Performance Improvement Plan for Beed

Prepared by:
CEPT University and AIILSG in consultation with Beed Municipal Council
November, 2011

pas performance assessment system

Performance Improvement Plan for Beed

Prepared by:

Centre for Environmental Planning and Technology (CEPT) University

and

All India Institute of Local Self Government (AIILSG)

in consultation with

Beed Municipal Council (BMC), Beed

2012

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Abbreviations

AIILSG	*All India Institute of Local Self Government*
BMC	*Beed Municipal Council*
CEPT	*Centre for Environmental Planning and Technology*
CPHEEO	*Central Public Health and Environmental Engineering Organisation*
ESR	*Elevated Service Reservoir*
GIS	*Geographic Information Systems*
GoI	*Government of India*
GW	*Ground water*
HH	*Households*
Hrs	*Hours*
LAI	*Local Action Indicator*
Lpcd	*Litres per capita per day*
MC	*Municipal Corporation*
MCl	*Municipal Council*
MLD	*Million Litres per Day*
MoUD	*Ministry of Urban Development*
MSW	*Municipal Solid Waste*
Na	*Not applicable*
Nd	*No data*
NP	*Nagar Panchayat*
NRW	*Non-Revenue Water*
O&M	*Operation and Maintenance*
SLF	*Scientific Land Fill*
STP	*Sewage Treatment Plant*
SWM	*Solid Waste Management*
TPD	*Tonnes Per Day*
ULB	*Urban Local Body*
WDS	*Water Distribution Station*
WS	*Water Supply*
WTP	*Water Treatment Plant*
WW	*Waste Water*

Executive Summary

The preparation of this Performance Improvement Plan (PIP) for water supply and sanitation has been led by the Beed Municipal Council (BMC) with support from the PAS Project through teams from All India Institute of Local Self Government (AIILSG), Mumbai and the CEPT University, Ahmedabad.

The preparation of PIP has been done in response to a request from the Government of Maharashtra. The two focus areas of 'making cities Open Defecation Free' and 'moving towards 24x7 water supply' were suggested by the Chief Secretary, Government of Maharashtra in an inception meeting, for starting the Government of India's Service Level Benchmarking (SLB) process in Maharashtra. In addition to that, the inherent theme for PIPs is improving coverage and service levels for un-served poor (slum dwellers) and improving financial sustainability. This PIP exercise uses the set of indicators given by the Govt. of India's Service Level Benchmark Initiative as a baseline to assess past performance and identify priorities.

City Profile: **Beed** is part of Aurangabad division and is one of the six districts of Marathwada region. It is also administrative headquarter of Beed District. Beed Municipal Council (BMC) is the administrative body of Beed city. Beed is categorized as Class-A municipality with population of approx. 1.46 lakh. The area of Beed city is 8.29 sqkm. In addition to the census population, it has been estimated by the ULB that there is a floating population to the extent of 15,000.

There are 20 slum settlements in the city and all the settlements are notified by the state. All these slum settlements are located on private lands. The total population of slum is 87,856 which is 60% of city's population.

Water supply: The Water supply department of BMC is responsible for water production, treatment and distribution in Beed. Beed city gets 22 MLD water from two different surface sources 1) Bindusara Dam and 2) Sindhaphana Dam. Beed also extracts around 2 MLD water from 950 bore wells and 3 open wells in the city. The average water supply at consumer end is 118 lpcd. There is no proper periodic survey in Beed at the source, treatment plant and at consumer end. For leak detection, pressure, continuity and regular water supply to move towards 24x7 water supply, BMC needs to have periodic survey at these points to have proper track of the system. Quality of water supplied is 100%, but the reliability of the data is 'D'. The tests are conducted regularly at accredited centers. The records are still kept manually and not yet computerized. BMC needs to have proper sampling regimen for monitoring water quality. Proper records should also be maintained for the samples passing the test and also for the samples that were not to the mark. The estimated NRW in the system is 22%. The efficiency of redressing complaints is high but the records are maintained manually. The cost recovery in WS dept is 68% with efficiency in collection of these charges at 65% in 2010-11.

To move towards 24x7 water supply system, BMC needs to initiate some immediate actions like upgrading human resources, improving management information systems, regularizing illegal connections etc which are easier to implement. BMC will also need to undertake actions which require substantial efforts following the guidelines of MoUD for technical, commercial and institutional improvements. The draft report of water and energy audit for water supply for Beed is already completed. BMC has also proposed to undertake surveys like consumer survey, GIS mapping and hydraulic modeling. The recommendations from the audits and surveys will help to improve the technical aspects of the water supply system in Beed. The commercial/financial improvement in water supply can be achieved through higher cost recovery and collection efficiency of water related charges and also by reducing operating expenses. One of the options to increase the cost recovery is by introducing volumetric tariffs which can be done once meters are installed at consumer end. For institutional improvement in the system, BMC needs to enhance technical staff capacity required for managing 24x7 water supply.

Sanitation: As per the recent figures from census 2011, 85% of the households have access to improved and unimproved latrine/toilets facilities within their premises. Around 7% of the Households depend on shared sanitation. The coverage of properties with toilets as reported by BMC is 82% in 2010-11 this indicates the percent of population that has access to toilets (individual, community/shared or pay & use). The coverage of toilets in slums is only 27%. The city doesn't have underground sewerage network. BMC does not collect any user charges/taxes in Sewerage/Sanitation and SWM. BMC does not have any proposal in pipeline to collect any Sewerage or sanitation tax/charges in near future. Underground sewerage scheme was proposed under UIDSSMT in 2008 but was not sanctioned due to some technical reasons. The council has put this proposal under Nagarothan and is waiting for its approval.

Open Defecation: There are 35 pay & use toilet seats in Beed. There are also community toilet blocks with 530 toilet seats of which only 270 are functional. Considering the norm of 40 persons per toilet seat, the existing 'functional' toilet facilities are not sufficient for BMC. Though the Census 2011 shows that only 8.6% population is resorting to open defecation, but a detailed calculation after working out dependency on "functional" community seats, the estimated population resorting to open defecation comes to 19% (27763 persons).

The council has started construction of 3100 individual toilet seats under Integrated Low Cost Sanitation (ILCS). An additional 1192 individual toilet seats are also sanctioned under Maharshtra Sujal Nirmal Abhiyan (MSNA). The Council has also floated tenders of 6 pay and use toilets with 60 seats on BOT basis. Hence, 4292 individual toilets have been proposed which will increase the coverage of toilets to 96%. This will bring down open defecation to 4 % (5745 persons).

Services to slums: The coverage of water supply through individual water connections in slums is 33% with 5857 individual WS connections in 2010-11. Around 152 stand posts were converted into group connections in the slums in 2010-11. The coverage of individual toilets in slums is around 26.5% in 2010-11. Once the individual toilets sanctioned under MSNA and ILCS are constructed, the coverage of individual toilets will also increase. The door to door collection of solid waste in slums is 97%.

Municipal Finance of BMC**:** The municipal finances have been re-casted and reviewed for the last seven years, from 2005-06 to 2011-12. The total budgeted revenue income for BMC in 2011-12 was Rs. 27.58 Crores. Past trends shows that own revenue sources of income have formed an average of 41% share in revenue income. The only source of tax revenue for BMC is property tax. The external sources of income contribute the highest share of the total revenue income at 58%. The revenue expenditure has grown at ~10% CAGR in this period. The revenue expenditure on water supply, waste water and SWM is 40% followed by public health and welfare forms 23%. The revenue account is in deficit for 6 out of 7 years of budget analysis.

There are about 12 existing misc. loans on the books of the BMC. The interest paid on outstanding loans and principal repayment for various loans has been added into various heads. The total principal loan amount is Rs.867 lakhs. These loans were used for various purposes before the period under considered.

The capital income has increased from Rs. 3.05 Cr during 2005-06 to Rs. 33.08 Cr in the year 2009-10. However this increase is primarily due to the UIDSSMT Grant that was made available to BMC for the purpose of the water supply project which started from 2007-08. The impact of UIDSSMT project was also observed in capital expenditure as this has increased substantially from Rs2.14 Cr in 2005-06 to Rs. 29.59 Cr in the year 2009-10. It has been budgeted at Rs. 16.6 Cr for the year 2011-12. From the assessment based on aBusiness-as-usual scenario, it was observed that BMC does not have any investible surplus for the next 10 years.

Summary of Performance Improvement Plan for BMC: The proposals suggested are focused on two key areas of establishing '24X7 water supply system' and 'moving towards an open defecation free' BMC, as well as improvements in key processes and operations related to the above areas. Based on the analysis of the water and sanitation sectors in Beed, the Performance Improvement Plan for BMC has been summarized below.

Table 1 Summary of Performance Improvement Plan for BMC

Key actions for improvement	Costs required	Current status
Water supply: towards 24X7 system		
Planning and implementation of 24X7 for entire city	Rs. 19.66 Crores (Table 11)	Preparation of DPR is required for 24x7
		Water audit and energy audit is at draft stage
		Need to conduct technical surveys like Hydraulic modeling, GIS mapping, Consumer survey
Sanitation: towards OD free		
Refurbishing non-functional community toilets (including IEC costs)	Rs. 0.27 Crores (Table 13)	Ground level survey
Total cost of PIP	**Rs. 19.93Crores**	

BMC has to undertake improvement actions related to processes followed in the water supply and sanitation operations. These actions being no or low cost can be immediately taken up by the Council in Phase I (2013-2014). These include regularizing un-authorized connection, IEC campaigns; appoint technical staffs, periodic surveys at source, treatment and consumer; proper sampling regimen for monitoring water quality, levy telescopic rates for water supply, regular surveys through zonal sanitary inspectors, Preparation of Septage Management Plan, increase complaint redressal system with systematic computerized record keeping of complaints received and redressed.

The PIP improvements for BMC have been proposed in 3 phases:

- Phase I: Immediate interventions (2013-2014)
- Phase II: Midterm interventions (2015-17)
- Phase III: Long Term Interventions (from 2018-2020)

Phase I: Immediate interventions (from 2013 - 2014):

The interventions mentioned above to augment revenue as well as process improvements which do not require capital investment are proposed to begin in 2013. This includes interventions such as improving reliability of information through better formats, surveys, etc as well as initiatives such as increasing collection efficiency of charges, introducing drainage tax, etc. BMC can complete the required activities like consumer surveys, GIS mapping, Hydraulic modelling, etc which are ongoing projects to move towards 24x7 water supply by 2013-14.

BMC can undertake detailed on ground survey of existing toilets and non-functional community toilets in 2013-14. The condition in Pay & Use toilets is comparatively better than those of community toilets. Hence for the O&M of the community toilets arrangements with CBOs for O&M can be explored. BMC should also prepare Septage management plan and start its implementation in pilot zones in Phase I.

Once the revenue augmentation measures and process improvements are in place, it is proposed that BMC can begin its capital intensive projects in Phase II and Phase III.

Phase II: Midterm interventions (from 2015 - 2017):

- **Water Supply:** Once the ongoing UIDSSMT project is completed, BMC can initiate creation of pilot DMAs in 2015. BMC should also install bulk flow meters and consumer end meters to all connections by 2015-2017, so that BMC can levy telescopic rates in water supply from 2015 to achieve better cost recovery from 2015 onwards to achieve better cost recovery. BMC should also try 24x7 in pilot zone in 2016-17.
- **Sanitation:**
  - **Refurbishment of existing non functional community toilets:** Once the detailed survey is done in Phase I, BMC can refurbish its 144 (out of 260) non-functional community toilet seats in 2015-16 to cater the OD population and remaining non functional community toilet seats out of 260 in 2016-17.
    BMC can also start with implementation of Septage Management Plan at city level in this phase.
  - **Building awareness on safe sanitation practices:** Campaigns to bring awareness related to cleanliness and hygiene practices and the negative health impacts due to open defecation need to be conducted by the Council. The campaigns should begin by triggering initiation in the slum settlements and undertaking transect walk to the open defecation sites to highlight the above issues.

Phase III: Long term interventions (from 2018 - 2020)

Once the above measures of Phase II are in place, BMC can begin implementation of 24X7 for the entire city from 2018.

Table 2 PIP for BMC Phase I of (2013-2014), Phase II (2015-2017) and Phase III (2018-2020)

Proposed Improvement areas	2014	2015	2016	2017	2018	2019	2020
Water supply	**Phase I**	**Phase II**			**Phase III**		
Regularizing un-authorized connection							
Appoint technical staffs							
Periodic surveys at source, treatment and consumer end							
Proper sampling regimen for monitoring water quality							
Conduct consumer survey for entire city							
Undertake hydraulic modeling for the entire water supply network							
Installation of bulk flow meters and meters at consumer end							
Distribution network augmentation: creation of pilot DMAs							
Levy telescopic rates for water supply							
24x7 Water supply system for the city							
Sanitation (including sewerage)							

Proposed Improvement areas	2014	2015	2016	2017	2018	2019	2020
Regular surveys through zone sanitary inspectors							
Preparation of Septage Management Plan and Implementation in pilot zone							
Ground level survey & preparation of DPR for refurbishment of community toilets							
Implementation of Septage Management Plan at city level							
Refurbish existing non-functional community toilets							

From the assessment of Business-as-usual scenario, it was observed that currently BMC does not have any investible surplus to consider improvements in the performance of service delivery. As the project for water supply under UIDSSMT is under implementation, it would be important to consider the additional revenue and incremental O&M for the project after its completion to get more accurate scenario of investible surplus. It was observed that BMC will have net investible surplus from 2015-16 after incorporating impact of UIDSSMT.

BMC can also improve its investment capacity after revenue enhancement measures. Some of the steps that can be taken to increase revenue are as follows:

1) Increase in property tax collection efficiency
2) Increase in water supply tariff
3) Increase in collection efficiency for water charges

It was observed that after revenue enhancement measures and incorporating impacts of UIDSSMT project, a considerable surplus starts as early as 2015-16. BMC will be able to fund implementation of 24X7 and ODF for the entire city completely from its own sources and will not have to look at external funds for the same. Considering this BMC can target to complete it by 2020.

Table 3 Sources of revenue to fund 24X7 water supply and ODF in BMC (in Rs. Crores)

Performance Improvement Actions	2015	2016	2017	2018	2019	2020
Implementation of 24X7 system for BMC	1.73	3.58	3.58	3.58	3.58	3.58
Open Defecation Free City	0.27					
Investible surplus after increasing the revenue	2.00	3.73	5.69	7.88	10.67	14.21
External funds required	No external funding required					
Reference from Table 11and Table 13						

In order to realize the targets set for improving water supply and sanitation in CMC, the existing institutional framework must be enhanced to enable better operation and management of these services. While in certain areas, it is the lack of a defined policy restricting provision of services, in other instances it is the improper regulation of the existing policies. CMC has to focus its attention on improving policies related to services,

financial sustainability, and accountability to the consumers. Some of the additional measures BMC need to undertake includes augmentation of staff at BMC, mobilization of external support through Project Management Consultants (PMC), NGOs and CBOs, setting up of PIP taskforce and performance monitoring through regular target setting.

1. INTRODUCTION

The preparation of this Performance Improvement Plan (PIP) for water supply and sanitation has been led by the Beed Municipal Council (BMC) with support from the PAS Project through teams from All India Institute of Local Self Government (AIILSG), Mumbai and the CEPT University, Ahmedabad.

The preparation of PIP has been done in response to a request from the Government of Maharashtra. The two focus areas of **'making cities Open Defecation Free'** and **'moving towards 24x7 water supply'** were suggested by the Chief Secretary, Government of Maharashtra in an inception meeting, for starting the Government of India's Service Level Benchmarking (SLB) process in Maharashtra. In addition to that the inherent theme for PIPs is improving coverage and service levels for un-served poor (slum dwellers) and improving financial sustainability. This PIP exercise uses the set of indicators given by the Govt. of India's Service Level Benchmark initiative as a baseline to assess past performance and identify priorities. During the preparation of PIPs several dialogues, periodic consultations and meetings with Beed Chief Officer and officials from respective departments were held.

Preparation of the PIP has been done in following stages:

Initial Performance Assessment: Based on the data from the BMC, an initial assessment of all SLB indicators for the past three years was done. As a part of the preparatory work, a preliminary profile of BMC using SLB indicators was prepared. The BMC teams were assisted to generate a city profile based on comparative performance assessment of BMC for last three years based on their data in PAS benchmarking system. This involved past trends as well as comparison with other Class A Municipal Councils in Maharashtra. The existing service levels are assessed along with their respective reliabilities against service level benchmarks to be achieved.

This was discussed with the BMC officials at the first PIP consultative workshop in June, 2011 at Beed. The workshop was attended by Beed Chief Officer, respective heads of water supply department, sanitation department, and tax department. Preliminary priorities were identified at this workshop. Particular focus was also placed on the issues around making the city open defecation free and exploring the possibility of introducing 24x7 water systems. The outcome of the consultation was initiating diagnostic assessment of PIP in Beed.

Detailed Diagnostics and Issues Identification: The diagnostic assessment was prepared by taking into consideration the ground realities, local conditions, and assessment of the present situation. A detailed field guide developed for purpose of PIP preparation included data templates, survey formats; transect walks, schedules of interviews, Focus Group Discussions (FGD) guidelines, areas for digital documentation, dimensions of stakeholder consultations etc.

The emphasis was on understanding the current data record systems and measures to improve the performance data reliability.
Detailed discussions with BMC engineers and support staff were held to assess water and sanitation situation. City level reconnaissance surveys and dedicated field visits were undertaken by teams to facilities including water source as well as treatment and distribution/ collection systems for water supply, sanitation and solid waste management to validate secondary data and identify performance issues.

For detailed qualitative insights the teams visited all slums and conducted FGDs with slum dwellers. Transect walks in slum settlements and along city roads helped in mapping slum locations, open defection sites, public and community toilets, solid waste dumping sites etc. In addition to that key person interviews, FGDs and consultations were held with safai-karamcharis, contractors and private parties to identify service delivery issues from consumers' perspectives.

Action Planning and Preliminary Costing: Consultations with sector experts were also held in August 2011 for proposing actions and estimating the required capital cost/ investment based on identified improvement areas. At the end of the expert consultations the options for improving water supply, sanitation and SWM scenario were discussed with concerned BMC officials and Chief Officer. The diagnostic study, detailed assessment and preliminary strategies for improvement were shared with BMC officials during second PIP consultative workshop in September 2011 at Beed. The suggestions by BMC officials were taken and incorporated in the PIP.

On identification of city priorities, consultations were held with the Chief Officer, opinion leaders, Municipal councillors, BMC officers, and representatives of water and sanitation committees to discuss priorities for municipal water supply and sanitation.

While proposing strategies and actions for improvement the assessment of on-going projects was done. The actions for improvement were identified, prioritised and streamlined in consultation with BMC officials to achieve both priority/ focal areas - 'Open Defecation Free BMC' and '24 X 7' water supply.

In this PIP report the identified interventions are classified as procedural/policy interventions as short term in Phase I, minimal capital expenditure with midterm in phase II and substantial capital expenditure with long term in Phase III. Process and policy related actions to improve reliability of performance indicators are also identified. Block cost estimates have been developed for the actions identified.

The proposed strategies and actions for improvement and estimated capital cost required to implement actions was discussed with BMC officials during the third PIP consultative workshop in November 2011 at Beed.

Preliminary Validation of Draft Performance Improvement Plan by BMC: The proposed draft PIP was shared with BMC, and finalised by incorporating the revisions suggested. The Beed PIP has been validated by Beed CO & BMC officials.

It describes improvement actions and the costs that will have to be incurred to implement the identified actions. The proposals have been reviewed by technical teams at the AIILSG and CEPT University. This PIP report will be submitted to the state government for review and guidance. It is anticipated that the Beed Municipal Council will identify low-cost actions that can be taken immediately and provide funds for these actions from their budget. For actions that require significant capital expenditure, the BMC will prepare detailed project reports and seek assistance under state and national programmes.

Photo Plate 1 Overview of Beed & BMC

2. CITY PROFILE

This section discusses general characteristics of Beed related to location, population and area, aspects related to slum settlements, and human resources in BMC. Also, aspects related to municipal finances specifically with respect to water supply and sanitation services are discussed here.

2.1 Location and Demography

Figure 1 Location Map of Beed City

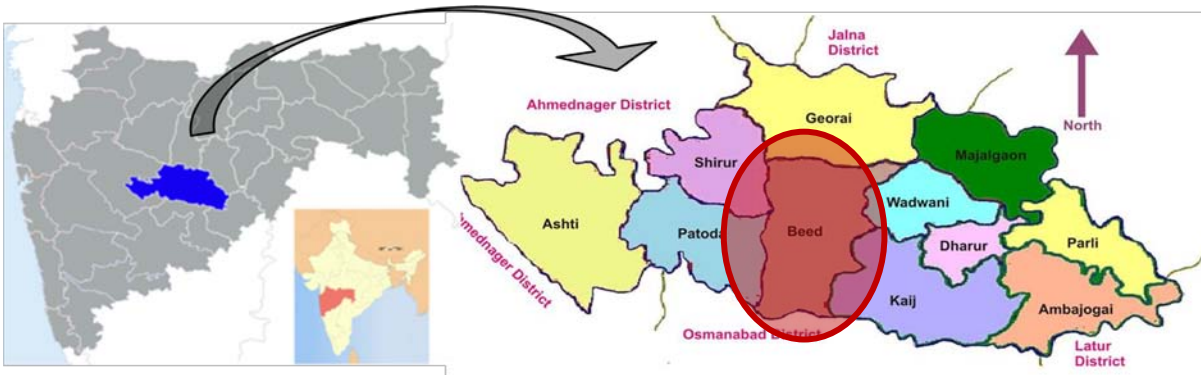
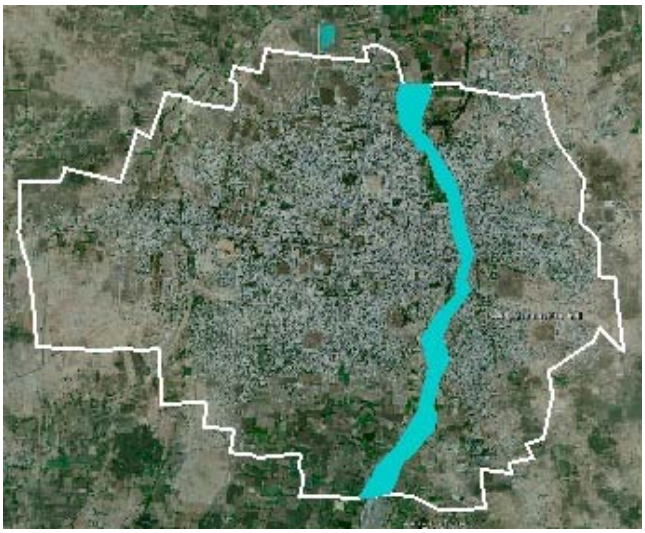


Figure 2 Beed City Map



Beed is part of Aurangabad division and is one of the six districts of Marathwada region. It is also administrative headquarter of Beed District. Beed Municipal Council (BMC) is the administrative body of Beed city. Categorized as a Class A municipality (population greater than 1 lakh), it has a population of approx. 1.46 lakh (based on provisional Census 2011) with an area of 8.29 sq.km. There are 42 election wards in Beed as shown in Figure 3. In addition to the census population, it has been estimated by the ULB that there is a floating population to the extent of 15,000.

Beed City is situated on the Deccan Plateau 18.99°N 75.76°E at 519 MSL. Economy of Beed depends majorly on monsoon dependent agriculture, service sector and small businesses. Beed District is famous across the state as 'labour bank' as it provides labour for agriculture and construction across the state.

Figure 3 Ward level map of Beed city

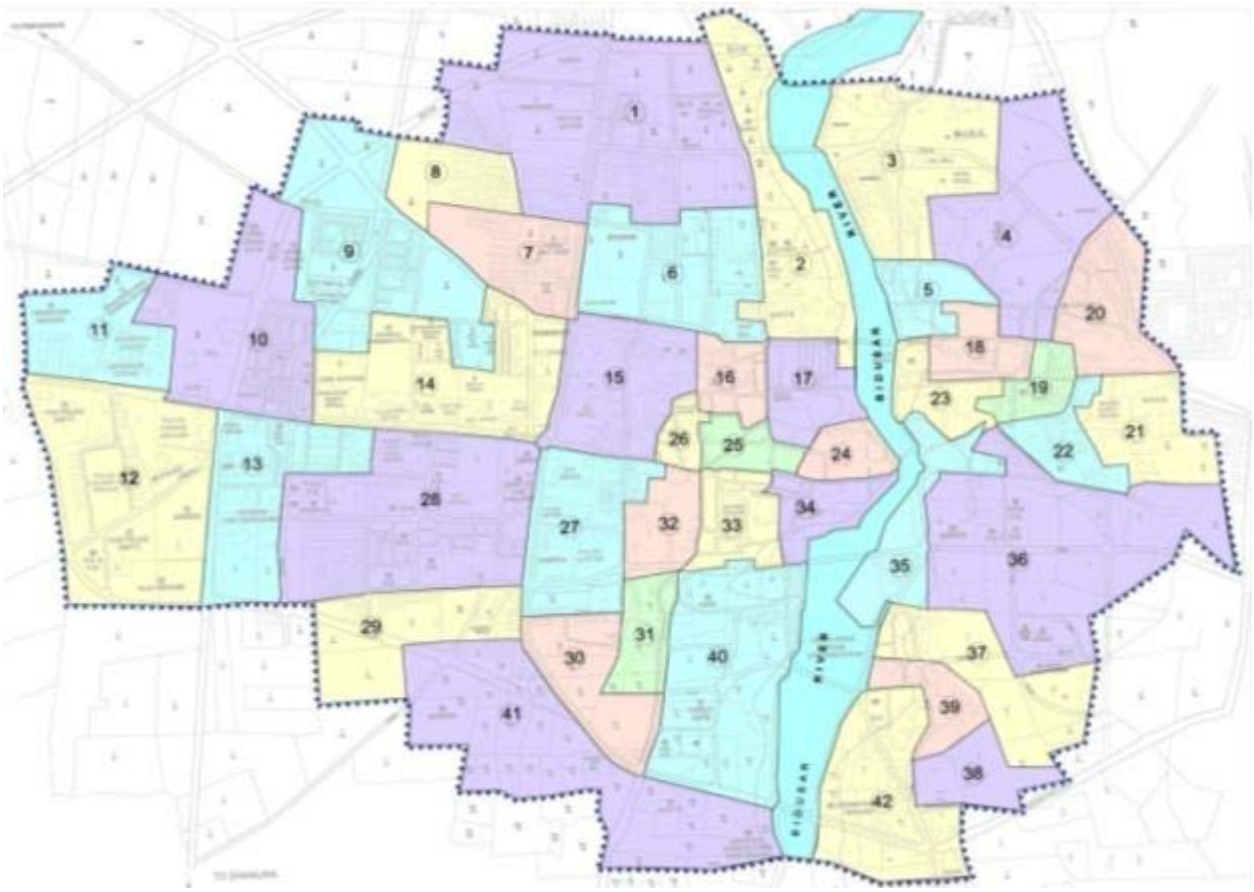


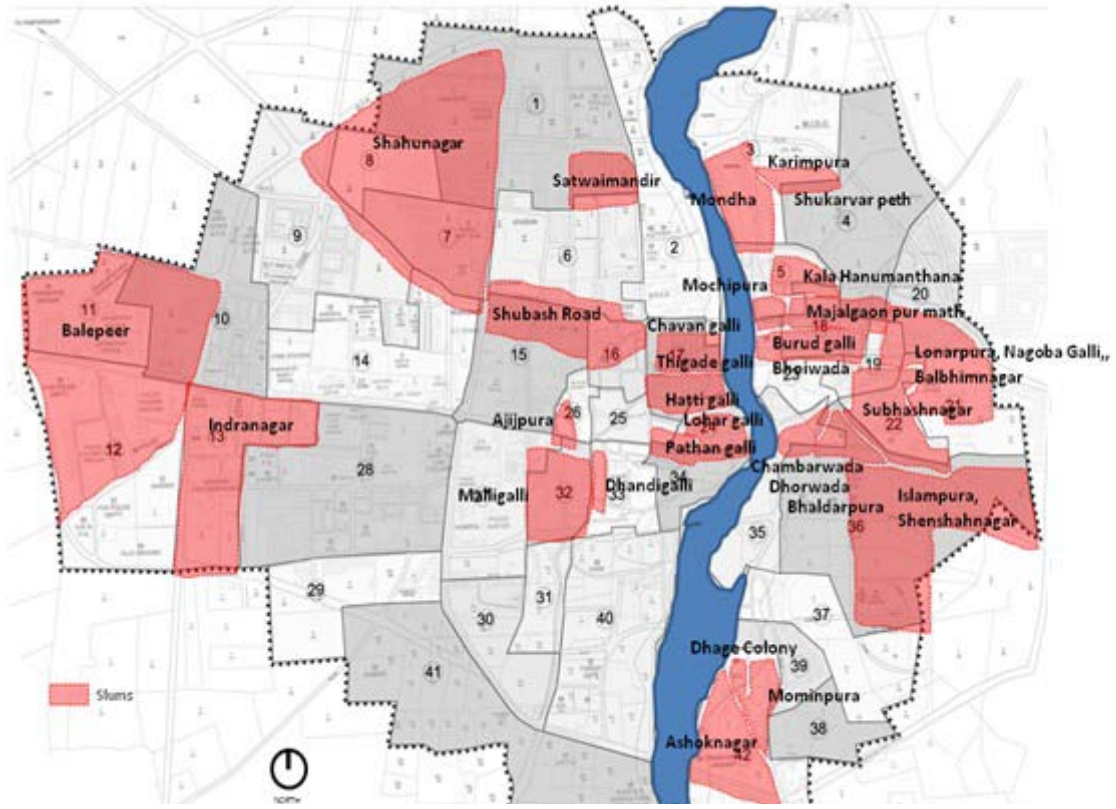
Table 4 Beed City Profile

Beed Municipal Council General Information	
Class	A
District	Beed
Area (2011) Sq.Km	8.29
Total Population (2001)	1,38,196
Population (2011)	1,46,237
Total HHs (2001)	24,705
Total HHs (2011)	39,404
Total Properties (2011)	38,569
Source: (Beedwebsite) (PAS)	

The ancient name of Beed was Champavati nagar. This historical city is situated on the bank of Bindusara River, which is a sub-tributary of Godavari River. The city is surrounded by various temples and historical places. River Bindusara flows through the city dividing it in two parts, Peth and Kasba. The city is of historic importance and functions as a centre for local religious tourism.

2.2 Services in Slums in Beed

Figure 4 Map showing slum pockets



One of the focal areas under the PAS program improvement areas is the provision of services to urban poor. While the performance measurement tool captures information at city level on services provided to slums, a more detailed measurement tool was also developed to capture settlement level variations in services.

Table 5 Slum profile

BMC City Slum Profile	
Total No of Slum pockets	20
Notified Slum pockets	20
Slums on Govt Land	0
Slums on private land	20
Total Slum Population (2011)	87856
No. of HHs	17571
HH size in slums	5.0
Percent of Slum population	60.08%

As part of the PIP diagnostic assessment, quick spot visits to some of the slum settlements were also carried out to understand the characteristics of the slums in the city. The total population in slums is approx. 87,856 i.e. around 60% of the Beed's total population. There are 20 slum settlements in the city and all the settlements are notified by the state. All the twenty slum settlements in the city are located on privately-owned lands. The detailed list of slum settlements along with the ward number and amenities is given in Annex 1.

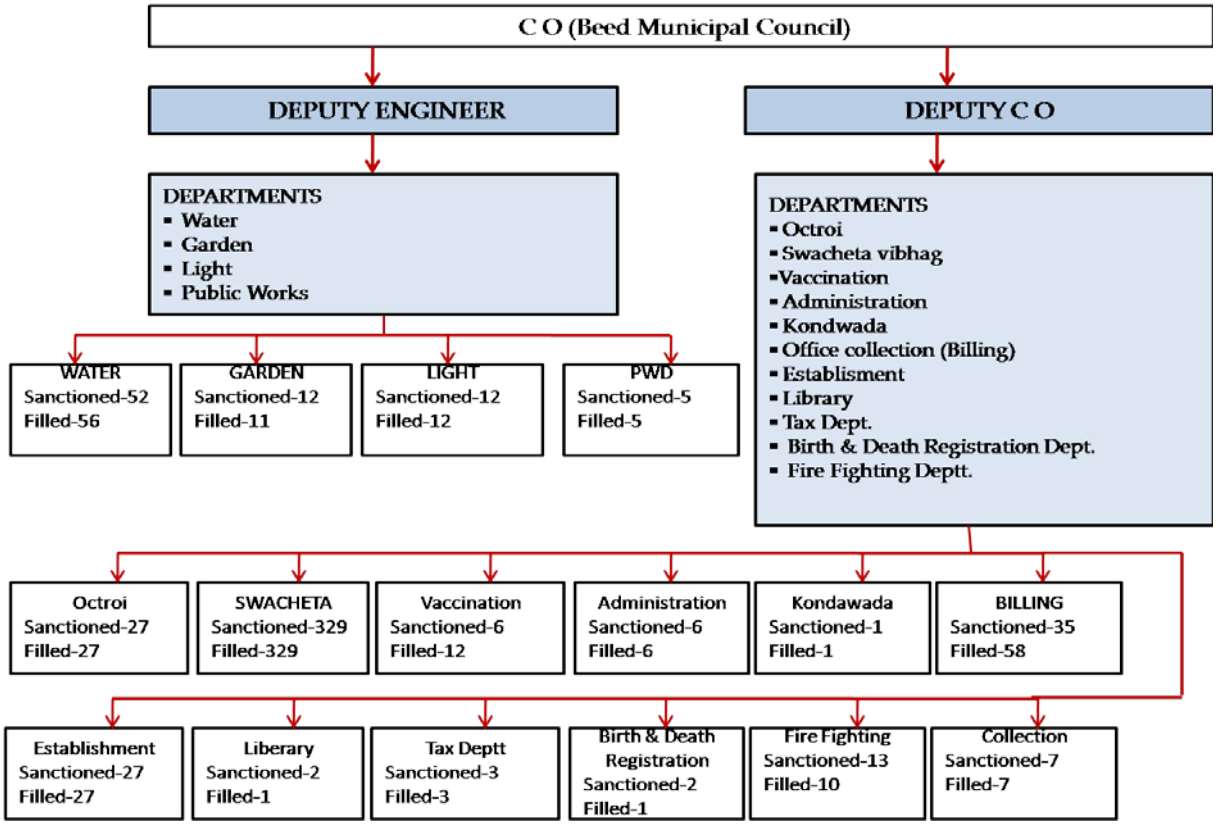
Previous work on slum up-gradation includes VAMBAY under which only 244 houses were constructed covering population of 2560. Current slum up-gradation programs include IHSDP with 2096 housing upgraded covering slum population of 10,500 across 9 slum pockets. The total cost of the project was 2,245.97 Lakhs; GoI subsidy was 1,341.44 lakhs, GoM subsidy was 142.02 lakhs & beneficiaries' contribution was 193.34 lakhs. Other than provision of dwelling units, the project also included basic amenities and infrastructure like water supply line (62.60 lakhs), Roads & storm water drains (284.4 lakhs) and Street lights (38.99 lakhs) which was provided by GoI at subsidy of 100% (IHSDP)

BMC has policy to provide individual WSS services to slums which includes all the 20 settlements. All the slum settlements are covered under property tax assessment. The council has earmarked 5% of budget towards servicing the poor. However, a look at the budget from 2005-06 till 2011-12 shows that on average 8% of CapEx has been spent on Slum development. (Annex 4)

2.3 Staffing of Beed Council

Chart 1 Organization Chart of BMC below shows the structure with sanctioned and recruited posts in Beed Municipal Council. The overall sanctioned staff for Beed Municipality is 539, while recruited staff is around 566. This shows that there is overstaffing in Beed Municipality.

Chart 1 Organization Chart of BMC



Water Supply:

The sanctioned post in Water Supply department is only 52 but currently 56 are working in the department. It has around 25% technical staff which includes senior manager, engineer, accountant, electricians and plumbers. There are no meter readers sanctioned or working in the department though 25% connections are metered. 75% of the working staff is labour in WS department.

Chart 2 Staff working against Sanctioned in WS, WW & SWM

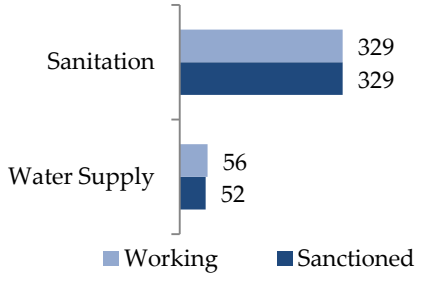
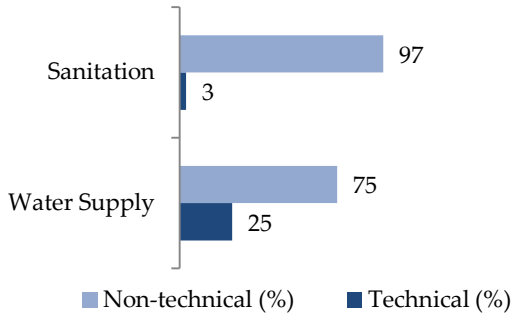


Chart 3 Technical & Non-technical staff in WS, WW & SWM



Source (CEPT University, 2009 - 2011)

Sanitation:

There are 329 sanctioned posts in Sanitation department and all posts are filled. Sanitary inspector and supervisor (total 9 number) which forms the technical staff is only 3% while remaining are Safai Karamcharis and drivers.

2.4 Municipal Finance Assessment

BMC's current accounting system is a cash-based system. All expenses towards regular maintenance are treated as revenue expenses, while expenses on new projects are treated as capital expenses. BMC maintains a consolidated general budget that includes all the functions of the council. Thus slums and urban poor, water supply and sewerage etc. have not been budgeted separately but under the same consolidated budget. The accounting and the budgeting system adopted by BMC records the various line items of receipts i.e. income and expenditure under three broad categories including revenue account, capital account and extra-ordinary account as per their sources and applications.

The municipal finances of BMC have been re-casted and reviewed for the last seven years. (From 2005-06 to 2011-12) For 2005-06 to 2009-10 the information is from 'Actuals', while budget estimates are given for the remaining two years.

Table 6 Municipal Finance summary of BMC (in Rs Crores)

Items	2005-06 (A)	2006-07 (A)	2007-08 (A)	2008-09 (A)	2009-10 (A)	2010-11 (B)	2011-12 (B)
Revenue Account							
Revenue Income	13.77	11.64	14.03	13.08	19.34	26.47	27.58
Revenue Expenditure	13.27	20.91	14.69	17.72	21.49	27.96	30.54
Operating Ratio	96%	180%	105%	135%	111%	106%	111%
Capital Account							
Capital Income	5.19	10.18	16.88	8.09	33.38	20.05	20.39
Capital Expenditure	3.39	4.73	5.39	15.52	29.59	16.51	18.1
Overall surplus/ (deficit)	**2.29**	**(3.83)**	**10.83**	**(12.06)**	**1.64**	**2.06**	**(0.67)**

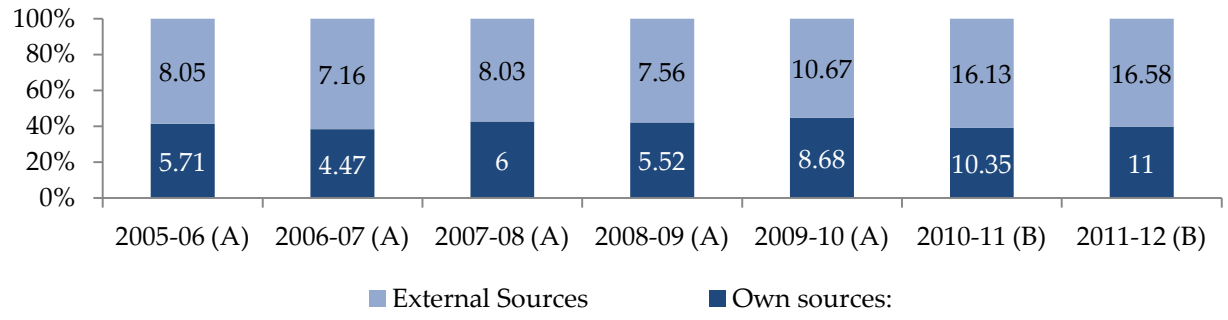
Source: (CRISIL Advisory Services)(Beed Municipal Council Budgets, 2005-06 to 2011-12)

Revenue Account:

The revenue account comprises two components - revenue income and revenue expenditure.

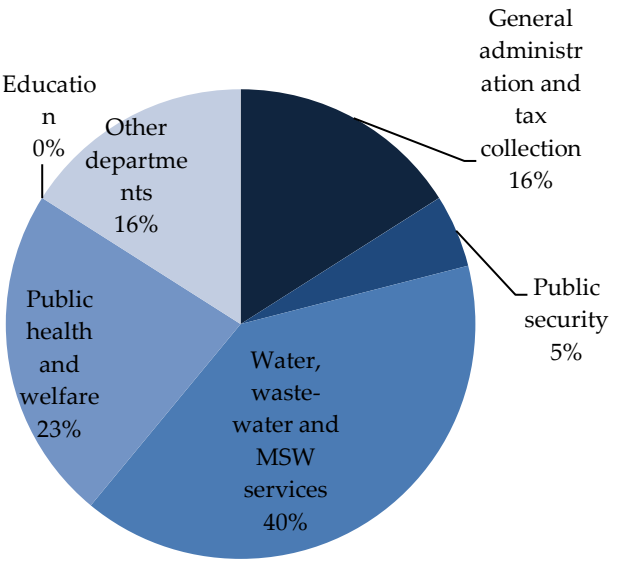
Revenue income comprises internal/own resources in the form of tax and non-tax items. External resources are in the form of shared taxes/ transfers and revenue grants from the State and Central Governments.

Chart 4 Trend of own and external sources of revenue income of BMC (in Rs Crores)



Own sources contribute on an average 41% of revenue income (2005 to 2012) and recorded CAGR of 11%. Tax revenue for BMC is only through property tax (CAGR 14%). The budgeted figures are projected moderately with an increase of 10% and 20% in the tax income for the years 2010-11 and 2011-12 respectively. Non-Tax Revenues consists of rents from municipal property, charges of various services including water supply and fees for issue of licenses and approvals (CAGR 10%). As in Chart 4, the External source of income contributes the highest share of average 58% of the total revenue income over the period under consideration (CAGR 7%). BMC should try to increase the share of the own sources of revenue with respect to external source.

Chart 5 Composition of revenue expenditure



Source: (Beed Municipal Council Budgets, 2005-06 to 2011-12)

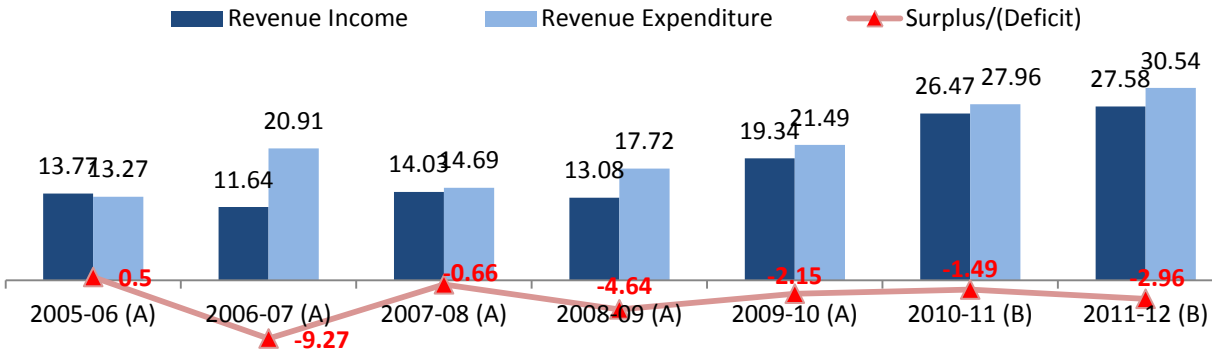
Revenue expenditure comprises expenditure incurred on salaries, operation & maintenance cost and other heads. The growth of revenue expenditure in this period was at 13% CAGR.

As seen in Chart 5, share of expenditure on water supply, waste water and SWM at 40% followed by public health and welfare forms 23%.

The surplus/deficit of the revenue account in the period under consideration was in deficit for 6 years out of 7 years (Chart 6). The surplus observed in 2005-06 was 0.5 Cr while deficit was as high as -9.27 in 2006-07.

Debt Servicing:

Chart 6 Revenue income vs. expenditure of BMC (in Rs Crores)



Source: (Beed Municipal Council Budgets, 2005-06 to 2011-12)

There are about 12 existing misc. loans on the books of the BMC. The interest paid on outstanding loans and principal repayment for various loans has been added into various heads. The total principal loan amount is Rs.867 lakhs. These loans were used for various purposes before the period under consideration. Annex 2 presents a consolidated statement of the outstanding loan obligations.

Capital Account:

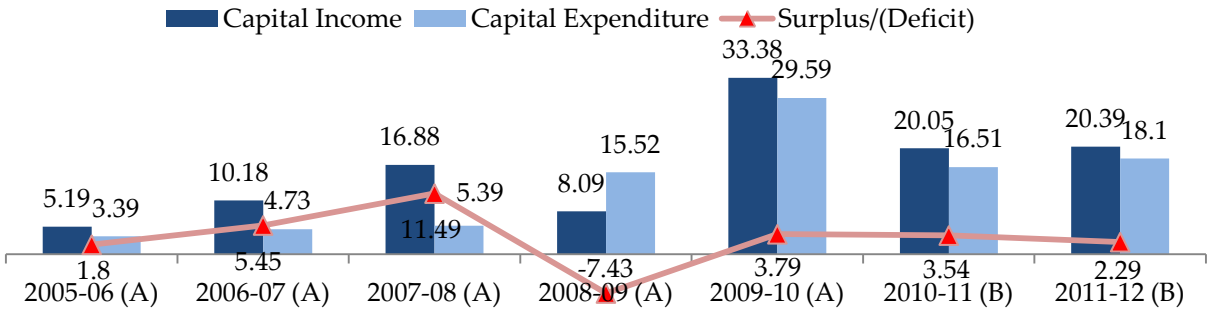
In general, the capital account of BMC consists of incomes on account of capital grants under various schemes of Government of India (GoI) and Government of Maharashtra (GoM) and expenditure on account of utilization of capital grants under such schemes and for asset creation.

The capital income has increased from the level of Rs. 3.05 Cr during 2005-06 to Rs. 33.08 Cr in 2009-10. This increase is primarily due to the UIDSSMT Grant which was made available to BMC for the purpose of the water supply project which started from 2007-08. (Annex 3)

Similar impact of UIDSSMT project was observed in Capital expenditure which has increased substantially from the level of Rs. 2.14 Cr in 2005-06 to Rs. 29.59 Cr in the year 2009-10. It has been budgeted at Rs. 16.6 Cr for the year 2011-12 (

Annex 4). Chart 7 provides a snapshot of Capital income against Capital expenditure along with the surplus/deficit in the period of consideration. The capital utilization was highest in 2008-09 under period of consideration to the extent of 192% as shown in Table 7. The capital utilization in previous years is low because as discussed earlier, UIDSSMT project started in 20078-08.

Chart 7 Capital income vs. expenditure of BMC (in Rs Crores)



Source: (Beed Municipal Council Budgets, 2005-06 to 2011-12)

Table 7 Capital utilization ratio

Items	2005-06 (A)	2006-07 (A)	2007-08 (A)	2008-09 (A)	2009-10 (A)	2010-11 (B)	2011-12 (B)
Capital utilization	**65%**	**46%**	**32%**	**192%**	**89%**	**82%**	**89%**

Based on the trend of income and expenditure during the period 2005-06 to 2011-12 it is likely that the financial position of Beed Municipal Council will be in marginal surplus from the situation that it is right now. BMC needs to enhance its revenues by adding new income sources. The share of revenues from assigned revenues, grants and contribution like MSNA, UIDSSMT, Dalit wasti water supply, etc is high as compared to revenues from own sources. Such sources of revenue are not under the control of the ULB and therefore it is advisable to reduce the dependence on such sources. The income from own sources would provide funds for maintenance of assets being created through grants and help in achieving financial sustainability.

Photo Plate 2 Water supply in Beed

3. ASSESSMENT AND PROPOSALS FOR WATER SUPPLY

This section provides an overview of the water supply system in BMC, its performance and issues, and proposals for improvement.

3.1 Assessment of Current Water Supply Systems

Beed city gets water from two different surface sources. These sources include Bindusara dam constructed on Bindusara River which is around 15 km from the city and Sindhaphana dam which is located 42 km from the city in the Majalgaon Taluka. Beed also gets around 1.5-2.0 MLD from ground sources. There are about 950 bore wells and 3 open wells in the city.

Chart 8 Schematic diagram of water supply system in BMC

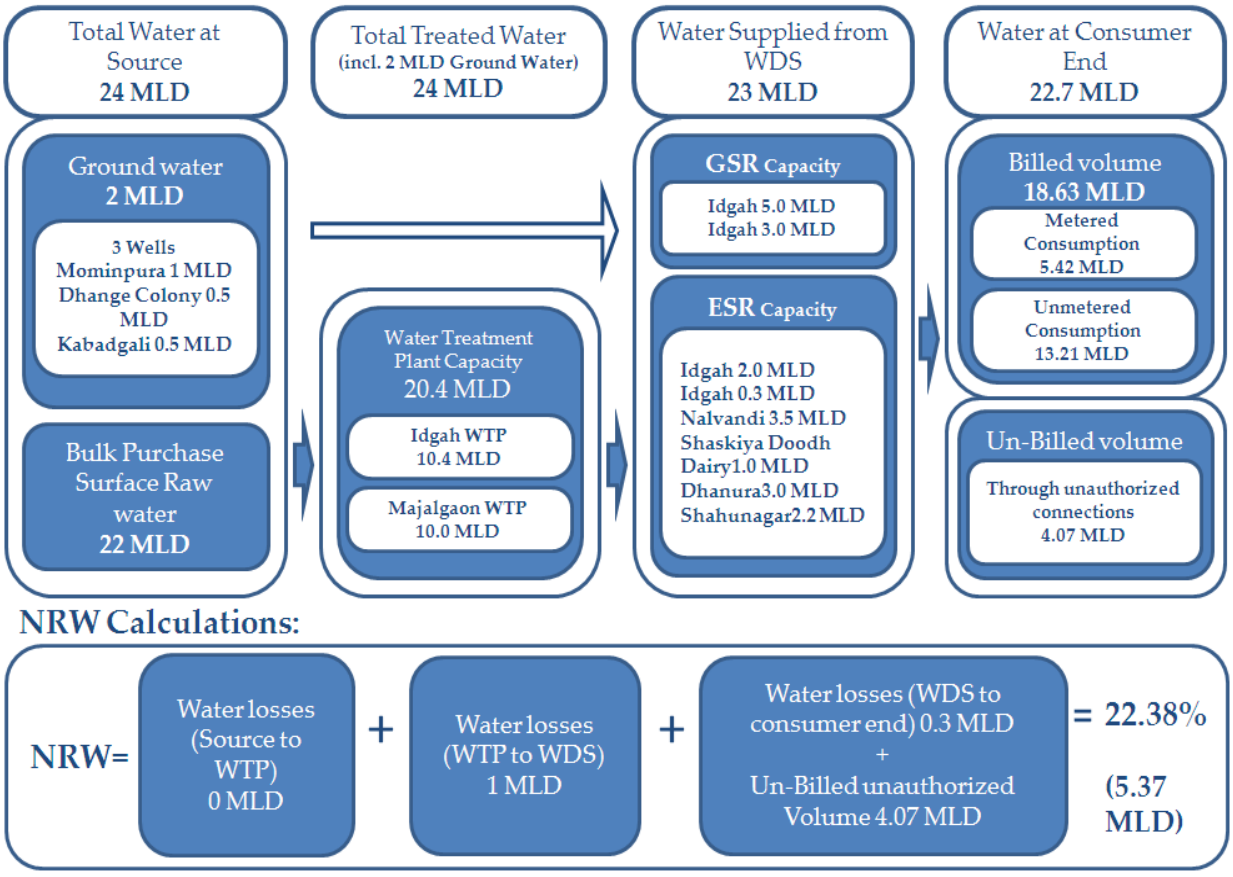
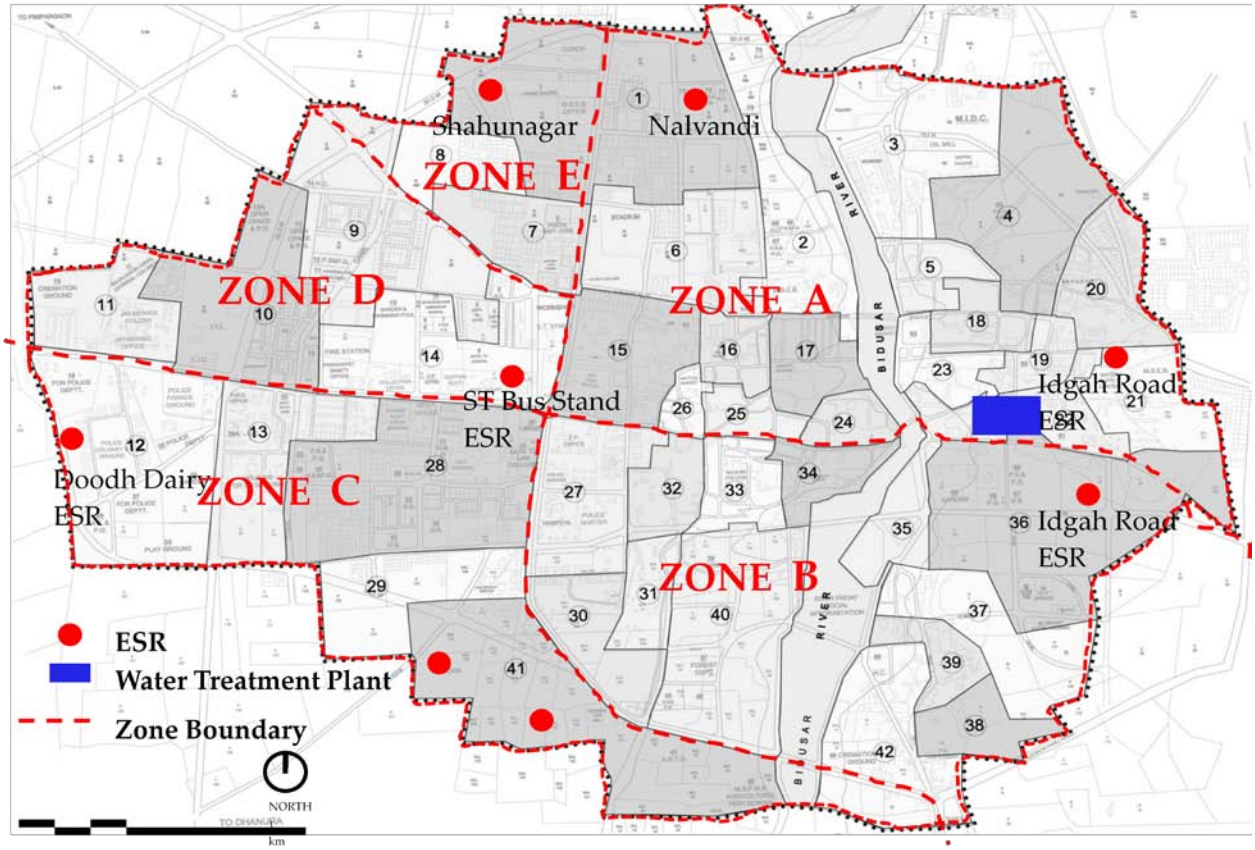


Chart 8 above provides the schematic diagram of water supply in Beed. The raw water purchased from two surface sources goes to two water treatment plants i.e. Idgah and Majalgaon (total treatment capacity of 38 MLD). 10.4 MLD of purchased water is treated at Idgah and 10 MLD at Majalgaon WTP which is distributed among 6 ESR's located at various locations in the city. The ground water (from open wells and borewells) directly goes to GSR. The total water reaching at WDS is 23 MLD. From WDS the water reaching the

consumer end is only 22.7 MLD. Out of which billed volume is only 18.63 MLD. The overall estimated NRW of the system is around 22% i.e. 5.37 MLD in the whole system.

As shown in Figure 5, the city is divided into 5 water supply zones. Water from Bindusara is supplied to outskirts of the city by gravity and water from Sindhaphana is supplied to core city.

Figure 5 Water supply zones, location of ESR & WTP in Beed



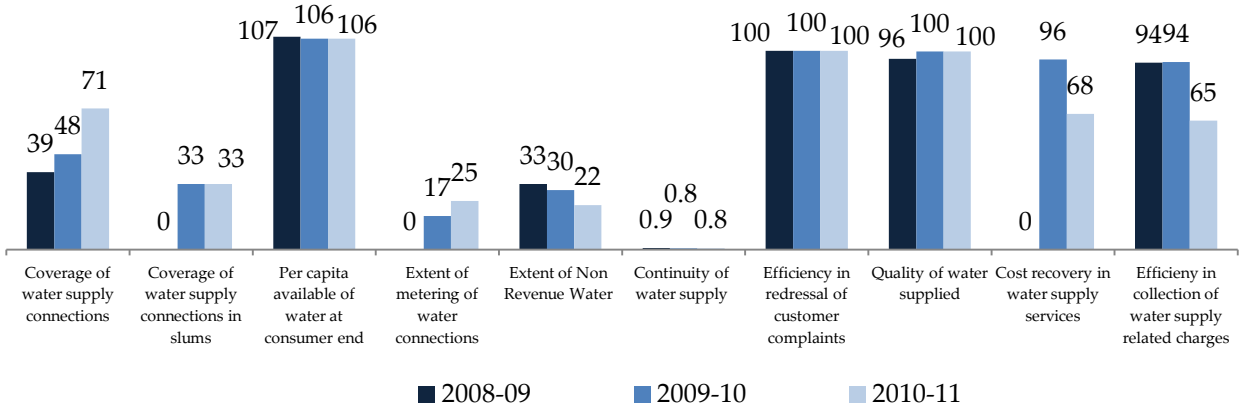
Good to show a map with location of the surface sources and the areas it serves

Length of Trunk mains and Transmission mains are 56 km and 10.2 km respectively. Total length of distribution network is approximately 255 km. Some areas in the city do not have distribution network. This includes some part of slums and newly added areas. The project to cover some of these areas is under implementation. Water is supplied for 1.5-2 hrs every alternate day. There are 27,389 connections in the city out of which 6500 (25%) are metered. The total number of non-domestic connections is 235 and all of them are metered connections.

There is no proper periodic survey in Beed at the source, treatment plant and at consumer end. For leak detection, pressure, continuity and regular water supply to move towards 24x7 water supply, BMC needs to have periodic survey at these points to have proper track of the system.

3.2 Assessment of service delivery

Chart 9 Areas of poor and good performance in Beed for water supply



3.2.1 Access and Coverage

Coverage of Water supply connections: The coverage of water supply connections in Beed is 71% as of 2010-11. During the discussion with ULB officials it was found that there are approximately 6000 illegal connections. These connections are predominantly in the slums. If these illegal connections are regularized, the coverage of WS connections would increase to more than 80% without much of capital investment.

The increase in connections from previous years is mainly in residential metered connections. A Project under UIDSSMT which includes laying of new WS distribution network in the areas that do not have network has already commissioned and is expected to complete by 2013.

Proposals for improvement: The areas which are not included in the water distribution network are mainly slums and newly added areas. BMC needs to increase its coverage through extending new connections through existing network. BMC will also need to simplify connection application process and clear the pending applications for additional connections. BMC can also regularize illegal connections to increase its coverage of legal water connections.

Table 8 Details of Consumer connections in BMC

Category	Number of Connections	Metered connections	Flat rate connections
Residential	27154	6500	20654
Non-Residential	235	235	0
Total	27389	6735	20654
Source: **(CEPT University, 2009 - 2011)**			

3.2.2 Service levels and Quality

Per capita supply of water: The per capita water supply when produced is 164 lpcd while per capita water supply after treatment is 157 lpcd. The average per capita water supply at consumer end is only 127 lpcd due to high losses in distribution network as shown in Chart 8. This average lpcd of Beed is lower than CPHEEO norms of per capita water supplied at consumer end at minimum 135 lpcd.

Continuity of water supply: The water supplied in BMC is for one and a half hour every alternate day.

Table 9 Lpcd at various points of water supply

	At Source	After treatment	At consumer end
MLD	24	23	18.63
LPCD	164	157	127

Quality of water supply: Quality of water supplied is 100%, but the reliability of the data is D. The tests are conducted regularly at accredited centers. The records are still kept manually and not yet computerized. BMC needs to have proper sampling regimen for monitoring water quality. Proper records should also be maintained for the samples passing the test and also for the samples that were not to the mark.

Metering: As seen from Chart 9 and Table 8, the extent of metering in BMC is around 25% Remaining 75% connections are unmetered. The metering of WS connection was taken up under MSNA. As discussed with BMC officials, only 6000 residential connections were included for metering. One important issue is lack of human resources/meter readers in ULB staff for taking the meter reading. At present the meters are installed but these connections are not charged by volumetric tariffs because no meter readings are recorded for the billing purpose due to lack of technical staff. It is important that the connections which are already metered should be assessed by meter readers and to introduce volumetric billing for metered connections.

Drawing lessons from several cities managed by the Maharashtra Jeevan Pradhikaran (MJP), and as required under Maharashtra Sujal Nirmal Abhiyan (MSNA), BMC needs to ensure that metering is installed for all consumer connections.

Proposals for improvement: As the per capita water produced is higher than the norms, BMC needs to reduce its NRW to increase the consumer end per capita water supply. The city is divided in to 5 water zones as in Figure 5, each zone gets water every alternate day. The total water reserved with irrigation department till 2031 is 38 MLD. The city currently draws only 22 MLD of water. The source is ample but water is supplied only 15 days in a month. The city has the capacity to supply water every day for same number of hours, but due to political reasons (as cited by the ULB officials) they are not in position to supply water every day. Proper schedule of WS would reduce half the problem without any requirement of augmentation of water source.

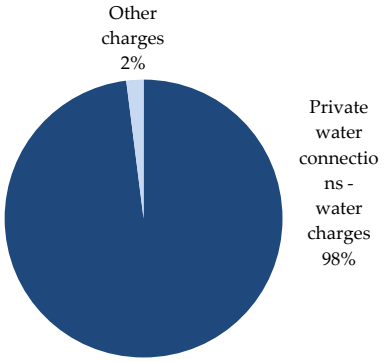
BMC should install flow meters and consumer meters to all the connections so as to keep a track on water losses which will eventually increase the cost recovery. BMC should prioritize the repairing of major leakages in the water supply network as per the recommendations mentioned in the draft Water Audit report. BMC should also train its staff to conduct periodic surveys at the major bulk production and consumer points. These can be done either through methods like bucket survey or using portable flow meters.

3.2.3 Financial Sustainability

Cost recovery (O&M) of water supply: The cost recovery of BMC in water supply sector has decreased to 68% compared to previous year which was 95.5%. The collection efficiency of water related charges has also decreased from 94% to 65% in 2010-11. (Chart 9)

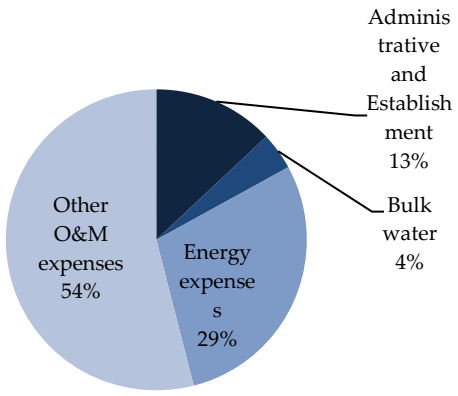
Annex 6 provides the details of the revenue income and revenue expenditure towards provision of water supply services by BMC.

Chart 10 Revenue Income from Water



Source: (Beed Municipal Council Budgets,

Chart 11 Revenue Expenditure for water supply



Source: (Beed Municipal Council Budgets, 2005-06 to 2011-12)

The major contribution in revenue income of WS is from water connections and water charges at 98%. (Chart 10) Remaining 2% is from other charges like water supply connection form fees, road cutting charges, regularization of illegal connections, water tanker fees, etc. The tariff structure of water related charges is provided in Annex 8.

The revenue expenditure of WS department is dominated by O&M expenses (54%) and energy expenses (29%) followed by administrative & establishment expenses.

The income from water supply service has grown at CAGR of 28% from the year 2005-06 to 2009-10, while the revenue expenditure on water supply has grown at CAGR of 17% during the assessment period. Though the growth rate of income is much higher than that of expenditure, the water account has remained in revenue deficit during the assessment period. The operating ratio has declined from 262% in 2005-06 to 102% in 2011-12.

The annual account of the revenue expenditure for water supply indicates that the BMC might be defaulting on the payments towards power charges. This is evident from the actual and budgeted figures towards energy payments. The actual expenditure has decreased from

Rs 51 Lakh to Rs 26 lakhs with an annual decrease of 15% from the year 2005-06 to 2009-10. The exact amount of dues for the power charges towards the electricity board cannot be assessed from the budget figures given. (CRISIL Advisory Services) The arrears amount because of the possible default of payments cannot be determined as BMC follows a single accounting cash based system. The per capita expenditure towards water supply by BMC is Rs 210 (2011-12 Budgeted) which is pretty low when compared against the per capita norm prescribed by HPEC (Rs. 491 per capita)

Annex 7 provides the details of Capital income & expenditure in water supply system. From 2007-08, Beed has started getting major funds under UIDSSMT. It is a water supply augmentation scheme that has been approved under UIDSSMT and which is under implementation. The expenditure under UIDSSMT has started from 2008-09. The project is designed to provide water to population of 3,78,156. The project cost approved under UIDSSMT scheme is Rs. 20.76 Crores. Considering the escalation, the project cost is Rs. 31.98 Crore. The grants under Maharashtra Sujal Nirmal Abhiyan are budgeted as capital income and are expected to be utilized for water supply system in 2010-11 and 2011-12.

3.2.4 Efficiency in Service Operations

Extent of NRW: BMC water supply system has NRW of approx. 22%. During the discussion with ULB officials it was found that there are approximately 6000 illegal connections. Apart from unbilled consumption and apparent losses, the main water loss was observed in real losses with major leakages in distribution network.

Efficiency in redressal of customer complaints: The efficiency of redressing customer complaints in 24 hours is 100% consistent for 3 years as shown in Chart 9. BMC has a system to record complaints received and redressed. Though the system allows for monitoring and analyzing complaints on a regular basis, but the records system is manually maintained and not yet computerized.

Proposals for improvement: The draft report on water and energy audit is completed. (September 2012 status) As mentioned, BMC needs to undertake improvement measures as recommended in the Audit report such as periodic surveys at bulk production and distribution points. BMC has proposed to conduct technical studies like GIS mapping, consumer survey, etc. These surveys will help to reduce illegal connections, detect leakages & losses in the network, and reduce the NRW and equitable water supply distribution.

During the analysis it was observed that the reliability scales of almost all the service level indicators was either C or D i.e. based on least reliable data sources. The connection registers were not properly maintained, there were duplication of records etc. BMC should start keeping proper records of the complaints received and redressed with details like serial numbers, date and time of receiving as well as redressing. BMC should also initiate the computerization of the records on complaints, connections, bill generation, collection, etc

3.2.5 Equity in Service Delivery

Coverage in Slums: Beed has 20 slum settlements which accounts to around 60% of the city's population. All the slum settlements are notified and are on private lands. The coverage of water supply connections to individual HHs in the slums is 33% (~5857 connections). There are no functional stand-posts in these slum settlements. Around 152 stand posts were converted into group connections for the slums in 2010-11.

3.3 Proposed actions for water supply

The following interventions are proposed based on discussions with the Council, and analysis of the key indicators and their data reliability. The proposals listed below mainly include the no-cost or low cost interventions that need to be carried out by BMC. Capacity building of the staff must also be conducted to ensure proper implementation of these interventions.

As the focus of improvement in water supply is to move towards a 24X7 water supply system, the interventions mentioned below need to be carried out immediately by BMC to ensure basic systems are in place. Detailed interventions which will incur capital investment by BMC are discussed in the next section (3.4)

Table 10 Low cost interventions in Water Supply Service Improvement

Categories	Interventions required
Access and Coverage	• Regularizing un-authorized connections will help in increasing the coverage. • Encourage legal connections in existing network • Increase coverage in slum areas
Service levels and quality	• Hydraulically redesign the water supply system for equitable water supply system. • Appoint technical staffs like meter readers. • Training of staff to conduct periodic surveys at the major bulk production and consumer points, either through methods like bucket survey or using portable flow meters • Increased monitoring of quality procedures and reporting • Simplifying connection application procedure.
Financial sustainability	• Incorporate telescopic tariff rates once metering is done. • Improve collection efficiency
Efficiency in service operations	• Reduce unmetered authorized water consumption • Reduce apparent losses through unauthorized consumption by regularizing them. • Increase complaint redressal system with systematic computerized record keeping of complaints received and redressed.

3.4 Moving towards 24 X 7 water supply in Beed

Govt. of Maharashtra's major focus in performance improvement has been the planning and implementation of 24X7 water supply system in all Class A cities in the state. While steps towards achieving 24X7 water supply require substantial efforts, certain actions related to up gradation of human resources and improved management information systems are easier to implement. The technical guidelines suggested by MoUD towards 24X7 systems provide an approach based on the technical, commercial and institutional improvements required. (MoUD, 2008)

Technical improvements:

The technical inadequacies in Beed water supply system may obstruct the shift towards 24x7 water supply. These are discussed below.

- High NRW in the system;
- Major water losses in Pipelines comprising the distribution network;
- Reliable data on distribution networks and customers do not exist;
- Illegal connections;
- Extent of metering is only 25%;
- Consumer meters are still charged at flat tariffs as BMC doesn't have meter readers;
- Improper schedule and management of water production, supply and continuity

Some of the technical and commercial constraints mentioned by MoUD guidelines are resolved through the implementation of GoM's reform program of MSNA. These are listed below.

High NRW, major water losses in the distribution network and reliable data on distribution networks and customers can be achieved through:

1. Water and energy audit study: The draft report of water and energy audit is completed. This Water audit will help in identification of major points of losses (real: physical and apparent) from source to consumer end in the network. Along with leak detection studies, this will help locate critical areas in the network. The network refurbishment and augmentation can then focus on these areas on priority basis.
   Energy Audit report results will help in identifying head losses in pumping system, efficiency of pumps, etc. The losses mentioned in energy audit can be reduced by replacement of inefficient pumps, panels and its accessories. It will also help in reducing power consumption which will eventually help in decreasing the electricity bills.
2. GIS mapping: BMC has proposed to undertake GIS mapping which will provide detailed location maps and pipelines network across the city.

3. Fixing other major & minor leakages in the complete WS system: The minor & major leakages which are detected in water Audit study should be repaired on priority basis. This will increase the service delivery at consumer end and reduce the NRW in the system.

Illegal connections can be reduced through:

4. Consumer end survey: 100% consumer survey will help in identifying and subsequent regularization of illegal connection**s.** It will provide data on household consumption which will help in assessment of augmentation of water sources, if required.

Improper schedule and management of water production, supply and continuity can be managed through:

5. Hydraulic modeling: BMC has proposed to undertake Hydraulic modeling which will help to implement equitable distribution zones in the city. The consumer survey mentioned above will provide data on household consumption which will help in assessment of augmentation of water sources, if required.
6. Demarcation of District Metering Area (DMA)s & installation of bulk flow meters: The analysis of results generated from GIS mapping and hydraulic modeling can be used for demarcation of DMA. Once the DMAs are demarcated, bulk flow meters can be installed to monitor quantity of flow into these DMAs.

Lower extent of metering, metered connections is still charged at flat tariffs as BMC doesn't have meter readers:

7. Consumer end metering and volumetric tariff: The reforms mentioned above related to regularization of illegal connections, implementation of recommendations from water audit and energy audit, formation of DMA, etc. will reduce the operation and maintenance expenditure. Once these reforms are in place, the city should move towards 100% metering at consumer end and volumetric tariff to recover full O & M cost. BMC should also appoint meter readers for effective implementation of volumetric tariff.

The current status of water supply related initiatives taken by BMC are summarized below:

Box 1 Current status of initiatives taken by BMC

- UIDSSMT Project for increasing water supply connection coverage is under implementation.
- Water Audit Study – Draft completed
- Consumer Survey – Draft completed
- GIS mapping and Hydraulic modeling – Under process
- Tender process for preparation of DPR under process.

*Status as on September 2012

The capital investment required in improving the technical aspects for moving towards 24x7 water supply are provided in Table 11.

Commercial improvements: Given that the technical improvements need to be financially sustainable, the conversion to 24X7 water systems requires advanced commercial systems and procedures. Along with computerized billing and collection system with updated consumer records, BMC also needs to shift from flat tariff towards volumetric tariff. With introduction of metering and volumetric tariff system, consumers will be charged based on the water quantity they consume. Actions for imposing new user charges and improving the cost recovery should be given high priority by the BMC. The tariff structure should be worked out considering the expenditure incurred by BMC towards servicing the part of the water demand.

Institutional improvements: BMC has to significantly improve its managerial and technical skills to shift towards 24X7 water systems. Some of the technical aspects that will require improved skills and automation are

- Planning and design of water supply infrastructure from source to distribution/ customer for 24X7 system, including concept and establishment of DMAs.
- Restructuring of existing systems, presently operated under intermittent conditions, to continuous supply at minimal cost and simultaneously maintaining supply throughout the conversion process.
- Appropriate hydraulic models and application to planning, design and operation.
- All aspects of pressure management including specification of pressure valves
- Design and specification of flow and pressure measurement and control devices for management of continuous supply.

Hence the operational skills required to plan and implement these measures would include operation under continuous supply, pressure management, proactive detection and repair of leaks, proactive detection and regularization/ disconnection of illegal connections, mapping of water service infrastructure on GIS linked to operational, maintenance and customer

services tracking. The staff at BMC needs to be augmented in order to ensure smooth functioning of the 24X7 system.

A summary of the actions and cost implications towards achieving 24X7 water systems is given below.

Table 11 Block cost estimates for 24x7 water supply

	Head	Block Cost-Rs	Unit	Rs Crores
1	Satellite Image	90000	Upto 64 sq.km.	0.0090
2	Supply and installation of GIS software	195000	Each	0.0195
3	Digitization of satellite image	6250	Per sq.km.	0.0052
4	Physical Surveys- GIS Network Survey and Base Map Survey	3000	Rs./ km	0.0964
5	Consumer Surveys	36	Rs. / HH	0.1419
6	Water Audit	4700000	Rs. For towns of pop. 2 Lakh	0.4700
7	Energy Audit		L.S	0.3000
8	Hydraulic Model (320 nodes- with 10 nodes/km)	600	Rs/ node	0.1926
9	Billing Software + 1 year maintenance	1000000		0.1000
10	Bulk Flow Meters (10)	30000	Rs. Per bulk flow meter	0.0750
11	Replacement of House Service Connections (metering existing unmetered connections)	3500	Rs/ connection with mechanical meter	7.1743
12	Cost of 100% coverage (new connections with meters)	7000	Rs/ connection with mechanical meter	7.8000
13	Rehabilitation of Network to be replaced and around 20% to be added	7300000	Rs. / sq. km	0#
	TOTAL (1+2+3+4+5+6+7+8+9+10+11+12+13) Rs. Lakh			16.3838
	Including 20% Contingencies			3.2768
	Total			19.6606
# the network is new and doesn't need replacement				
TOTAL ESTIMATED COST FOR 24 X 7 WATER SUPPLY IN BEED				**19.66 Cr.**

Photo Plate 3 **Sanitation and sewerage in Beed**

Photo Plate 4 MSWM in Beed

4. ASSESSMENT AND PROPOSALS FOR SANITATION

This section captures the sanitation aspects in Beed related to coverage of toilets in the city as well as services in slums, Septage management and a summary of proposed interventions for improving sanitation in the city.

4.1 Coverage of toilets

As per the recent figures from census 2011, 85% of the households have access to improved and unimproved latrine facilities within premises and connected to pipe sewer, septic tank, ventilated improved pit latrine, etc. Around 7% of the Households depend on shared sanitation. However, 9% of households do not have access to any sanitation (improved/shared/unimproved) and thus resort to open defecation. The coverage of toilets as reported by BMC is 82% in 2010-11. This accounts for both individual toilets as well as access to community/ pay-n-use (shared) toilets for both residential and non-residential properties. However, coverage of households with individual toilets in slums has increased from 23% in 2010 to 27% in 2011. There are around 4658 individual toilets in the slums. The remaining slum population in BMC is dependent on community toilets and pay-&-use toilets.

There are 530 community toilet seats (only 270 are functional seats) and 35 Pay & Use seats which serve the people of Beed. Remaining seats are non functional due to poor maintenance, non availability of water, no light connection, accessibility etc. Community toilets are maintained by BMC. No private contracts are given for O&M of the toilets. 3100 individual seats have been sanctioned under ILCS and 1192 more are in pipeline under MSNA. Council has floated tenders of 6 new pay and use toilets with 60 seats on BOT basis. Hence, 4292 new individual toilets (in total) have been proposed which will increase the coverage of toilets from 82% to 96%.

Chart 12 Access to sanitation in Panvel (CENSUS, 2011)

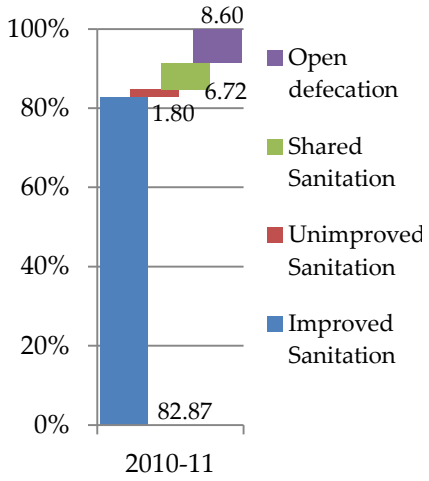
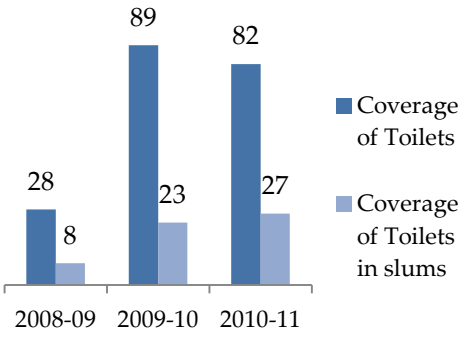


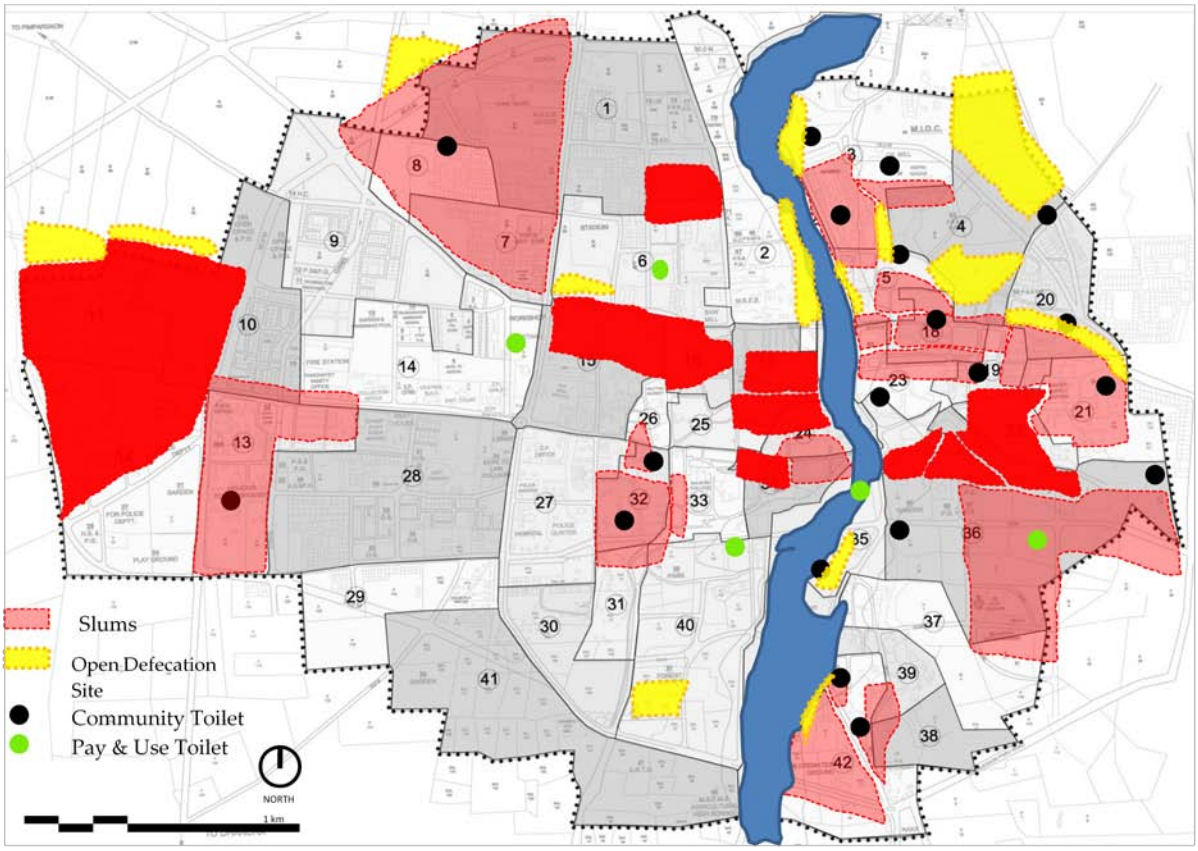
Chart 13 Coverage of toilets in city and Slums



Source: (CEPT University, 2009 - 2011)

Figure 6 Location of Community Toilets & OD sites

Figure 7 Location of Community Toilets & OD sites



Open defecation: Figure 7 provides the location of slum settlements across the city. The slum pockets which do not have any access to community or pay & use toilets are highlighted in red. Currently, there are 9 out of 20 slum pockets in the city which do not have access to community toilets. Also the pockets which have community toilets are poorly maintained. During the visit, a few open defecation sites were also identified in the city. The major Open defection sites are along the river and open land at the outskirts of the city.

There are approximately 7500 Households that do not have individual toilets in the city as the coverage of toilets is only 82%. In the slums only 4658 HHs have individual toilets out of total 17571 slums HHs. There are total 270 functional community toilet seats which can cater only 2160 HHs taking 40 persons/seat. Remaining population which doesn't have access to either individual toilets or community toilets resorts to open defecation. Though the census 2011 shows that only 9% HHs resort to open defecation, but a detailed calculation (Table 12) points out that approx. 19% of city's population don't have access to toilets. Hence, an estimated population of 27763 resort to open defecation. But after construction of toilets under ILCS (3100 toilets) and MSNA (1192 toilets) the open defecation will be reduced to around 4% i.e. estimated population of 5745.

Table 12 Open Defecation Calculations for Beed

	Description	Calculations	Number	After construction of toilets under ILCS and MSNA
A	Total HHs in city		28510	28510
B	HHs with individual toilets		20938	20938
B1	New Toilets under ILCS			3100
B2	New Toilets under MSNA			1192
B3	HHs with toilets after ILCS & MSNA	B3=B+B1+B2		25230
C	HHs without individual toilets	C=A-B3	7572	3280
D	Total functional community toilet seats		270	270
E	Estimated HHs dependent on these public use seats	E=D*8 HHs	2160	2160
F	HHs not having access to toilets	F=C-E	5412	1120
G	Estimated Population resorting to OD	G=F*5.13	27763	5745
H	**Percent of population resorting to OD to total population**	**H=G*100/A**	**18.98%**	**3.93%**

4.2 Moving towards Open Defecation Free Beed City

Given that Govt. of Maharashtra's major focus in urban sanitation has been towards **'making cities Open Defecation Free',** the performance improvement plan in sanitation for BMC has concentrated on the covering the gap in toilet coverage and related components (like IEC, awareness campaigns, etc.).

Based on the above analysis, various options have been worked out for provision of individual toilets; group & community toilets where constraints for providing individual toilets exist, construction of additional community toilets with refurbishment of existing ones wherever required can be explored. Refurbishment of non-functional community toilet seats will take around 0.27 Cr. The calculations are based on the assumption that toilets under ILCS and MSNA will be constructed by that time.

- **Option 1 is to keep the existing community toilets and refurbish non-functional community toilets serving 40 persons per seat.**
    - BMC can ensure ODF through refurbishing existing non-functional community toilet seats. Under this scenario, BMC will have to maintain its existing 270 functional and refurbish existing 260 non-functional community toilet seats. Assuming cost of Rs 10000 per seat to refurbish it, the total cost works out to Rs 0.27 Crores.
- **Option 2 is to keep the existing community toilets and provide group toilets with 5 HH/seat i.e. 25 persons per seat**
    - According to this option, along with maintaining existing functional community toilets, BMC can go for group toilet seats among groups of 5 HHs. BMC will have to construct 224 group toilet seats at Rs 50,000 per seat. The total cost works out to Rs 1.18 Crores.

- **Option 3 is to provide individual toilets to all households and not use community toilets**
    - BMC can alternatively look for the option of ODF through provision of individual toilets to the HHs without depending on community toilets. In this scenario, BMC has to construct approx. 1120 individual toilets at an average cost of Rs 25,000 per toilet. The total cost works out to Rs 2.94 Crores.

Table 13 Summary of options to make BMC ODF city

Sr. No.	Description	Calculations	Scenario 1 (community toilets)	Scenario 2 (group toilets)	Scenario 3 (individual toilets)
A	Total number of community toilet seats (functional)		270	270	270
B	Estimated Population resorting to OD		5745	5745	5745
C	Estimated HHs resorting to OD	C=B*5.13	1120	1120	1120
D	Non-functional community & pay & use toilet seats to be repaired		260	..	..
E	Total number of community toilet seats after refurbishing non functional community toilet seats	E=A+D	530		
F	HHs that would be served after refurbishing non functional seats	F=E*40	4240		
G	Number of new seats required	G=C/H	..	224	1120
H				(5HHs/seat)	(1 HH/seat)
I	Cost (Rs/seat with septic tank)		10000	50000	25000
J	Expenditure (in Cr)		0.26	1.12	2.80
K	IEC Activities at 5% of construction cost	L=5% of K	0.01	0.06	0.14
L	**Total**	**M=K+L**	**0.27**	**1.18**	**2.94**

By analyzing the three scenarios in Table 13, option 1 is more feasible in which the option is to keep and maintain existing functional community toilets and refurbish non-functional community toilets. As discussed, the estimated OD population is around 5745 for which 144 additional seats are required. But the city already has 260 non functional community toilet seats which can cater this OD population and still city will have additional 116 refurbished seats which will help to cater future population or can reduce the ratio of 40persons/seat to 30 persons/ seat.

Awareness Campaigns: The Council must also simultaneously undertake community mobilization and awareness campaigns in order to ensure that the community toilet blocks are maintained/ managed properly. Campaigns to bring about awareness related to cleanliness and hygiene practices, safe sanitation practices and negative health impacts due to open defecation needs to be conducted by the Council. The campaigns should begin by

triggering initiation in the slum settlements and undertaking transect walk to the open defecation sites to highlight the above issues.

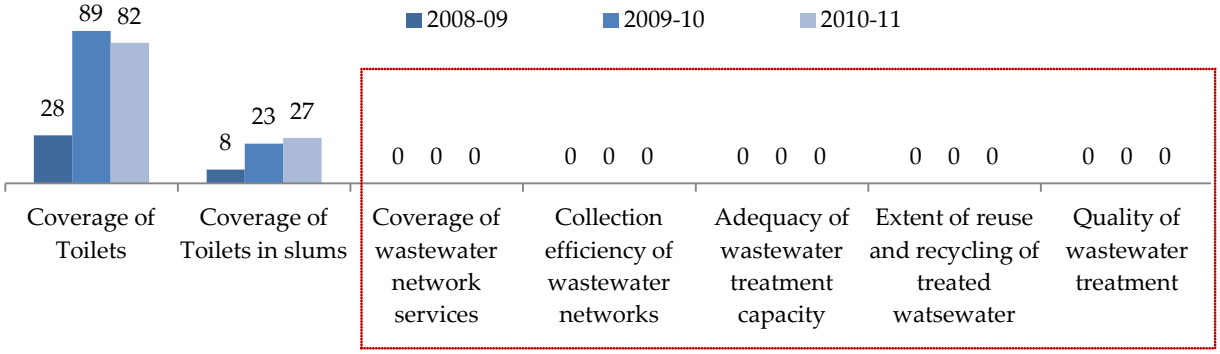
4.3 Septage and sullage management

According to Census 2011, most of the properties with toilets have disposal system through Septic tanks. As there is no underground sewer network in Beed, around 79.4% of toilets have Septic tank.

All the waste water is collected through a network of open drains. This waste water is then disposed off in the river without any treatment.

The maintenance of these drains is also an issue. As these drains are open, solid waste generated often finds its way into these drains and ultimately blocks the flow of waste water. Also there are toilets which dispose the excreta directly in to the open drains as they don't have any onsite sanitation system. This undesirable situation needs immediate attention.

Chart 14 Waste water KPIs of Beed



Source: (CEPT University, 2009 - 2011)

Collection of Septage: BMC provides service for cleaning septic tank in Beed. The charges for emptying the septic tank within city limits and outside the city limits are Rs 3000. The city doesn't have any treatment facility for the Septage collected. The Septage is disposed on open dumps without treatment.

Treatment/Disposal: As discussed earlier and in Chart 14, there is no sewerage network; hence no collection, treatment and safe disposal facility for waste water in Beed. All the waste water is collected through a network of open drains and is disposed off in the river without any treatment. While the Septage collected from septic tanks are disposed on open dumps.

Strom water drainage network: There is no provision of covered drains in Beed. The length of open drainage network is around 260 kms, which covers almost 100% area of the city.

BMC staff cleans these drains whenever needed. No private contracts are given for cleaning of these drains. It is also observed that there is no proper schedule for maintenance of open drains. They are generally cleaned before & after monsoons. The drains in Beed are lined properly barring few slum areas where the condition needs urgent attention.

Proposals for Improvement: BMC needs to undertake initiatives to implement proper Septage management plan as the city doesn't have underground sewerage network. The only way of waste disposal is through septic tanks.

Table 14 Waste water system in Beed

<table>
<tr><th></th><th>Generation Point</th><th>Collection & Transmission</th><th>Treatment</th><th>Reuse & Recycle</th><th>Disposal</th></tr>
<tr><td rowspan="2">Fecal Sludge Disposal</td><td>Coverage of Toilets : 82%</td><td rowspan="2">The ULB has its own vacuum machine to clean septic tanks
• No. of Machine: 1
• Charges within city limit: Rs 3000
• Charges outside city limit: Rs 3000</td><td rowspan="2">No treatment of Septage waste</td><td rowspan="2">No Reuse of Septage waste</td><td rowspan="2">Sludge is disposed in a trenching ground within the MSW dumping area.</td></tr>
<tr><td>Coverage of individual toilets in slums: 27%
• No. of slum HHs – 87856
• Number of individual toilets in slums: 4658
• Total community toilet seats: 530
o Functional: 270
o Non Functional: 260
• Total Pay & Use toilet seats: 35</td></tr>
<tr><td rowspan="2">WW & SWD Disposal</td><td rowspan="2">• Cost per toilet seat:
o Individual toilet + septic tank: Rs 25000
o Community Toilet with septic tanks: Rs 100000</td><td rowspan="2">• No sewer network
• The sullage waste is transported through Open drains</td><td colspan="2">No STP in the city</td><td rowspan="2">The sullage water is directly disposed off in the river</td></tr>
<tr><td>No treatment of sullage waste water</td><td>No reuse of sullage waste water</td></tr>
<tr><td>Projects</td><td>• 3100 individual seats have been sanctioned under ILCS
• 1192 more are under pipeline under MSNA</td><td colspan="4">Proposal for new sewerage network has been submitted to GoM but not yet sanctioned</td></tr>
<tr><td>PSP</td><td></td><td>No Private Sector Participation for cleaning of septic tanks</td><td></td><td></td><td></td></tr>
</table>

Govt. of India's Draft of Advisory on Septage Management in Indian cities (MoUD, 2011) further states that pumping programs that focus on routine inspection and pumping when required (rather than mandated periodic pumping) are most efficient. This is because

households generate varying volumes of sludge at different rates. It also mentions that prior to sending the trucks for de-sludging, the service provider (local government/private operator) can consider sending an inspection crew to inform the residents of such activity, locate manholes and access points, and probe tanks to determine level of accumulated sludge. One simple means of gauging sludge depths is by using a probe on a long handle and submerge into the tank. The policy states that the standard practice in India is to de-sludge every two years or so. Community run programs such as distribution of flyers about proper care and maintenance of septic tanks would also help build awareness among people. Some of the aspects that the Septage Management Plan should undertake include:

- **Manual of Practice:** Listing operation procedures for specific equipment and documenting day to day procedures
- **Record keeping and manifests:** Maintain accurate records related to septic tanks and volume pumped for billing and compliance purposes. These records should specify location or address of the pumped septic tank, Septage characteristics (residential/commercial), details of property owner, volume of Septage pumped, any other details like deficiencies in piping/ manholes, etc.

Record keeping is an important part of the monitoring aspect as it allows the local government to keep track of the service it provides.

Improvement in Monitoring: The Septage management plan will include estimation of Septage generated in the city, increased provision of public services to cater to safe disposal of Septage, encourage private operators and community based organizations to provide services like emptying of septic tanks, monitor emptying and tracking operator activities, and provide health and safety guidelines for the operators (MoUD, 2011). The Council will need to regularly monitor the effluent and dried Septage quality. Additionally, the state government on its part needs to ensure that the current policies are amended to support and require local governments to improve sanitation, reorganize and clarify institutional roles and responsibilities.

4.4 Sewerage project under UIDSSMT

As mentioned, the city doesn't have any facility of underground sewerage. Majority of the town has surface drainage system which was built on need basis and extended without proper design. The underground sewerage project under UIDSSMT for Beed city was designed after a detailed survey of HHs and the topography of the city. The city was divided into three districts for provision of underground drainage network. District I & I are on right side while District III is on left side of the river. The system was designed for the year 2031 as ultimate stage and year 2016 as intermediate stage. The proposed scheme consisted:

- Lateral, sub-branches, branches
- Sub-trunk and trunk main
- Common sump well and pump house

- Pumping Machinery
- Rising main from sump well to Waste Stabilization Pond
- Waste Stabilization Pond (facultative type)

The total cost of the project was Rs 1396.15 Lakhs. The contribution for project funding was 80%, 10% and 10% by GoI, GoM and BMC share respectively. The proposal was made in 2008 but the project was not sanctioned due to some technical reasons. The council has put this proposal under Nagarothan and is waiting for its approval.

4.5 Summary of proposed actions

The following interventions are proposed based on discussions with the Council, and analysis of the key indicators and their data reliability. The proposal listed below to make BMC open defecation free is based on experiences and constraints faced in current management of toilet options. Extensive awareness campaigns must also be conducted to ensure achievement of being open defecation free.

Option of maintaining 'functional' seats and refurbishing 'non-functional' seats of community toilets is considered here to make BMC Open defecation free City. After a detailed ground level survey, the non functional community toilet seats can be refurbished in two stages. The first stage can cater existing OD population by refurbishing 144 non functional seats (out of 260). In the second stage, BMC can refurbish remaining non functional seats. BMC also has to prepare a Septage Management Plan to ensure safe and proper disposal of Septage and streamline its operations.

Table 15 Summary of improvement actions for Sanitation in BMC

Activity	Status/ Next steps	Description
Strategies for ODF	Preparation of DPR	• Refurbishing existing Non-functional community toilet seats
	IEC Campaigns	• Undertake IEC activities • Undertake transect walk to the open defecation site • Targeting for the change in the mindset and behavioural pattern of the people.
Strategies for Septage Management	Preparation of Septage Management Plan and DPR	• Preparation of Septage Management Plan for the city till the underground drainage system project is not constructed. • Systematic implementation of comprehensive Septage management plan.
	Human & material resource improvement and procurement	• Need to improve the fleet capacity for inspection facilities and efficient working of the Septage management. • Procurement of machinery and resources as per the requirement of the Septage management plan.

5. SUMMARY OF PERFORMANCE IMPROVEMENT PLAN FOR BEED

This section provides summary of all the improvement actions for water supply and sanitation, including costs of implementing these actions. The section also gives insight into the policy as well as institutional implications along with the phasing of the improvements that have been proposed.

5.1 Summary of proposals

The proposals summarized below are focused on two key areas of establishing 24X7 water supply system and moving towards open defecation free BMC, as well as improvements in key processes and operations related to these two focal areas.

Based on the analysis of the water and sanitation sectors in Beed, the Performance Improvement Plan for BMC has been summarized in Table 16. The total PIP cost for BMC will be Rs. 19.93 Crores.

Table 16 Summary of Performance Improvement Plan for BMC

Key actions for improvement	Costs required	Current status
Water supply: towards 24X7 system		
Planning and implementation of 24X7 for entire city	Rs. 19.66 Crores (Table 11)	Preparation of DPR is required for 24x7
		Water audit and energy audit is at draft stage
		Need to conduct technical surveys like Hydraulic modeling, GIS mapping, Consumer survey
Sanitation: towards OD free		
Refurbishing non-functional community toilets (including IEC costs)	Rs. 0.27 Crores (Table 13)	Ground level survey
Total cost of PIP		**Rs. 19.93 Crores**

BMC also has to undertake improvement actions related to processes followed in the water supply and sanitation operations. These actions being no or low cost can be immediately taken up by the Council. These include

- Regularizing un-authorized connection
- IEC campaigns
- Appoint technical staffs
- Periodic surveys at source, treatment and consumer end
- Proper sampling regimen for monitoring water quality
- Levy telescopic rates for water supply
- Regular surveys through zonal sanitary inspectors
- Preparation and implementation of Septage Management Plan

- Increase complaint redressal system with systematic computerized record keeping of complaints received and redressed.

5.2 Phasing and steps to improvement

BMC has to improve its current financial position in order to carry out the improvements suggested above. The suggestions for improvement are based on analysis of the Business-as-usual (BAU) and interventions required to improve the BAU scenario.

Investment capacity in BAU scenario: The BAU scenario is based on the hypothesis that the past trends in key financials of the BMC would continue in the future. Based on such assumption the key financials of the council have been projected and the investible surplus has been determined. Table 17 provides the investment capacity of BMC in business-as-usual scenario projected till 2021-22. From the assessment of BAU it was observed that currently BMC does not have any investible surplus to consider improvements in the performance of service delivery.

Table 17 Projected investment capacity - Business As Usual (BAU) scenario (Rs. In Crores)

Year	Revenue surplus (other than WS, WW and SWM)	Revenue surplus for WS, WW and SWM	Debt servicing	Capital surplus	Investible surplus/ (need for external funds)
Budgeted					
2010-11	4.63	-6.12	-	3.55	2.06
2011-12	5.17	-8.14	-	2.3	-0.67
Estimated					
2012-13	5.27	-5.88	2.43	-1.81	-4.85
2013-14	5.36	-5.65	2.20	-2.03	-4.51
2014-15	5.44	-5.35	1.96	-2.25	-4.12
2015-16	5.51	-4.97	-	-2.47	-1.93
2016-17	5.55	-4.49	-	-2.69	-1.63
2017-18	5.58	-3.90	-	-2.92	-1.24
2018-19	5.58	-3.18	-	-3.14	-0.74
2019-20	5.56	-2.30	-	-3.37	-0.11
2020-21	5.51	-1.25	-	-3.59	0.67
2021-22	5.43	0	-	-3.82	1.62
Source: (CRISIL Advisory Services)					

From the Table 17 it is clear that unless BMC is able to add to its revenue income, it would need to depend on external funding just to finance its operations and routine capital expenditure.

As the project for water supply under UIDSSMT is under implementation, it would be important to consider the additional revenue and incremental O&M for the project after its completion to get more accurate scenario of investible surplus. The information regarding the operation and maintenance cost and additional revenues have been simulated using the assumptions provided in Annex 5. Table 18 provides the revenue and cost implications of the UIDSSMT project under implementation and the investible surplus considering the net effect of the project. As seen from Table 18, BMC will have net investible surplus from 2015-16 after incorporating impact of UIDSSMT.

Table 18 Investible surplus incorporating the net impact of UIDSSMT project under implementation-Scenario I (Rs. In Crores)

Year	Investible surplus	Incremental revenues	Incremental costs	Net effect	Net investible surplus
Budgeted					
2010-11	2.06	-	-	-	-
2011-12	-0.67	-	-	-	-
Estimated					
2012-13	-4.85	-	-	-	-4.85
2013-14	-4.51	0.48	0.05	0.43	-4.08
2014-15	-4.12	1.18	0.05	1.13	-2.99
2015-16	-1.93	2.17	0.06	2.11	0.18
2016-17	-1.63	3.54	0.09	3.45	1.82
2017-18	-1.24	5.43	0.14	5.29	4.05
2018-19	-0.74	8	0.21	7.79	7.06
2019-20	-0.11	11.48	0.3	11.18	11.07
2020-21	0.67	16.14	0.42	15.72	16.39
2021-22	1.62	22.37	0.58	21.79	23.41
Source: (CRISIL Advisory Services)					

Investment capacity after revenue enhancement measures

It is extremely critical that BMC undertakes revenue enhancement measures or otherwise it would need to resort to external resources to fund its internal operations as well. Some of the steps that can be taken to increase revenue are as follows:

1) Increase in property tax collection efficiency
2) Increase in water supply tariff
3) Increase in collection efficiency for water charges

The above actions do not require capital investments for implementations and need only process changes. To simulate the effect of the above changes in the investment capacity the following assumptions have been made.

Table 19 Assumptions for simulation of revenue enhancement

S. No.	Item	Assumption
1	Property tax	Current collection efficiency: 74%[1] Targeted collection efficiency: 95%
2	Increase in water supply tariff	Based on the proposed tariff
3	Increase in collection efficiency of water charges	Current collection efficiency: 75% Targeted collection efficiency: 95%

Table 20 presents the incremental revenues because of the revenue enhancement measures.

Table 20 Investible surplus after revenue enhancement actions-Scenario II (Rs in Crores)

Year	Investible surplus	Increment due to improvement in property tax collection	Increment due to tariff revision and improvement in water charges collection	Net investible surplus
Budgeted				
2010-11	2.06	-	-	-
2011-12	-0.67	-	-	-
Estimated				
2012-13	-4.85	-	0.52	-4.33
2013-14	-4.51	0.21	0.99	-3.31
2014-15	-4.12	0.45	1.58	-2.09
2015-16	-1.93	0.71	2.33	1.11
2016-17	-1.63	1.01	2.82	2.20
2017-18	-1.24	1.34	3.25	3.36
2018-19	-0.74	1.42	3.75	4.44
2019-20	-0.11	1.50	4.33	5.72
2020-21	0.67	1.59	4.99	7.26
2021-22	1.62	1.69	5.76	9.07
Source: (CRISIL Advisory Services)				

As currently BMC does not levy any sewerage/ sanitation tax or user charges, BMC may also consider imposing charges for solid waste management and sanitation services for further enhancement in investible surplus. Along with revenue enhancement measures BMC may also take up actions for expenditure optimization.

An additional scenario has also been worked for revenue enhancement of BMC, which includes both, first - actions taken under scenario I which includes implementation of UIDSSMT project, increase of connections & revenues and second - incremental costs & actions considered under scenario II.

[1] *The actual property tax collection efficiency for Beed is not available. Here, it has been considered that in sync with the actual water charge collection efficiency of Beed.*

Table 21 Investible surplus after revenue enhancement actions – Scenario III (Rs. In Crores)

Year	Investible surplus	Incremental costs due UIDSSMT Project	Additional revenues after implementation of UIDSSMT project and increase in water tariff and collection efficiency	Increment due to improvement in property tax collection	Net investible surplus
Budgeted					
2010-11	2.06	-	-	-	-
2011-12	-0.67	-	-	-	-
Estimated					
2012-13	-4.85	-	0.52	-	-4.33
2013-14	-4.51	0.05	1.1	0.21	-3.25
2014-15	-4.12	0.05	1.98	0.45	-1.74
2015-16	-1.93	0.06	3.27	0.71	2.00
2016-17	-1.63	0.09	4.44	1.01	3.73
2017-18	-1.24	0.14	5.73	1.34	5.69
2018-19	-0.74	0.21	7.41	1.42	7.88
2019-20	-0.11	0.3	9.57	1.5	10.67
2020-21	0.67	0.42	12.37	1.59	14.21
2021-22	1.62	0.58	15.98	1.69	18.70
Source: (CRISIL Advisory Services)					

The PIP improvements for BMC have been proposed in 3 phases:

- Phase I: Immediate interventions (2013-2014)
- Phase II: Midterm interventions (2015-17)
- Phase II: Long Term Interventions (from 2018-2020)

Phase I: Immediate interventions (from 2013 - 2014):

The interventions mentioned above to augment revenue as well as process improvements which don't require capital investment are proposed to begin in 2013. This will include interventions such as regularizing illegal connections, improving reliability of information through better formats, appoint technical staff, undertake surveys, etc as well as initiatives such as increasing collection efficiency of charges, introducing drainage tax, etc.

As discussed, BMC can complete the required activities like consumer surveys, GIS mapping, Hydraulic modelling, etc which are ongoing projects to move towards 24x7 water supply by 2013-14.

BMC can undertake detailed on ground survey of existing toilets and non-functional community toilets in 2013-14. The condition in Pay & Use toilets is comparatively better than those of community toilets. Hence for the O&M of the community toilets arrangements with CBOs for O&M can be explored. BMC should also prepare Septage management plan and start its implementation in pilot zones in Phase I.

Once the revenue augmentation measures and process improvements are in place, it is proposed that BMC can begin its capital intensive projects in Phase II and Phase III.

Phase II: Midterm interventions (from 2015 - 2017)

- **Water Supply:** Once the ongoing UIDSSMT project is completed, BMC can initiate creation of pilot DMAs in 2015. BMC should also install bulk flow meters and consumer end meters to all connections from 2015 to 2017, so that BMC can levy telescopic rates in water supply from 2015 onwards to achieve better cost recovery. BMC should also initiate 24x7 water supply in pilot zone in 2016-17.
- **Sanitation:**

  Refurbishment of existing non functional community toilets: Once the detailed survey is done in Phase I, according to option 1 discussed in Table 13 for ODF Beed, BMC can refurbish its 144 (out of 206) non-functional community toilet seats in 2015-16 to cater the OD population and remaining non functional community toilet seats out of 260 in 2016-17. BMC can also start with implementation of Septage Management Plan at city level in this phase.

  - **Building awareness on safe sanitation practices:** Campaigns to bring awareness related to cleanliness and hygiene practices and the negative health impacts due to open defecation need to be conducted by the Council. The campaigns should begin by triggering initiation in the slum settlements and undertaking transect walk to the open defecation sites to highlight the above issues.

Table 22 PIP for BMC Phase I of (2013-2014), Phase II (2015-2017) and Phase III (2018-2023)

Proposed Improvement areas	2014	2015	2016	2017	2018	2019	2020
Water supply	**Phase I**	**Phase II**			**Phase III**		
Regularizing un-authorized connection							
Appoint technical staffs							
Periodic surveys at source, treatment and consumer end							
Proper sampling regimen for monitoring water quality							
Conduct consumer survey for entire city							
Undertake hydraulic modeling for the entire water supply network							
Installation of bulk flow meters and meters at consumer end							
Distribution network augmentation: creation of pilot DMAs							
Levy telescopic rates for water supply							
24x7 Water supply system for the city							
Sanitation (including sewerage)							
Regular surveys through zone sanitary inspectors							
Preparation of Septage Management Plan and Implementation in pilot zone							
Ground level survey & preparation of DPR for refurbishment of community toilets							
Implementation of Septage Management Plan at city level							
Refurbish existing non-functional community toilets							

Phase III: Long term interventions (from 2018 - 2020)

Once the above measures of Phase II are in place, BMC can begin implementation of 24X7 for the entire city from 2018. BMC can also start with implementation of Septage Management Plan at city level

If BMC increases its investible surplus by enhancing revenue and increased income from UIDSSMT project (Table 21), then BMC will not have to depend on external funding for its PIP actions. The cost which will incurred in 24x7 WS and ODF can then be adjusted from its own surplus.

Table 23 Funding for PIP actions

Performance Improvement Actions	2015	2016	2017	2018	2019	2020
Implementation of 24X7 system for BMC	1.73	3.58	3.58	3.58	3.58	3.58
Open Defecation Free City	0.27					
Investible surplus after increasing the revenue	2.00	3.73	5.69	7.88	10.67	14.21
External funds required	No funding required					
Reference from Table 11and Table 13						

5.3 Institutional imperatives to achieving proposed improvements

In order to realise the targets set for improving water supply and sanitation in BMC, the existing institutional framework must be enhanced to enable better operation and management of these services. While in certain areas, it is the lack of a defined policy restricting provision of services, in other instances it is the improper regulation of the existing policies. BMC has to focus its attention on improving policies related to services, financial sustainability, and accountability to the consumers.

Augment staff at BMC: BMC needs to augment its staff as major percentage of the staff comprises non-technical personnel. Across all sectors, BMC require senior management staff for efficient working of these services.

Mobilisation of external support: Additionally, BMC needs to mobilise external support through NGOs and CBOs in project formulation and implementation, especially related to services of water supply and sanitation in slums. Given that the implementation of proposals related to 24X7 WS requires high technical skills, BMC needs to also bring external support through Project Management Consultants. Arrangements should be made with Project Management Consultants for continued support throughout implementation of the 24X7 project, both immediate and long term.

A summary of the institutional reforms that BMC needs to undertake are given below.

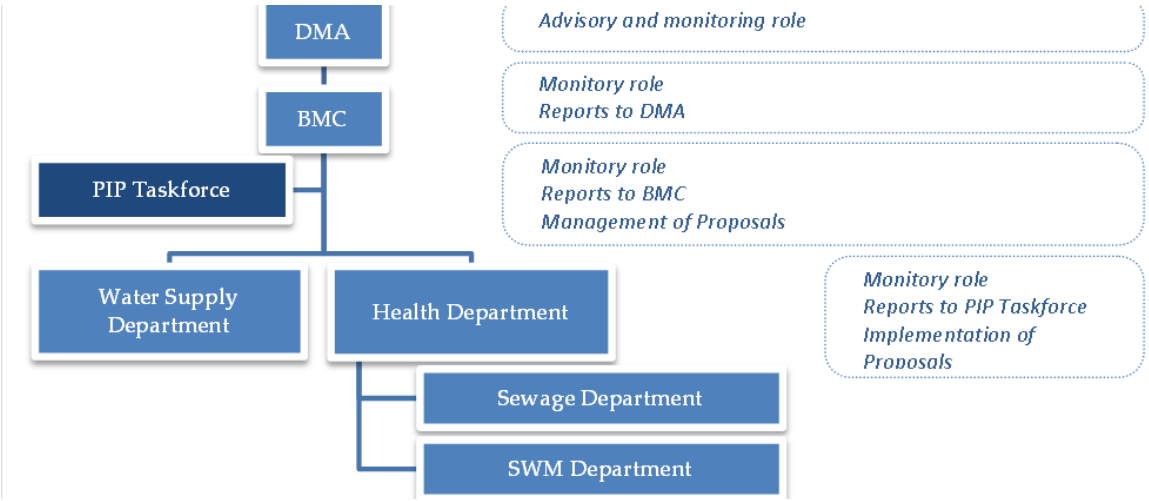
Table 24 Institutional improvements proposed for BMC

Area of improvement	Suggested improvements
Across all sectors	
Human resource management	BMC needs to augment its technical staff in view of proposed projects like 24X7 water supply system and open defecation free BMC.
Equity in service delivery	Reform institutional arrangements to target and monitor improvement of services in slum settlements.
Financial sustainability	Increase in water supply tariffs, provisions to introduce tariff for SWM and Septage management as per Septage management plan.
Consumer redressal system	BMC to maintain records of customer complaints and redressal for all the services and gradually shift to computerised system.

The Council has to also form a PIP taskforce in order to ensure proper implementation of the proposed projects. This is discussed below.

Constitution of the PIP taskforce: The first step towards implementation of the proposed projects is to constitute a PIP taskforce. The taskforce should comprise managerial and technical staff from water supply and sanitation department. This can also include resource persons with experience in implementing continuous water supply systems as this involves advanced technical skills. The Council must legally mandate the PIP taskforce with implementing the proposed projects. Appropriate budget provisions should be made to properly manage the taskforce. The responsibilities of the taskforce will include quarterly progress updates to Chief Officer and General Body, and annual progress reports to the Urban Development Department (UDD). A broad schematic chart of the institutional

Chart 15 Institutional structure for PIP implementation



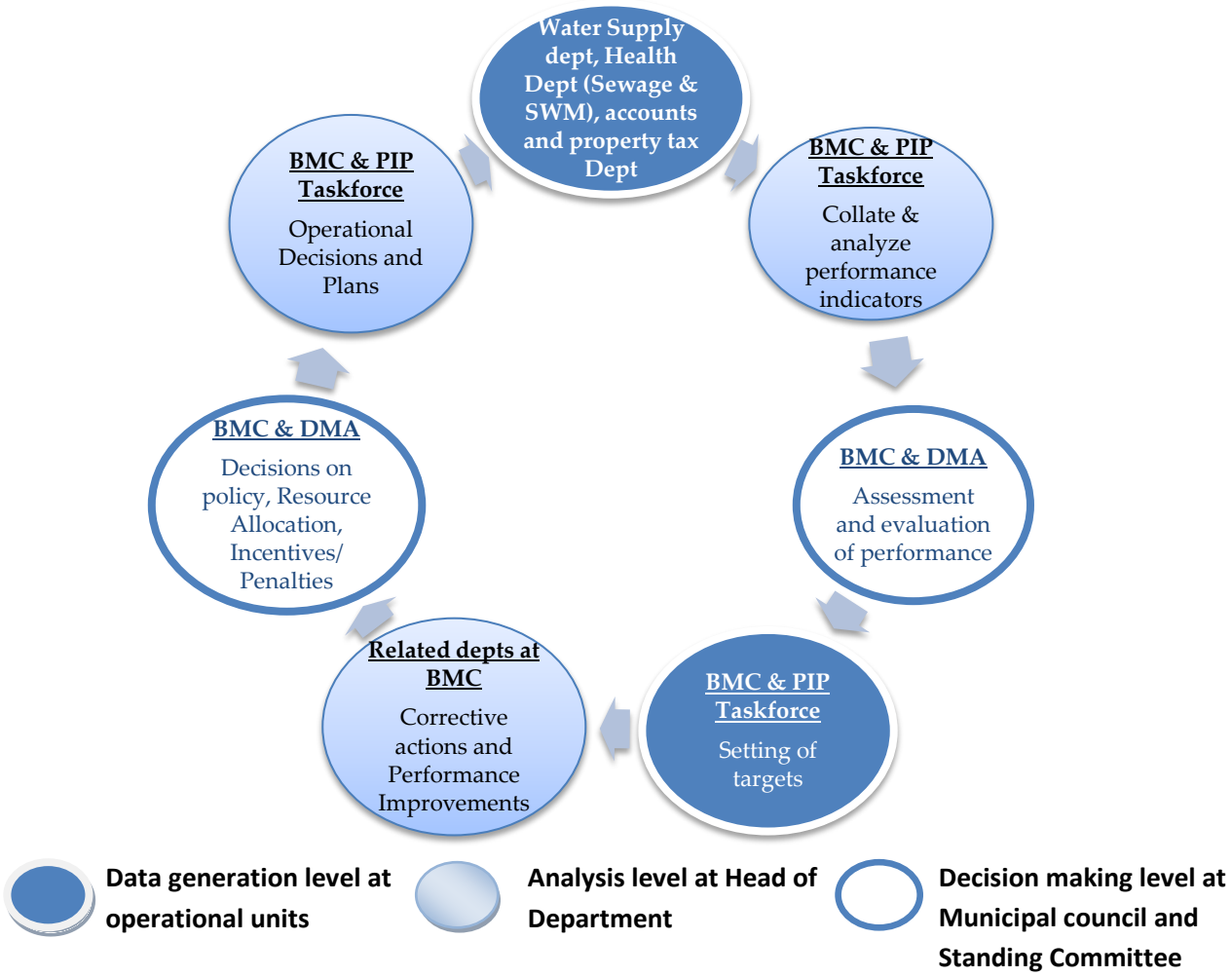
structure is shown below.

Performance monitoring through regular setting of targets and use of performance indicators: In order to ensure that BMC is able to achieve the performance improvement proposals outlined above, it is necessary that it has a well structured monitoring framework in place. The monitoring aspects will include

- Timely data capture and analysis of performance indicators
- Assessment and evaluation of the progress
- Setting of targets and corrective action if required
- Decisions on policy, resource allocation and incentives/ penalties
- Operational decisions and plans

As the performance improvement proposals are phased from 2013 till 2020, it is necessary for BMC to ensure that through the above process, the targets set for each year is achieved and if required corrective measures need to be incorporated. This will be possible only if the information related to performance indicators are updated and analysed regularly. Similarly, policies to provide incentives and penalties based on their performance needs to be implemented. A possible performance monitoring framework is suggested below.

Chart 16 Performance monitoring framework proposed for BMC (*Adapted from MoUD)*



Website: http://www.urbanindia.nic.in/programme/uwss/slb/slb.htm

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Annexes

Annex 1 List of Slum settlements in Beed (1999)

Sr No	Ward Name/ No.	Slum name	Owner-ship	Total Population	No of HHs	No. of Individual Toilet	No of Community toilet blocks	No of Seats in community toilet	No of Functional seats in community toilets	No of pay & use toilet blocks	No of seats in pay & use toilet blocks
1	1	Balepeer	Private	7233	1292	80	0	0	0	0	0
2	2	Satwaimaidan, Shahunagar	Private	3013	538	47	0	0	0	0	0
3	3	Malives,Maligalli, Bundelpura, Bhaji Mandi, Kabadgalli, Satwaimaidan Road	Private	3479	621	45	0	0	0	0	0
4	4	Lohargalli, Chavan Galli,Thigale galli	Private	1614	288	43	0	0	0	0	0
5	5	Mondha Mashurshaha Darga	Private	3200	571	60	1	10	2	0	0
6	6	Kalahanumanthana, Karimpura, Shukarwarpeth	Private	3131	559	44	1	20	2	0	0
7	7	Balbhimnagar, Lonarpura	Private	2361	422	46	2	40	15	0	0
8	8	Shanivarpeth, Harijanwada, Nagobagalli, Backside of Kharibawadi	Private	4175	746	65	1	16	4	0	0
9	9	Khadakpura, Bhoiwada, Chambarwada	Private	3618	646	50	1	10	2	0	0
10	10	Subhashnagara, Majalgaonkar Math	Private	4383	783	57	0	0	0	1	10
11	11	Islampura, Bhaldarpura	Private	2783	497	57	1	20	3	0	0
12	12	Mominpura, Dhorawada	Private	4175	746	45	3	30	4	0	0
13	13	Ashoknagar, Dhage Colony	Private	4801	857	51	3	30	3	0	0
14	14	Khasbaag	Private	4175	746	40	1	10	10	0	0
15	15	Maligalli, Azizapura	Private	4035	721	75	0	0	0	0	0
16	16	Hattikhana	Private	4314	770	35	0	0	0	0	0
17	17	Rajurivase Dhandgalli	Private	4453	795	30	0	0	0	0	0

18	18	Backside of Housing Board Colony, Indira nagar	Private	3757	671	51	1	10	2	0	0
19	19	Mochipura, Saalgalli	Private	1739	311	18	1	10	0	0	0
20	20	Barshi Road of Barshi Naka	Private	2365	422	42	0	0	0	0	0

Annex 2 Consolidated statement of loans as on 31st April 2010 (Rs. Lakh)

S. No.	Loan amount	Interest rate	Outstanding amount
1	2.18	6.75%	2.18
2	23.80	11.50%	23.80
3	8.475	13.50%	8.48
4	16.81	12.50%	16.81
5	548.71	13.00%	548.71
6	19.00	8.50%	19.00
7	45.00	10.25%	45.00
8	8.00	12.00%	8.00
9	3.50	14.00%	3.50
10	13.37	15.00%	13.37
11	4.92	15.35%	4.92
12	173.50	10.50%	86.18
Total	**867.3**		**779.9**
Source: Budget documents of Beed Municipal Council, (CRISIL Advisory Services)			

Annex 3 Capital Income (in Crores)

Item	2005-06 (A)	2006-07 (A)	2007-08 (A)	2008-09 (A)	2009-10 (A)	2010-11 (B)	2011-12 (B)
Slum development	2.14	2.76	1.15	0.45	0.3	1.95	1.75
Roads and city development grants	1.68	2.62	1.86	2.92	7.73	8.5	4.5
UIDSSMT water supply scheme	0	0	9.34	0	9.34	3	8.79
Sujal Nirmal Yojana	0.06	0	0.04	0	2.25	2	2
Other grants	1.31	4.8	4.49	4.72	13.76	4.6	3.35
Total	**5.19**	**10.18**	**16.88**	**8.09**	**33.38**	**20.05**	**20.39**

Annex 4 Capital Expenditure (in Crores)

Items	2005-06 (A)	2006-07 (A)	2007-08 (A)	2008-09 (A)	2009-10 (A)	2010-11 (B)	2011-12 (B)
Road development and drains	0.84	1.81	1.6	2.44	9.42	6.05	2.05
Slum development	1.25	2.58	0.16	0.43	0	1.5	1.5
UIDSSMT water supply project	0	0	0	10.36	10.76	3	8.79
Other capital works	1.3	0.34	3.62	2.28	9.41	5.96	5.76
Total	3.39	4.73	5.39	15.52	29.59	16.51	18.1
Capital utilization	65%	46%	32%	192%	89%	82%	89%

Annex 5 Assumptions for simulation of impact of Water Supply UIDSSMT project under implementation

S. No.	Item	Assumption
1.	Design population	3,78,156
2.	Current population (2011)	1,46,237
3.	Current coverage of water supply	42%
4.	Current covered population (2011)	61,420
5.	Targeted coverage of water supply	100%
6.	Annual revenue increase targeted	30%
7.	O&M expenses as a % of capex	1.5%

Annex 6 Revenue income and expenditure of water supply system (in Rs Crores)

Items	2005-06 (A)	2006-07 (A)	2007-08 (A)	2008-09 (A)	2009-10 (A)	2010-11 (B)	2011-12 (B)	CAGR (A)	% share (A)
Revenue Income									
Water tanker fees	0.00	0.00	0.07	0.00	0.00	0.01	0.01	10%	1%
Private water connection fees	0.00	0.00	0.00	0.00	0.02	0.01	0.01	55%	0%
Private water connections - water charges	1.10	1.11	1.52	1.52	2.91	3.00	3.00	27%	98%
Water supply connection form fees	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	0%
Road cutting charges	0.00	0.00	0.00	0.00	0.01	0.01	0.01	28%	0%
Regularisation of illegal connections fees	-	-	0.02	-	-	-	-	0%	1%
Total	1.11	1.12	1.61	1.53	2.93	3.02	3.02	28%	
Revenue Expenditure									
Administrative and Establishment expenses	0.24	0.26	0.29	0.30	0.30	0.30	0.40	6%	13%

Bulk water	0.09	0.17	0.06	0.02	0.04	0.05	0.05	-16%	4%
Energy expenses	0.51	0.84	0.60	0.89	0.26	1.50	1.50	-15%	29%
Other O&M expenses	2.07	1.35	0.84	0.77	0.79	1.44	1.44	3%	54%
Interest payment	-	-	-	-	-	-	-	0%	0%
Miscellaneous expenses	-	-	-	-	-	-	-	0%	0%
Total	2.90	2.62	1.78	1.99	1.4	2.99	3.09	-17%	
Operating Ratio for water supply	262%	235%	111%	130%	48%	99%	102%		
Per Capita expenditure on water supply in Rs/ capita	205	183	124	138	96	205	210		

Annex 7 Capital income and expenditure of water supply system (in Rs Crores)

Particulars	2005-06 Actuals	2006-07 Actuals	2007-08 Actuals	2008-09 Actuals	2009-10 Actuals	2010-11 Budgeted	2011-12 Budgeted
Capital Receipts							
State scheme grants							
Water supply scheme	0.06	0.00	0.04	0.00	2.25	1.00	1.00
Sujal nirmal yojana	0.00	0.00	0.00	0.00	0.00	1.00	1.00
Central scheme grants							
UIDSSMT	0.00	0.00	9.34	0.00	9.34	3.00	8.79
External funds	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Others							
Dalit wasi water supply - grant	0.74	2.15	1.10	1.50	8.80	2.00	2.00
Total	**0.80**	**2.15**	**10.48**	**1.50**	**20.39**	**7.00**	**12.79**
Capital Expenditure							
Capital work in progress							
UIDSSMT scheme expenditure	0.00	0.00	0.00	10.36	10.76	3.00	8.79
Sujal nirmal scheme	0.00	0.00	0.00	0.00	0.00	1.00	1.00
Others	0.84	0.25	0.21	0.14	2.43	1.30	1.35
Total	**0.84**	**0.25**	**0.21**	**10.49**	**13.19**	**5.30**	**11.14**
Surplus/Deficit	**-0.04**	**1.9**	**10.27**	**-8.99**	**7.2**	**1.7**	**1.65**

Annex 8 Tariff statement for Beed- Water Supply[2]

Year	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010
Domestic Rs/KL	1000/ Annum	1500/ Annum	1500/ Annum	1500/ Annum	1500/ Annum	1500/ Annum
Non-Domestic Rs./KL	--	--	--	--	17.50 / KL	17.50 / KL
Commercial Rs./KL	--	--	--	--	--	--
Industrial Rs./KL	--	Rs 15 / KL	Rs 15 / KL	Rs 15 / KL	Rs 39 / KL	Rs 39 / KL
Source: **(CRISIL Advisory Services)**						

[2] *Source: www.mahaurban.org*

The Performance Assessment System (PAS) Project

The PAS Project aims to develop appropriate methods and tools to measure, monitor and improve delivery of water and sanitation in cities and towns in India. The PAS Project includes three major components of performance measurement, performance monitoring and performance improvement. It covers all the 400+ urban local governments in Gujarat and Maharashtra.

CEPT University has received a grant from the Bill and Melinda Gates Foundation for the PAS Project. It is being implemented by CEPT University with support of Urban Management Centre (UMC) in Gujarat and All India Institute of Local Self-Government (AIILSG) in Maharashtra.

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