
CHAPTER IV

PERFORMANCE AUDITS

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URBAN DEVELOPMENT DEPARTMENT

4.1 Delivery of Basic Civic Services by Select Municipal Councils

Executive Summary

The Municipal Councils (MCs) plan for social and economic development as well as to provide essential civic services to its citizens such as, supply of drinking water, disposal of sewage and management of solid wastes, street light, fire services, registration of birth and death, regulation of building, maintenance of roads, parks and gardens etc.

A performance audit of delivery of three basic civic services i.e. water supply, solid waste management and sewage management by 36 MCs was conducted between February and August 2014 covering the period 2011-14. The performance audit revealed that average water supply in 17 of the 36 MCs ranged between 25 and 69 lpcd against the mandated 70 lpcd, due to losses from the distribution system, reduced efficiency of WTPs and irregular electric supply. Twenty one water supply augmentation projects taken up by 20 MCs at a cost of ₹708 crore under Central scheme (UIDSSMT) and State schemes (MSNA and MSJNA) suffered from significant time and cost overruns. The reforms in water supply services taken up by 24 MCs at a cost of ₹33.57 crore were lagging behind.

Except one MC, none of the 35 MCs were segregating MSW either at source or at the landfill sites and unprocessed solid waste was being dumped in the landfill sites in a non-environment friendly manner or directly in the pits/near water bodies/road sides. Bio-gas plants and vermi/mechanical composting plants constructed/partially constructed at a total cost of ₹6.29 crore by 11 of 36 MCs could not be put to optimal use due to repair and maintenance problems, lack of demand for the end product (cooking gas) etc. A number of MCs did not have valid authorisation from the State Pollution Control Board for setting up waste processing and disposal facilities in landfill areas or for operating slaughter houses.

The sewage collection and disposal system in 32 of the 36 MCs were inadequate. The waste water was connected either to open drains or storm water drains leading to the nearby rivers. In 34 MCs, 208.51 MLD was being discharged without treatment either due to inadequate capacity of STPs or non-functioning of STPs. Only two of the 10 capital projects sanctioned between March 2008 and February 2014 at a total cost of ₹612.17 crore for upgradation of underground sewage system in 10 MCs were commissioned.

None of the 36 MCs were able to achieve the Service Level Benchmarks prescribed by MoUD, GoI against various performance indicators in water supply, solid waste management and sewage management.

4.1.1 Introduction

Municipal Councils (MCs) are created for smaller urban areas and they are categorised based on their population. The MCs are governed by the Maharashtra Municipal Councils, Nagar Panchayats and Industrial Townships Act, 1965 (MMC Act). It is mandatory on the part of the MCs to plan for social and economic development as well as provide essential civic services to its citizens, such as, supply of drinking water, disposal of sewage and management of solid wastes, street light, fire services, registration of birth and death, regulation of building, maintenance of roads, parks and gardens *etc.* There are 238 MCs¹ in the State as on March 2015. The revenue receipts of MCs include property tax, water charges, lease and rental income and other miscellaneous fees that MCs are authorised to levy and collect as per MMC Act. The Government of Maharashtra (GoM) also releases compensatory grants (in lieu of abolition of octroi), pilgrimage tax and grants. In addition, MCs also receive capital grants-in-aid from Government of India (GoI) and GoM for creation and augmentation of civic infrastructure. The revenue receipts and compensatory grants are used by MCs to provide basic civic services and also to meet its establishment expenditure.

4.1.2 Organisational set up

The Principal Secretary, Urban Development Department (UDD) is the head of the administrative department. He is assisted by Director of Municipal Administration (DMA) which functions as a nodal agency for receipt of grants from GoI and GoM and their disbursement to MCs. The DMA is also responsible for scrutiny of action plans prepared by the MCs and their implementation for developing and augmenting the civic services. The Chief Officers, MCs/Nagar Panchayats (NPs) are responsible for actual execution of works.

4.1.3 Audit objectives

Audit selected three basic civic services being provided by the MCs *i.e.* water supply, solid waste management and sewage management, for detailed scrutiny with a view to ascertain broadly that delivery of these basic services by the MCs was efficient and effective with optimum use of available resources. The specific audit objectives are indicated in the relevant sections of this report where these basic services are discussed.

4.1.4 Audit criteria

Appropriate criteria were derived from the following documents:

- Maharashtra Municipal Councils, Nagar Panchayats and Industrial Townships Act, 1965;
- Solid Waste (Management and Handling) Rules, 2000 and Bio-Medical Waste (Management and Handling) Rules, 1998; and

¹ Category A (population between one lakh and three lakh): 12; Category B (population between 40,000 and one lakh): 63; Category C (population between 25,000 and 40,000): 148; and NPs (population between 15,000 and 25,000): 15

- Guidelines issued by GoI, GoM and Maharashtra Pollution Control Board (MPCB) from time to time.

4.1.5 Scope and methodology of audit

A performance audit of delivery of three basic civic services *i.e.* water supply, solid waste management and sewage management by the MCs was conducted between February and August 2014 covering the period 2011-14². For this purpose, records of DMA and 36³ of 238 MCs were selected for detailed scrutiny by using stratified sampling method⁴. The audit examination also involved test check of records in UDD, GoM. Joint visits to various sites were also conducted by audit with representatives of MCs to ascertain the efficiency of various civic services being provided by them.

An entry conference with the Principal Secretary, UDD was held in June 2014 wherein the audit objectives, criteria, scope and methodology of audit were discussed. An exit conference was held with the Secretary, UDD in January 2015 wherein the audit findings and recommendations of audit were discussed. However, the minutes of the exit conference duly signed by the Secretary, UDD was not received as of March 2015, despite repeated reminders. The draft performance audit report was issued to the Government in September 2014; their response was awaited as of March 2015.

Audit findings

4.1.6 Water Supply Services

As per MMC Act, it is mandatory for the MCs to supply at least 70 litres per capita per day (lpcd) water to the citizens. Besides, the Service Level Benchmarks (SLB) prescribed (July 2008) by the Ministry of Urban Development (MoUD), GoI *inter alia* specified 100 *per cent* metering of water connections, 100 *per cent* coverage of water supply connections, 100 *per cent* cost recovery in water supply services *etc.* The GoM adopted these national benchmarks for water supply services in February 2010.

For improving the civic infrastructure in small and medium cities, MoUD, GoI launched the Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSSMT) in December 2005 under Jawaharlal Nehru National Urban Renewal Mission (JNNURM). The Water Supply and Sanitation Department, GoM also introduced (October 2008) the State scheme namely, Maharashtra Sujal Nirmal Abhiyan (MSNA) to establish a self-sustainable 24x7 water supply system by identifying the gaps in civic infrastructure through reforms and by undertaking capital works. The reform

² The audit of MCs and Nagar Panchayats was entrusted by GoM to Comptroller and Auditor General of India under Technical Guidance and Supervision in March 2011

³ Akot, Alandi, Akkalkot, Ballarpur, Bhandara, Bhusawal, Chalisgaon, Dondaicha-Warvade, Gondia, Hinganghat, Hingoli, Ichalkaranji, Jalna, Katol, Khamgaon, Kulgaon-Badlapur, Lonavala, Manmad, Mehekar, Nandurbar, Narkhed, Osmanabad, Pandharpur, Panvel, Phaltan, Ratnagiri, Sawantwadi, Shirdi, Sillod, Sinner, Tuljapur, Udgir, Umarched, Uran, Washim and Yavatmal

⁴ Selection of MCs including NPs was done on the basis of category and population giving equal representation to all the six regions in the State. Accordingly, six out of 12 MCs under A category, 18 out of 63 MCs under B category, 11 out of 148 MCs under C category and one out of 15 NPs were selected

work included consumer survey to assess water requirement and detection of illegal connection, water and energy audit *etc.* In addition, UDD, GoM also introduced (February 2010) an infrastructure development scheme namely, Maharashtra Swarna Jayanti Nagrothan Mahaabhiyan (MSJNA) for development of roads, sewage systems, buildings, water supply systems *etc.*

Water supply services in 36 selected MCs were examined in audit to ascertain whether:

- infrastructure was created and the mandated quantity of water supplied;
- sufficient funds were available for executing water supply schemes;
- schemes for augmentation of water supply and reforms were implemented economically, efficiently and effectively; and
- SLBs for water supply services were attained.

4.1.6.1 Non-supply of mandated quantity of water

Though the MMC Act mandated supply of 70 lpcd of water to the citizens, audit observed that in 17 out of 36 selected MCs, average supply of water during 2013-14 ranged between 25 and 69 lpcd as shown in **Table 1**.

Table1: Details of 17 MCs where supply of water was less than 70 lpcd during 2013-14

Region	Name of MCs (average supply of water in lpcd)
Konkan	No such cases were detected (Konkan is a water abundant region receiving maximum rainfall)
Pune	Akkalkot (66)
Nashik	Dondiacha-Warvade (25) and Manmad (50)
Aurangabad	Jalna (31), Osmanabad (49), Sillod (39), Udgir (45) and Hingoli (69)
Amravati	Akot (31), Khamgaon (59), Mehekar (53), Umardhed (65) and Washim (62)
Nagpur	Bhandara (51), Ballarpur (58), Gondia (51) and Narkhed (66)
Source : Data published by GoM	

Of the 17 MCs where water supply was less than 70 lpcd, 12 MCs took up water supply augmentation works which were under progress as of October 2014. The remaining five MCs⁵ did not submit any DPR for water supply augmentation works to the DMA. Further, two MCs (Jalna and Sillod) though completed water supply augmentation works during 2013-14, yet they were not able to raise the supply from the existing 31 lpcd and 39 lpcd to the mandated 70 lpcd either due to inability of the MCs to bear the electricity charges or poor maintenance of the water supply infrastructure.

The primary reasons for shortfall in supply of the mandated quantity of water in these 17 MCs were losses from the distribution system, decrease in efficiency of Water Treatment Plants (WTP) and pumping machineries, irregular electric supply *etc.*

⁵ Ballarpur, Bhandara, Mehekar, Udgir and Umardhed

4.1.6.2 Delay in completion of water supply augmentation schemes

In 36 selected MCs, 20 MCs implemented 21 projects under UIDSSMT, MSNA and MSJNA for augmentation of water supply from the existing capacity to 70 lpcd or 135 lpcd. A synopsis of the 21 projects sanctioned under these three schemes, status of their completion, expenditure incurred as of October 2014 *etc.* are shown in **Table 2**.

Table 2: Status of water supply projects taken up under UIDSSMT, MSNA and MSJNA in the selected MCs as of October 2014

Name of the Scheme	No. of projects sanctioned	Original sanctioned Cost as per DPR (₹ in crore)	Period of sanction	Projects completed	Ongoing projects	Expenditure incurred on completed and ongoing projects (₹ in crore)
UIDSSMT (13 MCs)	13	563.82	September 2006 to July 2008	6	7	734.29
MSNA (07 MCs)*	7	106.78	February 2009 to July 2011	1	6	90.41
MSJNA (01 MCs)*	1	37.67	February 2010	0	1	25.11
Total	21	708.27		7	14	849.81

Source: Data furnished by DMA and MCs

* Manmad MC was involved in execution of projects under two schemes (MSNA and MSJNA)

Examination of the projects for augmentation of water supply under UIDSSMT, MSNA and MSJNA schemes revealed the following:

(a) Implementation of projects under UIDSSMT

The cost of 13 projects (₹ 563.82 crore as per DPR⁶) taken up under UIDSSMT was to be shared between GoI, GoM and MC in the ratio of 80:10:10 respectively. However, due to delay (up to two years) at the level of the nodal agency (DMA) and the State Level Sanctioning Committee (SLSC)⁷ in according sanctions to these projects, the estimated cost of the projects increased from ₹ 563.82 crore to ₹ 852.56 crore. The difference of ₹ 288.74 crore had to be equally borne by GoM (₹ 144.37 crore) and the MCs (₹ 144.37 crore). Had the estimates been revised by the DMA and put up before the SLSC prior to obtaining sanction, the extra financial burden on GoM and the MCs could have been avoided and funds to the extent of ₹ 288.74 crore could have been fruitfully utilized for other developmental works in the State.

There was also time lapse of 12 to 39 months in award of 13 water supply projects from the date of their approvals by GoI, due to delay in receipt of funds from GoI/GoM, time taken in estimating the revised cost of projects due to lack of technical resources in the MCs/DMA, time taken for tendering process and evaluation of bids, land issues *etc.* Consequently, the tender cost

⁶ Detailed Project Report

⁷ SLSC constituted representative from the State Government and MoUD, GoI

of 13 works increased by ₹ 385.48 crore⁸ over the DPR costs sanctioned by GoI. Further, of the 13 projects taken up, five projects⁹ were completed with delays ranging from 10 to 40 months. The remaining seven projects were under execution as of October 2014 and they have already exceeded their original schedule of completion by 13 to 39 months.

(b) Implementation of projects under MSNA

Under the State scheme MSNA, the project cost is shared between GoM and the MCs in the ratio of 80:20 in A category MCs and 90:10 in B and C category MCs. Seven augmentation projects were approved by GoM during the period February 2009 to July 2011 at a total cost of ₹ 106.78 crore.

Of the seven projects, one project was completed with delay of 14 months (expenditure incurred: ₹ 8.08 crore) while the remaining six projects were in progress as of October 2014 with time overrun of three to 44 months (expenditure incurred: ₹ 82.33 crore). The main reasons for delay in execution of projects were public agitation, stoppage of one work due to erosion of river bank at proposed Kolhapur Type (KT) Weir¹⁰, delay in receipt of grants from GoM *etc.*

Major findings on two of the seven projects are discussed below.

(i) Augmentation of water supply project in Hinghanhat MC

The main source of raw water for Hinghanhat MC was from river Wuna for which a KT Weir was in existence since 1883. Due to damage to the KT Weir in floods (1994), temporary bunds were constructed every year to maintain the required water level in Wuna river to meet the requirement of the MC. To meet the demand of 135 lpcd of water, GoM sanctioned (July 2009) a project under MSNA at a cost of ₹ 5.18 crore for construction of a new KT weir (in lieu of the damaged KT Weir), including a new intake well and inspection chamber. The Central Design Organisation, Nashik¹¹ (CDO) had prepared (April 2008) the design of the KT Weir and recommended construction of a guide wall adequately pitched with stone pieces in order to strengthen the embankment of the river at the shoulder of KT Weir's. However, the MC prepared the estimates (July 2009) without considering guide wall as recommended by the CDO and the estimates were technically approved in July 2009 without the guide wall.

The MC awarded the work of construction of KT Weir in April 2010 at a cost of ₹ 4.92 crore to be completed by October 2011, which was subsequently extended up to May 2013. However, during execution of the project, 30 to 40 meters of the embankment of the river at the shoulder of the KT weir was washed away due to floods in June 2012. Till July 2012, 90 *per cent* of the work relating to the new KT weir was completed for which the contractor was paid ₹ 5.34 crore. To complete the balance 10 *per cent* work including

⁸ Difference between accepted cost of tenders (₹ 949.30 crore) and original sanctioned costs as per DPR (₹ 563.82 crore)

⁹ One project registered a delay of only two months and therefore, excluded from delay category

¹⁰ Kolhapur-type weir is a low level dam built across a river for storage of water

¹¹ A GoM authority established for designing of earthen dams, lift irrigation schemes, canal structures *etc.*

construction of guide wall and extra work necessitated by floods, the MC submitted (January 2014) fresh estimates of ₹ 13.37 crore (cost of guide wall was only ₹ 1.25 crore) to Water Supply and Sanitation Department, GoM on which decision was pending as of October 2014.

Thus, non-adherence to the recommendations of the CDO, Nashik *ab initio* for construction of guide wall not only led to an extra expenditure of ₹ 7.20 crore¹² and delay of 17 months (June 2013 to October 2014), it also deprived 1.02 lakh citizens of Hinganghat MC of the benefits of increased water supply of 135 lpcd for at least 17 months.

(ii) Augmentation of water supply project in Akkalkot MC

MC, Akkalkot awarded (October 2011) a water supply augmentation project to a contractor at cost of ₹ 9.28 crore. The work *inter alia* included providing and laying of Ductile Iron (DI) pipes (350 mm) for rising main from Bori river. Audit observed that against an estimate of 13,003.50 running metre (Rmt) of DI pipes prepared by the MC through a consultant, the contractor used only 11,229.47 rmt (86 *per cent*) in the project. However, the MC made a payment of ₹ 4.68 crore (March 2014) to the contractor for the entire 13,003.50 rmt, leading to an excess payment of ₹ 63.79 lakh to the contractor for 1,774.03 rmt.

The excess DI pipes (1,774.03 rmt) were in the possession of the MC as of March 2015 and were of no use, as the work of rising main had already been completed and their utilization in near future appears to be remote because, the design life of the rising main already established would cater to the MC up to 2041.

(iii) Reforms under MSNA

The MSNA is a reforms-led programme. It places thrust on a series of reform measures and has the ultimate objective of achieving 24x7 water supply alongside a sustainable institutional arrangement for optimizing water management.

The reforms under MSNA comprised conducting of (i) consumer survey to assess water requirement and detection of illegal connection, (ii) water and energy audit, (iii) Geographic Information System (GIS) mapping of hydrology linked with digital database, (iv) hydraulic modelling for providing efficient distribution network and (v) bulk metering/flow metering.

Of the 36 selected MCs, reforms works were sanctioned in 27 MCs¹³ during July 2009 to March 2013 at a cost of ₹ 33.57 crore. Expenditure incurred by these 27 MCs till October 2014 was ₹ 10.80 crore. The status of reform works in 24¹⁴ of 27 MCs is given in **Table 3**.

¹² ₹ 13.37 crore – (₹ 4.92 crore + ₹ 1.25 crore)

¹³ Hinganghat, Jalna, Alandi, Yavatmal, Ballarpur, Akot, Udgir, Hingoli, Washim, Gondia, Ratnagiri, Bhandara, Uran, Manmad, Akkalkot, Dondaicha-Warvade, Osmanabad, Khamgaon, Sawantwadi, Katol, Narkhed, Umardhed, Shirdi, Phaltan, Chalisgaon, Pandharpur and Panvel

¹⁴ Ballarpur, Hingoli and Gondia MCs did not furnish information to audit

Table 3: Progress of completion of reform works in 24 MCs

Nature of reform works	No. and names of MCs which did not complete the reform works
Consumer survey	Nine out of 24 MCs (Alandi, Bhandara, Hinganghat, Manmad, Osmanabad, Pandharpur, Phaltan, Udgir and Uran)
Water and Energy audit	10 out of 24 MCs (Akkalkot, Alandi, Bhandara, Chalisgaon, Hinganghat, Jalna, Osmanabad, Phaltan, Sawantwadi and Uran)
GIS mapping	Eight out of 24 MCs (Alandi, Bhandara, Hinganghat, Osmanabad, Pandharpur, Phaltan, Shirdi and Uran)
Bulk metering /Flow metering	14 out of 24 MCs (Alandi, Akot, Hinganghat, Hingoli, Jalna, Udgir, Ratnagiri, Bhandara, Uran, Manmad, Osmanabad, Khamgaon, Shirdi and Phaltan)
Hydraulic modelling	Nine out of 24 MCs (Alandi, Bhandara, Hinganghat, Jalna, Osmanabad, Pandharpur, Shirdi, Udgir and Uran)
Source: Data collected from MCs	

Audit also observed inadequacies in implementation of reforms by the MCs which are discussed below.

- As per MSNA guidelines of October 2008, the reform works should precede water supply augmentation works (capital works). Audit observed that GoM sanctioned (February 2009) a project for augmentation of distribution network in Manmad MC at a cost of ₹ 4.79 crore. However, the works relating to various reforms amounting to ₹ 1.41 crore was sanctioned by GoM only in August 2009. Consequently, while the MC went ahead with the capital works for laying new distribution network (16.29 km) at a cost of ₹ 4.10 crore in August 2009, the report on reforms relating to hydraulic modelling component came after 32 months in March 2012. The distribution network was completed to the extent of 95 *per cent* by January 2012.

The action of GoM to award capital works prior to completion of reforms not only violated the scheme guidelines, the MC also could not make use of the recommendations made in the reforms report (which was submitted in March 2012) with specific reference to hydraulic modelling for improving the efficiency of distribution network. Moreover, an expenditure of ₹ 20 lakh incurred up to December 2014 on reform works (hydraulic modelling component) also proved to be unfruitful.

- The billing module was one of the 11 modules available in Municipal Administration Information Network Software System (MAINet) which was developed by Kalyan Dombivali Municipal Corporation (KDMC) during 2002-04. This billing module was distributed by DMA and its implementation by the MCs commenced from July 2009. Despite availability of billing module, four MCs (Umarkhed, Katol, Narkhed and Sillod) incurred an unfruitful expenditure of ₹ 32 lakh

between August 2009 and October 2013 on procurement of software for computerised billing and collection of water charges under the reforms works.

The Secretary, UDD accepted the facts during exit conference and stated that DMA had since stopped sanctioning of expenditure for procurement of software and all the MCs were using MAINet.

(c) Implementation of project under MSJNA

Under MSJNA, GoM sanctioned (February 2010) one project for Manmad MC at a cost of ₹ 37.67 crore. The project was awarded in October 2012 at a cost of ₹ 42.91 crore to be completed by October 2013. The project was in progress as of October 2014 and the contractor was paid ₹ 25.11 crore. The project is discussed below.

The current requirement of Manmad MC for drinking water is 8.4 million litre per day (MLD). The source of raw water for the MC is Palkhed Left Bank Canal (PLBC). During last 10 years, the Irrigation Department reduced the rotation of raw water in PLBC gradually from 240 days to 100 days in a year (five to six intervals). Raw water received from PLBC is first stored in Patoda Balancing Tank (PBT) having capacity of 148 million litre (ML). From PBT, raw water is pumped to a Water Treatment Plant (WTP) for distribution to the citizens (after treatment) and the excess water is stored in another earthen dam of larger capacity of 3,468 ML (Waghdardi dam), which is located at a distance of 18 km from PBT. During canal closure period, the water stored in PBT and Waghdardi Dam is used for distribution to the citizens.

The MC prepared (December 2009) a DPR to enhance the pumping capacity of raw water from existing 20 MLD to 52.14 MLD and the storage capacity of PBT from 148 ML to 520 ML, in order to cater to the future demand of the MC for 13.81 MLD up to the year 2042. The GoM sanctioned the project (February 2010) at a cost of ₹ 37.67 crore under MSJNA. The MC awarded the project for augmentation of the capacity of PBT along with allied works in October 2011 at a cost of ₹ 42.91 crore for completion by October 2013. The component relating to augmentation of the capacity of PBT in the contract was pegged at ₹ 9.03 crore.

Upon scrutiny of the project proposal/DPR, calculations done by the MC and other related contract documents, audit observed that the decision to augment the capacity of PBT from 148 to 520 ML at a cost of ₹ 9.03 crore was flawed due to the following reasons:

- The MC would receive raw water for 110 days in a year in five to six intervals which would be sufficient to meet the demand of citizens for 110 days and simultaneously, both the storage tanks (PBT and Waghdardi dam) would also be filled up from the excess water pumped out. This excess water from both the storage tanks can also be used during the canal closure period.
- In Waghdardi dam, the MC would be able to store 4,216¹⁵ ML of excess raw water in 110 days (in six intervals), in view of the enhanced

¹⁵ $52.14\text{MLD} - 13.81\text{MLD} = 38.33\text{MLD} \times 110\text{ days} = 4,216\text{ML}$ (excess water pumped in Waghdardi dam)
 $4,216\text{ML}$ less 30 per cent evaporation losses = $2,951\text{ML} \div 13.81\text{MLD} = 214\text{ days}$

pumping capacity of 52.14 MLD and requirement of 13.81 MLD (projections up to 2042). After accounting for the permissible evaporation losses of 30 *per cent* from Waghdardi dam (as also considered by the MC), 2,951 ML would be available in the dam that would be sufficient to cater to the needs of the MC for 214 days¹⁵ in a year during canal closure period.

- Given the existing capacity of PBT (148 ML), 888 ML would be available during the year (in six intervals) and, after accounting for the permissible evaporation losses of 30 *per cent*, 622 ML would be available. This would be sufficient to meet the needs of the MC for 45 days¹⁶.

Thus, the MC would be in a position to cater to the needs of the citizens for 369 days (110 days +214 days +45 days) without increasing the capacity of the PBT from 148 ML to 652 ML. Further, even after considering the projected demand of the MC for 10 MLD up to the year 2030, the MC would be in a position to cater to the needs of the citizens for 496 days. In addition, the MC did not consider the availability of rain water during monsoon period while preparing the DPR. If rain water had also been taken into account, the need for augmentation would not have arisen at all due to increased availability of water in both the storage tanks (PBT and Waghdardi dam).

The decision of the MC to augment the capacity of PBT was therefore, flawed and resulted in an unnecessary expenditure of ₹ 9.03 crore.

4.1.6.3 Service level benchmarking

Benchmarking is recognized as an important mechanism for introducing accountability in service delivery. It involves measuring and monitoring of service provider performance on a systematic and continuous basis. Sustained benchmarking can help utilities to identify performance gaps and introduce improvements through the sharing of information and best practices, ultimately resulting in better services to people. Recognizing its importance, Ministry of Urban Development (MoUD), GoI promulgated (July 2008) Service Level Benchmarking (SLB) in four key sectors *viz.* Water Supply, Sewage Management (Sewage and Sanitation), Solid Waste Management (SWM) and Storm Water Drainage (SWD).

The SLBs prescribed by GoI was adopted by GoM in February 2010 to be achieved by all MCs. As per the instructions issued (October 2010) by GoM, each MC was to fix goals for SLB achievements during each financial year and furnish the details of achievement of these goals to State Government.

(a) Non-achievement of SLBs

During 2013-14, number of MCs (out of 36 selected MCs) which did not achieve the SLBs prescribed by GoI or those set by the MCs themselves in respect of nine indicators in water supply services, are shown in **Table 4**.

¹⁶ 148 ML x 6 intervals = 888 ML less 30 *per cent* evaporation losses = 622 ML ÷ 13.81 ML = 45 days

Table 4: Achievement against SLBs during 2013-14

Service level benchmark indicators	National benchmarks	No. of MCs which did not achieve the SLB of GoI as on March 2014	Range of achievement by the MCs	Range of targets fixed by MCs to be achieved as on March 2014	No. of MCs which could not achieve their own targets as on March 2014.	Percentage of MCs which could not achieve their own targets
Coverage of water supply connection	100 per cent	36	35-96 per cent	40-100 per cent	31	86
Per capita supply of water	135 lpcd	30	25-129 lpcd	35-340 lpcd	27	75
Extent of metering of water connection	100 per cent	35	0-94 per cent	5-100 per cent	17	100
Extent of non-revenue water	20 per cent	26	21-56 per cent	0-50 per cent	29	81
Extent of cost recovery in water supply services	100 per cent	27	20-99 per cent	25-305 per cent	22	61
Efficiency in collection of water supply related charges	90 per cent	36	12-87 per cent	15-99 per cent	29	81
Continuity of water supply	24 hours per day	36	6	1-7	24	75
Quality of water supplied	100 per cent	18	52-99 per cent	85-100 per cent	18	50
Efficiency in redressal of customer complaints	80 per cent	13	28-77 per cent	42-100 per cent	13	36

Source: Data published by GoM

Evidently, none of the 36 MCs were able to achieve the SLBs prescribed by GoI in respect of all the nine indicators during 2013-14. Individual targets fixed by the MCs could also not be achieved by 36 per cent to 100 per cent of the MCs during 2013-14.

Findings of audit on three of the nine indicators *i.e.* cost recovery in water supply services, extent of non-revenue water and extent of metering of water connections are discussed below.

(i) Shortfalls in cost recovery of water supply services

The SLBs of GoI prescribed 100 per cent recovery of cost of water supply services in order to ensure that services being provided are cost-effective. The GoM issued detailed guidelines (August 2010) for fixation of rates for water supply services for various category of consumers by considering cost of raw water, establishment charges, capitalization of interest, if any, depreciation charges *etc.* in order to ensure that full cost of operations and maintenance or recurring costs are recovered.

Audit however, observed that of the 36 selected MCs, 28 MCs during 2011-12, 25 MCs during 2012-13 and 24 MCs during 2013-14 were not able to achieve the national benchmark of 100 *per cent* cost recovery in water supply services and consequently, sustained an operational loss¹⁷ totalling ₹ 130.45 crore. The main reasons for operational losses were non-revision of rates for water supply services by the MCs to meet their actual costs, high percentage of non-revenue water, poor collection of water charges *etc.* Audit also noticed that six¹⁸ MCs were able to reduce their operational losses during March 2014 as compared to March 2012.

The Secretary, UDD stated during exit conference that it was very difficult to insist on 100 *per cent* recovery of water charges by the MCs, considering that the MCs were not able to supply water regularly to its citizens.

(ii) High percentage of non-revenue water

The major reasons of non-revenue water (NRW) are loss of water due to poor maintenance of distribution network, water theft, illegal connections, non-metering of water connections *etc.*

Audit observed that of the 36 selected MCs, 19 MCs during 2011-12, 23 MCs during 2012-13 and 26 MCs during 2013-14 registered high NRW to the extent of 21 *per cent* to 57 *per cent*, against the national benchmark of maximum 20 *per cent*. However, during 2013-14, 10 MCs¹⁹ were able to restrict the NRW within the national benchmark of 20 *per cent*.

The Secretary, UDD stated that the instructions would be issued to the MCs for ensuring NRW within permissible limit.

(iii) Non-metering of water connections

Consumer metering induces efficiency in water use, reveals leakages in the distribution system and enables high-end consumers to be charged more for consuming more.

Audit observed that during 2011-14, of the 36 selected MCs, only one MC (Sawantwadi) met the national benchmark of 100 *per cent* metering of water connections, 22 MCs had no metering while 13 MCs had partial metering between 0.1 *per cent* and 94 *per cent*.

4.1.7 Solid Waste Management

4.1.7.1 Management of municipal solid waste

Municipal solid waste management involves collection, segregation, storage, transportation, processing and disposal of municipal solid waste generated in municipal or notified areas. The Municipal Solid Wastes (Management and Handling) Rules, 2000 (MSW Rules) were notified by the Ministry of Environment and Forest (MoEF), GoI in September 2000 that made every municipality, within its territorial jurisdiction, responsible for management and handling of solid waste.

¹⁷ Cost of water supply services minus total demand raised for water charges

¹⁸ Hinganghat, Ichalkaranji, Khamgoan, Umarched, Washim and Mehekar

¹⁹ Alandi, Ichalkaranji, Katol, Lonavala, Phaltan, Shirdi, Sinner, Tuljapur, Udgir and Uran

The management of solid waste by 36 selected MCs was examined in audit to ascertain whether:

- required infrastructure was created for disposal of MSW;
- MSW was disposed as per Rules;
- monitoring and review mechanisms were in place and SLBs were achieved.

The basic requirement for management of MSW is availability of land for segregation, processing and its disposal in an area allocated for landfilling²⁰, in an environment friendly manner. Landfilling needs to be restricted to non-biodegradable, inert and other wastes that are not suitable either for recycling or for biological processing so as to minimize the burden on landfill. It is also obligatory for every municipal authority to obtain authorization from the State Pollution Control Board for setting up waste processing and disposal facilities in the designated landfill area.

(a) Non-segregation of waste as per MSW Rules

As per MSW Rules, two separate bins (both for public and households) should be arranged to collect recyclable waste (wet and dry) and non-recyclable waste (inert materials such as stones, debris *etc.*) at the source itself. Further, as per Maharashtra Pollution Control Board (MPCB) norms, the waste so transported to landfill sites were to be further segregated for which conditions like construction of non-permeable lining system at the base and walls of waste disposal area (landfill), provision for leachates²¹ collections, installation of landfill gas control system *etc.* were to be adhered to.

Audit observed that except Panvel MC, none of the 36 selected MCs have any mechanism to weigh or dispose of the MSW being collected from residential and commercial establishments every day, in an environment friendly manner in the designated landfill sites. As per audit estimation, 829 Metric Ton (MT) of MSW per day or 3.03 lakh MT²² of MSW per year was being generated by 36 MCs. However, in none of the 35 MCs, MSW was being segregated at source and the MPCB norms for development of landfill sites were also not adhered to. Consequently, further segregation of waste at the landfill sites was not being done by the MCs and the waste so collected were being dumped in the landfill sites. The disposal of MSW in an unscientific manner may have an adverse impact on ground water and quality of air.



²⁰ Landfilling means disposal of residual solid wastes on land in a facility designed with protective measures against pollution of ground water, surface water and air fugitive dust, wind-blown litter, bad odour, fire hazard, bird menace, pests or rodents, greenhouse gas emissions, slope instability and erosion

²¹ Leachates means liquid that seeps through solid wastes or other medium and has extracts of dissolved or suspended material from it



²² Worked out by audit considering the population of 36 MCs (based on 2011 Census) and MSW generation of 250 grams per person per day, as per Manual on Solid Waste Management prepared by All India Institute of Local Self Government, Mumbai in May 2000.

(b) Storage, handling and transportation of waste in violation of MSW Rules

As per MSW Rules, every municipal authority is required to ensure proper storage and transportation of MSW and vehicles used for transportation of MSW should be covered to prevent their scattering. Further, the waste being transported should not be visible to public nor exposed to open environment. Joint visits by audit in 18 of 36 selected MCs revealed that four²³ MCs were transporting MSW in open vehicles without covering the waste.

	
<p>Jalna Municipal Council transporting MSW without covering the vehicle</p>	<p>Yavatmal Municipal Council transporting MSW without covering the vehicle</p>

The MSW Rules further prohibits manual handling of waste and if unavoidable due to constraints, manual handling should be resorted to under proper precaution with due care for safety of workers. The MCs being the principal employer have to ensure that the workers engaged by the contractors (through open tendering) for cleaning/collecting/transporting/disposal of MSW were being provided with safety tools/gadgets such as, uniforms, gloves, masks, gum boots, spades, separating flaps *etc.* Audit however, observed that no procedure was laid down by the MCs for ensuring compliance to the Rules either by obtaining necessary documentary evidence from the contractors or through periodical inspections of sites. During joint inspection in two MCs (Pandharpur and Osmanabad), audit observed that segregation of MSW at landfill site was being done without safety tools/gadgets.

	
<p>Segregation of waste at bio-gas plant in Pandharpur MC being done without any safety tools/gadgets</p>	

²³ Akkalkot, Manmad, Jalna and Yavatmal

(c) Processing of MSW

As per MSW Rules, municipal authorities shall adopt suitable technology or combination of such technologies to make use of wastes so as to minimize burden on landfills. In consonance with MSW Rules, biodegradable wastes were to be processed by composting, vermicomposting, anaerobic digestion or any other appropriate biological processing for stabilization of wastes.

For processing of MSW, MCs have established bio-gas plants and vermi/mechanical composting²⁴ plants. Audit findings on establishment/operation of bio-gas and vermi/mechanical composting plants are discussed below.

(i) Non-functioning of bio-gas plants

Bio-gas plants were established in five²⁵ of the 36 selected MCs at a total cost of ₹ 2.26 crore between May 2006 and August 2013. These plants were established for processing of MSW and generation of cooking gas/electricity. The status of the bio-gas plants is indicated in **Table 5**.

Table 5: Status of bio-gas plant established in selected MCs

Sl. No.	Name of MC	Installed capacity (in MT/day)	Purpose	Year of construction	Expenditure on construction (₹ in lakh)	Status of functioning of bio-gas plants
1.	Panvel	5	Cooking gas and electricity generation	May 2006	18.85	Not functioning since May 2014 due to pending repairs to the plant. Prior to May 2014, the processing of waste was done only to the extent of 0.5 MT to one MT per day, due to lack of demand for cooking gas. The gas generated was released in air or burnt.
2.	Kulgaon-Badlapur	5	Cooking gas and electricity generation	August 2013	49.80	Plant not commissioned as of October 2014 due to lack of demand for gas and non-procurement of generator for generation of electricity.
3.	Uran	5	Cooking gas and electricity generation	February 2011	71.53	Plant was processing only three MT per day of waste due to lack of demand for cooking gas. The gas generated was released in air. Generator was not procured for electricity generation.
4.	Pandarpur	6	Electricity generation	August 2008	58.60	Not functioning since December 2013 due to pending repair and maintenance of plant and generator.
5.	Washim	5	Electricity generation	September 2009	26.80	Due to negligence of the contractor, the construction of plant could not be completed and commissioned as of October 2014. As such, the contract was terminated in February 2013.
Total					225.58	
Source: Information furnished by MCs						

²⁴ Vermicomposting involves use of earthworms and bio-organisms to turn organic waste to compost while in mechanical composting, organic waste is converted to compost by natural phenomenon

²⁵ Panvel, Uran, Kulgaon-Badlapur, Pandharpur and Washim

As can be seen from **Table 5**, five bio-gas plants constructed/partially constructed at a cost of ₹ 2.26 crore could not be put to optimal use due to repair and maintenance problem, lack of demand for the end product (cooking gas) etc. The MCs did not assess the reasons for poor demand for cooking gas for taking suitable remedial action. Besides, the basic objective of processing of waste by reducing burden on landfills also remained unachieved.

(ii) Under-utilisation of vermi/mechanical composting plants

In six of the 36 selected MCs, vermi/mechanical composting plants were established for production of compost as shown in **Table 6**.

Table 6: Status of vermi/mechanical composting plants

Sl. No.	Name of MC	Installed capacity of plant to process waste (in MT/day)	Year of construction	Expenditure on construction and O&M till October 2014 (₹ in lakh)	Capacity ²⁶ to produce compost from year of commissioning of the plant till October 2014 (in MT)	Actual production till October 2014 (in MT)	Status of functioning of Vermi/mechanical composting plants
1.	Sawantwadi	6	2003	13.33	396	15.18	Plant was not running to full capacity due to lack of demand for compost.
2.	Chalisgaon	30	2004	72.70	1800	470.67	Plant was not running to full capacity due to lack of demand for compost.
3.	Phaltan	10	2003	30.00	660	63.10	Plant was not running to full capacity due to inadequate bio-degradable waste. Plant stopped functioning since 2009 due to disconnection of electricity by MSEB for running the segregation plant and sprinklers.
4.	Pandharpur (mechanical composting)	40	2011	Not available with MC	480	Not available with MC	Plant commissioned in 2012 but not running to full capacity. Plant stopped functioning since January 2014 due to disconnection of electricity by MSEB for running the segregation plant and sprinklers.
5.	Nandurbar (mechanical composting)	15	Work order was placed in January 2008	123.52	540	Nil	The plant was not commissioned till October 2014.
6.	Yavatmal	40	2008	163.79	1050	165	Plant commissioned in January 2009 but, not running to full capacity.
Total				403.34	4926	713.95	

Source: Information furnished by MCs

²⁶ It takes 45-60 days to turn organic waste into compost hence, only six cycles in a year is considered by MCs for production of compost. The expected production has been arrived at by audit considering six cycles per year, capacity of the plant and period of operation. For instance, for capacity of 6 MT/day for 6 cycles in a year for 11 years, Sawantwadi MC (refer Sl. No. 1 of Table 6) was expected to produce 396 MT of compost till October 2014 (6 MT/day x 6 cycles x 11 years = 396 MT)

It is evident from **Table 6** that despite an investment of ₹ 4.03 crore by six MCs on construction of vermi/mechanical composting plants, only 714 MT of compost was produced against the expected production of 4,926 MT of compost till October 2014. Due to under-utilisation of plants, bio-degradable waste was being dumped in the landfill sites without any treatment.



A vermicompost plant having capacity to process 40 MT of MSW was commissioned in January 2009 at a cost of ₹ 163.79 lakh by Yavatmal MC (refer **Sl. No.6** of **Table 6**). The MC awarded the work of operation and maintenance of the vermicompost plant to Urjit Passco (first contractor) for 36 months at a monthly charge of ₹ 1.20 lakh (April 2009 to December 2009), ₹ 1.35 lakh (January 2010 to March 2011) and ₹ 1.48 lakh (April 2011 to March 2012). The monthly charges covered expenses towards segregation of 20 to 25 MT of MSW daily for compost generation, payment of electricity and water charges for running the plant, labour charges *etc.* The revenue generated from sale of compost was to be retained by the contractor. For the period from September 2012 to March 2015 (31 months), the work of operation and maintenance of vermicompost plant was awarded to Kanak Enterprises (second contractor) for a fixed monthly payment of ₹ 1.85 lakh. The contract envisaged segregation of 40 MT of MSW daily for compost generation. During the intervening period from April 2012 to August 2012 (five months), the compost plant was not used due to delay in finalisation of contract with the second contractor.

Audit observed that during the period April 2009 to August 2014, the contractors segregated only five MT of MSW against the daily requirement of 25 MT (up to March 2012) and 40 MT (up to August 2014). However, the contract did not contain any provision regarding the quantum of deduction to be made in the event of failure of the contractor to segregate the entire quantity of MSW as per contract. Considering, the quantum of MSW segregated and used for composting *vis-a-vis* the quantity of MSW to be segregated as per contract, the MC made an excess payment of ₹ 70.08 lakh to the contractors.

The Secretary, UDD stated during the exit conference that action would be taken to recover the excess payment made to the contractors.

(d) Non-disposal of MSW in an environment friendly manner

Audit observed that all the 35 MCs were dumping unprocessed MSW either in the available landfill sites or unauthorisedly directly in the pits, on the road sides or near water bodies.

	
<p>Alandi MC: Dumping ground at the bank of river Indrayani</p>	<p>Ratnagiri MC: Dumping ground near water storage tank</p>

Further, of these 35 MCs, only eight²⁷ MCs had valid authorisation for setting up waste processing and disposal facilities in the designated landfill areas. The authorisation initially granted by MPCB to 15²⁸ MCs had lapsed between December 2003 and September 2014, due to non-submission of application for renewals by the MCs. In remaining 12 MCs²⁹, no records were available regarding authorisation granted by MPCB.

(e) Unauthorised operation of slaughter houses

As per the provisions contained in Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981, consent from State Pollution Control Board was required for operating slaughter houses and it was also obligatory to provide Effluent Treatment Plants (ETPs) by the operators of the slaughter houses to treat the effluents generated by slaughtering activities.

In 16³⁰ of the 36 selected MCs, which were operating slaughter houses, only seven³¹ MCs had obtained consent from MPCB. The consent initially granted by MPCB to four of the seven MCs had lapsed between March 2010 and October 2014. Of these four MCs, three³² MCs did not submit applications for renewal of consent while one MC (Ballarpur) though submitted an application for renewal in May 2013, the renewal was not granted by MPCB as of October 2014. The reasons for non-renewal of consent by MPCB to Ballarpur MC were not furnished to audit. Thus, 13³³ MCs were operating slaughter houses unauthorisedly without consent from MPCB as a result, effluents discharged from the slaughter houses were released into open drains which were ultimately flowing into water bodies causing water pollution.

4.1.7.2 Management of bio-medical waste

The Bio-Medical Waste (Management and Handling) Rules, 1998 (BMW Rules) was notified by GoI in July 1998 and applicable to all persons who generate, collect, receive, store, transport, treat, dispose or handle bio-medical waste in any form. As per BMW Rules, each health unit such as hospital, clinic, laboratory, blood bank in the jurisdiction of MC must dispose of BMW (blood, soiled cottons, syringes, catheters *etc.*) scientifically on their own or through an agency. The BMW is hazardous in nature and requires to be destroyed according to specific treatment assigned for different items by the MPCB which otherwise may create/transfer diseases to other living beings. The MPCB on application authorises the State Government or private agencies to treat the BMW. Audit observed the following:

- It is the responsibility of the MCs to ensure that all the health units functioning in their jurisdiction were treating BMW scientifically. For

²⁷ Akkalkot, Hingoli, Ichalkaranji, Katol, Pandharpur, Sawantwadi, Sillod and Yavatmal

²⁸ Akot, Bhandara, Dondaicha-Warvade, Hinganghat, Khamgaon, Manmad, Mehekar, Nandurbar, Narkhed, Osmanabad, Sinner, Tuljapur, Udgir, Uran, and Washim

²⁹ Alandi, Ballarpur, Bhusawal, Chalisgaon, Gondia, Jalna, Kulgaon-Badlapur, Lonavala, Phaltan, Shirdi, Umardhed and Ratnagiri

³⁰ Akot, Ballarpur, Bhandara, Dondaicha-Warvade, Hinganghat, Hingoli, Ichalkaranji, Katol, Mehekar, Nandurbar, Narkhed, Phaltan, Shirdi, Tuljapur, Umardhed and Washim.

³¹ Hingoli, Katol, Ballarpur, Narkhed, Akot, Ichalkaranji and Phaltan

³² Katol, Narkhed and Akot

³³ Akot, Ballarpur, Bhandara, Dondaicha-Warvade, Hinganghat, Katol, Mehekar, Nandurbar, Narkhed, Shirdi, Tuljapur, Umardhed and Washim

this purpose, each MC was required to maintain database of all the health units functioning in its jurisdiction. Eight³⁴ of the 36 selected MCs did not have the list/details of health units functioning and generating BMW within their jurisdiction.

- In 17³⁵ of the remaining 28 MCs, 1,161 health units were functioning but, only 712 health units (61 *per cent*) were treating the BMW. 39 *per cent* of the health units were not treating BMW thus, exposing the human beings and animals to health hazards. In the remaining 11 MCs, all the health units were treating BMW as per Rules.

The Secretary, UDD while accepting the facts stated during exit conference that specific guidelines for implementation of norms envisaged in the BMW Rules would be issued.

4.1.7.3 Non-achievement of SLBs

The SLBs prescribed by GoI in July 2008 against eight performance indicators in MSW and the achievements there against by 36 selected MCs is shown in **Table 7**.

Table 7: Achievements against SLBs of GoI during 2013-14

Service Level Benchmark indicators	National benchmarks (<i>per cent</i>)	No. of MCs which achieved the SLBs	SLB achievement by remaining MCs (range of achievement in percentage)
Household level coverage of MSW	100	1	35 MCs (1- 98)
Efficiency of collection	100	6	30 MCs (67 -99)
Extent of segregation of MSW	100	0	36 MCs (0 -25)
Extent of scientific disposal of MSW	100	0	36 MCs (0)
Extent of cost recovery in SWM services	100	0	36 MCs (0-45)
Extent of MSW recovered	80	1	35 MCs (0-70)
Efficiency in redressal of consumer complaints	80	29	7 MCs (46-77)
Efficiency in collection of SWM charges	90	1	35 MCs (0-81)

Source : Data published by GoM

It could thus, be seen that none of the 36 MCs were able to achieve the national benchmarks with regard to collection, segregation, scientific disposal of MSW, cost recovery of services *etc.*

4.1.8 Sewage Management

As per MMC Act, construction of drains, sewers, tunnels, culverts, Sewage Treatment Plants (STP) *etc.* across or under any street or any place for the purpose of disposal of effluents generated and their discharge into sea/river

³⁴ Kulgaon-Badlapur, Panvel, Sinner, Yavatmal, Jalna, Akot, Nandurbar and Lonavala

³⁵ Alandi, Chalisgaon, Hinganghat, Katol, Khamgaon, Manmad, Mehekar, Narkhed, Osmanabad, Pandharpur, Ratnagiri, Sawantwadi, Shirdi, Tuljapur, Umardhed, Uran and Washim

after their treatment, are the mandatory duties of MCs. National benchmarks prescribed 100 *per cent* coverage of toilets, sewage network services, adequacy of sewage treatment capacity *etc.*

The sewage management in 36 selected MCs was examined in audit to ascertain whether:

- proper infrastructure existed for collection and disposal of waste water;
- schemes for improving the waste water collection and its disposal was executed economically, efficiently and effectively; and
- SLBs for sewage management prescribed by GoI were achieved.

4.1.8.1 Adequacy of sewage collection and disposal infrastructure in MCs

A sound sewage management requires direct access to toilets to improve the sanitation facilities, direct connection with sewage network, conveying of sewage to STP of adequate capacity for treatment before its final discharge. In the 36 selected MCs, 247.15 MLD of sewage was generated during 2013-14. The status of sewage collection and disposal infrastructure in 36 selected MCs during 2013-14 is given in **Table 8**.

Table 8: Status of sewage collection and disposal infrastructure in the selected MCs during 2013-14

Indicators	Availability in percentage as against national benchmark of 100 <i>per cent</i>	Range of achievement by MCs			
		Zero <i>per cent</i>	01-50 <i>per cent</i>	51-80 <i>per cent</i>	81-100 <i>per cent</i>
Coverage of toilets	47-98	No such cases	2	15	19
Coverage of sewage network services	0-56	32	3	1	0
Collection efficiency of sewage network	0-96	32	3	0	1
Adequacy of sewage treatment capacity	0-160	32	1	1	2

Source: Data published by GoM

Table 8 above revealed the following:

- None of the MCs had 100 *per cent* access to individual or community toilets. The coverage of properties having access to individual or community toilets ranged between 47 *per cent* (Washim) and 98 *per cent* (Ratnagiri).
- In four³⁶ of 36 MCs, the properties had direct connection to underground sewage or waste water collection networks. In two other MCs (Alandi and Bhusawal), the underground sewage network was very old and non-functional as of October 2014 and the sewage generated was flowing to the nearby water bodies. In the remaining 30 MCs, waste water was connected either to open drains or storm water

³⁶ Ichalkaranji, Lonawala, Shirdi and Pandharpur

drains leading to the nearby rivers. The sewage collected from soak pits were disposed of in dumping grounds without any treatment.

- The collection efficiency of sewage network (quantum of waste water collected at the inlet of STP to percentage of total waste water generated) ranged between 23 and 96 *per cent* in four MCs³⁷ and was 'nil' in respect of remaining 32 MCs. Thus, the effectiveness of the system (either underground system or open drains) to collect and convey the waste water for treatment was poor in majority of the MCs.
- Only two MCs (Shirdi and Pandharpur) were able to treat the entire waste water generated before its final discharge. In the remaining 34 MCs, 208.51 MLD was being discharged without treatment either due to inadequate capacity of STPs or non- functioning of STPs.

4.1.8.2 Implementation of capital projects for underground sewage system

For upgradation of underground sewage system, the SLSC/GoM sanctioned 10 projects (seven under UIDSSMT and three under MSJNA) between March 2008 and February 2014 at a total cost of ₹ 612.17 crore. The status of implementation of these projects as on October 2014 is given in **Table 9**.

Table 9: Status of implementation of capital projects for underground sewage system

Sl. No.	Name of the MC	Sanctioned cost (₹ in crore)	Tendered cost (₹ in crore)	Date of sanction	Date of award of contract	Expenditure till October 2014 (₹ in crore)	Status of work
UIDSSMT							
1.	Gondia	125.72	Not tendered	18.06.2013	-	-	Work not commenced
2.	Shirdi	24.26	37.95	28.09.2006	13.08.2009	37.04	Commissioned
3.	Pandharpur	31.75	57.00	04.05.2007	27.10.2009	31.75	Commissioned
4.	Kulgaon-Badlapur	151.46	226.43	29.12.2008	15.02.2010	162.15	Incomplete
5.	Hingoli	61.61	Not tendered	20.07.2013	-	-	Work not commenced due to non-release of funds
6.	Panvel	31.07	49.41	01.03.2008	August 2009 for STP and February 2010 for sewer line	31.72	Incomplete
7.	Ichalkaranji	82.60	97.45	04.02.2014	28.08.2014	20.50	Incomplete

³⁷ Ichalkaranji (43 *per cent*), Lonavala (23 *per cent*), Pandharpur (26 *per cent*) and Shirdi (96 *per cent*)

MSJNA							
8.	Nandurbar	47.37	49.89	20.02.2010	17.07.2010	19.21	Incomplete
9.	Lonavala	21.52	26.01	31.03.2010	31.10.2011	1.50	Incomplete
10.	Washim	34.81	31.88	25.11.2010	31.12.2012	6.54	Incomplete
Total		612.17					
Source: Information collected by audit from MCs							

As may be seen from **Table 9**, only two projects in Shirdi and Pandharpur MCs were commissioned. Six projects³⁸ registered time lapse of 13 to 34 months from date of sanction to final award, due to unresolved issues regarding execution of work by Maharashtra Jeevan Pradhikaran (MJP) or the MC, delay/non-release of funds by GoI/GoM, abandonment of work by the contractors *etc.* Seven projects³⁹ registered an increase of ₹ 151.11 crore in the tendered cost over the initial sanctioned cost. Five projects⁴⁰ registered a time overrun of six to 36 months over their due dates of completion, due to revision of plans, work abandoned by the contractor, laxity on the part of contractor to complete the work *etc.*

Audit findings on three of the 10 projects indicated in **Table 9** are discussed below.

- In Gondia MC, the work of underground sewage system was initially sanctioned under UIDSSMT in March 2012 at a cost of ₹ 82.33 crore (refer **Sl. No. 1** of **Table 9**). However, due to inadequate preparation of estimates in respect of two items of work (connection of houses/properties with new sewer lines and reinstating the road surface), a revised sanction had to be issued in June 2013 at an enhanced cost of ₹ 125.71 crore. Even after issue of revised sanction in June 2013, the work could not commence until October 2014 because a decision to execute the work either through MJP or by the MC was taken as late as March 2014.

The Secretary, UDD stated during exit conference that guidelines would be issued for timely commencement of works and in cases where substantial period had elapsed, grants would be withdrawn.

- The GoI approved (March 2008) construction of STP (14 MLD capacity) and 42.46 km underground sewer line to Panvel MC at a cost of ₹ 31.07 crore under UIDSSMT (refer **Sl. No. 6** of **Table 9**). Technical sanction was accorded by the Chief Engineer, MJP, Pune in February 2008 at a cost of ₹ 37.02 crore. Work order for construction of the STP was issued to a contractor in August 2009 at a cost of ₹ 15.44 crore. The construction of STP was completed in 2013 at a cost of ₹ 15.06 crore. The work of laying of 42.46 km sewer line was awarded in February 2010 to another contractor at a cost of ₹ 28.97 crore to be completed by February 2012. Audit observed that as of October 2014, only 16.04 km of sewer line (38 *per cent*) could be laid

³⁸ Shirdi, Pandharpur, Kulgaon-Badlapur, Panvel, Lonavala and Washim

³⁹ Shirdi, Pandharpur, Kulgaon-Badlapur, Panvel, Ichalkaranji, Nandurbar and Lonavala

⁴⁰ Lonavala, Panvel, Kulgaon-Badlapur, Nandurbar and Pandharpur

after incurring an expenditure of ₹ 14.72 crore. As a result, individual properties could not be connected with the sewer lines and consequently, trial run of the STP already constructed in 2013 at a cost of ₹ 15.06 crore could not be conducted as of October 2014.

- The GoM sanctioned (March 2010) a project for augmentation of underground sewage system to Lonavala MC under MSJNA at a cost of ₹ 21.52 crore (refer **Sl. No. 9** of **Table 9**). The MC awarded (October 2011) the work to a contractor at a cost of ₹ 26.01 crore with scheduled date of completion of April 2014. The contractor, as per the contract condition, submitted (October 2011) security deposit of ₹ 65.02 lakh in the form of Deposit Call Receipts (CDRs) issued by The Nanded Merchant's Co-operative Bank Limited, Nanded.

On request (May 2012) of the contractor, the MC paid (June 2012) interest bearing mobilisation advance (MA) of ₹ 1.50 crore to the contractor though there was no such provision in the contract. The MC also did not obtain matching bank guarantee from the contractor.

In February 2013, Pen MC informed Lonavala MC that the contractor in question had submitted fake CDRs relating to a work executed by him earlier under their jurisdiction. At this, Lonavala MC ascertained the authenticity of the CDRs submitted by the contractor and found them to be fake. When this fraud was pointed out to the contractor, the contractor submitted fresh Demand Drafts (DDs) in March 2013 amounting to ₹ 65 lakh as security deposit. The MC encashed the DDs and adjusted the same against interest of ₹ 38.95 lakh due on MA and the balance amount of ₹ 26.05 lakh against the principal amount of MA. A police complaint was filed (November 2013) against the contractor and the contract was rescinded in December 2013. Since the whereabouts of the contractor was not known, MC was not able to recover the balance principal amount of MA (₹ 1.24 crore)⁴¹ as of October 2014. The MC prepared (January 2014) fresh estimates for the work at a cost of ₹ 25.10 crore, which was pending for technical sanction as of October 2014.

Thus, while the augmentation work of underground sewage system to be completed in April 2014 did not even commence as of October 2014, the MC was saddled with a loss of ₹ 1.24 crore due to sheer negligence. Further, the action of the MC to rescind the contract without recovering its dues from the contractor was also not in order.

The Secretary, UDD while accepting the facts stated that the instructions of Finance Department, GoM would be followed before making payment of MA to the contractors.

4.1.8.3 Tardy implementation of underground sewage system works

As per Government Resolution of February 2010, water supply augmentation works aimed at supplying 135 lpcd in municipal areas should be concomitant with full-fledged underground sewage network system. Audit observed that though 64 to 100 *per cent* water supply augmentation works for 135 lpcd were

⁴¹ ₹ 150 lakh minus ₹ 26.05 lakh = ₹ 123.95 lakh

completed in five of 36 selected MCs, the underground sewage system in these MCs either did not commence or partially completed to the extent of only three to 39 *per cent* as of October 2014. The details are shown in **Table 10**.

Table 10: Status of implementation of underground sewage system works *vis-à-vis* water supply augmentation works

Name of MCs	Date of sanction of water supply augmentation works	Physical progress as on October 2014 (in percentage)	Date of sanction of underground sewage system	Physical progress as on October 2014 (in percentage)
Gondia	July 2008	73	June 2013	Not yet started
Washim	December 2006	71	November 2010	39
Hingoli	September 2007	64	July 2013	Not yet started
Nandurbar	March 2008	100	February 2010	39
Ichalkaranji	September 2007	100	February 2014	3

Source: Information collected from MCs

Evidently, this mismatch between water supply augmentation works and underground sewage network system would create civic hazard and pollution in the municipal areas as soon as the level of 135 lpcd is achieved by all the five MCs.

4.1.8.4 Non-achievement of SLBs

The SLB achievement by 36 selected MCs against nine indicators prescribed by MoUD, GoI or those set by the MCs themselves for sewage management is shown in **Table 11**.

Table 11: Achievement against SLBs during 2013-14

Sl. No.	SLB indicators	National benchmarks (per cent)	No. of MCs which achieved the national benchmarks (range in per cent)	No. of MCs which fixed its own targets (range in per cent)	No. of MCs which achieved the targets
1.	Coverage of toilets	100	None	36 MCs (35-100)	11 MCs
2.	Coverage of sewage network services	100	None	7 MCs (30-75)	None
3.	Collection efficiency of the sewage network	100	None	6 MCs (30-70)	None
4.	Adequacy of sewage treatment capacity	100	2 MCs (100-160)	5 MCs (40-90)	1 MC
5.	Quality of sewage treatment	100	4 MCs (100)	5 MCs (35-100)	3 MCs
6.	Extent of reuse and recycling of sewage	20	1 MC (87)	6 MCs (8-90)	None
7.	Efficiency in redressal of consumer complaints	80	25 MCs	36 MCs (45-100)	21 MCs
8.	Extent of cost recovery in sewage management	100	1 MC	22 MCs (1-100)	3 MCs
9.	Efficiency in collection of sewage charges	90	1 MC (100)	22 MCs (15-100)	2 MCs

It could be seen from **Table 11** that except for efficiency in redressal of consumer complaints (refer indicator at **Sl. No. 7** above), the achievement of SLBs by the MCs against rest of the eight indicators was poor.

4.1.9 Monitoring of service delivery

An effective internal control system provides a reasonable assurance on overall management process and shows the extent of monitoring of operations carried out by an organisation. The DMA under the control of the UDD, GoM exercises administrative control and monitors the activities of the MCs. The deficiencies noticed in monitoring of service delivery by the DMA were as under:

- The entire activities of the MCs are monitored by the DMA centrally from Mumbai. Due to insufficient number of administrative and technical staff/resources, approvals to project proposals and DPRs were delayed in the office of DMA.
- No reports and returns have been prescribed by the DMA for the MCs for effective monitoring and implementation of State projects (MSNA and MSJNA) with reference to the original sanctioned costs and timelines.
- The reasons for not fixing the SLB targets by the MCs against various indicators for water supply, solid waste and sewage and the under-achievements there against have never been assessed or evaluated by the DMA for suitable remedial action.
- In terms of Municipal Solid Wastes (Management and Handling) Rules, 2000 MCs are required to submit detailed information with regard to disposal of solid waste, hospital waste and slaughter houses in Form-II to the MPCB. There were however, delays in submission of information to MPCB by majority of MCs but, the DMA failed to monitor this statutory requirement.

4.1.10 Conclusion and recommendations

Water Supply Services

The average water supply in 17 of 36 selected MCs was between 25 and 69 lpcd against 70 lpcd mandated by the MMC Act. The shortfall in water supply was due to losses from the distribution system, reduced efficiency of WTPs/pumping machineries and irregular electric supply.

In order to achieve the target of 70 lpcd in 17 affected MCs, the ongoing water supply augmentation works in 12 MCs needs to be completed in a time bound manner and the remaining five MCs, which did not submit any DPR for augmentation works to the DMA, should initiate immediate action in this regard.

Twenty one water supply augmentation projects taken up by 20 MCs at a cost of ₹ 708 crore under Central scheme (UIDSSMT) and State schemes (MSNA and MSJNA) suffered from significant time and cost overruns and as of October 2014, only seven of 21 projects have been completed.

In order to avoid time and cost overruns, the Government may ensure that the project proposals are scrutinised, sanctioned and awarded timely. The Government should also release its share of funds for the Central and State schemes timely to avoid further slippages in the projects.

The reforms in water supply services taken up by 24 MCs at a cost of ₹ 33.57 crore were lagging behind. None of the 36 selected MCs were able to achieve the service level benchmarks against nine indicators either prescribed by MoUD, GoI or set by the MCs themselves. Majority of the 36 MCs were far away from achieving the target of 100 *per cent* recovery in water supply services and in fact, sustained and operational loss of ₹ 130.45 crore during 2011-14.

In order to optimize water management, reforms in water supply services should be completed and adopted by the MCs. The collection efficiency of water dues should be improved by vigorous follow-up and penal action as per Rules. The Government/MCs should make concerted efforts to achieve the SLBs to identify performance gaps and introduce improvements.

Solid Waste Management

Except one MC, none of the 35 MCs were segregating MSW either at source or at the landfill sites and unprocessed solid waste was being dumped in the landfill sites in a non-environment friendly manner or directly in the pits/near water bodies/road sides.

The Government may ensure that the MCs dispose of MSW in an environment friendly manner in consonance with MSW Rules, 2000.

Bio-gas plants and vermi/mechanical composting plants constructed/partially constructed at a total cost of ₹ 6.29 crore by 11 of 36 MCs could not be put to optimal use due to repair and maintenance problems, lack of demand for the end product (cooking gas) *etc.*

The bio-gas/mechanical composting plants should be established only after confirming end users or buyers to ensure their gainful use. Repair and maintenance problems should be addressed on priority to make the plants functional at the earliest.

A number of MCs did not have valid authorisation from MPCB for setting up waste processing and disposal facilities in landfill areas or for operating slaughter houses. Thirty nine *per cent* of the health units operating within the jurisdiction of 17 MCs were not treating bio-medical waste. None of the 36 MCs were able to achieve the national benchmarks with regard to collection, segregation, scientific disposal of MSW, cost recovery of services *etc.*

The Government should enforce the MSW Rules, 2000 to ensure that all the MCs have valid authorisation from MPCB for setting up waste processing and disposal facilities or for operating slaughter houses. The MCs should maintain database of all the health units generating bio-medical waste under their jurisdiction and also conduct periodical inspection of such units to ensure scientific disposal of waste by the health units.

Sewage Management

The sewage collection and disposal system in 32 of 36 selected MCs were inadequate. The waste water was connected either to open drains or storm water drains leading to the nearby rivers. The sewage collected from soak pits were discharged at dumping grounds without any treatment. In 34 MCs, 208.51 MLD was being discharged without treatment either due to inadequate

capacity of STPs or non-functioning of STPs. Only two of 10 capital projects sanctioned between March 2008 and February 2014 at a total cost of ₹ 612.17 crore for upgradation of underground sewage system in 10 MCs were commissioned. Six projects registered time lapse of 13 to 34 months from date of sanction to final award, seven projects registered an increase of ₹ 151.11 crore in the tendered cost over the initial sanctioned cost and five projects registered a time overrun of six to 36 months over their due dates of completion. The achievement of service level benchmarks by the MCs against eight of the nine indicators in sewage management was poor.

The Government should ensure that underground sewage network in the affected MCs are upgraded timely for effective collection and disposal of sewage/waste water. The existing capacity of the STPs should be upgraded, wherever necessary, and all non-functional STPs should be made operational.