10 | 15 | ळीरालाल | Yes | Open Defecation |
| 11 | 15 | राधेश्याम यादव | Yes | Open Defecation |
| 12 | 15 | ब्लीराम | Yes | Open Defecation |
| 13 | 15 | मानसिंह यादव | Yes | Open Defecation |
| 14 | 15 | राकेश कुमार यादव | Yes | Open Defecation |
| 15 | 15 | भैयालाल यादव | Yes | Open Defecation |
| 16 | 15 | नन्हेलाल यादव | Yes | Open Defecation |
| 17 | 15 | रामसनेही यादव | Yes | Open Defecation |
| 18 | 16 | चुन्नीलाल जुगराज | Yes | None |
| 19 | 17 | नर्मदा प्रसाद चौरे | Yes | Open Defecation |
| 20 | 17 | निर्भय सिंह चौरे | Yes | Open Defecation |
| 21 | 19 | कमलेश पंडित | Yes | Open Defecation |
| 22 | 19 | तिवारी जी | Yes | Open Defecation |
| 23 | 19 | हरि कहार | Yes | Open Defecation |
| 24 | 19 | किशन कहार | Yes | Open Defecation |
| 25 | 19 | फदाली कहार | Yes | Open Defecation |
| 26 | 19 | जगदीशप्रसाद गौड़ | Yes | Open Defecation |
| 27 | 19 | जयराम दास केवट | Yes | Open Defecation |
| 28 | 19 | दशरथ चिंतामन संतोरे | Yes | Open Defecation |
| 29 | 19 | श्रोती महाराज | Yes | Open Defecation |
| 30 | 19 | मथुराप्रसाद सराठे | Yes | Open Defecation |
| 31 | 19 | शोभा जागेश्वर केवट | Yes | Open Defecation |
| 32 | 19 | रमेश यादव | Yes | Open Defecation |
| 33 | 19 | उदयभान मेहरा | Yes | Open Defecation |
| 34 | 19 | अब्बू कबाड़ी | Yes | Open Defecation |
| 35 | 19 | गुड्डी राजू ठाकुर | Yes | Open Defecation |
| 36 | 19 | जमनादास रैकवार | Yes | Open Defecation |
| 37 | 19 | जमनाबाई ढीमर | Yes | Open Defecation |
| 38 | 19 | रूकमणि मांझी | Yes | Open Defecation |
| 39 | 20 | बाबूलाल गंगा | Yes | Open Defecation |
| 40 | 21 | रेवाराम नंदलाल | Yes | Open Defecation |
| 41 | 26 | राजेन्द्र | Yes | Open Defecation |

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| Annex 6: List of Surveyed Households, where Information on Sanitation Arrangements is Contradictory | | | | |
|---|---|---|---|---|
| Sl # | Wards | Head_Name | On Plot Facility Available | Facility Type |
| 42 | 26 | भूरा | Yes | Open Defecation |
| 43 | 26 | अनोखी | Yes | Open Defecation |
| 44 | 26 | शंकर | Yes | Open Defecation |
| 45 | 26 | भाऊ | Yes | Open Defecation |
| 46 | 26 | चन्दन | Yes | Open Defecation |
| 47 | 27 | कुसुमबाई बेवा हीरालाल | Yes | Open Defecation |
| 48 | 27 | राजू जाटव | Yes | Open Defecation |
| 49 | 27 | काशीराम बाजीलाल | Yes | Open Defecation |
| 50 | 27 | सीताराम गणेश | Yes | Open Defecation |
| 51 | 27 | मुकेश मदनलाल | Yes | Open Defecation |
| 52 | 27 | नन्हेलाल जुगराज माछिया | Yes | Open Defecation |
| 53 | 27 | प्रेम जगन्नाथ | Yes | Open Defecation |
| 54 | 27 | सिमियाबाई बेवा चोखेलाल मांझ | Yes | Open Defecation |
| 55 | 27 | जुगराज बुद्धालाल मांझी | Yes | Open Defecation |
| 56 | 27 | लक्ष्मीबाई बेवा नाथूराम मांझी | Yes | Open Defecation |
| 57 | 27 | भगवानदास रामप्रसाद ढ़ीमर | Yes | Open Defecation |
| 58 | 27 | डालचंद दयाचंद कहार | Yes | Open Defecation |
| 59 | 27 | लीलाधर नंदू सुनानिया | Yes | Open Defecation |
| 60 | 27 | पुष्पाबाई बेवा सुरेश कहार | Yes | Open Defecation |
| 61 | 27 | जमनाप्रसाद मेगूलाल सिंगारिया | Yes | Open Defecation |
| 62 | 27 | नर्मदाप्रसाद परसराम | Yes | Open Defecation |
| 63 | 27 | शंकरलाल मंगू कहार | Yes | Open Defecation |
| 64 | 27 | रमेश पूरनसिंह कहार | Yes | Open Defecation |
| 65 | 27 | मुन्नीबाई द्वारका मांझी | Yes | Open Defecation |
| 66 | 27 | नन्हू बिहारीलाल मांझी | Yes | Open Defecation |
| 67 | 27 | लखन मांझी | Yes | Open Defecation |
| 68 | 27 | लखन तांतू केवट | Yes | Open Defecation |
| 69 | 27 | द्वारकाप्रसाद रामप्रसाद मांझी | Yes | Open Defecation |
| 70 | 27 | मधु केवट | Yes | Open Defecation |
| 71 | 27 | पवन पप्पू सुपयार सिंह केवट | Yes | Open Defecation |
| 72 | 27 | जिजियाबाई बेवा छोटेलाल केवट | Yes | Open Defecation |
| 73 | 27 | तिजियाबाई बेवा भैयालाल चमार | Yes | Open Defecation |
| 74 | 27 | रमेश भैयालाल गोरेलाल चमार | Yes | Open Defecation |
| 75 | 27 | परसराम छन्नू चौधरी | Yes | Open Defecation |
| 76 | 27 | गरीबदास परसराम चमार | Yes | Open Defecation |
| 77 | 27 | गेंदालाल रामकुमार चमार | Yes | Open Defecation |
| 78 | 27 | विष्णुप्रसाद देवीप्रसाद | Yes | Open Defecation |
| 79 | 27 | गुलाबप्रसाद देवीप्रसाद चमार | Yes | Open Defecation |
| 80 | 27 | मटरू विजयराम चमार | Yes | Open Defecation |
| 81 | 27 | सुंदरीबाई महेश केवट | Yes | Open Defecation |
| 82 | 30 | शंकरलाल यादव | Yes | Open Defecation |
| 83 | 32 | आबिद खां | Yes | Open Defecation |

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| Annex 6: List of Surveyed Households, where Information on Sanitation Arrangements is Contradictory | | | | |
|---|---|---|---|---|
| **Sl #** | **Wards** | **Head_Name** | **On Plot Facility Available** | **Facility Type** |
| 84 | 32 | हबीब उल्ला | Yes | Open Defecation |
| 85 | 32 | सीताराम | Yes | Open Defecation |
| 86 | 32 | पतीराम पाल | Yes | Open Defecation |
| 87 | 32 | चम्पालाल यादव | Yes | Open Defecation |
| 88 | 33 | रामगोपाल मुंशीलाल मालवीय | Yes | Community toilet |
| 89 | 33 | परमलाल विजय | Yes | Community toilet |
| 90 | 33 | माखनलाल शंकरलाल यादव | Yes | Community toilet |
| 91 | 33 | फुलियाबाई हरिजन | Yes | Open Defecation |
| 92 | 33 | बामनराव चोखाजी खंडारे | Yes | Open Defecation |
| 93 | 33 | कमल बाबूलाल मुरेले | Yes | Open Defecation |
| 94 | 33 | बृजेश बाबूलाल मुरेले | Yes | Open Defecation |
| 95 | 33 | कमला बाई | Yes | Open Defecation |
| 96 | 33 | बलदेव लोटिक कहार | Yes | Open Defecation |
| Source: Sanitation Survey, 2008 | | | | |

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## Annex 7: Roles and Functions of ULB

1. Urban planning including town planning
2. Regulation of land-use and construction of buildings
3. Planning for economic and social development
4. Roads and bridges
5. Water supply for domestic, industrial and commercial purposes
6. **Public health, sanitation conservancy and solid waste management**
7. Fire services
8. Urban forestry, protection of the environment and promotion of ecological aspects
9. Safeguarding the interests of weaker sections of society, including the handicapped and mentally retarded
10. Slum improvement and upgradation
11. Urban poverty alleviation
12. Provision of urban amenities and facilities such as parks, gardens, playgrounds
13. Promotion of cultural, educational and aesthetic aspects
14. Burials and burial grounds; cremations, cremation grounds and electric crematoriums.
15. Cattle pounds; prevention of cruelty to animals
16. Vital statistics including registration of births and deaths
17. Public amenities including street lighting, parking lots, bus stops and public conveniences
18. Regulation of slaughter houses and tanneries

*Source*: Twelfth Schedule, 74$^{th}$ Constitutional Amendment Act, 1992, Government of India