State Level Rank

04

City Sanitation Plan for Nashik

FOREWORD

I am pleased to provide some introductory thoughts to this document, which arrives at an important turning point in the development of Nashik City. I would like to express my deep appreciation for the initiative and support given by GIZ in the preparation of the City Sanitation Plan. This document is a succinct overview of the City Sanitation Plan for Nashik City in order to recognize the stress areas in the sanitation sector and establish priorities in the intervention areas along the defined strategic guidelines.

City Sanitation Plan is a 30-year strategic framework to deliver on the long-term vision we have set for the sanitation sector for Nashik City. This framework forms the basis on which the city administration will work with stakeholders - including other government agencies, service providers and beneficiaries - in our common mission to overcome the vast gaps in sanitation services. The process culminating in this framework included in-depth research and wide-ranging consultation with city stakeholders. Building on the objectives set out in the National Urban Sanitation Policy of 2008, the technical team under GIZ conducted 6 months of data-driven research which resulted in the release of the preliminary draft 'Nashik Status Report' document for stakeholders' comment in August 2010. A two-month period allowing for stakeholders' comment and consultation followed. Post validation of the data presented in the preliminary draft, the draft 'City Sanitation Plan' was released in June 2011 followed by stakeholder consultations and subsequent finalization of the strategic framework. Today, I can confidently say that all interested parties had a meaningful opportunity to contribute to the adopted framework.

This document is not exclusive in the context of planning for the city because its formulation has been synergized with the elements of Nashik's City Development Plan. The strategic plan reflects the thoughts, feelings, ideas, and wants of the stakeholders of the city and moulds them along with the city's purpose, mission, and regulations into an integrated document. The final section of this document will serve as a guide for implementing the process for the stakeholders. This document is not a static document as this can be quickly adjusted with additional scenarios that may occur. With this document, and with the community-defined commitments that lie behind it, we are enabled to establish a clear case for a strategic choice that presents itself in relation to a current or predicted transport gap; given the balanced view of the range of options available coupled with the timeframes within which each explicit strategic choice needs to be made.

We consider the evolving agenda based on the document to be ambitious, but achievable. The framework is ambitious because it puts forward an uncompromising vision of sanitation services which are in tune with the needs of our city and the real needs of community, whilst at the same time striving to come as close to financial self-sufficiency as possible. This means that sanitation sector must deliver improved basic services and better services to all users. Furthermore - since we are operating in a context of limited national resources – it also means that these objectives must be reached at the lowest possible system cost, that services must aim to be self-sustaining and that they must generate the necessary reinvestment to meet future customer requirements.

Ambitious though these goals may be, they are achievable because the framework is based on current realities and judiciously forecasted trends. It spells out the roles and sets clear targets for government, private service providers and customers. The role of city administration is to put appropriate institutions in place and define clear rules to regulate investment and operations in an attempt to achieve the agreed goals for the sanitation sector.

This strategic framework represents the first foundation of a new collective process which will breathe life into our long-term vision and strategy and will guide all our collective actions as we strive to meet the needs of the city and our community. Wide ownership of the process will ensure that the strategy remains dynamic and adaptable as it is continually enriched and enhanced by the experience of implementation. It is with a great deal of satisfaction that we declare this strategic framework to be the action agenda for the 'Sanitation Sector'. This agenda is the basis on which the initiatives must be evaluated, especially by the most important stakeholder in the sanitation sector - the informed and demanding customer.

The formal implementation of this agenda starts in earnest today with the release of this strategy document and continues for the next 30 years. Along the way we intend to address the national goals to which government is committed and meet the needs of the community we have chosen to prioritize.

B Sanap

B.D. Sanap, (I.A.S)
Commissioner
Nashik Municipal Corporation

1.1 : NASHIK

The city of Nashik situated in the state of Maharashtra, is popularly known as the "Grape City" of India because of its many vineyards. The city is administrated by the Nashik Municipal Corporation (NMC) and is also the headquarters of the Nashik District. Nashik has 108 wards within 6 administrative zones making Nashik the third largest city in Maharashtra.

Nashik is a part of the industrial and manufacturing triangle in Maharashtra along with Mumbai and Pune. It's location on the banks of river Godavari makes it a major pilgrimage centre as well. Its fast growing population, religious importance and industrial orientation results in a significant sanitation problem in city.

Nashik secured an over all sanitation score of 45.91 out of 100 and has been ranked on 42nd out of the 423 Indian cities evaluated in the sanitation ranking exercise carried out under the mandate of the National Urban Sanitation Policy (NUSP) through Ministry of Urban Development, Govt. of India. This score indicates the need for considerable improvements in the sanitary conditions of the city.

As per NUSP's directions the NMC carried out a detailed assessment of the sanitary conditions in the city. Some of the pressing sanitary issues have been presented in Fig 1. This assessment was done in order to come up with a City Sanitation Plan to address the current concerns and plan for the future sanitary requirements thorough a participatory approach that takes into account factors such as cross-cutting issues, inclusivity of the urban poor, analysis of issues and solutions at ward level granularity, prioritisation of issues, and to come up with definite timelines for the implementation of solutions.

1. Open defecation / urination
2. Solid waste is not segregated at source
3. Pollution of the Godavari River due to open drains
4. Treated wastewater is neither reused nor recycled
5. Possibility of ground water pollution due to septic tanks

Figure 1: Sanitation issues in Nashik City

Each city has been scored under 19 indicators which are divided into three categories:

- Output (50 points)
- Process (30 Points)
- Outcomes indicators (20 points)

Based on the scores, the cities were classified thus:

Category	Points	Category	Points
	≥33		34-66
	67-90		91-100

Figure 2: National Urban Sanitation Policy Sanitation Rating

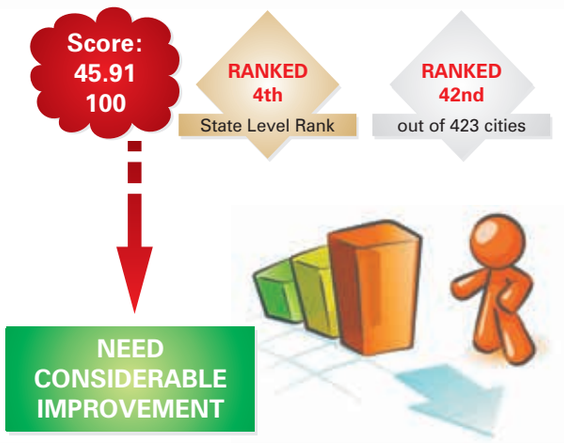


Figure 3: NUSP Sanitation Ranking for Nashik

1.2 : NATIONAL URBAN SANITATION POLICY

The Ministry of Urban Development, Government of India, issued a National Urban Sanitation Policy in 2008 with a vision to make all Indian cities and towns completely "sanitised, healthy and liveable".

The NUSP instructs states to come up with their own detailed state-level urban sanitation strategies and City Sanitation Plans (CSP). It moots the idea of completely sanitised and open-defecation-free cities as its target, and the setting up of a multi-stakeholder City Sanitation Task Force to achieve this. The Policy gives significant emphasis on environmental considerations, public health implications, and reaching the underserved and urban poor. The policy suggests four funding options: funds directly from central and state governments; funds through existing funding schemes; funds via public-private partnerships; and funds from external funding agencies. The Policy directs that at least 20% of the funds should be earmarked towards servicing the urban poor. The GoI also plans to confer awards to the best performing cities, which is reminiscent of the Nirmal Gram Puraskar awards for villages for the same cause.

SANITATION STATISTICS OF URBAN INDIA

- 7.87% urban households do not have access to toilets and defecate in the open
- More than 37 % of the total human excreta generated is unsafely disposed
- More than 60% of the country's GDP is being lost due to public health and environmental costs due to unsafe sanitation
- 75% of all surface water across India is being contaminated due to the discharge of untreated municipal wastewater

The GOI had initiated a city sanitation rating exercise based on urban sanitation indicators. The aim of this exercise is to help cities prioritise areas of improvement vis-à-vis development and implement holistic CSP.

1.3 : APPROACH AND METHODOLOGY

The approach and methodology adopted for the development of CSP is depicted in Figure 4. The scope of work being:

- Formation of a City Sanitation Task Force (CTF)
- Carrying out a baseline review
- Supporting awareness-generation and a sanitation campaign
- Identifying technology options
- Enhancing capacity and knowledge management
- Formulating a City Sanitation Plan

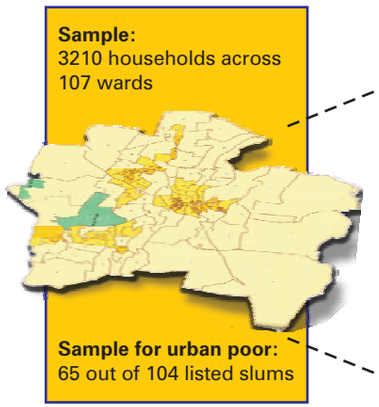
CSP Focal Points:

PLAN COMPONENTS

- Access to Toilets
- Waste water Management
- River Pollution and Storm Water Management
- Water Supply
- Solid Waste Management

STRATEGIC SUPPORT PILLARS

- Governance and Institutional Framework
- Capacity Building
- Awareness Generation
- Financial Sustainability



Inception interaction
- Interaction with Local ULBs, GoI, State, Bilateral & multilateral agencies.
- Setting up CityTask Force

Baseline Research Focus
- Demographic, Spatial and socio-economic context
- Service level/Access Indicators
- Ongoing/Completed initiatives
- Intuitional understanding
- GIS / Thematic maps
- Database management systems

Methodology
- ULB interactions/data collection
- States level interactions
- Gap filling surveys

DIAGNOSTIC PHASE

Situation Analysis
- Demographic/Spatial Issues
- Sanitation infrastructure / access
- Policy/Institutional issues
- Financing
- Database management issues
- Availability of GIS maps

Initiation of evaluation of options
- Technology options to bridge gaps
  - Onsite & Offsite
  - Shared vs stand-alone
  - Pollution mitigation
  - Investment/recurring costs
  - Institutional Framework
- Components of behaviour change in ward level pilots
- Funding options

CONSULTATION/ANALYSIS

Crystallize range of solution
- Vision and Targets
- Technology Choices
- Institutional Framework
- Funding options
- Implementation Road map

Submission of Draft CSP
- Consultation with CTF and MouD

FINALISATION OF CSP

FINALISATION OF OUTPUTS

Figure 4: City Sanitation Policy - Approach & Methodology

Urban areas by nature are in a state of continuous evolution, and they undergo cyclical periods of natural growth, decline and revitalization over the course of time. Recognizing trends is a key element in ensuring the efficient long-term allocation of resources and a sound principle of land use planning.

Population projections help in long-range planning and infrastructure investment by indicating the scope and scale of population change.

1. GROWTH & PRESENT POPULATION

Nashik is the third-largest city in Maharashtra and one of the fastest growing cities in India.

- The population of Nashik city grew from 0.15 millions in 1951 to 1.49 million in 2011
- The city attracts a floating population of 1 Lakh people (mostly pilgrims) daily

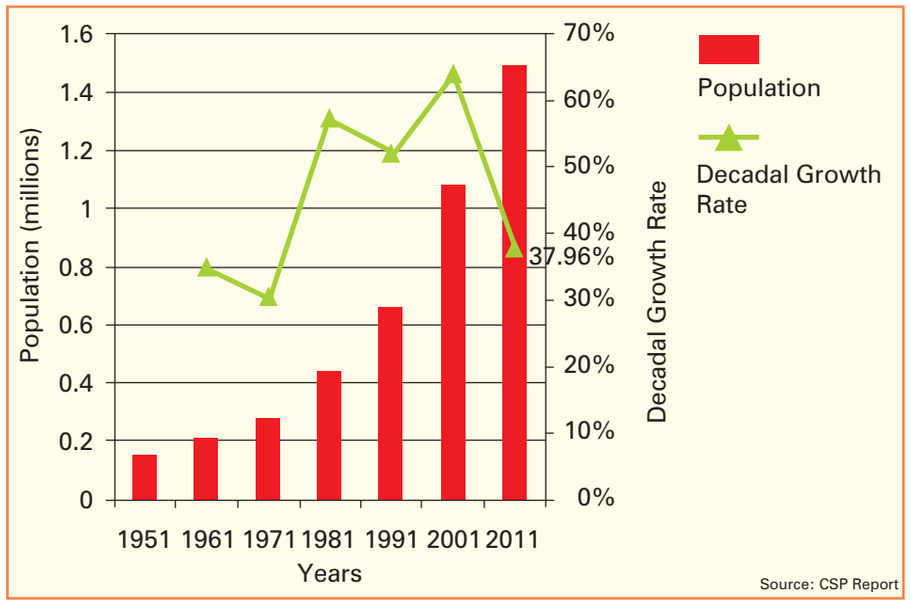


Figure 5: Nashik's Population and Decadal Growth Rate

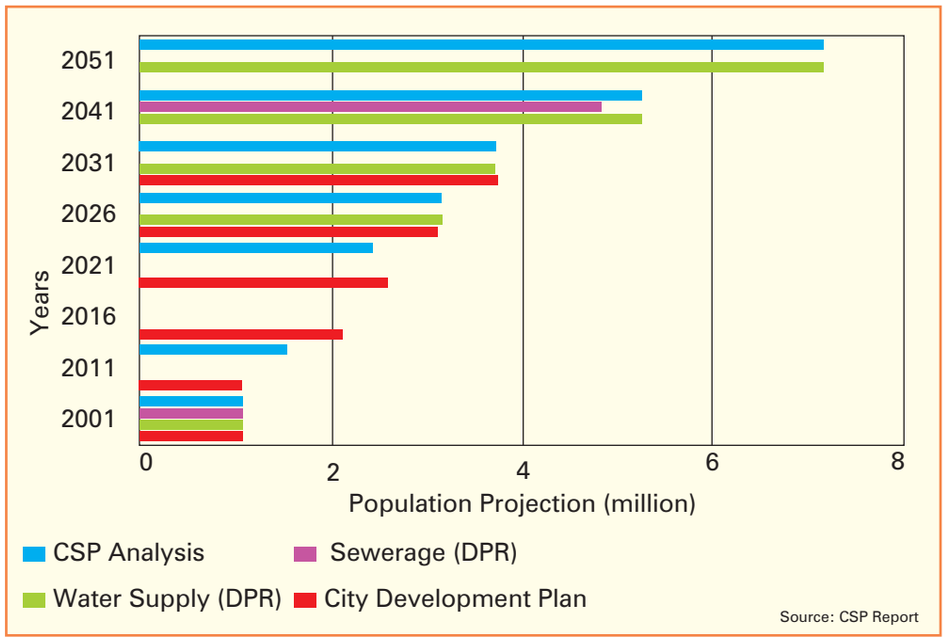


Figure 6: Nashik's Population Projection

2. POPULATION PROJECTIONS

The population of Nashik is expected to grow from 1.08 million to 1.75, 2.6 and 3.75 million by 2011, 2021 & 2031 respectively. Notably there are variations in population projections in various studies and DPRs. This variation in population projection has serious implications for future planning.

- As per the 2011 census, Nashik's urban poor population is 2.1 lakhs which is 14% of its total population in the same year

SANITATION COMPONENTS

Does the city have access to toilets?

a) Access To Toilets

What if I stay in an urban area?

The survey revealed 73% of the respondents had in-house toilet facilities whereas 23% used public toilets, as presented in figure 7. This means, Nashik has a fairly good coverage in terms of sanitation, mostly via in-house toilets. The respondents without household toilets mostly used a community toilet complex. Due to Nashik's good sanitation coverage, open defecation does not seem to be a widespread problem and is limited to low-income households and slum pockets which is a matter of concern.

NMC area has 5,568 Public toilet seats, out of this majorly people use public toilet facility in commercial areas (35%) in comparison to residential (12 to 15%). This again indicates prevalence of individual toilets in residential areas and need of public toilets in commercial or public places.

In terms of complaint redressal mechanism, NMC was found to be fairly good.

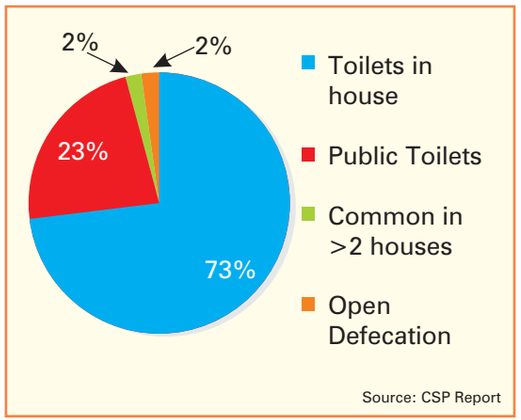


Figure 7: Distribution of Toilet Facility

What if I stay in an urban poor area?

The status of toilets in slum areas, based on an independent mapping of 65 slums (74 toilet blocks), indicates that there are 62 slums which are located in close proximity to the city sewer lines whereas 18 slums are located near water bodies. Most of the settlements have access to community toilets and a few households have individual toilets (51 slums have access to toilet within the slum, 10 slums use a facility located outside the slum, 4 slums have no access to toilets). The access to toilet scenario for the urban poor is presented in figure 8. The average toilet to person ratio in the 51 slums with a toilet facility is 1:65.

The physical conditions of the 74 toilet blocks were found to be less than satisfactory. Out of these toilet blocks, 15 are maintained on a 'pay and use' basis mostly by private companies, and the rest are maintained by NMC. The amount a family pays monthly varies from ₹ 15 to 20 for this service.

The issue of open defecation phenomenon was found to be prevalent in 13 slums (ward number 1, 2, 8,10,11,59,69,76,94 and 96), mainly due to lack of the facility or poor maintenance of the existing toilet blocks.

The ward wise availability of toilet facilities in Nashik is presented in figure 9.

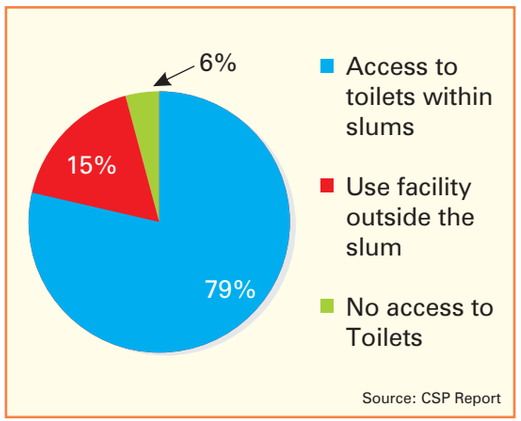


Figure 8: Access To Toilets - Urban Poor

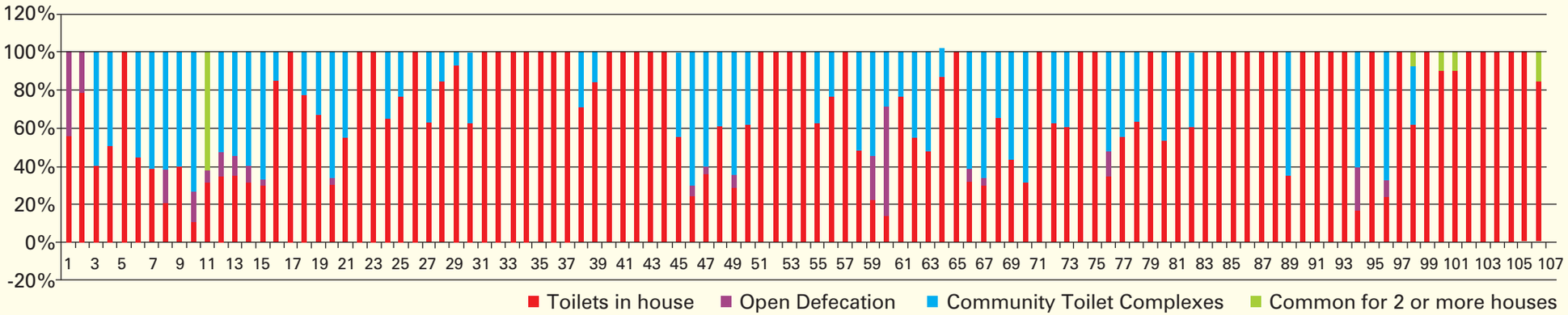


Figure 9: Ward Wise availability of Toilet Facility

What are the main issues that need to be addressed?

Prevalence of open defecation in slums and around religious areas, and open urination in public places
(Central Bus Stand, Ramkund Area)

Figure 10 highlights open-defecation-prone areas in the city.

Strengths

Wide coverage of individual toilets and good awareness on general hygiene are the strong points of Nashik's sanitation plan. Proper planning and maintenance would help in solving the issues.

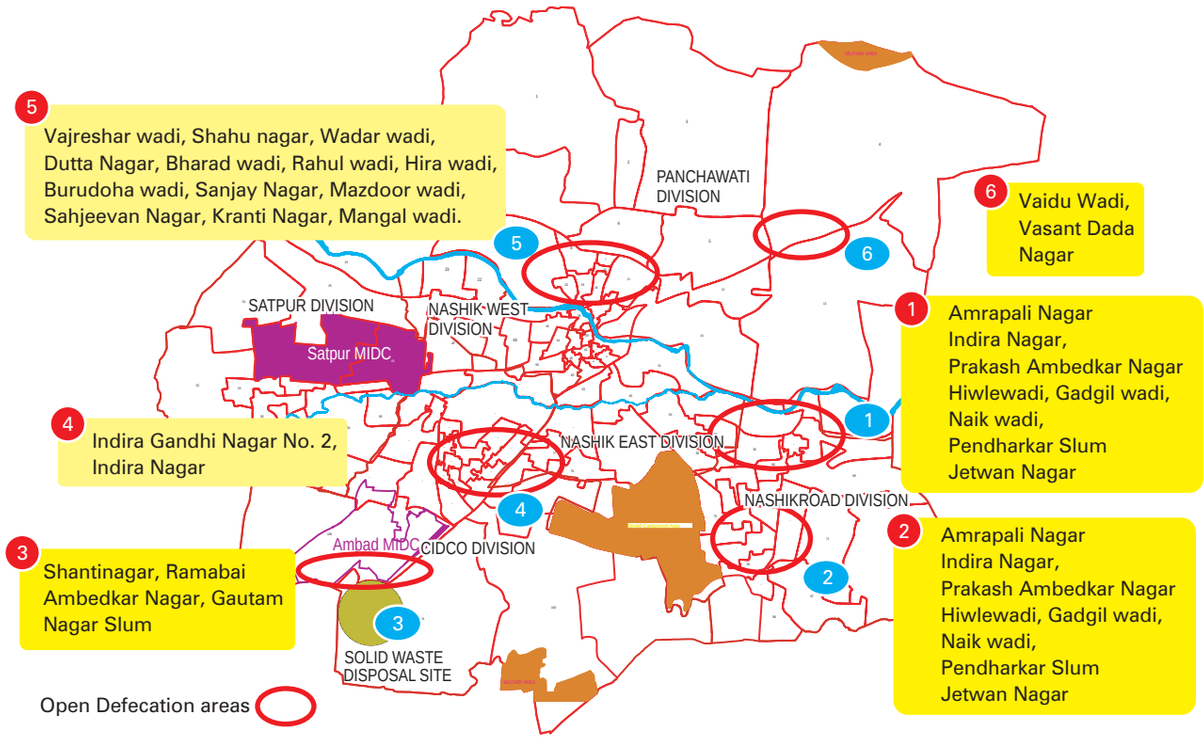


Figure 10: Open-defecation-prone areas in the city.

SANITATION COMPONENTS

How is the city's waste water management system?

b) Wastewater Management

There are two waste water management systems in Nashik: Off-site sanitation (through the sewerage system) and on-site sanitation (through septic tanks and soak pits). The diagrammatic representation of the city's waste water management system is presented in figure 11.

NMC's sewerage system covers nearly 54% of its residential area. The town planning department has made septic tanks mandatory for getting building permissions in the city. About 80 to 85% of septic tanks and other individual toilets are connected to this network. These septic tanks are cleaned by the NMC on demand from the citizens. The statistics for property-wise connection to this sewerage network, and division wise residential and commercial establishments that have soak pits are presented in figure 12 and 13 respectively.

In addition to the septic tanks, several households, located mainly in the New Nashik zone, have soak pits – which are lined pits without a floor and that allow human waste to filter through alluvial sand before reaching the underground aquifer. The outlets of septic tanks are connected to the sewer networks, and the sewage disposal in this system is done at the pumping stations of the existing facility. Septage collected from the septic tanks by the vacuum suction trucks is disposed in the sewage pumping stations or into the sewers.

Nashik has three Sewage Treatment Plants (STP) located at Tapovan, Chehedi and Panchak. The CPCB's nation-wide assessment graded Tapovan and Chehedi as satisfactory facilities and Panchak as a good facility.

URBAN POOR: Out of 74 toilet blocks, there are 17 connected to septic tanks and one to a biogas plant. This could be due to the non-availability of sewerage lines when the toilet blocks were built. But now, the city has a fairly good spread of sewerage networks and it has already been stated that 62 out of 65 slums are next to city sewer lines. It might be necessary to plug the outlet of these septic tanks directly to the city's sewerage network. There are 18 slums that are located near water bodies.

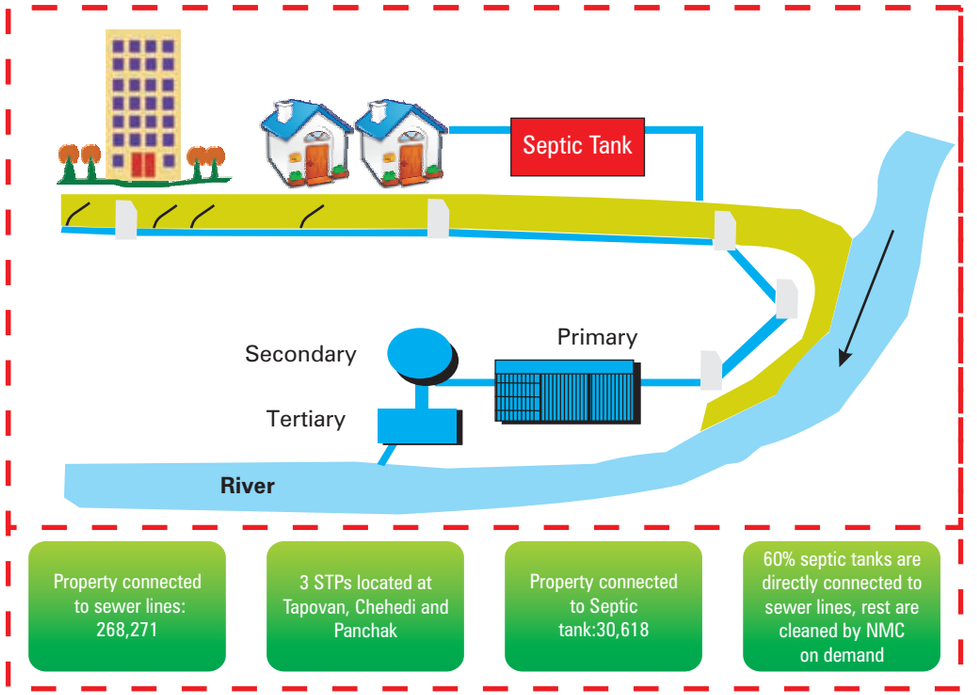


Figure 11: Schematic Diagram of Nashik's Sewerage System

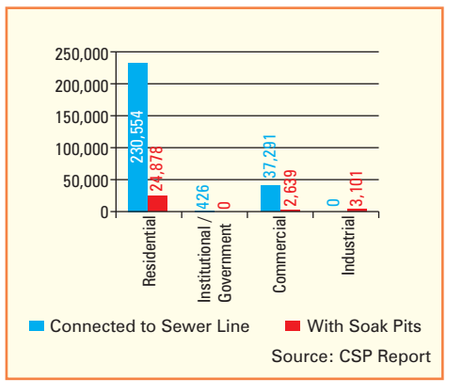


Figure 12: Property-wise Connections to Sewerage Network

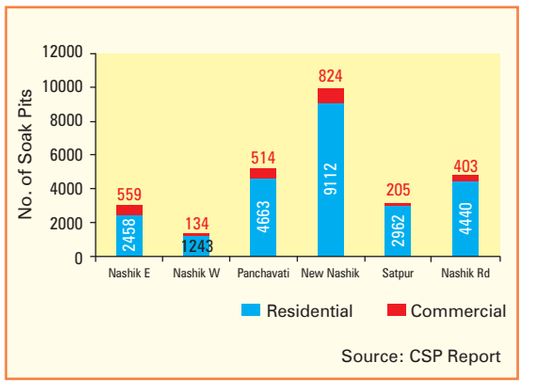


Figure 13: Division Wise Residential & Commercial Establishment Having Soak Pits

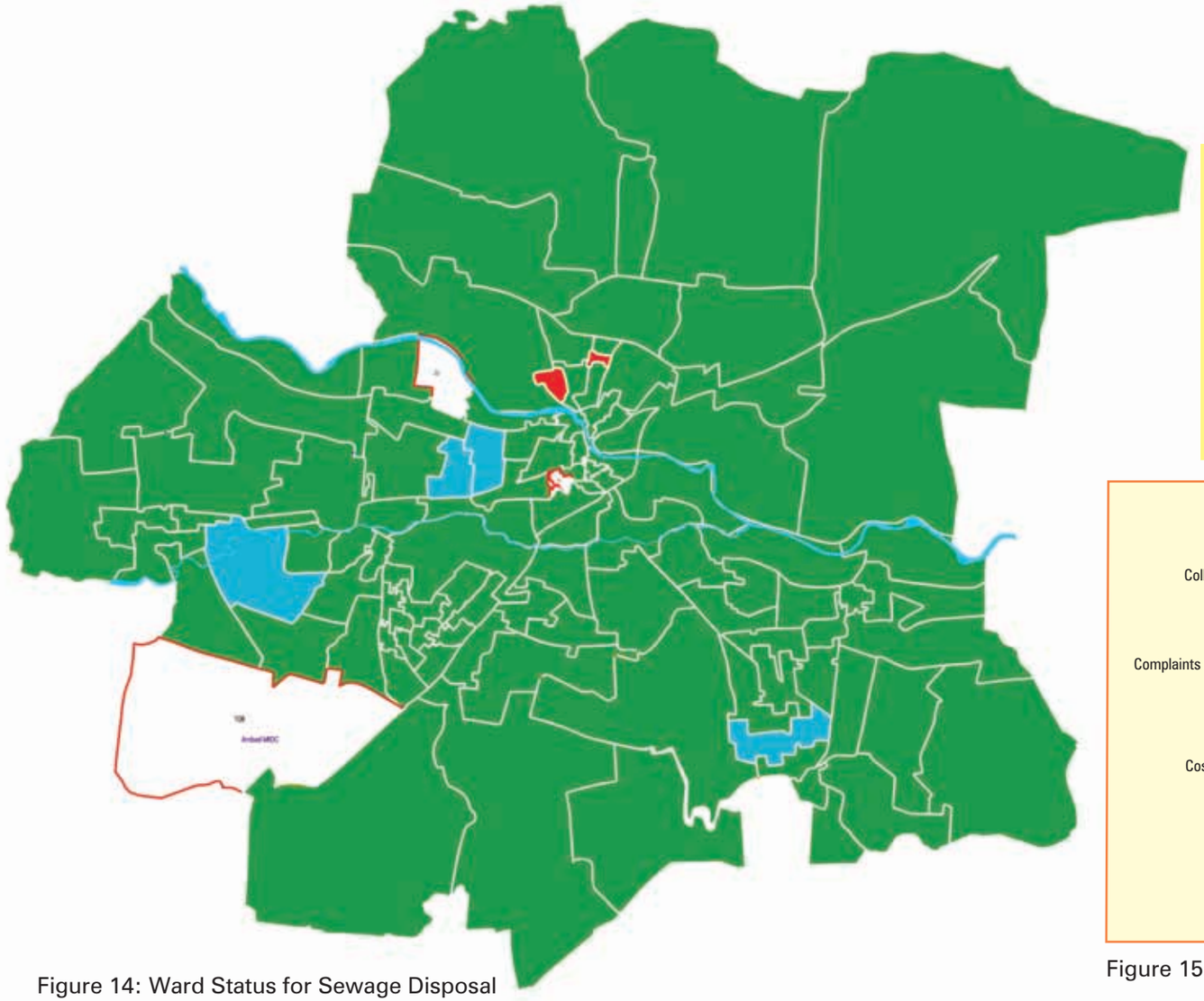


Figure 14: Ward Status for Sewage Disposal

Fact Sheet

- Wards 1, 2, 8, 10, 11, 12 and 13 continue disposing the sewage through open drains
- The highest proportion of sewage (30%) being let into open drains is from Ward 10

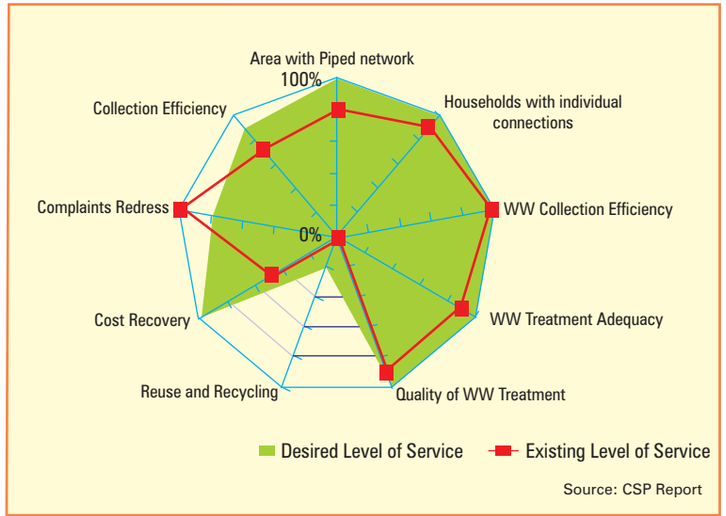


Figure 15: Service Level Benchmarking For Wastewater

Wards disposing 60% or more than 60% of sewage through sewer line	Wards disposing more than 40% of sewage through septic tanks	Wards disposing sewage through Open Drain

What are the main issues that need to be addressed?

Existing septic tanks could create potential risks of ground water pollution, and affect public health and utilisation of sewage treatment plants

Approximately 60% of the properties have septic tanks of which 40% are further connected to the sewerage network. In the New Nashik Zone there are several households that also have soak pits. These septic tanks or soak pits are cleaned by NMC on a demand basis. NMC has six vehicles to de-sludge septic tanks from the city's six zones, out of which only four vehicles are in condition, that indicates the need for additional vacuum suction vehicles on priority.

The practice of providing sewerage connection through septic tanks could potentially lead to sub-optimal waste water collection, STP infrastructure utilisation, and create a potential risk of ground water pollution

Figure 16: Leakage from Septic Tank of Public Toilet Complex near Ramkund area

Lack of information on waste water volume flows and non-automated sewerage system]

Significant variation with very low BOD levels were noticed for extended periods of time at the Tapovan and Chehedi STPs. The analysis of this variation in BOD levels is constrained due to non-functioning or non-availability of bulk meters at STPs, and lack of information on volume of flows.

Opportunity

Limited efforts towards waste water recycling, reuse, and waste to energy conversion.

Strength

The city has good coverage of the sewerage network and a sound engineering department to address the concerns in this sector.

SANITATION COMPONENTS

How is the city's rivers & drainage network?

c) River Pollution and Storm Water Management

The city's rivers are polluted mainly due to the discharge of untreated industrial effluents and domestic sewage, agriculture runoff, solid waste, and pilgrimage-related wastes.

Nashik has two main industrial estates within the NMC area, Ambad and Satpur with 314 and 204 industries respectively. Most of the large and medium scale industries have their own Effluent Treatment Plants. However, there are no Common Effluent Treatment Plants to treat the effluent from small industries and as a result these industries contribute to the point source pollution of water bodies, especially in River Godavari and Nasardi. The data on the quantity and nature of effluents discharged through various industries into these water bodies is not maintained.

In addition to industrial waste water, domestic wastewater is also directly discharged from slums, residential areas, and smaller drains into the sewerage network. In underserved areas yet to be connected, sewage directly enters the rivers at some places.

The natural drainage network of the city is highlighted in the figure 17.

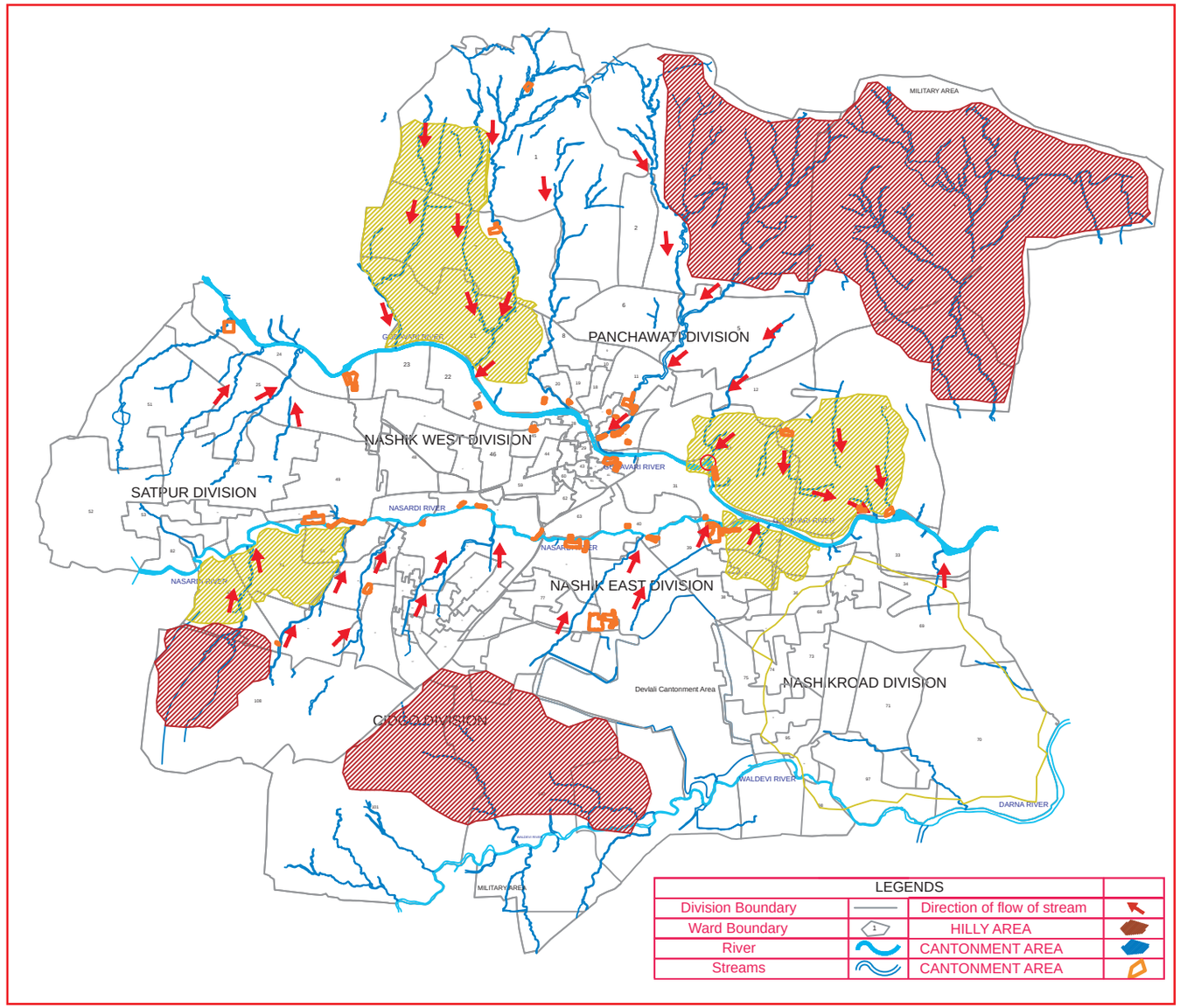


Figure 17: Map Showing Natural Drainage Network in Nashik

Only 4% of the NMC area is covered by storm water drainage network. The lack of storm water drains and the blocking of natural drains and the dumping of garbage into existing drains causes water logging in several areas of the city. Water logging, especially during heavy, rains, affects the areas near the central bus stand, the railway station, the Ram Kund area, Canada Corner, and slums on Nashik Road.

URBAN POOR

In case of the slum's storm water drainage and water logging situation, 19 out of 65 slums have fully covered gutters, 11 have them totally underground, 13 have open gutters and 21 slums have partly covered gutters. But the physical condition reveals that only five slums have reported kuccha gutters while 42 are fully covered. The distribution of various types of gutters is also presented in figure 18. However, these gutters flood frequently, especially during the monsoons, and a key reason for that is the inadequate gradient of these gutters.

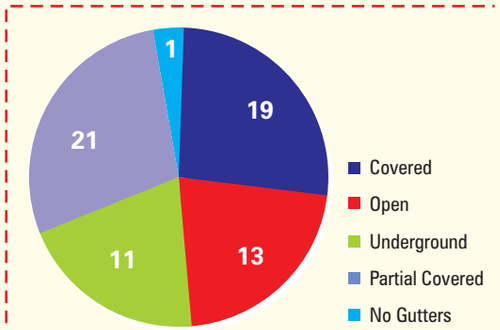


Figure 18: Slums with various types of gutters

Figure 19: Polluted stretch of the Godavari River in Nashik city

What are the main issues that need to be addressed?

River Godavari in the vicinity of Nashik faces severe risk of pollution from a combination of industrial and domestic sources along with agricultural run-off.

Pollution hot spots and sources of pollution are marked in figure 21.

Strength

Nashik's topography facilitates gravitationaly draining of storm water.

Figure 20: Polluted Stretch of River Godavari at Ramkund area

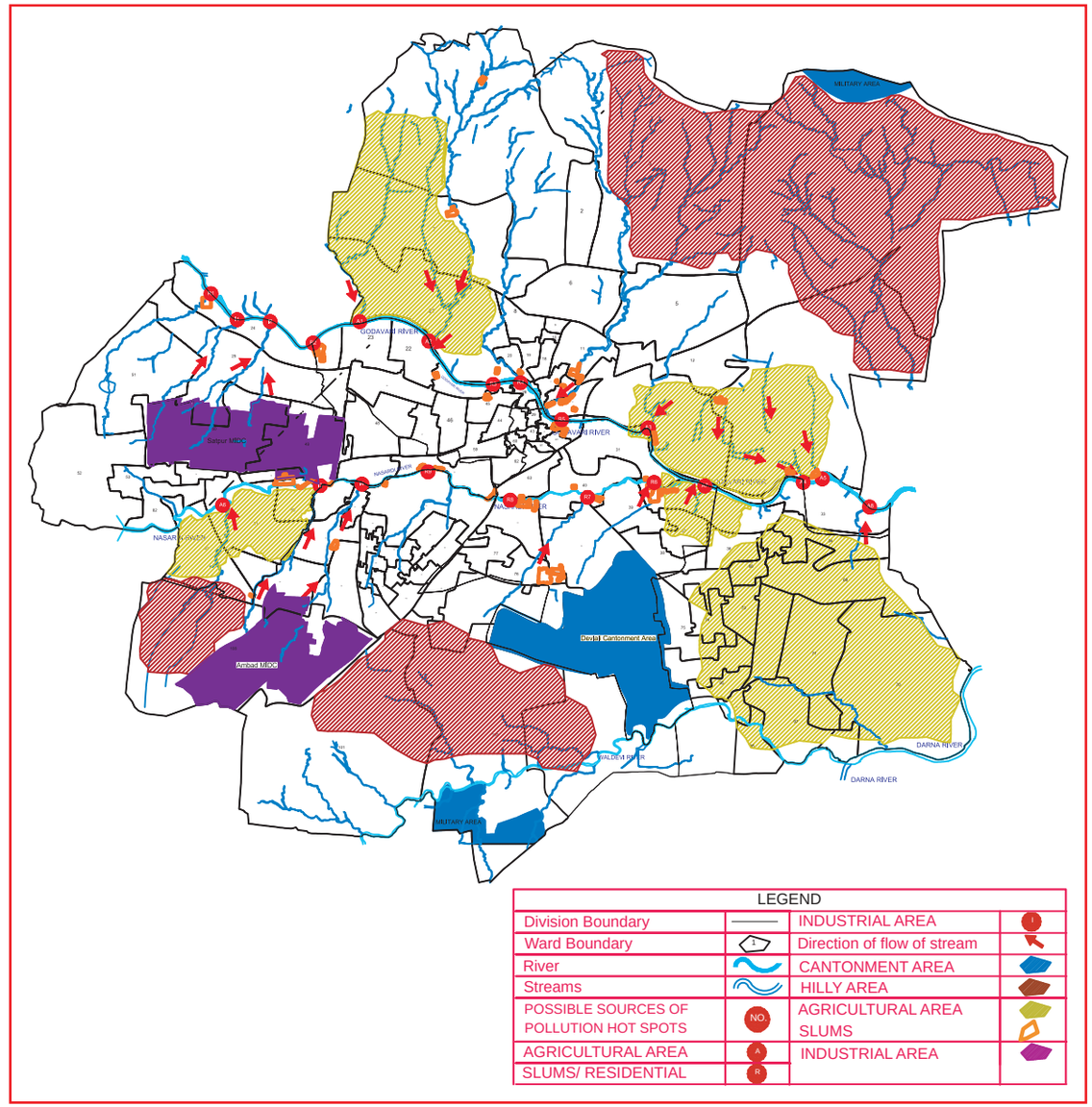


Figure 21: Map Showing Pollution Hot Spots and Possible Sources of Pollution in Nashik

SANITATION COMPONENTS

How is the city's water supply?

d) Water Supply

The city of Nashik receives piped water from two sources: Gangapur Dam headworks on river Godavari, which supplies water to almost 1.6 million residents in the NMC area and the head works on the river Darna, which services the Nashik Road area. Nashik has five water treatment plants at Shivajinagar (capacity 97 MLD), Bara Bunglow (capacity 81 MLD), Panchvati (capacity 71 MLD), Gandhinagar (capacity 26 MLD), and Nashik road (capacity 73 MLD) to meet its treated water demand.

The distribution network covers 1,440 km., which is about 71% of the road length within NMC and covers nearly 88% of the developed areas excluding slums. About 10% of the population is not covered by municipal water supply, particularly in some wards on the outskirts of the city or in select slum pockets. NMC's estimated gross per capita water supply is 149 LPCD based on the quantity of treated water put in the system, commercial water use, and system losses, which is higher than the 135 LPCD norms. Drinking water supply is intermittent and within a fixed time schedule for every zone and sub zone. NMC has 95% metered connections in its area. The Water Supply Department of NMC does not have any data on non revenue water. However the estimated figure is about 57% of the total treated water.

URBAN POOR

The survey revealed that out of 65 slums, 57 had public stand posts (PSP). The number of PSPs in each slum varied from 1 to 14 and in a few slums an average of 50 families were using a single PSP. There were also 11 slums that were fully covered with individual water connections. Also, 49 slums did not have any hand-pumps or bore-wells while 13 slums had one hand pump and 3 slums had 2 hand pumps each. Therefore, slums presented a mixed picture, as shown in figure 24.

Figure 22: Leaking public standpost

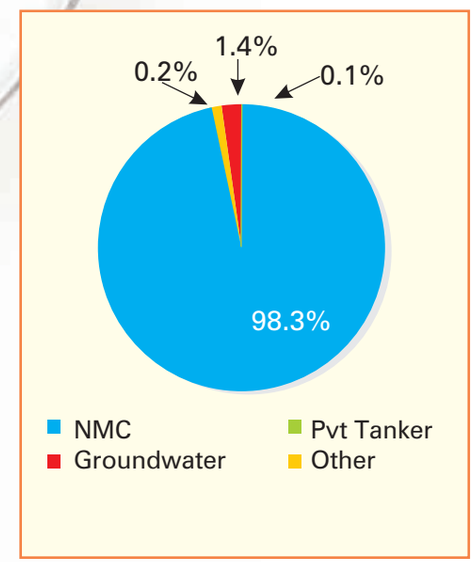


Figure 23: Source of Water Supply

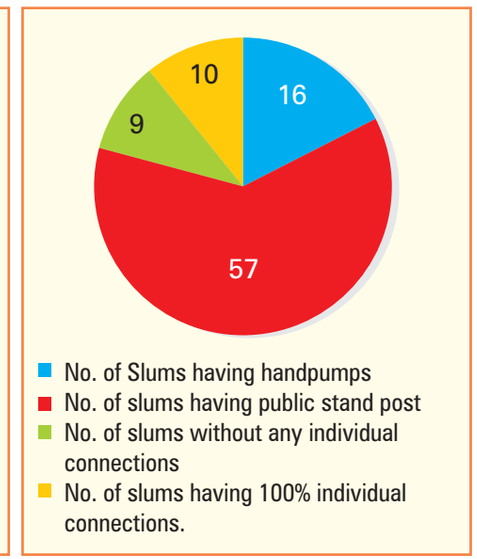


Figure 24: Water supply in slums

What are the main issues that need to be addressed?

Non-Revenue Water (NRW) levels are high and needs urgent attention.

NMC's water supply system performance on coverage (91% of population served) and per capita supply (149-155 LPCD) is good. However, the amount of Non-Revenue Water (NRW) is very high at an estimated 57%. Even though 95% of the connections are metered, billing is not linked to volumetric supply due to a combination of faulty meters and irregular meter reading operations. Water supply coverage in slums is fairly extensive. Most slums (57 of the 65 slums surveyed) had at least one public stand post with a supply duration of four hours (two hours in the morning and two hours in the evening).

However, only 11 of the 65 slums studied had individual water connections. While reported cost recovery and collection efficiency of NMC's water supply system was 72% and 92% respectively in 2008 and 2009, on-going projects could add to O&M cost burden.

Figure 25: Group of water supply pipes near ITI signal

Strength

There is availability of raw water and good water supply.

Weakness

There is no comprehensive planning and monitoring of water supply system.

SANITATION COMPONENTS

How is the City's Solid Waste Management?

e) Solid Waste Management

Nashik stands fairly well in the solid waste management sector. NMC estimates that the per capita solid waste generation in their area is over 300 gms per person per day. In 1996, NMC had introduced "GhantaGadi" (vehicles with bells) for door-to door-collection of waste. This system helped Nashik become a bin-free city successfully. NMC uses full-sized and mini-trucks, as well as tractor trailers to transport solid waste collected by the GhantaGadis to the waste disposal sites.

The recent analysis of solid waste components collected within the NMC area reveals that 37.8% are easily compostable (short-term biodegradable) materials, 19.50% are hard lignitic materials (long term biodegradable) while 16.20% are an assortment of textiles, plastic, rubber, etc (source: DPR on SWM, NMC). Nashik has a Municipal Solid Waste (MSW) facility established at Khatprakalp that has a variety of processing units.

URBAN POOR

It has been observed that most slums have specific dumping places where households regularly dump their garbage. This is due to a number of factors like the inadequate frequency of the GhantaGadis, the vehicles not reaching the interiors of the slum, not staying long enough, or there is no service provision at all. NMC arranges to periodically clear the garbage from these open spaces.

Figure 26: Schematic Representation of Solid Waste Management in Nashik.

Figure 27: municipal solid waste facility in Nashik.

Data Sheet for MSW Disposal

- 25% of the city's wards undertake (in different proportions) burning of solid waste to dispose their MSW
- Only 44% wards dispose their solid waste entirely via NMC's GhantaGadis.
- 44% wards are still practicing open dumping of solid waste disposal.

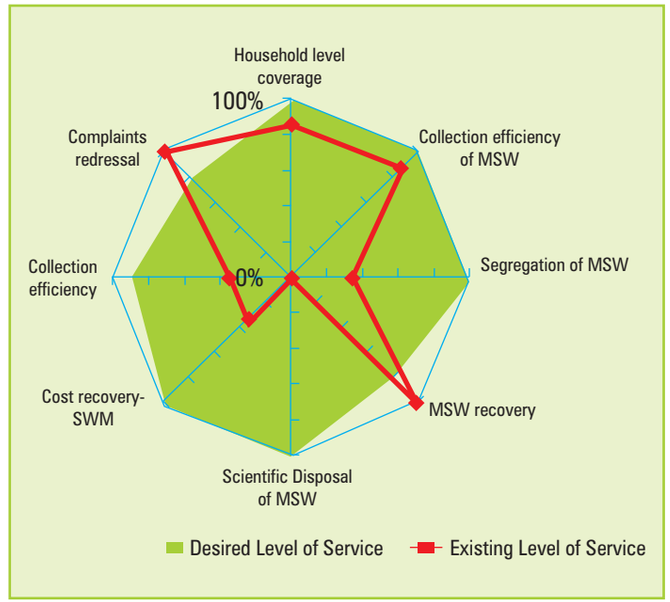


Figure 28: Service Level Benchmarking For MSW

The ward-wise detailed scenario for Municipal Solid Waste disposal is presented in figure 29

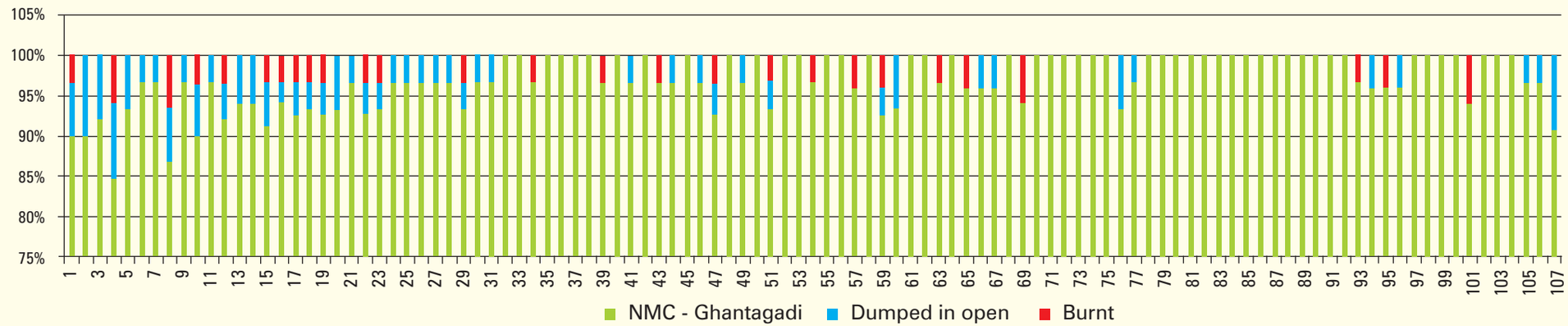


Figure 29: Disposal of MSW

What are the main issues that need to be addressed?

Lack of source segregation and limited waste recovery level

NMC has abolished waste bins and introduced door-to-door collection through "GhantaGadis" but it is constrained by the availability and number of vehicles. The current number of vehicles allows coverage only once a day, and in some areas once in two days. Furthermore, there is no segregation of waste at source because of which composting of biodegradable waste is not up to the mark.

Figure 30: GhantaGadi used for collection of waste

No vision for comprehensive solid waste management at city level, and very low O&M cost recovery

Nashik has successfully become a dustbin-free city by implementing a door-to-door solid waste collection system. NMC started various small scale initiates such as composting, biomedical waste disposal, and waste to energy generation. However, there is more to achieve on a larger scale such as source segregation, composting, e-waste management, and waste to energy generation. Therefore, a comprehensive approach is required to plan and implement these on-going initiatives for Municipal Solid Waste Management in Nashik.

Presently, a user charge is not levied on solid waste management, but is collected as a conservancy tax as part of the property tax. This conservancy tax is not adequate to recover O&M charge completely.

Weakness

No segregation, high SWM costs of operation, no control over garbage thrown in open areas especially near slums, open drains and the Ram Kund area.

Opportunities

The scope of generating revenue from processing, and the scope for PPPs are under process.

2. Governance and Institutional Frameworks

NMC is an Urban Local Body (ULB) formed in November 1982. NMC operates under the legal framework provided by the Bombay Municipal Corporation Act 1948, under which the statutory responsibilities relating to sanitation services are vested with the NMC. There is, however, some sharing of responsibilities with various State-Government agencies.

The institutional framework in Nashik for urban services at state and local levels includes state-level agencies (i.e. Maharashtra Water Supply and Sanitation Department, Maharashtra Jeevan Prardhikaran, etc.) involved in urban governance and service provision, and city-level municipal organisation.

Within NMC, there are detailed departmental responsibilities of service provision as well as an institutional structure for discharging their responsibilities. The adjacent table clearly signifies the overlapping and diffused accountability for sanitation within the corporation.

Figure 31: City Sanitation Task Force meeting in Nashik

Services	Planning, Procurement, Design and Construction	Operation & Maintenance
Water Supply		
a) Entire water supply system	Water Supply Department	Water Supply Department
b) Tanker water supply		Maintenance of NMC owned Tankers by Mechanical Department
c) Water quality testing		Water Quality Testing by State government's district laboratory
d) Related to land reservation and allocation	Town Planning Department	
Waste-water management		
a) Sewage Treatment Plants	Sewerage Department	Private operators/ contractors maintain the STPs under the monitoring of Mechanical Department
b) Pumping Stations	Sewerage Department & Mechanical Department	Mechanical Department
c) Sewerage Network	Sewerage Department	Sewerage Department
d) Septic Tank	Design and Construction done by Public Works Department	a) Septic Tank Cleaning done by Health Department b) Septic Tank Cleaning vehicles are maintained by Mechanical Department c) O & M of municipal owned septic tanks (for public toilet complexes) by Public Works Department
e) Related to land reservation and allocation	Town Planning Department	Town Planning Department
Storm Water Drainage	Sewerage Department	Sewerage Department
Solid Waste Management		
a) Collection of MSW and transfer to MSW Processing plant	a) Purchase of vehicles (Ghanta Gadis) by Mechanical Department	a) Done by private operator and monitored by Health Department b) Maintenance of vehicles (Ghanta Gadis) by the vehicle supplier company for initial five years under the monitoring of Mechanical Department.
b) Municipal Solid Waste Processing plant	Mechanical Department	Mechanical Department
c) Related to land reservation and allocation	Town Planning Department	Town Planning Department
Slums		
a) Provision of water supply, sewerage and MSW collection services	For respective services as described above	For respective services as described above
b) Awareness, beneficiary identification	Slum department	Slum department
c) BSUP scheme	Projects Department	For respective services as described above
d) Implementation of government schemes (Except for BSUP)- civil works, construction works, provision of social amenities	Public Works Department Nashik Municipal Corporation	Public Works Department Nashik Municipal Corporation
e) Related to land reservation and allocation	Town Planning Department	Town Planning Department

What are the main issues that need to be addressed?

Diffused accountability, inadequate staffing, and lack of exposure to modern sanitation practices within the NMC

Of the total posts in NMC 10 % posts are vacant, while in case of Class II category employment, around 13 % of the sanctioned posts are vacant. Similarly for Class III and Class IV employment, the percentage of vacant posts to sanctioned posts in the respective categories is 16% and 5%. In view of the large scale implementation of projects under Jawaharlal Nehru National Urban Renewal Mission (JNNURM), there is a spike in work load particularly among the Class I and II officials, where implementation of capital projects is being handled in addition to their O&M responsibilities. There is overlapping and diffused accountability for sanitation even within the NMC. As in the case of many ULBs, responsibility for sanitation is diffused across multiple departments. O&M of water supply and sewerage infrastructure is being handled by the engineering department. While solid waste management services are being handled by the public health department, procurement of vehicles is also handled by the engineering section. Public toilets are managed through private contracts which are inadequately monitored. The capital work of public toilets is done by the Public Works Department (PWD) while the O &M responsibility is with the Health Department. However, the repairs of public toilets are done by PWD. There appears to be no regulation and accountability in place for on-site sanitation. Regulatory and monitoring mechanisms for oversight on service delivery and tariff fixation are in place but are weak.

3. Financial Sustainability

How is the financial sustainability of NMC?

Financial sustainability could be studied by assessing financial inflows (i.e. income: revenue, capital, extra-ordinary) and outflows (i.e. expenditure: revenue, capital, extra-ordinary) over a period of time.

NMC had a Cumulative Annual Growth Rate (CAGR) of 19% in Revenue Income and a 17.4% CAGR in Expenditure during 2004-09. Overall surplus grew at a CAGR of 56%. The share of capital expenditure in total expenditure increased from 28% to 58% (a CAGR of 41%), indicating a significant increase in asset creation under JNNURM. NMC's revenue income consists of tax incomes from own sources (octroi, property tax and others), non-tax incomes from own sources (water charges and others) and revenue grants.

NMC's collection efficiency of property and water tax is in the range of 67 to 77% and 65% to 72% respectively during the FY05 to FY09.

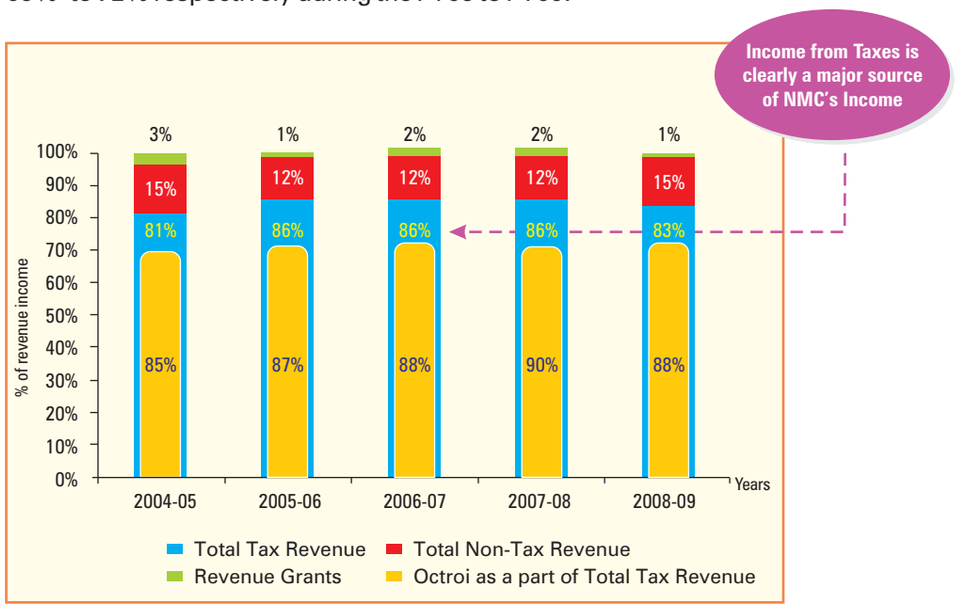


Figure 32: Composition of Revenue Income

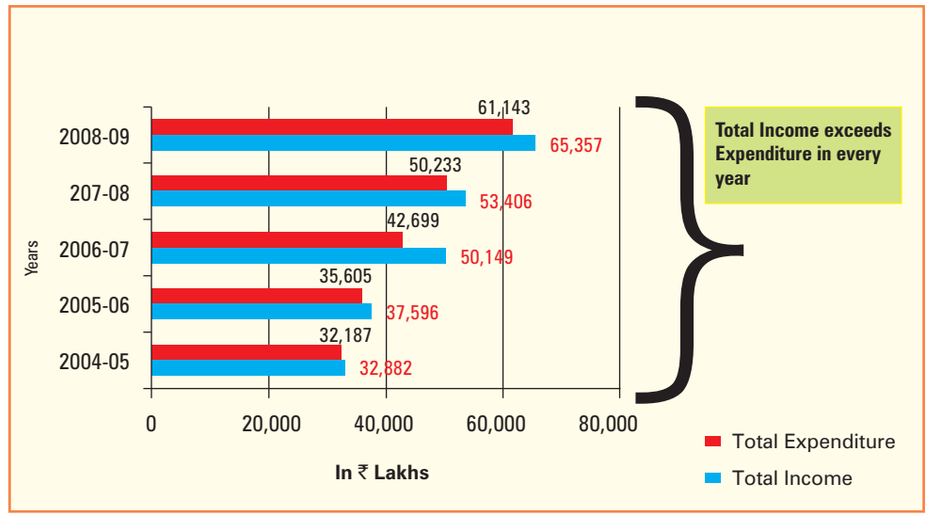
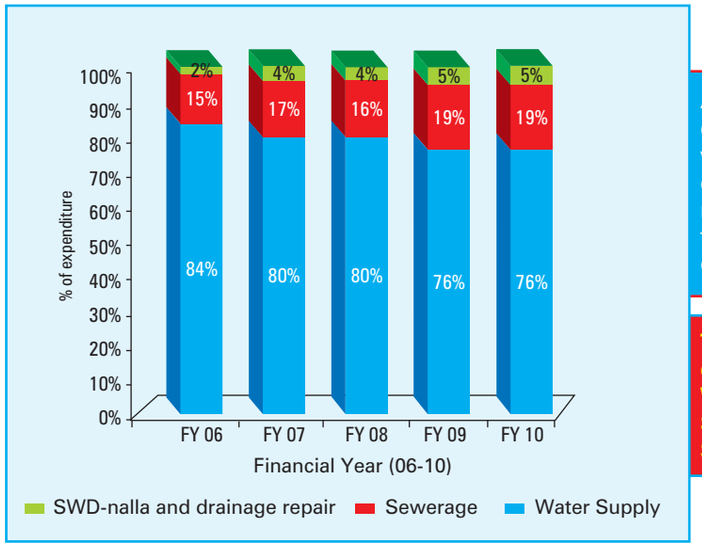


Figure 33 NMC: Total Income Vs Expenditure

GoM has initiated measures to abolish Octroi tax starting with the D class ULBs and the same is also expected to be phased out from the NMC in near future. As octroi is the major source of revenue income, this move could impact its revenue adversely.

The Octroi tax alone accounted for 73% of the total revenue income in 2008-09.

Property Tax contributed 11% of Revenue Income in 2008-09 and growing at a CAGR of nearly15% during the period 2004-05 to 2008-09.



Annual O&M expenditure on water supply constitutes nearly 80% of the total O&M expenditure.

The O&M expenditure on Water Sewerage: SWD is 15:5:1.

Figure 34: O & M Expenditure Water, Sewerage and SWD

NMC's overall revenue expenditure grew at a CAGR of 11% during the period 2004 to 2009, slightly lower than Revenue Income CAGR of 13%. Administrative expenses and employee salaries accounted for 40% of the Revenue Expenditure and grew at nearly 14%.

NMC's capital expenditure for water supply, sewerage, storm water drains, and divisional committee budget was Rs 14,970 Lakh in 2009-2010. The CAGR for capex in water supply, sewerage, and storm water drains during the period was 69%, 8% and 251% respectively. The overall capex showed a CAGR of 43.4%.

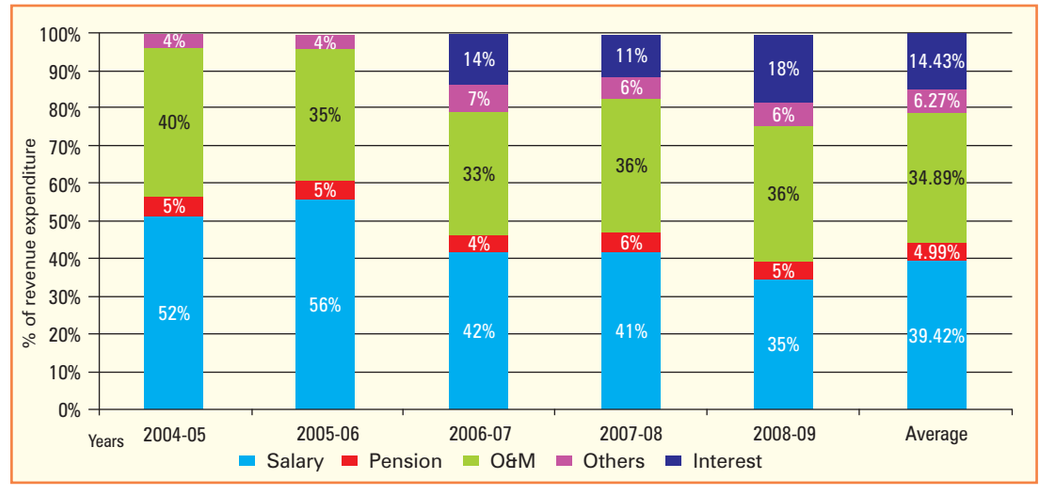


Figure 35: Composition of Revenue expenditure from FY 05 to FY 09

O&M cost recovery dipped from 159% in 2002-03 to 48% in 2009-10, largely due toan 8-fold increase in the O&M expenditure while revenue (SBT) barely doubled.

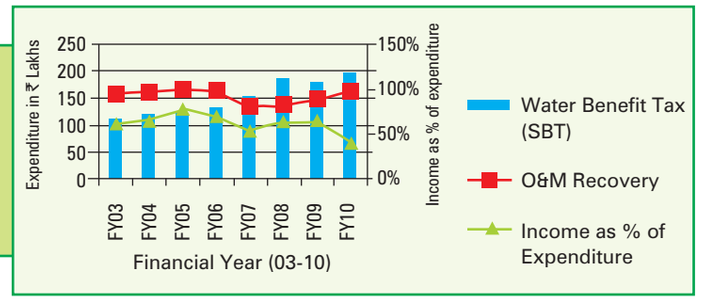


Figure 36: Water supply system O & M cost recovery

O & M cost recovery for water supply improved marginally from 94% in 2002-03 to97% in 2009-10, with a dip during FY 07and FY 08.

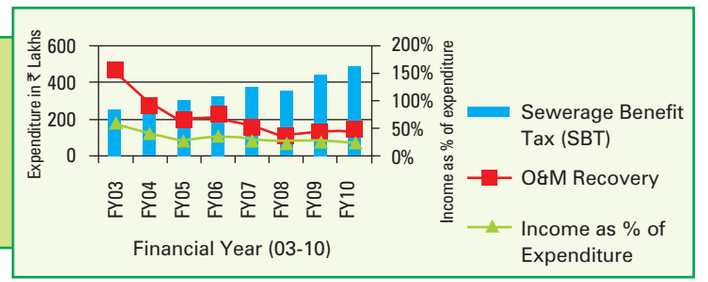


Figure 37 Sewerage system O & M cost recovery

What are the main issues that need to be addressed?

NMC's financials could get severely constrained; Cost recovery levels in sewerage and solid waste are very low vis-à-vis prevailing O&M costs.

Though the financial information provided by NMC has facilitated a fairly detailed analysis of cost recovery in water supply and sewerage systems, an analysis of expenditure of other aspects of sanitation, such as toilet access, is constrained due to classification of expenditure under different heads. Similarly, there is very little information available on costs of on-site sanitation incurred by citizens as the same is not formally captured by NMC. With the implementation of a number of capital projects under JNNURM, a sharp rise in O&M costs can be expected. For instance, it is seen that O&M costs of sewerage networks have gone up eight-fold in the last five years and is expected to increase further with the construction of new STPs. Cost recovery in water supply and sewerage are at 72% and 48% respectively, while collection efficiency is reported at 92% and 72% in water supply respectively. Cost recovery in solid waste management is at a low of 35%.

Strength

Municipal finances indicate a revenue surplus

Weakness

There is over dependency on octroi, and low cost recovery and collection efficiency on taxes and user charges.

CITY-LEVEL GOALS:
Identification of goals under the guidelines of NUSP and the accomplishment of the same would make Nashik 'a completely sanitised city'.

CITY-LEVEL KEY ISSUES:
Critical issues are identified at ward level, zone level, and across various economic levels (urban & urban poor). The affected areas are characterized and prioritized for immediate intervention.

RECOMMENDATION FOR KEY ISSUES:
Focused recommendations to address each key issue are designed. These recommendations are given in terms of technology required, costing, institutional and governance enhancement, community awareness and inclusiveness.

ACTION PLAN:
Specific action plans are designed across the five plan components (access to toilets, wastewater management, river pollution and storm water management, water supply, solid waste management), and major strategic support components (governance and institutional frame work and financial sustainability). These action plans are packaged around five pillars of intervention.

PILLARS OF INTERVENTION

- TECHNOLOGY
- FINANCE
- INSTITUTIONAL & GOVERNANCE
- CAPACITY ENHANCEMENT & COMMUNITY AWARENESS
- INCLUSIVENESS

The city sanitation plan recommends an action plan in two time horizons Planning Horizon spanning 30 years (2012-2041) and action horizon spanning 10 years (2012-21)

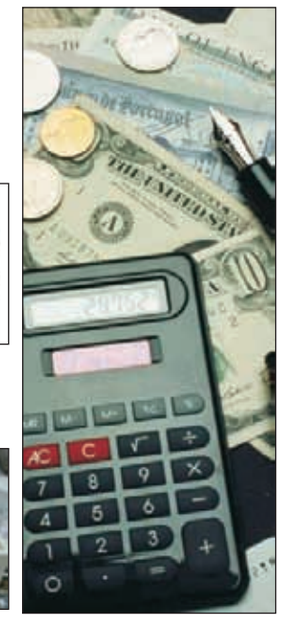
Planning Horizon (30 years: 2012-2041)

The Planning Horizon considers a period of 30 years from 2012 to 2041, and involves planning for an Intermediate Stage (2021 or 10 years) and an Ultimate Stage (2041 or 30 years). This Time Horizon is consistent with typical timeframes for planning infrastructure asset creation, and prepared of detailed project reports.

Action Horizon (10 years 2012-21)

The Action Horizon considers a period of 10 years from 2012 to 2021 and is the time frame for the actions recommended. This Action Time Horizon is further divided into actions along Short Term – (3 years) Medium Term - (5 years) and Long Term - (10 years).

This document only indicates immediate required action in the following sectors, which will collectively help Nashik in becoming a fully sanitised city.



Governance and Institutional Framework

Financial Sustainability

1: Access to Toilets

Nashik has good coverage in terms of access to toilets but the major issue of concern is open defecation which is rare but prevalent in some urban poor areas. To eradicate this issue, NMC should initiate the following actions:

- Implement an inspection and monitoring protocol to ensure timely maintenance and consistent service delivery in existing public and community toilets
- Initiate development and implementation of a city-wide toilet development and rehabilitation plan to eliminate open defecation / urination within three years
- Implement bye-laws to levy fines for open defecation/urination and incorporate toilet specifications as part of building regulations, in consultation with the Government of Maharashtra (GoM)
- Initiate awareness campaigns to facilitate awareness, usage, and ownership of shared community toilet facilities at the levels of slums, communities and schools

Monetary requirements

Based on a normative assessment, an estimated 2,531 community toilet seats for slums and 500 public toilet seats for the floating population are needed in the medium term involving a capital investment of ₹ 20.88 crores. Recurring O&M cost is estimated at ₹ 13.71 crores annually. However, assuming that 50% of the toilet complexes are managed on outsourced models, actual O&M cost burden on NMC is estimated to be at ₹ 6.9 crore annually.

Figure 38:Condition of community toilets

2: WasteWater Management

The issues requiring attention in this sector are: ground water pollution due to prevalence of septic tanks, lack of waste water information and no reuse/recycle of waste water. To address these issues NMC should initiate following actions:

I. To control ground water pollution due to prevalence of septic tanks:

- NMC should prepare a **detailed action plan** to progressively phase out septic tanks

a) The phasing should start from the old city area with septic tanks which are older than 10 years. Then the septic tanks which are constructed during previous decade but are not functioning effectively will be phased out. The action plan should have provisions for people participation and awareness campaigns.

b) Carry out property-level assessment of prevalence of septic tanks and collect necessary information

- **Two new vacuum suction trucks** need to be purchased as the existing numbers of trucks are inadequate.
- Clarify and enforce **bye-laws for monitoring and regulation of on-site sanitation,** in consultation with GoM.

a) Monitoring will be done by the Health Department.

b) Sanitary Inspectors will submit a monthly report to the department on the number of requests for cleaning of septic tanks, amount collected, and citizens' grievances.

c) A provision should be made for fines/ penalties for improper disposal of septage.

Based on normative assessment, the cost of provision and implementation of the above actions is estimated at ₹ 2.50 crores during 2011 to 2016.


Re-use and Recycling


Cost Recovery


Collection Efficiency


% of area with piped network

II. To collect and maintain information on wastewater, which will ultimately help in effective future planning

- Revise population estimates and projections based on the Census 2011 population.
- Undertake technical improvements of the sewerage system to improve wastewater collection efficiency and optimise treatment performance.

a) Purchase and install Electromagnetic Bulk Meters at STPs and sewage pumping stations to capture information on wastewater flows effectively. Bulk meters should be compatible with the PLC-SCADA system to provide information automatically.

b) Initiate a Rapid Technical Assessment Study of the sewage at various places coming to STPs to understand trends in BOD levels.

- Capture baseline information on septic tanks through a comprehensive household / property level water and sanitation survey
- Establish a wastewater quality monitoring protocol in coordination with MPCB

Based on normative assessment, the capital cost of implementing above actions is estimated at ₹ 12.5 crores during 2011 to 2016.

III. To increase the reuse and recycling of wastewater which is of utmost importance, firstly to meet the water demands of an ever-increasing population, and secondly to conserve the available fresh water:

- Conduct a feasibility study for upgrading STPs and exploring various options to treat up to tertiary levels, and commission waste to energy plants.

a) Treating waste water up to tertiary level, and reuse treated water for non-potable requirements

NMC has 400 gardens in the city that are supplied with potable water or ground water. This could be replaced with recycled wastewater.

Water requirement for non-potable industrial application could be met by the tertiary treated water.

b) Upgrading STPs and installation/ rehabilitation of waste-to-energy plants at STPs through capture of methane from sewage.

The energy so generated can be sufficient for the daily need of STP operations and premises.

The Panchak and Chehedi STPs have a gas collection system installed which needs to be properly operated by NMC.

The capital cost of implementing the above actions is estimated at ₹ 65 crores during 2011 to 2016. The O &M expenditure of sewerage system in 2016 would be ₹ 36.41 crores.

3: River Pollution and storm water management

Pollution of Nashik's rivers, especially Godavari, is the main issue of concern in this sector. To address this issue, NMC should initiate the following actions:

- Conduct a Feasibility Study for upgrading STPs and exploring various options to treat up to tertiary levels, and commission waste to energy plants.

a) Constitute a multi-stakeholder council comprising NMC, industrial areas, MPCB, and other stakeholders with support from GoM to oversee this program's implementation.

b) Compile, in collaboration with MIDC and MPCB, information on wastewater flows into the river particularly from the industrial areas.

c) Prepare a detailed project report on it.

- Implement a time-bound phased investment program to develop / rehabilitate a storm drain network in the city.

The capital cost of implementing the above actions is estimated at ₹ 45 crores during 2011 to 2016. In the long term, the recycling of wastewater and resell of water to industries, SEZs, and such on a revenue sharing basis can help in saving potable water and in turn the overall O&M cost.

Figure 39: Polluted Stretch of River Godavary in Nashik

4: Water Supply

The water supply seems to be fairly well in the NMC region. The issue of concern in this sector is the high levels of NRW (non-revenue water) which affects the financial sustainability of the NMC. The action plan to address this issue is:

➡ NMC should improve baseline information on water flows

a) Install bulk meters at intake works, water treatment plants, pumping stations, and storage reservoirs.

b) Initiate a drive to repair and maintain consumer meters.

c) Consider implementing PLC-based SCADA system to improve the overall efficiency of monitoring intake works, WTPs and pumping stations.

d) Conduct a Baseline Survey

➡ Build on the findings of the on-going water audit to launch a comprehensive city-wide NRW reduction program

a) Prepare a DPR for a city-wide NRW reduction program

b) Designate a NRW cell

➡ Illegal connections and faulty meters are the major reasons for a higher NRW. Therefore, it is necessary for NMC, in consultation with GoM, to **formulate/enforce a connection and disconnection policy.**

Based on a normative assessment, the capital cost of implementing the above actions and provisions is estimated at ₹ 109 crores during 2011 to 2016. Recurring O&M cost is estimated at ₹ 66 crores annually in 2016. In the long term, the recycling of waste water and reuse for gardening and other purposes can help in saving potable water and in turn the overall O&M cost.

Figure 40: Public stand post (PSP) in Nashik

5: Solid Waste Management

Nashik's solid waste management issue includes absence of solid waste segregation (this affects the opportunity to undertake optimum processing of solid waste), and lack of comprehensive solid waste management vision.

I. To address the absence of a solid waste segregation issue, NMC should undertake the following actions:

- Initiate segregation of waste at source in a phased manner

a) NMC should select 4-5 pilot wards, undertake source segregation there for 2 months, then conduct a qualitative and quantitative analysis of the waste.

b) Launch an awareness campaign

- Increase the frequency of door-to-door collection from every alternate day to daily wherever the service is not available by increasing its fleet of GhantaGaadis

Based on a normative assessment, the capital cost of implementing the above actions is estimated at ₹ 9 crores during 2012 to 2015. The recurring O&M cost is estimated at ₹ 47 crores annually in 2016. In the long term, initiatives like energy generation from waste and increase in sale of manure from composting would increase revenues for NMC.

Figure 41: Solid Waste

Figure 42: Solid Waste Awareness Campaign in Nashik

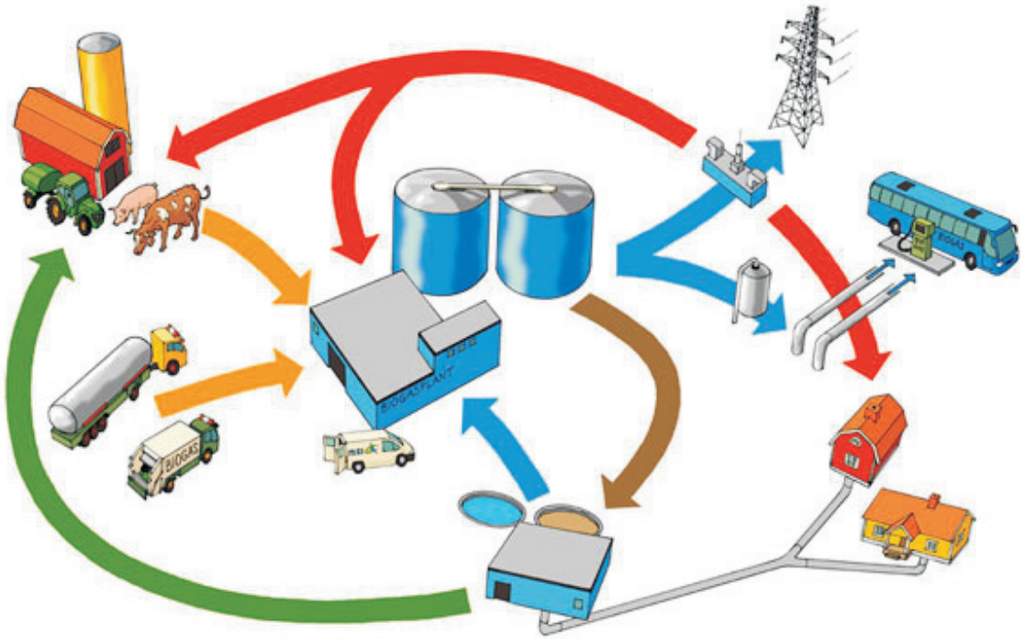
II. To initiate a comprehensive solid waste management, NMC should undertake the following actions:

- Prepare a vision for a Comprehensive Solid Waste Management Program
- With the target of achieving O & M cost recovery, NMC should, in consultation with GoM, incorporate bye-laws for formalising the policy

a) Right to levy, collect and retain user charges. NMC should also be able to assign/transfer this right to a service provider through a contractual relationship.

b) Articulate citizens' duties with respect to maintaining a clean environment, and to fulfil obligations in implementing modern practices such as source

c) Right to impose fines in case of non-compliance of citizens in their duties regarding sanitation.



Based on a normative assessment, the capital cost of implementing the above actions is estimated at ₹ 0.5 crores during 2012 to 2015.


Segregation of MSW


Scientific Disposal


Cost recovery-SWM


Collection Efficiency

6: Governance and Institutional Framework

Nashik's governance and institutional framework has two main issues diffused accountability for the services, and inadequate staffing. To address these issues, a two-way approach would be required from GoM and NMC.

GoM should undertake the following actions:

a) GoM should actively support ULBs in implementing local level policy framework through model bye-laws and guidelines. The subjects that should be considered are as follows:

Subjects for guidance manual:
- Public toilets configuration, sizing and operation

Building regulation: Toilet sizing and specifications as part of the Building Code

Subjects for Bye-laws:
- ✔ Groundwater management and rainwater harvesting
- ✔ Regulation, fixation and revision of user charges
- ✔ Connection and disconnection policy for water and sewerage connections
- ✔ On-site sanitation, decentralised treatment, and septage management

b) GoM should undertake an organisation assessment of NMC

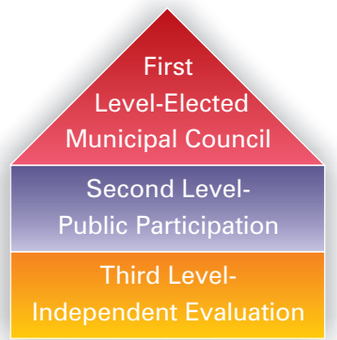
NMC should undertake the following actions:

a) Should strengthen the Health Department
- ✔ Give additional powers to the Health department such as repairs and maintenance up to ₹ 50 lakh per year with sanction from the Chief Engineer. Repairs above ₹ 50 lakh will be done by PWD as per existing practice.
- ✔ Appoint three deputy engineers in the Health Department for carrying out routine repairs and maintenance works.

b) Consider a three-level monitoring and evaluation framework

c) Implement training need assessment recommendations

d) Formulate a comprehensive cost recovery and tariff policy for sanitation services to facilitate fixation, revision, and regulation of user charges for sanitation services



7: Financial Sustainability

The NMC has low cost recovery which affects its financial sustainability. To address this issue, the NMC should implement the following action plan:

- Clarify cost recovery objectives and approach through a well-articulated and disseminated tariff policy in consultation with the GoM, and mechanisms / accountability for implementation as defined earlier.
- Implement a framework to track and disseminate information on O&M costs of all sanitation services, particularly in the context of additional O&M costs arising as a result of implementation of ongoing and proposed projects under JNNURM.
- Align user charges in sanitation services with cost recovery targets enunciated in NMC's Tariff Policy. In particular, implement the following actions towards improving cost recovery in the immediate term:

a) **Water Supply:** Improve metering infrastructure to facilitate regular meter reading, formulation of volumetric tariffs, and collection of user charges

b) **Sewerage:** Implement a user charge framework for sewerage connections that are based on the volumetric usage of water

c) **Solid Waste management:** Implement slab-based user charges to levy and collect differential levels of user charges from different categories of waste generators

A normative assessment of capital cost estimate across various sanitation components

Capital Investment (₹ Lakh)	Phasing of Investment			TOTAL
	Short	Medium	Long	
Access to Public Toilets- for Slums and Floating population	2,088	-	684	2,772
Water Supply	8250	2150	0	10400
Waste water management	3300	1200	0	4500
Storm Water Management	8100	200	0	8300
Solid Waste Management	2400	1100	0	3500
ISIP, Project Development and Capacity Building	1350	600	600	2550
TOTAL	**25,488**	**5,250**	**1,284**	**32,022**

The estimated O&M costs for sanitation service delivery effectively translate to about ₹ 300 per month per household and suggest that 100% O&M cost recovery is achievable through cross subsidy to lower-income households and leveraging other potential means of revenue realization including revenues from waste recovery and from recycling / re-use of waste water.

O&M COST	2012	2016	2021	2031	2041
Water Supply	4,417	6,563	10,525	26,273	60,324
Waste Water Management	2,466	3,641	5,755	14,358	33,060
SWM	3,108	4,675	7,842	21,532	54,612
Toilets	1,580	1,371	931	1,071	1,959
TOTAL (₹ In Lakh)	**11,570**	**16,250**	**25,053**	**63,234**	**149,955**
Annual Sanitation O&M Cost (₹ per capita)	718	840	1,031	1,699	2,859
Monthly Sanitation O&M Cost (₹ per capita)	60	70	86	142	238
Monthly O&M cost (₹ per household)	299	350	430	708	1,191

City Sanitation Task Force

Sr. No.	Designation & Affiliation	Name
1.	Mayor, NMC	Mrs. Nayana Gholap
2.	Deputy Mayor, NMC	Prof. Devyani Farandhe
3.	Commissioner, NMC	Mr. B.D. Sanap
4.	President Standing Committee	Mr. Sanjay Sable
5.	Leader of House	Mr. Sudhakar Budguar
6.	Leader of Opposition, NMC	Dr. Hemlata Patil
7.	City Engineer	Mr. Sunil Khune,
8.	Superintending Engineer	Mr. R.K. Pawar
9.	Medical Officer of Health (MoH)	Dr. Kondiram Pawar
10.	Executive Engineer (Mechanical)	Mr. S. S. Magare
11.	Public representative	Dr. Mamata Patil
12.	Public representative	Mr. Gurumit Singh Bagga
13.	Public representative	Mr. Bhagwan Bhage,
14.	Pollution Control Board	Regional Officer
15.	Journalist, Nashik	Mr. Sanjay Pathak
16.	Industry Representative	Mr. Lokesh Shevade
17.	Principal, J.D.C Bytco IMSR,	Dr. (Mrs.) A. A. Verulkar
18.	NGO Representative	Mr. Milind Babar
19.	Representative, Industrial Association, Nashik	NIMA
20.	Representative, Maharashtra University of Health Sciences, Nashik	Vice Chancellor
21.	Representative, Sulbah International, Nashik	
22.	Representative, Union of Sanitary Workers Nashik	


MINISTRY OF URBAN DEVELOPMENT
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ICRA Management Consulting Services
PREPARATION OF
ITY SANITATION PLAN, NASHIK
2ND CITY SANITATION TASK FORCE WORKSHOP
VENUE: NASHIK MUNICIPAL CORPORATION
DATE: MARCH 9, 2011

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COOPERATION
REPUBLIC OF INDIA
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