



Performance Improvement Plan for Parbhani

Prepared by:

CEPT University and AIILSG in consultation with Parbhani Municipal Council
2012

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Prepared by:

Centre for Environmental Planning and Technology (CEPT) University
and

All India Institute of Local Self Government (AIILSG)

in consultation with

Parbhani Municipal Council (PMC), Parbhani

2012

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ABBREVIATIONS

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ABBREVIATIONS

AIILSG	All India Institute of Local Self Government
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
MCI	Municipal Council
MLD	Million Litres per Day
MoUD	Ministry of Urban Development
MSW	Municipal Solid Waste
Na	Not applicable
Nd	No data
NMC	Nagpur Municipal Corporation
NP	Nagar Panchayat
NRW	Non-Revenue Water
O & M	Operation and Maintenance
PAS	Performance Assessment System
RDF	Refuse Derived Fuel
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

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EXECUTIVE SUMMARY

The preparation of this Performance Improvement Plan (PIP) for water supply and sanitation has been led by the Parbhani Municipal Council (PMC) 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: Parbhani Municipal Council in Maharashtra having population of approx. 3.2 lakh (Census 2011) is situated in the district of Parbhani. Parbhani is approximately situated at the centre of Maharashtra and covers an area of 56sqkm. The state capital, Mumbai lies to the west of Parbhani. The nearest major city is Aurangabad. Parbhani is well connected by road to other major cities also in Maharashtra and even in the neighboring state of Andhra Pradesh.

There are 72 slum pockets in Parbhani city. Out of which 53 pockets were notified during 1984-88 and remaining are non-notified slums. 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 slums in the city. Total population of the city is 3,07,000 (2011) and Slum population is 1,32,120 (43% of total population).

Water supply: The city of Parbhani receives water from two sources bulk raw water purchase from Irrigation dept and ground water from Chasme-hyat well. Major source is 17.45 MLD from Irrigation dept. and other minor source is 0.02 MLD from Chasme-hyat well. For bulk raw water purchase, city have intake well at Purna River (17 km from city) for 8 months and Siddheshwar dam (77 km from city) for 4 months of summer. Water quantity at sources is 17.47 MLD.

Coverage of individual HH water supply connection is 38%, which is very low. This is due to high no of illegal connections and no of un assessed properties. There are around 67,000 properties in the city but assessed properties are only 37,000. There are around 21977 no of connection, 870 public tap connections and 622 no. of hand pumps in the city.

Sanitation (including sewerage): Coverage of individual toilets at city level in Parbhani is 58%. Whereas approximately 500 HHs are dependent on community toilets. Parbhani does not have underground sewerage network at the city level. Parbhani has extensive network of surface drains in 48 sq. km. area. Mostly these are open drains except in market areas and city centre where they are concrete drains and partly covered. Ground water table is at medium depth from 40m onwards. The city has highest elevation of 425m above mean sea level in the centre and North West and lowest elevation of 403 m at south west. From the centre north west high ground, land slopes towards east to

south east to 410m. Major reasons for non functionality of community toilets are lack of water supply and existing condition of toilets which are not maintained

Services to slums: The slums cover an area of 5.3 sq.km which accounts to 43% of the total city area. Majority of the slums are located in the gaothan area i.e. in the core of the city. The percentage of slum population has increased from 33% to 43% in the last 3 years. There are 72 slums in Parbhani out of which 53 are notified slums. 20% of the HHs in slums have access to individual water connections whereas 13% HHs have access to individual toilets.

Municipal Finance of PMC: PMC's current accounting system is cash-based; income and expenditure heads are maintained on a cash basis. All expenses towards regular maintenance are treated as revenue expenses, while expenses on new projects are treated as capital expenses. PMC maintains a consolidated general budget that includes all the functions of the council. Total revenue expenditure of PMC is 44.3 Cr and capital expenditure is 83.7 Cr for the year 2011-12

The revenue sources of PMC can be classified into own sources or operating income and external receipts. Internal revenue income includes property tax, water tax, other taxes, user and service charges and rental income. The external revenue income includes grants and contributions for specific purposes including administration support grants, medical grants and other contributions. Expenditures incurred towards establishment cost, operation and maintenance expenditures for provision of services and repayment of loans are treated as revenue expenditure and expenditure on asset creation, purchase of equipment and investment in new projects, etc. are treated as capital expenditure.

Grants and Contributions constituted about 77% of the total revenue income generated for the past years, where the tax and non tax income contributed only 15% and 8% respectively. The trend has been steady with no major increase in the revenues through its own sources. 86% of the total revenue income from water, waste water and solid waste management is through water charges.

From the assessment it was observed that PMC has investible surplus till 2016-17 after which there will be decline in surplus and PMC cannot consider improvements in the performance of service delivery. In the business as usual scenario, PMC would not be able manage a substantial investible surplus.

Summary of Performance Improvement Plan for PMC: The proposals suggested are focused on two key areas of establishing 24X7 water supply system and moving towards an open defecation free PMC, 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 Parbhani, the Performance Improvement Plan for PMC has been summarized below.

Table 1-Summary of improvement actions to implement 24X7 systems

ACTION	COST IN CRORES	CURRENT STATUS
WATER SUPPLY : Towards 24 X 7 system		
24X 7 Water Supply	Rs 184	Water Augmentation already proposed and sanctioned under UIDSSMT. (104 crores). 40% work completed. Majorly covers the actions required for 24X7 WS
Replacement of connections with meters	Rs 6.3	Project can be proposed under MSNA
Other minimal cost actions (Water supply - plugging of leakages replacement of pumping machinery)	Rs 1.6	Project can be proposed under MSNA
SANITATION : Towards ODF		
Refurbishment of CTs before building individual toilets	Rs 0.1	
ODF city	Rs 21	Preparation of DPR required
Settled sewerage system (Details added in annex)	Rs 28	Preparation of DPR required
Other minimal cost actions -Sanitation - construction of septic tanks for existing toilets)	Rs 0.9	
Total Cost Parbhani Municipal Council	Rs 246	

The Council also has to undertake improvement actions related to processes in the water supply and sanitation operations. These actions have no or low cost, and thus can be immediately taken up by the Council. These include revision of 'new connection' format, periodic surveys at source, treatment and consumer end of water supplied, levying telescopic rates for water supply, drainage tax, and improve collection efficiency of sanitation tax.

The improvements for PMC have been proposed in two phases: 1) Immediate interventions (from 2013 - 2018), and 2) Long term interventions (from 2018 - 2023). The interventions mentioned above to augment revenue as well as process improvements are proposed to begin in 2013. The costs shown below indicated are inflated at 7.5% for each year.

Table 2- Phase 1 of PIP for PMC (2013-2018)

Proposed improvement areas	2013	2014	2015	2016	2017	2018
Water supply						
Consumer surveys for entire city						
Periodic surveys at source, treatment and consumer end						
Identification and regularization of illegal connections						
Water augmentation and improvement in water supply mechanism						
Policy level interventions (pre/post improvement in Water Supply mechanism)						
Installation of bulk flow meters and meters at consumer end						
Conduct water audit and leak detection surveys						
Undertake hydraulic modeling for entire water supply network						
Levy telescopic rates for water supply						
Sanitation (including sewerage)						
Refurbishment of CTs (5 No.)						
Preparation and Implementation of Septage Management Plan						
Preparation of DPR						
Improve collection efficiency of sanitation tax						

Once the revenue augmentation measures and process improvements are in place, it is proposed that PMC can begin its capital intensive projects for making the city ODF from 2018.

Augmentation of Water supply in Parbhani will help PMC move towards 24X7. PMC has augmentation proposals under UIDSSMT for network refurbishment and augmentation which is ongoing with 30% work completed as discussed in the earlier section. This includes Water Audit, and Refurbishment of old network. After the UIDSSMT project is in place, Parbhani can look at 24X7 Water Supply. Conducting consumer survey for metering of WS connections can begin in 2013 which the ULB can fund themselves. Actions like plugging of leakages and metering of connections need to be done. This can be undertaken under the Nagar Uthan scheme. This improvement is proposed to be completed within 4 years. PMC can also refurbish a selected 5 (10 seats each) community toilets in 2013-14 before the construction of individual toilets, which will cost Rs 0.5 lakhs. (Rs 10,000 per toilet seat)

PMC also needs to construct septic tanks for the existing toilets that do not have proper septic tanks

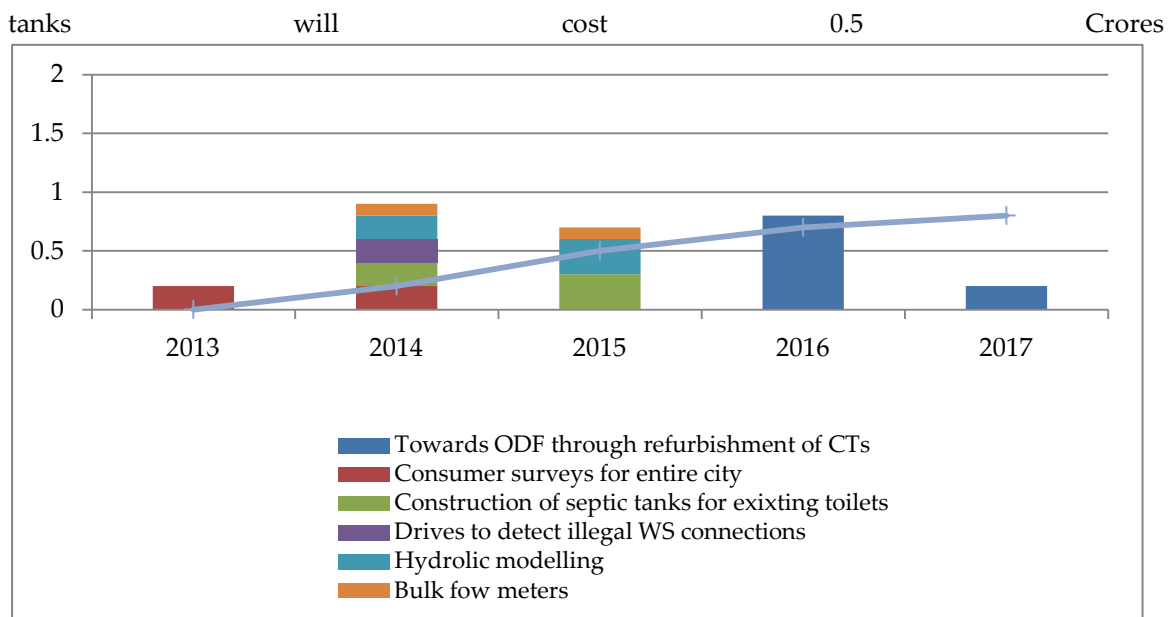


Figure 1-Phase 1: Proposed phasing of water and sanitation projects, after undertaking revenue enhancement measures

Phase 2 of PIP in PMC- 2018 to 2022:

- Starting from 2018, PMC can begin construction of individual and community toilets as the investible surplus from 2018 is substantial. As issues in existing community toilets were observed in terms of operation and maintenance, it is proposed that PMC refurbishes these community toilets before initiating construction of new community toilets.
- Existing community toilets can be refurbished and the maintenance of the same can be given to NGOs and CBOs. 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.
- PMC can go in for construction of individual toilets simultaneously. Construction of individual toilets will be completed in five years, while community toilets will be completed by four years.
- The other actions like IEC campaigns etc can take place before 2017.

Table 3. Sources of revenue to fund ODF in PMC (in Rs. Crores)

Implementation of ODF for PMC	2018	2019	2020	2021	2022
Total cost - ODF Plan	5.35	3.21	5.35	4.28	4.28
Investible surplus after implementation of other projects	1	1	1	1	2
External funds required	4.35	2.21	4.35	3.28	2.28

In order to realise the targets set for improving water supply and sanitation in PMC, 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. PMC has to focus its attention on improving policies related to services, financial sustainability, and accountability to the consumers

Photo Plate No 1: General Characteristics of Parbhani City



Parbhani Municipal Council office



Road Junction in Parbhani



Data Storage in Parbhani Municipal Council



Data Storage in Parbhani Municipal Council office



Discussions in the with the Deputy CO



Discussions with Sanitary Inspector



Discussions with the Officials



Discussions with the Officials

1 INTRODUCTION

The preparation of this Performance Improvement Plan (PIP) for water supply and sanitation has been led by the Parbhani Nagar Parishad 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. The PIP exercises use the set of indicators given by the SLB Initiative as a baseline to assess past performance and identify priorities.

Preparation of the PIP has been done in three stages:

Initial Performance Assessment: Based on the data received during PAS round II from the Parbhani Nagar Parishad, an initial assessment of all SLB indicators for the past three years were done by the PAS team. As a part of the preparatory work, a preliminary profile of ULBs using SLB indicators was prepared. The PMC teams were assisted to generate a city profile based on comparative performance assessment of ULBs for last three years based on PAS data. This involved past trends as well as comparison with other Class A Municipal Councils in Maharashtra.

The AIILSG/CEPT team visited Parbhani from 20th June to 26th June 2011 for further exploration of ground realities in UWSS. The preparatory work and the city profile of Parbhani were discussed with PNP officials at the first meeting on 24th July '11. The meeting was attended by the Chief Officer, along with officials from Water Supply and Health Dept. Preliminary priorities were identified at this meeting. Particular focus was also placed on the issues around making the city open defecation free and exploring the possibility of introducing 24x7 water supply. ULB officials shared their views towards taking their PIPs further and issues that they have to tackle in doing the same.

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, FGD guidelines, areas for digital documentation, dimensions of stakeholder consultations etc.

A rapid assessment of demographic /physical characteristics, institutional arrangements, key processes and municipal finances was also undertaken to build appropriate context for city performance

Detailed discussions with ULB engineers and support staff were held to assess water and sanitation situation on ground. Field visits were undertaken by teams to facilities like source, treatment and distribution systems to validate secondary data and identify performance issues. Wherever applicable, appropriate consultations were also undertaken with private service providers to help assess and validate issues from different perspectives.

For detailed qualitative insights, the team met respective ULB staff at all levels including safai karamcharis, valve operators etc. The team also met slum dwellers, contractors and private parties to understand issues at different levels and areas of services. Through focus group discussions and consultations with the citizens of Parbhani, service delivery issues were identified from consumers' perspectives. Transect walks in slum settlements and along city roads helped in mapping slum locations, open defecation sites, public and community toilets, solid waste dumping sites etc. On site situation and issues in services were captured through self-explanatory photographs that expressed depth of issues against which immediate actions need to be taken.

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 PMC officials and Chief Officer. The diagnostic study, detailed assessment and preliminary strategies for improvement were shared with PMC officials during second PIP consultative workshop in September 2011 at Parbhani. The suggestions by PMC officials were taken and incorporated in the PIP.

On identification of city priorities, consultations were held with the Chief Officer, opinion leaders, Municipal Councilors and PMC officers to discuss priorities for municipal water supply and sanitation. This PIP report presents the performance improvement plan of the ULB. It describes improvement actions and the costs that will have to be incurred to implement the identified actions. Efforts that are currently being taken by PMC to improvise service delivery were also considered while suggesting further actions in the respective sectors. The proposals have been reviewed by technical teams at the AIILSG and CEPT University.

Preliminary Validation of Draft Performance Improvement Plan by PMC: The proposed draft PIP was shared with PMC, and finalised by incorporating the revisions suggested. The Parbhani PIP has been validated by Parbhani CO, & PMC 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 Parbhani 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 PMC will prepare detailed project reports and seek assistance under state and national programmes.

This PIP report is to be submitted to the state government for a review. Based on the comments and guidance by the state government, the PMC 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 PMC will prepare detailed project reports and seek assistance under state and national programmes.

2 CITY PROFILE

This section discusses general characteristics of Parbhani related to population, aspects related to slum settlements, and human resources in PMC. Also, aspects related to municipal finances specifically with respect to water supply and sanitation services and extent of private sector participation is discussed here.

2.1 LOCATION

Parbhani, formerly known as “Prabhavatinagar”, is a city in the Marathwada region of Maharashtra. It is the administrative headquarters of Parbhani District. Parbhani is approximately situated at the centre of Maharashtra. The state capital, Mumbai lies to the west of Parbhani. The nearest major city is Aurangabad. Parbhani is well connected by road to other major cities also in Maharashtra and even in the neighboring state of Andhra Pradesh.

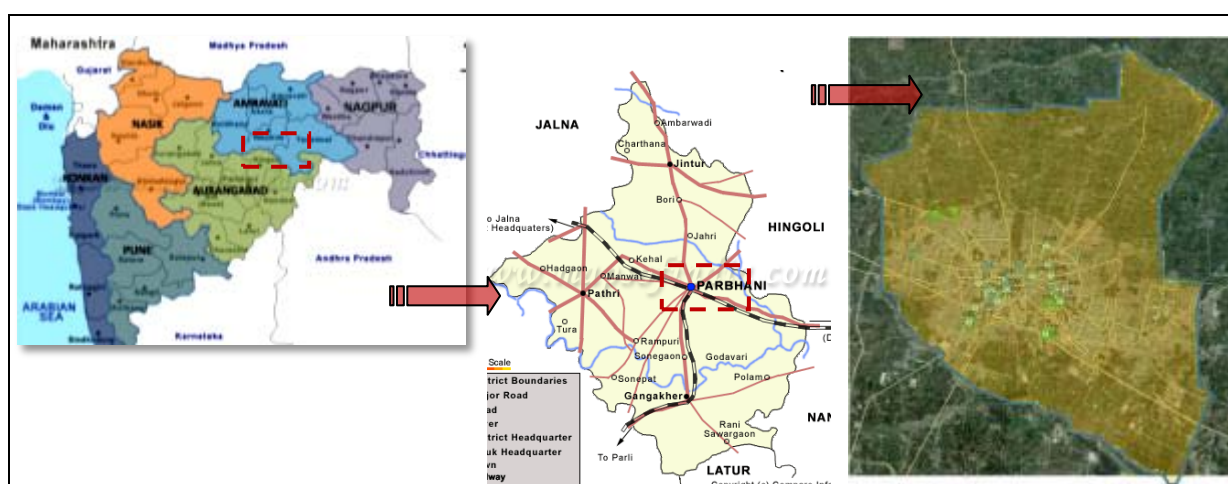


Figure 2- Location of Parbhani

Table 4- City Profile

General Details	2001	2011
Area	57.61	57.61
Population	259329	307000
No. of HHs	45200	56000
No of properties	30794	62230
No. of Slums	72	72

2.2 SERVICES IN SLUMS IN PARBHANI

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. There are 72 slum pockets in Parbhani city. Out of which 53 pockets were notified during 1984-88 and remaining are non- notified slums. 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 slums in the city. Total population of the city is 3,07,000 (2011) and Slum population is 1,32,120 (43% of total population)

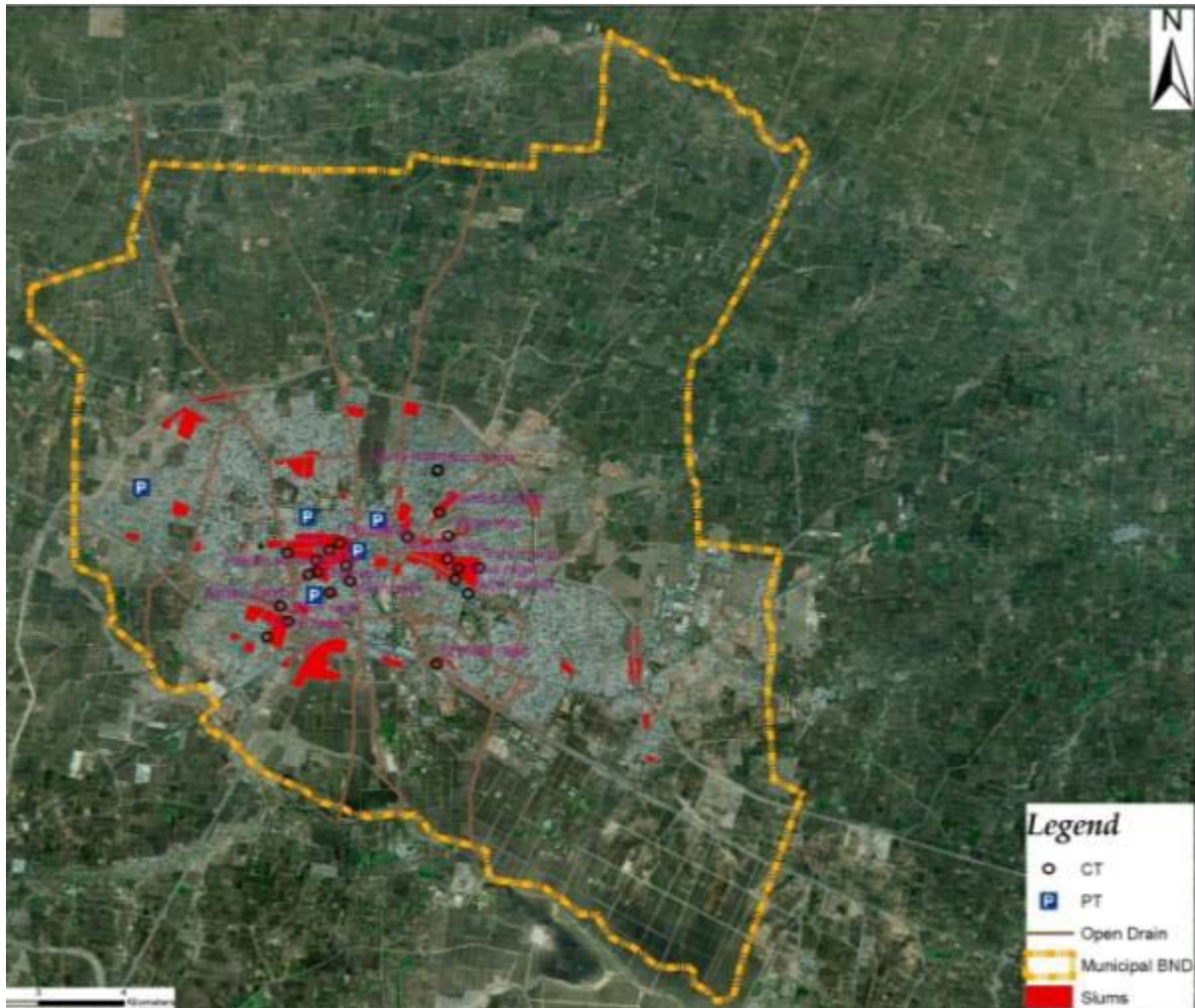



Figure 3- Location of slums
Source: (CEPT University, 2011)

The slums cover an area of 5.3 sq.km which accounts to 33% of the total city area. Majority of the slums are located in the gaothan area i.e. in the core of the city. Majority of the slums are located on private land. There are 5% of funds allocated in the budget for pro poor activities. Rehabilitation of slum settlements under IHSDP scheme is proposed. The IHSDP scheme proposes to construct 2798 dwellings in 8 slums.

Total number of slum settlements	72	
% notified slum settlements	73	
% notified slum settlements in 1985	22	
% notified slum settlements in 2006	78	
% non notified slum settlements	26	

Source: (CEPT University, 2011)

2.3 STAFFING OF PARBHANI COUNCIL

The Chief Officer is the overall authority who coordinates the functions of all municipal departments. The responsibilities of the various departments are divided between the deputy chief officer and the deputy engineer. The Deputy Engineer is responsible for water, light, garden and public works

departments. The deputy Chief Officer is responsible for the malaria, child welfare, vaccination, food, billing and sanitation departments.

Department	No of technical staff	No of non-technical staff
Water Supply	3	121
Waste water	1	260
SWM	7	Combined with WW

The Water Supply Department and Sanitation Department has two wings technical and administrative functions. The Sanitation and Solid Waste Management are clubbed under one department. Parbhani Municipal Council has less no of filled posts compared to the required manpower for services in the city.

Source: (CEPT University, 2011)

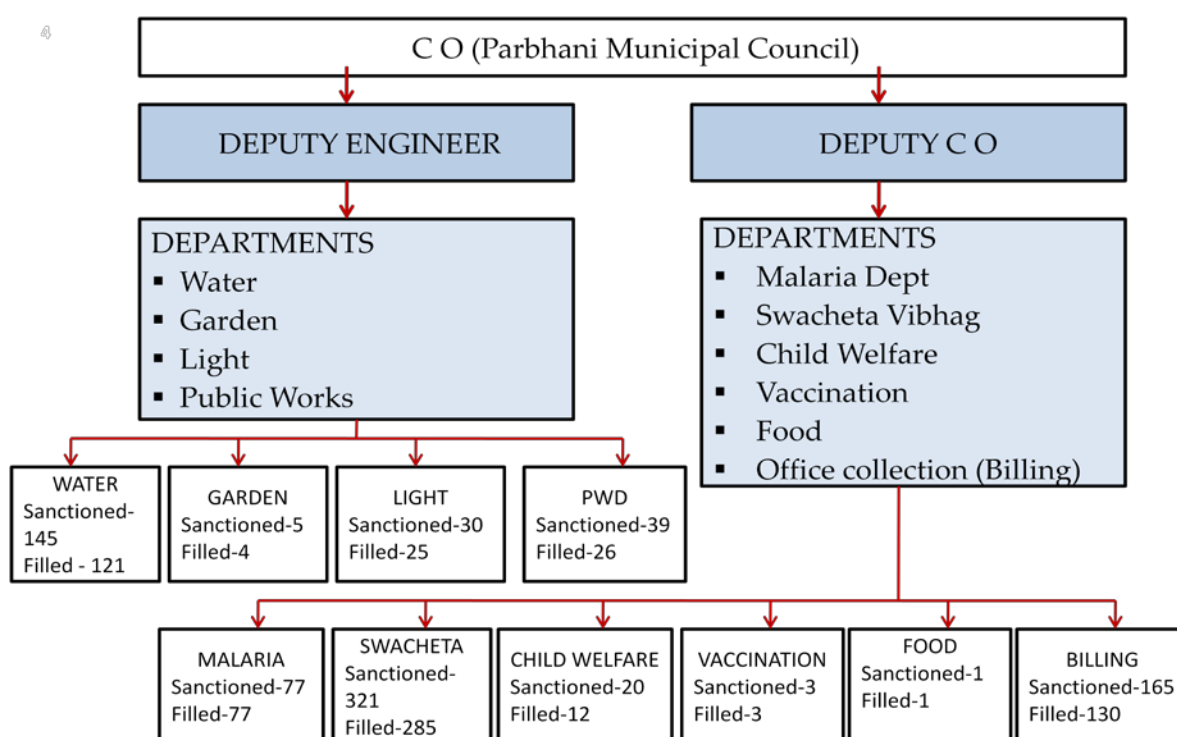
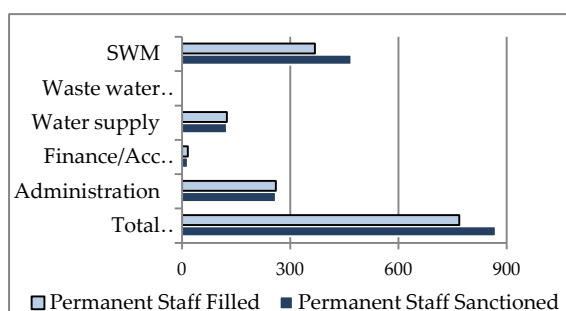


Chart 1- Institutional Organogram

Source: (CEPT University, 2011)



Graph 1-Sanctioned / Filled staff of PMC

The water supply department has very few of senior level staff that includes management and engineers. PMC has five Work inspectors and two engineers, seven plumbers and three electricians for the entire city. Sanitation and SWM staff is accounted within the SWM department. While the sanctioned posts for sanitary inspectors are thirteen, only seven of them are filled. Parbhani has sanctioned posts for sanitary supervisors. None of

the fifteen sanctioned posts for sanitary supervisors are filled. A huge number of staff in sanitation is in the non-technical category, namely / sweepers which is 96% of the total working staff. Municipal Finance Assessment¹

2.4 MUNICIPAL FINANCE ASSESSMENT

The cost recovery with respect to actual income and expenditure in Parbhani Municipal Council is very low and has decreased in the last year. As the city has no metered connections the water supply charges are volumetric. The charges levied are not recovered by the Council as people are not ready to pay due to the inconsistent service delivery by the Council.

Table 5- Revised financial summary (recast budget figures) of PMC (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)
Opening Balance	5.70	5.47	4.54	4.10	0.19	-	-
Revenue Account							
Revenue Income	15.62	15.83	20.35	21.40	20.76	35.66	40.15
Revenue Expenditure	14.76	15.87	19.43	21.41	22.48	33.25	44.33
Operating Ratio ²	95%	100%	96%	100%	108%	93%	110%
Capital Account							
Capital Income	1.33	2.83	8.74	2.88	52.55	62.55	87.69
Capital Expenditure	2.07	3.23	9.72	6.45	43.20	31.59	83.79
Extraordinary Receipt	0.15	0.14	0.12	0.15	0.19	0.24	0.72
Extraordinary Liabilities	0.51	0.61	0.53	0.50	7.87	1.07	0.66
Overall surplus/ (deficit)	0.11	(0.44)	(0.06)	(3.58)	7.62	33.38	(0.27)

Source: (CEPT University, 2011)

The above table gives an overview of the municipal finances of PMC at a glance;

Revenue account: The revenue income including income for water and waste water services for PMC has increased from Rs 15.62 Crores in 2005-06 to Rs. 20.76 Crores in 2009-10 at a CAGR 7%. There is a marginal dip in the income levels in the year 2009-10. The income has decreased from Rs. 21.40 Crores in the year 2008-09 to Rs 20.76 Crores in the year 2009-10. Otherwise, there is a steady increase in income levels from 2005-06 to 2008-09.

Revenue Income is budgeted at Rs. 40.15 Crores in 2011-2012 against an actual realization of Rs. 15.62 Crores in 2005-06 and Rs 20.76 Crores in 2009-10. PMC projected an increase of 72% for the year 2010-11 and 13% for the year 2011-12. PMC is very unlikely to achieve the income which is budgeted for the years 2010-11 and 2011-12 and this shows that the budgeted amounts are unrealistic.

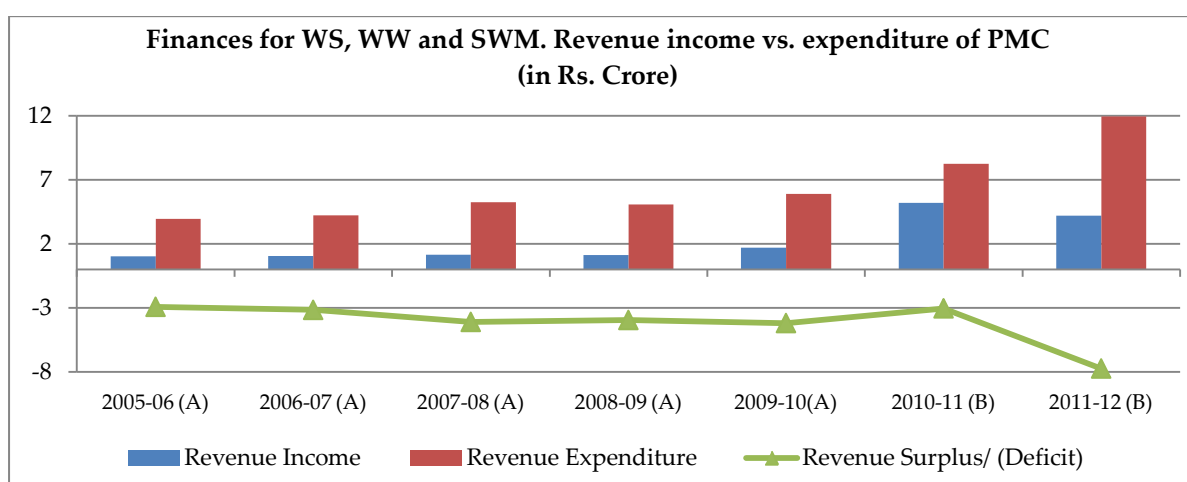
¹ - This section is based on a detailed analysis of municipal finances as reported in CRISIL 2012

² Calculated as Revenue Expense/ Revenue Income

On the other hand the revenue expenditure has increased from Rs. 14.76 Crores to Rs 22.48 Crores from the year 2005-06 to 2009-10 at CAGR of 11%. The expenditure has been consistently increasing during the period. PMC has followed the same approach for budgeting the expenditure amount. The revenue expenditure has been budgeted to a level of Rs. 44.33 Crores in 2011-12 from an actual level of Rs. 14.76 Crores in 2005-06. Given the trend of the actual figures for the expenditure, it is very unlikely that PMC will incur the budgeted expenditures for the year 2010-11 and 2011-12.

The fact that the revenue expenditure is increasing at a rate faster than the rate of increase in revenue income does not indicate a healthy trend for PMC. In fact, during the years 2006-07 and 2009-10 the actual financials indicate that the revenue expenditure was more than the revenue income. As a result there has been a marginal revenue surplus or no surplus for the period under consideration and does not represent any steady trend.

The collection efficiency in property tax has showed a rise where as collection efficiency in water supply tax shown a declining trend.



Graph 2-Income Vs Expenditure of PMC

Capital Account: The capital income has increased substantially from the level of Rs. 131.78 Lakh during 2005-06 to Rs 5255.00 Lakh in the year 2009-10. The same has been budgeted at Rs 6255.46 Lakh and Rs. 8769.00 Lakh for 2010-11 and 2011-12. However this increase is primarily due to the UIDSSMT Grant made available to PMC for the purpose of the water supply project, starting 2009-10.

Capital income for PMC includes grant and disbursements against various schemes like UIDSSMT, Maharashtra Sujal Nirmal Yojana and IDSMT among others.

As per the information from the ULB, there are also 58 separate loans outstanding on the books of the ULB. However during the period under consideration for the Municipal Finance Assessment, there are no inflows on account of new loans, through which one may infer that the loans represent obligations taken before 2007-08. It is observed that the capital expenditure mainly comprises of expenditure against the capital income received in form of grants under various schemes.

Table 6- Financial Summary - 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)
Finance Commission disbursement	0.37	0.87	2.62	0.85	2.16	1.74	2.00
Water and Sanitation	0	0	0	0.02	41.79	50.10	72.04
Slum Development	0.31	0.50	1.76	0.71	7.80	2.50	4.00
Other Development	0.65	1.46	4.36	1.30	0.80	8.21	9.65
Total	1.33	2.83	8.75	2.88	52.55	62.55	87.69

Source: (CEPT University, 2011)

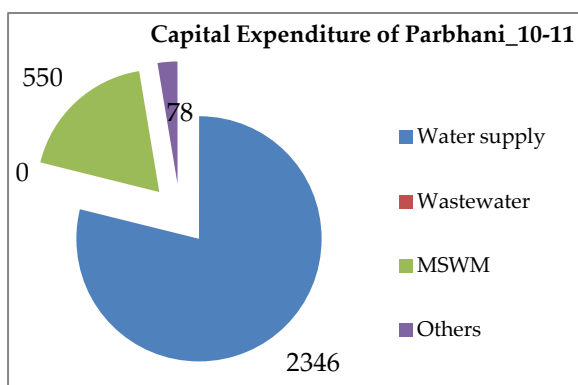
The capital expenditure has increased substantially from the level of Rs. 207 Lakh in 2005-06 to Rs 4320.38 Lakh in 2009-10. The capital expenditure has been budgeted at Rs 3163.91 Lakh and 8389 Lakh in 2010-11 2011-12. The increase of capital expenditure is mainly due to the water supply project under UIDSSMT as mentioned above. There is always a deficit in the capital account and PMC might be using its revenue sources for the revenue account for the capital expenditure. The trend is observed from the years 2005-06 to 2008-09 except for the year 2009-10, where PMC has received a grant the UIDSSMT water supply project.

The trend is observed from the years 2005-06 to 2008-09 except for the year 2009-10, where PMC has received a grant the UIDSSMT water supply project. PMC has utilized 95% of the grants received under this project and utilized only 9% of the grants received under slum development project. Overall during the year 2008-09, PMC had a surplus capital account with only 82% of the grants spent for different capital works.

Table 7- Financial Summary - 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)
Development scheme	1.13	1.53	6.94	2.87	2.54	2.64	4.25
Water supply and sanitation (including UIDSSMT project)	-	-	-	-	39.78	25.62	71.79
Slum	0.70	1.66	2.75	2.12	0.53	2.15	2.00
Housing	-	-	0.02	0.06	0.17	0.50	1.00
Roads	-	-	-	1.39	-	0.50	1.50
Others	0.25	0.05	0.01	-	0.19	0.18	3.25
Total	2.07	3.23	9.72	6.45	43.20	31.59	83.79

Source: (CEPT University, 2011)



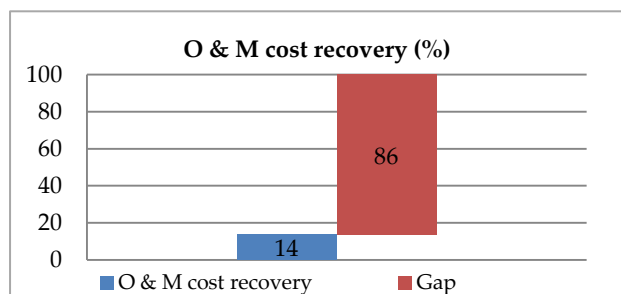
Graph 3-WS _ Capital expenditure

Table 8- Water Supply Expenditure _ Bifurcation

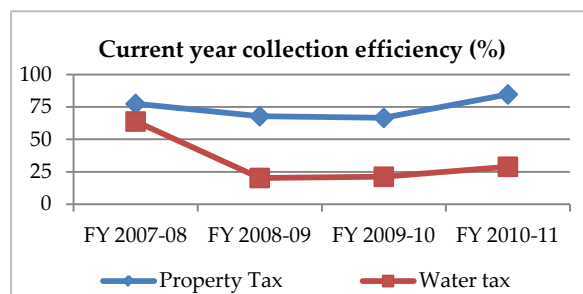
Expenditure (2009-10)	Values in Rs lakh
Establishment	151.55
Electricity	232.32
Machine Repairing	4
Fuel	3
Pani Patti	35
Operational maintenance	69.7
Total Expenditure	495.57

The Capital Expenditure in Parbhani Municipal Council is highest for Water Supply. The detail water supply expenditure is given below.

As against expenditure of 495.57 lakh, water tariff demand is only 155.35 lakhs. Water tariff for the residential half inch connection is Rs 804 per annum which is not revised since 1999. Collection efficiency of the water supply charge is 29% which is very low.



Graph 5-O & M cost Recovery



Graph 4-Collection efficiency of Water supply charges

The cost recovery of water supply services is at a very low level. PMC has 33% collection efficiency of its charges, and an average of 52% cost recovery. The cost recovery has actually decreased from 66% in year 2005-06 to 47% in the year 2009-10. This is mainly because of the increased expenditure on the services and low collection efficiency. PMC has increased the water tariff structure for improving the cost recovery of its O & M expenditure.

Photo Plate No 2: Water Supply in Parbhani



Condition of the Hand pump



Condition of the Hand pump



Methods of water storage



Conditions of public tap connection in a slum



Pressure pump used in the slums



Tap connection in a slum



Water Day in Parbhani



Water storage in slums

3 ASSESSMENT AND PROPOSALS FOR WATER SUPPLY

This section provides an overview of the water supply system in PMC, its performance and issues, and proposals to improvement. It also discusses the role and responsibilities of PMC as well as suggestions to improve upon the current status in the city.

3.1 ASSESSMENT OF CURRENT WATER SUPPLY SYSTEMS

The inhabited area in Parbhani under the water distribution network is 70%, HH level coverage is only 38%; HH level coverage in slums is only 19%. There are 5 water distribution zones. Map of area served under various distribution zones is given. Source: (CEPT University, 2011)

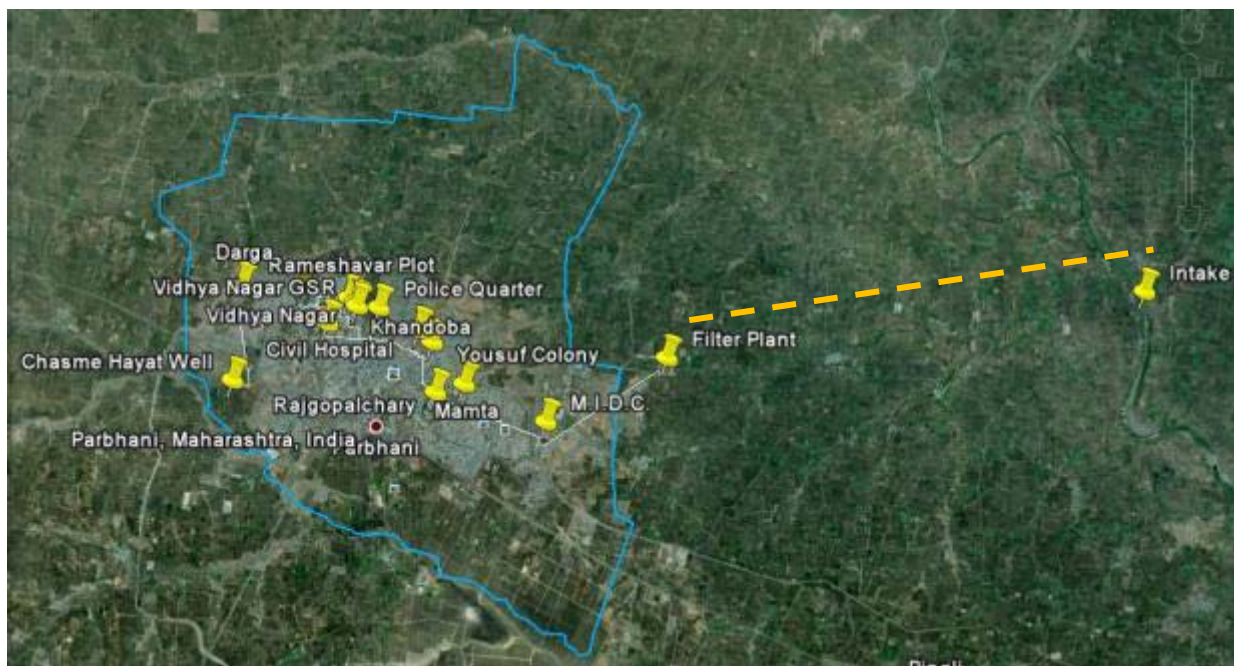
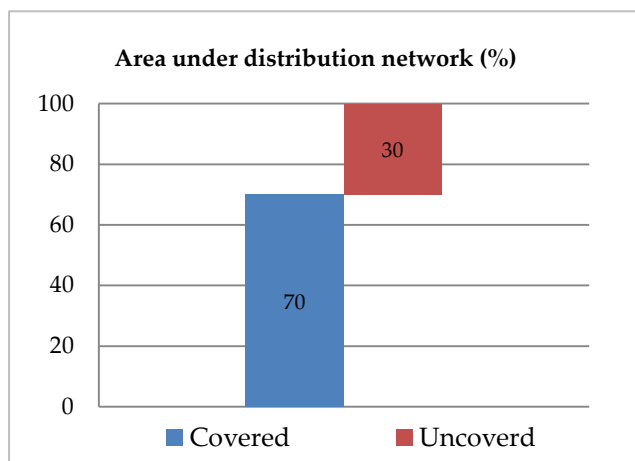


Figure 4- Water Supply Distribution Area



Figure 5- Water distribution stations

WATER SUPPLY SYSTEM: The city of Parbhani receives water from two sources bulk raw water purchase from Irrigation dept and ground water from Chasme-hyat well. Major source is 17.45 MLD from Irrigation dept. and other minor source is 0.02 MLD from Chasme-hyat well. For bulk raw water purchase, city have intake well at Purna River (17 km form city) for 8 months and Siddheshwar dam (77 km from city) for 4 months of summer. Parbhani has 5 water distribution zones. Water quantity at sources is 17.47 MLD.



Graph 6-Area under distribution network (%)

The bulk purchased raw water from the intake well then goes to the Rahati water treatment plant. The installed capacity of WTP is 21.6 MLD and 16.5 MLD water are being treated. So from 17.45 MLD of raw water, 16.5 MLD is the treated water and around 0.95 MLD water is being lost during transmission and treatment. Total amount of treated water supplied is 16.5 MLD and that is 54 lpcd. According to the CPHEEO guideline for non seweraged city, city has to provide 81 lpcd (70 lpcd + 15% of water losses), so supply gap of 27 lpcd at source.

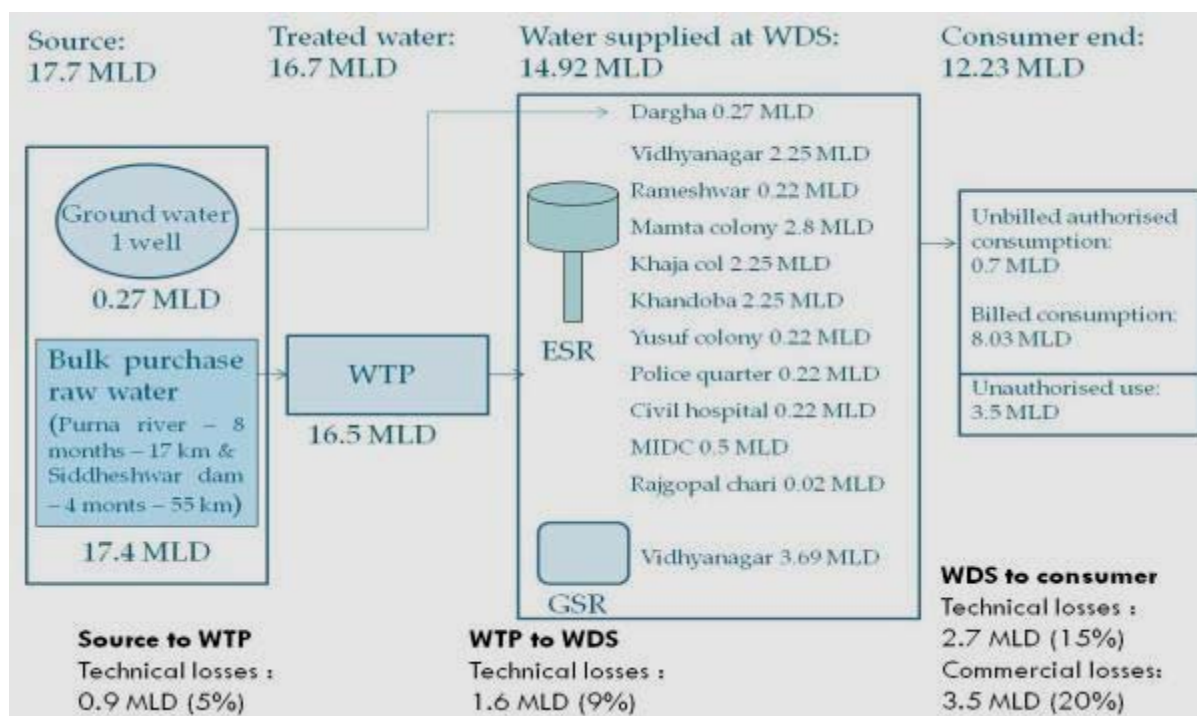
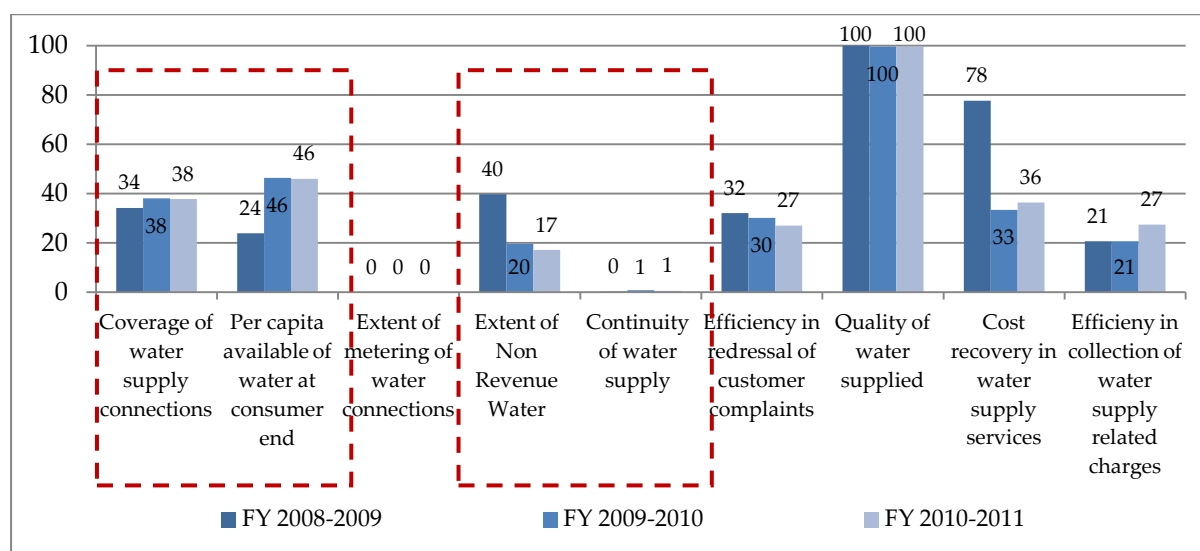


Figure 6- Water supply production, treatment and supply in Parbhani

3.2 ASSESSMENT OF SERVICE DELIVERY



Graph 7-Key Performance Indicators _ Water Supply

3.2.1 Access and Coverage

Coverage of water supply connections: The coverage of Water Supply connections in Parbhani have decreased from 43 % in 2008 to 38% in 2010. As per the discussions with the city officials the numbers of connections have not increased with respect to the new Households hence the marginal decrease in the coverage of Water supply connections. The water supply timings are not fixed in the ULB and the water supply is once in 10-15 days hence people are not willing to take connections resulting in low coverage. The distribution network has not increased from 2008.

Proposals for improvement: As mentioned previously, it is necessary to accurately assess the coverage of household level connections in the city. Once the Illegal connections in the city need to be regularized by conducting drives in the slum areas. Subsidies can be provided for the same. New connection drives need to be initiated along with simplification of connection procedure.

3.2.2 Service levels and Quality

Per capita supply of water: The per capita supply of water has marginally increased. For both the above indicators the reliability grade is D as the records maintained are manual and the figures are from the property tax records

Per capita supply of water (measured ex-treatment) is 57 lpcd while per capita supply at the consumer end (minus distribution losses, etc.) is only 45 lpcd. As the water augmentation plan under UIDSSMT is the per capita water supply supplied at consumer end would increase to 70 lpcd. . The work has already started which is estimated to be complete by 2016.

Water source for Parbhani city is Purna River near Rahati obstructs water let out from Siddheshwar Dam and water so stored is pumped to the city. Storage developed by this dam is very marginal and water is required to be let out frequently through rivers this result in heavy transmission losses and unauthorized lifting of water.

The water supply network hasn't been augmented since 1980. It was gathered from the discussions from the city officials that there have been frequent breakdowns in the network due to mining related activities in the nearby areas.

While the indicator assesses only water quantity supplied at consumer end, in order to ensure reliability of the indicator, the quantity at source and treatment plant also need to be accurate. This will also ensure better estimates of the extent of non-revenue water in the city. Currently, quantity is estimated on the basis of pumping capacities and hours of pumping.

Proposal for improvement: Periodic surveys need to be conducted at the major bulk production and consumer points. These can be done either through methods like bucket survey or using portable flow meters. This also needs to be factored into the contract to ensure the parameter of minimum wastage of water is met.

Continuity of water supply: Water supply timings in PMC are very erratic and water is supplied once in 4-5 days for two hours. In summer season, it reduces to once in 7 or 8 days. The timing of supply during the day is also not fixed which inconveniences the consumers a lot. This also increases instances of water being wasted during the supply hours. There are also issues of low pressure in certain parts of the city. Hence people in the city have installed pressure pumps in their houses.

Proposals for improvement: In order to ensure that water supply in all the zones of the city is regulated (fixed timings of supply and at adequate pressure), it is necessary to monitor water supply duration to all these zones separately through regular surveys coinciding with the water quantity surveys. The water supply timings need to be fixed. Considering the new water supply project sanctioned under UIDSSMT is in place we can expect the water availability to the consumers in a fixed manner at regular intervals.

Quality of water supply: Quality of water supply has remained constant at 100%. PMC undertakes residual chlorine and bacteriological tests at the source and consumer ends. PMC needs improvements to continue to maintain the quality of water and to monitor the same.

Proposals for improvement: More stringent monitoring of the quality procedures needs to be carried out by PMC. Additionally, possibilities of linking the complaint redressal system with quality monitoring need to be assessed. For instance, if particular areas of the city reports frequent complaints of low quality, these can be analyzed better for likely causes and solutions.

Metering: Parbhani has no metering at source, treatment and consumer end. Drawing lessons from several cities managed by the Maharashtra Jeevan Pradhikaran (MJP), and as required under the reforms required under the Maharashtra Sujal Nirmal Abhiyan (MSNA), PMC needs to ensure that metering is introduced for all consumer connections. Water supply augmentation project under UIDSSMT is sanctioned which would provide only metered connections. Under the scheme only new connections will be metered.

3.2.3 Financial Sustainability

Cost recovery (O&M) of water supply: Parbhani has not shown good performance in financial sustainability, namely cost recovery (O&M) at 36%, and collection efficiency of water supply charges/taxes at 21% in the year 2010-11. PMC has substantial arrears from the previous years. PMC has 3.4 Crores arrears in the year 2010-11 out of which only 0.5 Crores has been collected. PMC has

had substantial amount of arrears in the last 2 years. The collection efficiency is low as the citizens are not willing to pay the taxes for water due to the unavailability of water.

Table 9-Income in Water Supply in 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)
General water tax	0.86	0.95	1.09	0.64	0.86	3.80	3.80	NA	91%
Water tax- late fees	0.01	0.01	0.01	0.01	0.01	0.01	0.01	NA	1%
Private water connection fees	0.01	0.01	0	0.01	0.01	0.01	0.02	NA	1%
Water charges	0.11	0.05	0.02	0.07	0.06	0.15	0.20	NA	5%
Water tanker charges	0.01	0.01	0.01	0.01	0	0.02	0.03	NA	1%
Water connection charges	-	-	-	-	-	0.09	0.10	NA	1%
Total	1.00	1.03	1.14	0.73	0.94	4.08	4.16	-1%	

Given below are the current tariff levels of water supply in Parbhani

Revenues on account of water supply account for 86% of the total revenue income for water, waste water and solid waste management. The water supply revenues have actual negative CAGR of 1% between 2005-06 and 2009-10. However, the revenues have been budgeted with an annual increase 300% at Rs 408 Lakh in the year 2010-11 from Rs 94 Lakh in the year 2009-10. The budget figures for the year 2011-12 have an annual marginal increase of 2% at Rs 416 Lakh from the previous year

Table 10-Tariff statement for PMC - Water Supply (Rs.)

S.N of debt	Connection type	Connection size	Number of connections	Till 1st Oct 2011 (Old rate)		From 1st Oct 2011 (New rate)	
				Charges per Month	Demand per connection / year	Charges per Month	Demand per connection / year
1	Domestic	1/2"	21070	67	804	134	1608
2		3/4"	361	130	1560	260	3120
3		1"	76	305	3660	610	7320
4	Non- Domestic	1/2"	570	300	3600	600	7200
5		3/4"	70	595	7140	1190	14280
6		1"	23	900	10800	1800	21600
7		2"	27	1346	16152	2692	32304
8		3"	7	1800	21600	3600	43200
9		6"	1	22400	268800	44800	537600
10	Industrial (MIDC)	-	1	Rs. 7.89 per KL		Rs 39.45 per KL (Proposed)	

				Till 1st Oct 2011 (Old rate)		From 1st Oct 2011 (New rate)	
						rate)	
Total Connections			22206				

Revenues on account of water supply account for 90% of the total revenue income for water, waste water and solid waste management. The revenues have been budgeted with an annual increase 336% at Rs 411 Lakh in the year 2010-11 from Rs 94 Lakh in the year 2009-10. The budget figures for the year 2011-12 have an annual marginal increase of 2% at Rs 420 Lakh from the previous year.

The budgeted revenue for the year 2010-11 does not match the demand projections given the existing tariff rates and the number of water connections. There is an estimated demand of Rs 214 Lakh for the year 2010-11 which can be collected through water charges, where as PMC budgeted an amount is Rs 380 Lakh to be collected during the year. The same is true for the year 2011-12, after considering the new tariff rates for water supply to be implemented for collection of water charges, Rs 380 Lakh has been budgeted against projected demand of Rs 428 Lakh for the year 2011-12. This is likely because of the reason that PMC has low collection levels and high percentage of accumulated arrears. PMC:

Proposals for improvement: Introduction of telescopic rates after installation of meters at all connections. The collection efficiency of water charges needs to be improved. PMC needs more manpower in the department to improve collection efficiency.

Tariff structure for cost recovery for water supply services

According to the state government recommendations, the tariff structure was worked out considering the expenditure incurred by MJP towards servicing the part of the water demand. NRW levels in the existing system are at 44%. This revenue loss was factored in the calculations for arriving at the revised tariff. The tariff as calculated using the state government guidelines

Table 11: Derived volumetric tariff structure based on the Maharashtra State Government Recommendations

Consumer Group	Connections	Tariff Calculated on the basis of Maharashtra State Government Recommendations (Rs. / KL)
Residential	21507	5.55
Commercial	132	16.65
Institutional	698	11.10
Industrial		27.76

Here the underlying assumption is 100% collection efficiency. Reduction in collection efficiency would necessitate increase in the fare structure to maintain to cost recovery to 100%. Currently, industrial and mixed residential use connections are not given in the city. Categorizing on the existing connections into the categories recommended by the state government would enable some degree of cross subsidization and bring the tariff for residential connections a bit lower. However in absence of metering, the volumetric tariff devised for PMC may not be applicable.

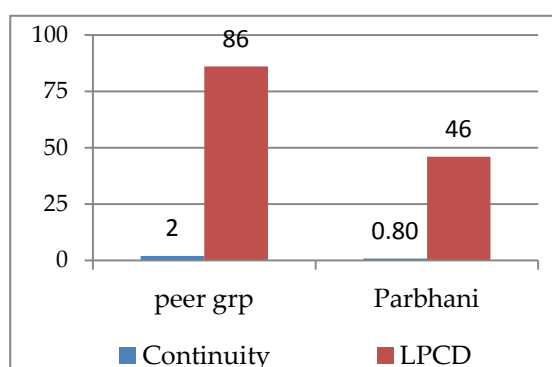
Table 12: Fixed tariff structure based for 100% recovery of water supply charges

S. No.	Type of connections	Connection size	Number of Connections	PMC tariff Rs. per year / connection	Revised tariff rates for 100% O&M recovery (In Rs. per year / connection)
1	Residential	1/2"	21070	1,608	2,371
2		3/4"	361	3,120	4,601
3		1"	76	7,320	10,794
4	Commercial	1/2"	570	7,200	10,617
5		3/4"	70	14,280	21,056
6		1"	23	21,600	31,850
7		2"	27	32,304	47,633
8		3"	7	43,200	63,700
9		6"	1	537,600	792,706
10	Industrial	-	1	Rs 35 per KL	-

3.2.4 Efficiency in Service Operations

Extent of NRW: As mentioned above, the per capita consumption (57 lpcd) is less compared to per capita supply (45 lpcd) due to substantial losses on the distribution network. This maybe at least partly due to the old network, as the network from Purna River was laid in 1978. However, as metering is not practiced in the city estimates of NRW are not validated.

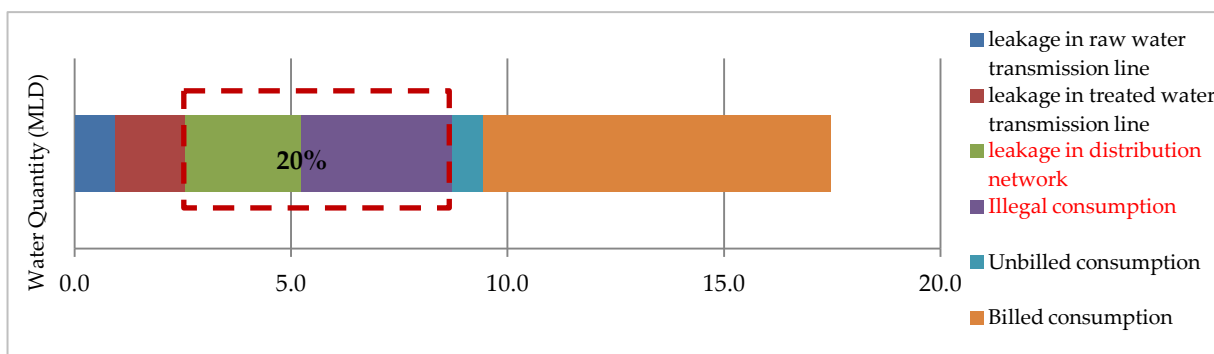
Water losses: There are 12 WDS from where 14.92 MLD water is being distributed to the consumer.. 1.61 MLD (9.2% of water supply at source) water are lost in the transmission network and at WDS. Length of the transmission line (WTP to WDS) is around 13 km. Around 123 litres of water per meter of transmission line are being lost.



Graph 8-Continuity and LPCD of water supply

Illegal connections Coverage of individual HH water supply connection is 38%, which is very low. This is due to high no of illegal connections and no of un assessed properties. PMC has 20% illegal connections in the city. There are around 67,000 properties in the city but assessed properties are only 37,000. It was gathered from the discussions with the city officials that these unaccessed properties have illegal connections there are around 21977 no of connection, 870 public tap connections and 622 no. of hand pumps in the city.

Proposals for improvement: In the initial phase, it is necessary to undertake improvement measures such as periodic surveys at bulk production and distribution points (as mentioned in per capita supply). PMC needs to update their property tax data base which should include the unaccessed properties. Households can also be estimated through connection register.



Graph 9-NRW _ water supply

Efficiency in redressal of customer complaints: The efficiency in redressal of customer complaints has decreased as the water supply timings are not fixed and consumers have to face the difficulty. The reliability for the same is B as proper records are maintained for the complaints received. Complaints are received in writing or by telephone and the ULB officials try to redress it within 24hrs.

Equity in Service Delivery: Parbhani has 72 slum settlements, of which 53 are notified settlements. The non-notified slum settlements in PMC are mostly located on the peripheral areas of the city, or along boundaries of notified slum settlements.

The settlements are provided access to water supply through household connections, public stand posts and in some cases, group connections. The coverage of household connections in slums is 20.4%. Parbhani does not have any group connections in slum settlements. Only notified slums are provided with the municipal water connection whereas the non notified slums do not have any provision for water supply connections. These settlements utilise the common hand pumps within the settlements.

3.3 PROPOSED ACTIONS/ INTERVENTIONS FOR WATER SUPPLY

Table 13- Proposed Action for Water Supply

Categories	Interventions required
Access and Coverage	<ul style="list-style-type: none"> Source augmentation and distribution network expansion project report is already prepared under UIDSSMT(140 crore) Provide internal infrastructure in slum area
Service levels and quality	<ul style="list-style-type: none"> Fixed the water supply timing Regularizing illegal connection Repairing / Replacement of existing transmission & distribution pipeline
Financial sustainability	Once metering is in place for entire city, the Council needs to be incorporate telescopic rates
Efficiency in service operations	PMC has to appoint staff for operating and managing the complaint redressal software system

3.4 MOVING TOWARDS 24 X 7 WATER SUPPLY IN PARBHANI

The Government of Maharashtra has decided to focus on continuous water supply as one of the themes for performance improvement planning in Class A cities of Maharashtra. Considering various aspects required for moving towards 24 x 7 water supply in Parbhani an attempt is given for estimating the overall costs for various items as follows. It shows that Parbhani will require minimum funds of Rs. 200 Crore to be raised from various sources to implement continuous water supply. Calculations are carried out by taking into consideration ongoing projects. In case of absence of funds, the ULB can also choose a pilot DMA and establish continuous water supply scheme. Lessons from pilot project can feed in to a city wide project with support from appropriate private partners.

Table 14- Cost Estimates for 24X7 Water Supply

COST ESTIMATIONS FOR 24 x 7 water supply in PARBHANI Municipality				
	HEAD	BLOCK COST	UNIT	Rs. Lakh
1	Satellite Image	90000	Up to 64 sq.km.	1.1
		1350	Beyond 64 sq. km. for each sq.km	
2	Supply and installation of GIS software	195000	Each	2
3	Digitization of satellite image-	6250	Per sq.km.	4
4	Physical Surveys- GIS Network Survey and Base Map Survey	3000	Rs./ km	
5	Consumer Surveys	36	Rs. / HH	22
6	Water Audit	4700000	Rs. For towns of pop. 2 Lakh	50
		15000	Rs. Additional for per 1000 pop. above 2 Lakh	
7	Energy Audit		L.S	30
8	Hydraulic Model (4140 nodes- with 10 nodes/km)	600	Rs/ node	23.8
9	Billing Software + 1 year maintenance	1000000		10
10	Bulk Flow Meters (28)	30000	Rs. Per bulk flow meter	8.5
11	Replacement of House Service Connections	5000	Rs/ connection with mechanical meter	633
12	Rehabilitation of Distribution Network- 100% (102 Km) to be replaced and around 20% to be added	7300000	Rs. / sq. km	14600
13	TOTAL (1+2+3+4+5+6+7+8+9+10+11+12) Rs. Lakh			15384
14	Including 20% Contingencies			3076
	TOTAL ESTIMATED COST FOR 24 X 7 WATER SUPPLY IN PARBHANI (Rs.)			184 Cr

Technical improvements: Given that the Council currently operates its water supply in intermittent conditions, technical shortcomings would exist which would constraint the shift towards establishing 24X7 water supply systems. These are discussed below.

- Reliable data on distribution networks and customers do not exist;
- Irregular Water Supply days and hours
- Physical losses of water at trunk main, transmission main and distribution network;
- Illegal connections at trunk main transmission main and consumer end Control of leakage on a routine, planned basis is impossible; and
- Collection efficiency and eventually cost recovery are poor as consumers are not willing to pay for poor quality of services
- Low coverage as people are not willing to avail the connections because of uncertainty in piped water supply
- Political influence on service delivery.

Reliable data on distribution network and customers is achieved through:

1. Consumer end survey: 100% consumer survey will help in identifying and subsequent regularization of illegal connections. It will provide data on household consumption which will help in assessment of augmentation of water sources, if required.
2. GIS mapping and hydraulic modeling: GIS mapping will provide detailed network maps with results from consumer survey and hydraulic modelling will help to implement equitable distribution zones in the city.

Irregular Water Supply days and hours can be improved through:

1. Water augmentation and improvement in water supply mechanism: Source augmentation and distribution network expansion project report is already prepared under UIDSSMT³ (Rs 104 crore)

Physical losses of water at trunk main, transmission main and distribution network can be avoided through:

1. Refurbishment of old network, detection and plugging of leakages

Low coverage of water supply connections can be improved through:

1. Additional connections by expanding distribution network: As people are not willing to avail the connections because of uncertainty in piped water supply the coverage of water supply connections is low. PMC needs to expand its coverage by increasing the distribution network and encouraging people to take water supply connections.

Water Augmentation Scheme proposed under UIDSSMT:

At present originally executed water supply scheme with Dudhana River as a source is discarded due to its long life and dryness. Secondly the existing water supply scheme with Purna River as a source can only fulfill present demand of Parbhani at 50 lpcd. There is considerable increase in the population of the city and also there is very rapid expansion and development of the city towards all the sides. Therefore present water supply to the city is unbalanced and there is practically no supply of water to newly developed area (Basmath road, Gangakhed road, Jintur road etc).

Purna River near Rahati obstructs water let out from Siddheshwar Dam and water so stored is pumped to the city. However storage developed by this Bhandara is very marginal and water is required to be let out frequently through rivers this result in heavy transmission losses and unauthorized lifting of water. There are two reservoirs at 55 and 65 km. these storage reservoirs are constructed across Purna River away from the city. They are under the Purna Irrigation Project and named as Yeldari and Siddheshwar respectively.

The ultimate stage demand of the city for the planed period of 30 years in features is 78.614 MLD (2038). Hence the underground source is beyond thought and a surface source is required.

Distribution System: The provision for remodeling of existing distribution system as per new zone requirements and new distribution system for newly developed area is made on per capita basis. This is designed for ultimate stage requirement with 2 volume flow. The distribution system is separate for each of the 7 zones and designed duly accounting existing available distribution.

Head Works: The head works of the scheme are proposed to be located on right bank of Yeldari dam about 300 m away from the dam line in between main dam and guide bund.

The intake well will be constructed at the end of the intake channel with a depth of 20m. The intake will be connected to a jack well and pump house through connecting main lay in three parallel pipe lines of 900 mm dia. The WTP of 40 MLD designed capacity conventional type is proposed to be located in Parbhani. The pure water will be collected in pure water sump at WTP site.

The break pressure tank in the form of GSR of 125.8 lakh litres capacity will be constructed in RCC at the end of raw water rising main.

900 and 800 mm diameter gravity main is proposed to be laid from BPT to proposed WTP on Parbhani Jintur road. These pipes will be laid underground with a total length of 47 kms.

The water collected in pure water sump at WTP will be pumped to MBR and Bharatnagar proposed ESR through separate pure water rising mains. The pumping machinery for these two branches is designed and provided. The capacity of pumps is restricted to immediate stage requirement.

Water from proposed MBR having capacity 14.12 lakh litres will be distributed to the existing ESR. The pipeline having diameter 1000mm to 300mm are proposed for feeding above ESRs with total length of 10845m.

For even distribution of water the city is divided in seven zones. Each zone is provided with adequate capacity ESR and separate distribution system. The ESRs are designed for 6 hrs.

Commercial improvements: Given that the technical improvements need to be financially sustainable, the conversion to 24X7 water systems requires advanced commercial systems and procedures. With introduction of metering and volumetric tariff system, consumers will be charged based on the water quantities consumed. In order to ensure that the system progresses smoothly, in the initial phase, the Council needs to develop public awareness.

Institutional improvements: To move towards 24X7 water systems, PMC has to significantly improve and supplement its managerial and technical skills as well as those of the private operator, as hitherto these skills were oriented towards maintaining an intermittent supply. Some of the technical aspects that will require improved skills and automation are

- Planning and design of water supply infrastructure from source to distribution to 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.

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

Table 15. Summary of improvement actions to implement 24X7 systems

Activity	Description	Status
Network and Customer database	GIS mapping and hydraulic modeling for entire city	Needs to be proposed
	100% Consumer end survey, including identifying and regularizing illegal connections	
100% metered network	Metering at all bulk production and distribution points, including at all consumer connections	Water Augmentation project proposed, and sanctioned under UIDSSMT and work has started. 100% metering can be undertaken after this under Nagar Utthan
Leakage control	Identification and regularization of illegal connections Conduct water audits and leak detection studies, and repair existing leakages in the system	Can be proposed under MSNA
Implementation of 24X7 in whole city	Water augmentation and improvement in water supply mechanism	Needs to be proposed after the UIDSSMT project is in place

Photo Plate 3: Sanitation and Sewerage in Parbhani



Clogged open drains



Solid waste on the streets



Clogged open drains



Broken down community toilets



Non functional community toilets



Broken down community toilets



Functional community toilets



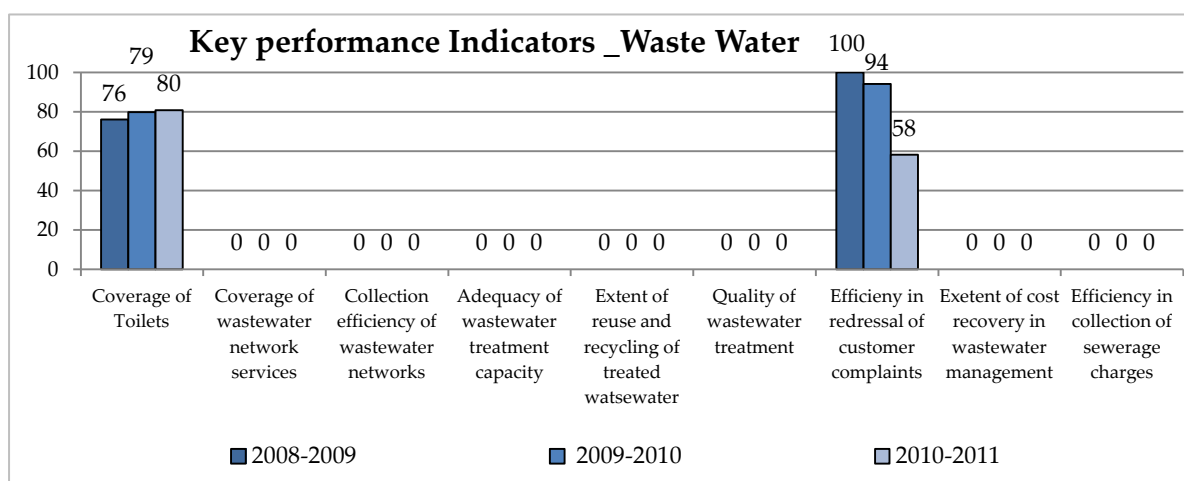
Open defecation sites

4 ASSESSMENT AND PROPOSALS FOR SANITATION

This section captures the sanitation aspects in Parbhani related to coverage of toilets in the city as well as services in slums, septage management, and impact of the ongoing sewerage network and a summary of proposed interventions for improving sanitation in the city.

Parbhani does not have underground Sewerage network at the city level. Parbhani has extensive network of surface drains in 48 sq. km. area. Mostly these are open drains except in market areas & city centre where they are concrete drains and partly covered. Ground water table is at medium depth from 40m onwards. City has highest elevation of 425m above mean sea level in the centre and North West and lowest elevation of 403 m at south west. From the centre north west high ground, land slopes towards east to south east to 410m. Roughly the city can be divided into two drainage districts with 7 nalas draining it. Three of the major nalas flow through the large (8000ha) Marathwada Agricultural University campus at the south east edge of city, remaining 4 nalas flow towards west.

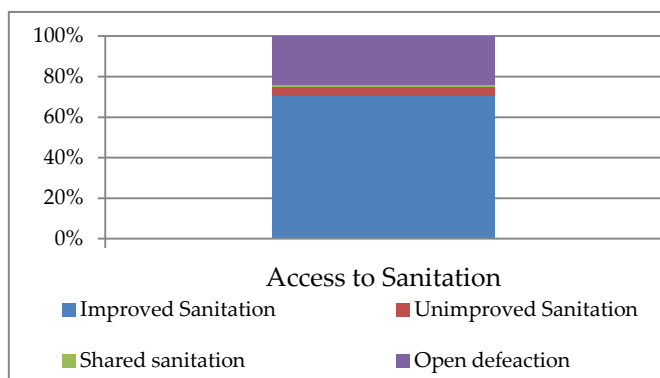
4.1 COVERAGE OF TOILETS



Graph 10-Sanitation _Key Performance Indicators

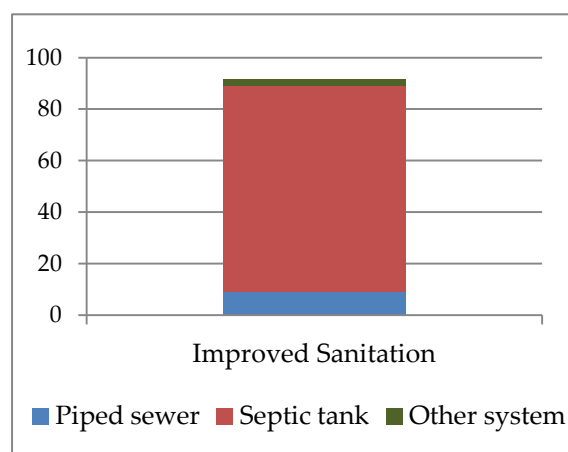
Coverage of toilets in Parbhani has remained almost constant in the last three years whereas the reliability grade is D as the values are from the property tax records.

As per the recent figures from census 2011, 70% of the households have access to safe sanitation implying latrine facilities within premises and connected to pipe sewer, septic tank and ventilated improved pit latrine. However, 9% of households do not have access to any sanitation improved/shared/unimproved) and thus resort to open defecation. The Council has also received funding to provide additional toilets for slum

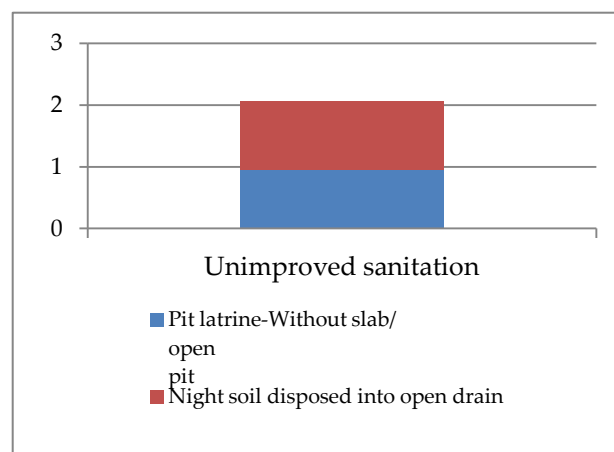


Graph 11- Access to sanitation

settlements under the IHSDP programs. PMC is building 2000 individual toilets under IHSDP



Graph 13- Improved Sanitation

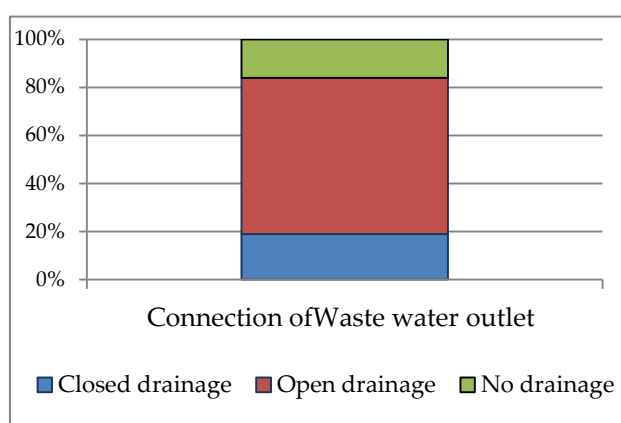


Graph 12- Unimproved Sanitation

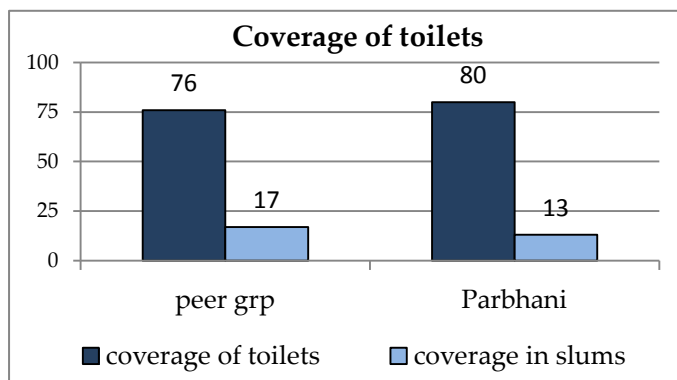
Total Number of properties in the City	62230
Total Number of properties with individual toilets	49784
Households dependent on functional community toilets	500

There are 24 community toilets in the city. Out of which only 4 are functional-(In use) Major reasons for non availability of community toilets are, no water connection, lack of availability of water and existing condition of toilets. The non availability of toilets is in slums.

The city is geographically divided into 2 unequal parts by a railway line. A canal running in the northern part of the city forms northern boundary limit of the city. These two physical features are areas where open defecation happens in large numbers.



Graph 14- Condition of Waste water outlet



Graph 15-Sanitation_ Coverage of Toilets

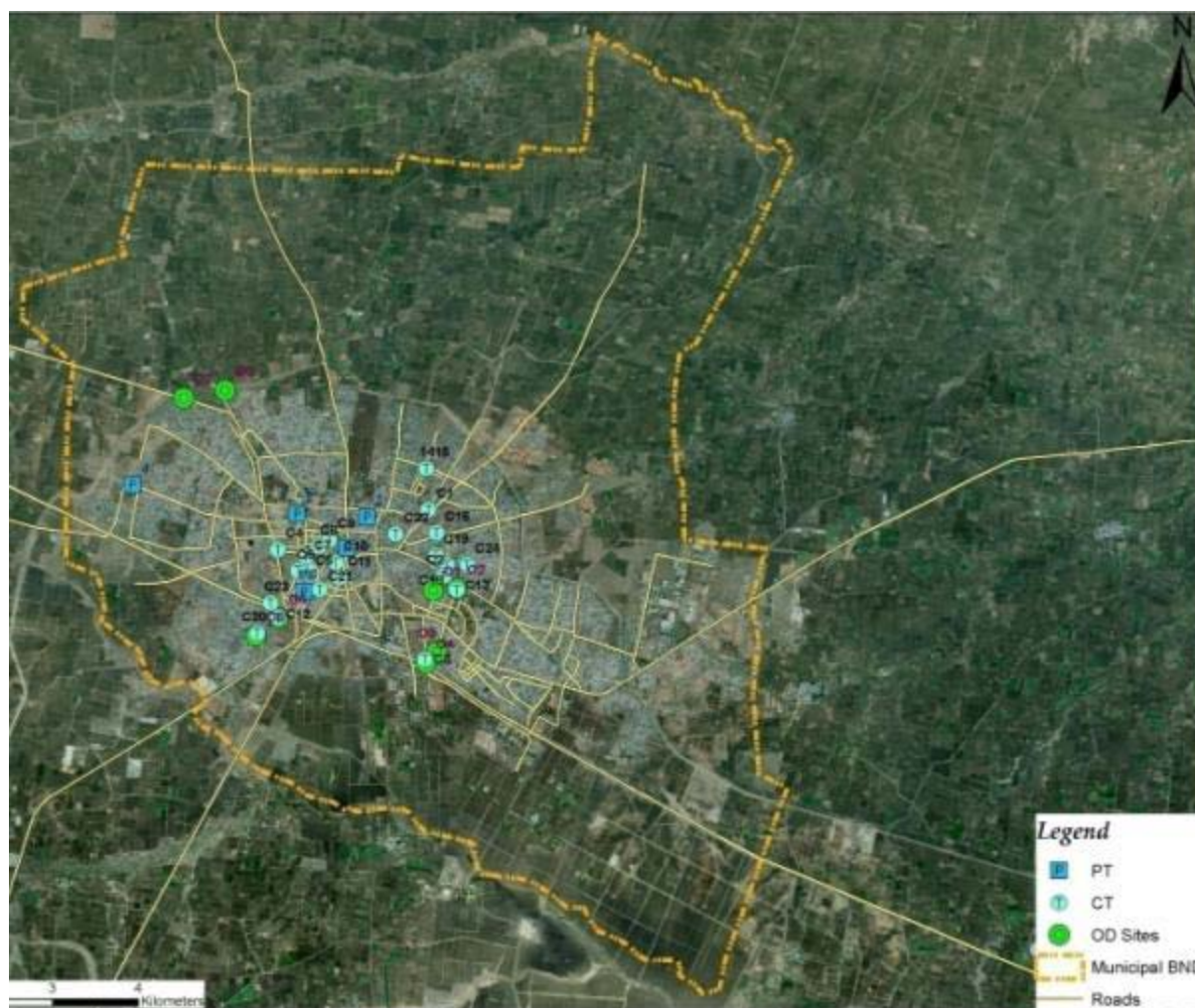
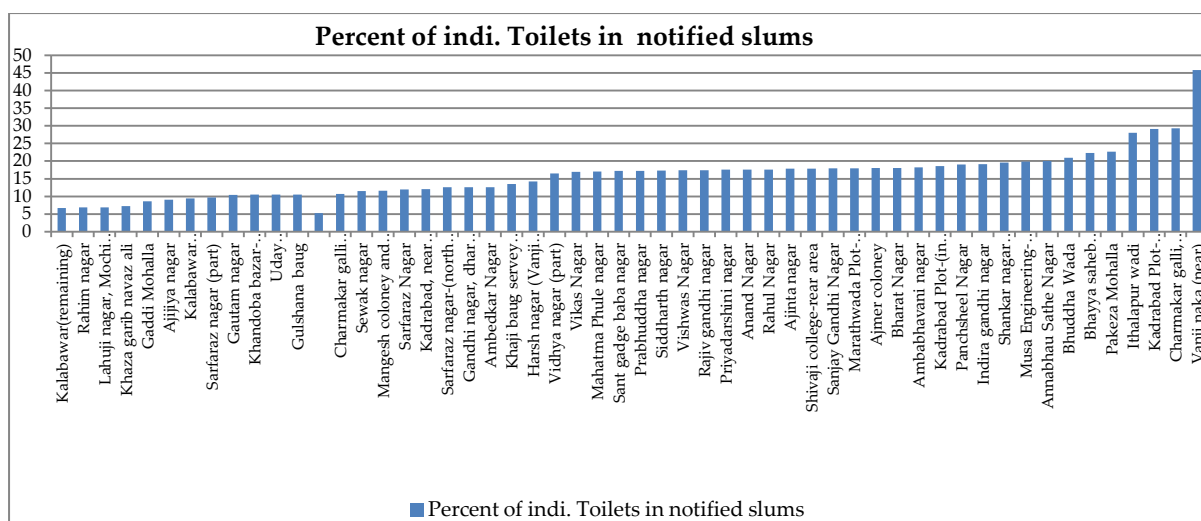
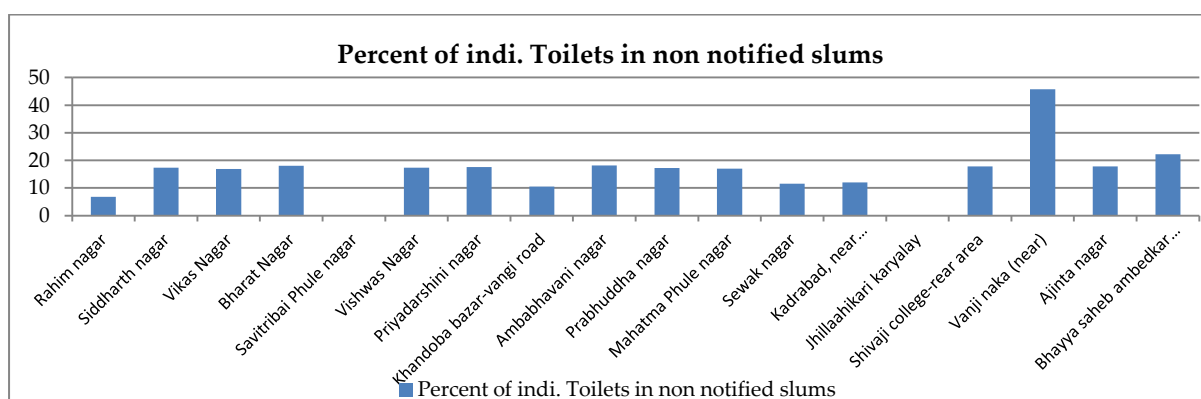


Figure 7- Location of Toilets in slums



Graph 16-Access to sanitation in notified slums. Source: (CEPT University, 2011)

The coverage of individual toilets in slums settlements in PMC is very low. Only 7 slums out of the total 72 in the council have reported to have toilet coverage more than 20 percent. Around 500 Households depend upon community toilets.



Graph 17-Access to sanitation in non-notified slums. Source: (CEPT University, 2011)

IHSDP Integrated Housing and Slum Development Scheme – Project Proposal for Parbhani is submitted and awaiting sanctioning. The project proposal is to build 2798 dwelling units with toilets. These 2798 units will be located in 8 different slums.

HIGHLIGHTS

IHSDP Integrated Housing and Slum Development Scheme – Project Proposal for Parbhani

Development Strategies

Incentives to be given to beneficiary

1. Security to tenure
2. Built housing with all the infrastructure like
3. Road, water supply, drainage, storm water drain, street light.
4. Provision of all livelihood amenities.
5. Provision of shops in same slum area and alternative house is given in same area or relocate

house in rehabilitation site.

6. Joint family considered as required individual house hold.

The development strategies are as under:

1. The houses under the slum have kachcha construction is considered for the new built housing development program.
2. Pacca RCC houses are not considered in built housing program
3. The new houses are 26.11 Sq m. carpet area and 32.03 Sq m. built up area.
4. Following infrastructure is provided in each slum settlement
 - a. Cement concrete roads
 - b. Water supply from main road to house
 - c. Sewerage line
 - d. Storm water drain for surface area
 - e. Street light
 - f. Development of children's play area
 - g. Pavers block for informal market area
5. Following livelihood amenities are also provided in each slum settlement as per need and sustainability
 - a. Informal market for daily goods
 - b. Multipurpose building having one community hall and office
 - c. Angan wadi for informal education

Housing details

- The proposed plan of slum relocation is 25.0 Sq m. Having 2 rooms, kitchen, water closet and bath.
- The detail of planning is such that each room gets natural ventilation.

In lay out backside of the house has 1 meter service lane having main line of water supply and drainage.

Land details

1. The existing land belongs to the municipal council and MPT to award for development of Khariwada slum relocation.

The existing slum pockets land ownership public/private and in such case up gradation of infrastructure is ideal solution

Utilization of existing land after relocation

- At present both slum area come under CRZ regulation violation and area goes to central government.

4.2 MOVING TOWARDS OPEN DEFECATION FREE IN PMC

In Parbhani about 58% households have individual toilets. Out of the 24 Community toilets 8 are not usable. Toilets are connected to septic tanks; overflow from septic tanks is carried in surface drains. The fecal sludge is dumped with garbage. An estimated 129,000 persons defecate in the open of which 84,000 are slum residents. There are 3045 individual toilets in slums, rest either use the few public / community toilets or resort to open defecation. The railway track and the irrigation canal on 3 sides of the city are the areas of open defecation. These numbers indicate that Parbhani faces a huge sanitation challenge

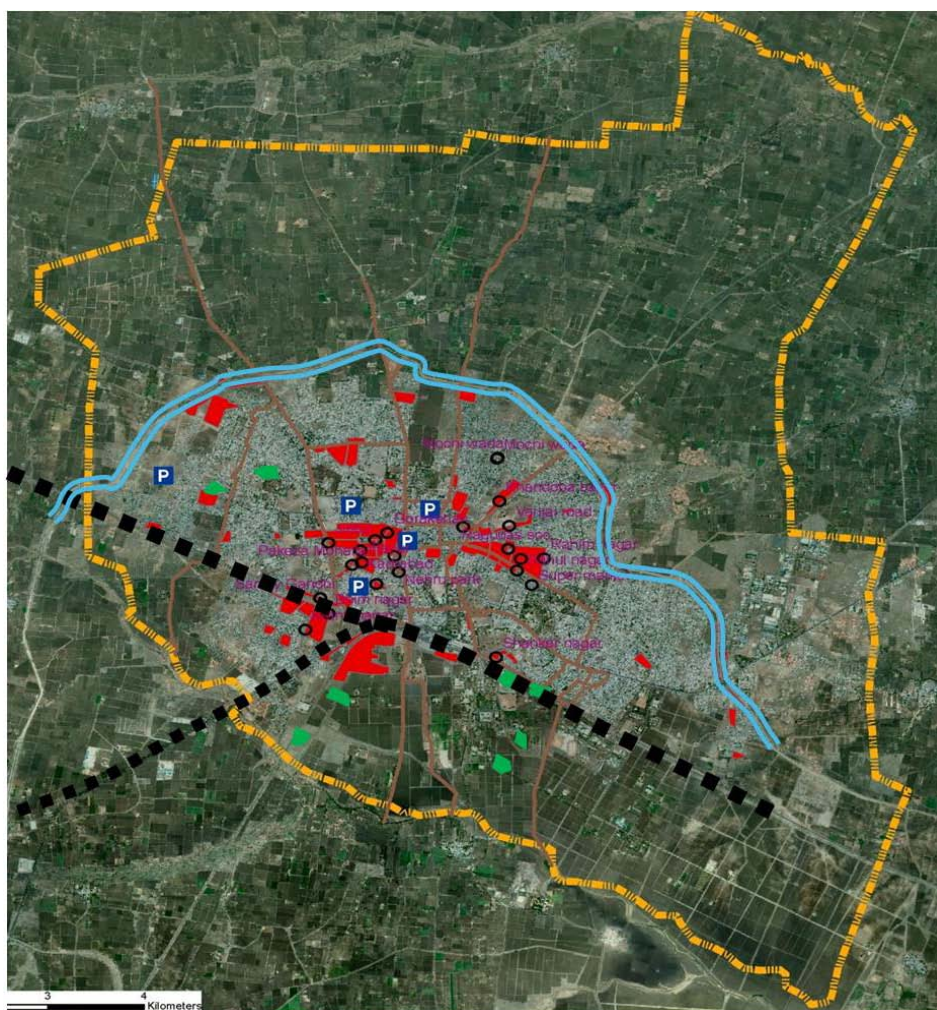


Figure 8- OD sites

Source: (CEPT University 2011)

The Government of Maharashtra has decided to focus on open defecation free cities as one of the themes for performance improvement planning in Class A cities of Maharashtra. For making Parbhani Open Defecation Free city, it is imperative to provide regular water supply which will help maintain the community toilets in a better way and make them usable. Other than additional water supply, the second priority is to provide additional individual, shared and community toilet seats, along with the required infrastructure, to meet the existing gap in demand and supply.

The reasons for open defecation appear to be two fold; firstly, residents seem to expect government to construct free toilets. Secondly, slum dwellers seem to be comfortable with open defecation since they seem to associate toilets with unhygienic conditions caused primarily due to lack of adequate water in community toilets and poor hygiene training.

Option 1: Achieving Open Defecation Free status through 100% provision of individual toilets: 40% of the population still resorts to open defecation. To ensure OD free status, the Council has to construct about 14835 individual toilets. Assuming average cost of Rs. 25,000 per individual toilet, the total cost works out to be Rs. 37 crore.

Option 2: Achieving Open Defecation Free status through provision of individual and community toilets: Based on this option, the Council would have to construct about and 72 community toilet blocks having 10 seats per block and Rs. 1,000,000 per seat (including connection to septic tank), the total cost works out to be Rs. 21 crore

Option 3: Achieving Open Defecation Free status through community toilets: Based on this option, the Council would have to construct about and 98 community toilet blocks having 10 seats per block and Rs. 1,000,000 per seat (including connection to septic tank), the total cost works out to be Rs. 16 crore

Only where individual toilets are not feasible because of space constraint community toilets or group toilets can be considered.

Table 16- Sanitation Cost Estimates for ODF

Strategies for ODF	Option 1	Option 2	Option 3
Number of individual toilets (14835 needed , 2000 constructed under IHSDP)	12835	4000	0
Number of seats in community toilets	0	1083	74175
Cost per individual toilet	25000	25000	0
Cost per seat in community toilet (including connection to septic tank)	0	100000	100000
IEC Activities at 5% of construction cost	0.05	0.05	0.05
Total cost (in Rs. crore)	32	21	17

Block costs: (Per Seat) 1. New com toilet seat: Rs. 100000/- 2. New Ind. Toilet with septic tank: Rs 25000/-

In Parbhani there are slums which can accommodate individual toilets at household level, In these areas individual toilets should be constructed. Where there is no space available, option of group toilets can be explored. Option of community toilets could be explored after the on ground surveys are done and precise data required for carving out spaces for group toilets in the community is made available especially in slums where there is no space. Considering PMC's current financial position, achieving 100% toilet coverage through option 1 does not seem to be financially sustainable. Issues of space constraints for constructing individual toilets have also been observed in some of the settlements. On the other hand, while option 3 is the less costly of the two options, operation and maintenance of the community blocks will remain an issue as similar issues can be seen in the existing community and pay-n-use toilets. During the site visits, it was observed that toilet blocks were not functioning due to lack of water supply. PMC needs to also look at refurbishment of such toilet blocks

before constructing new blocks. Option 2, which requires construction of individual toilets where possible and community toilet blocks in the remaining areas is therefore most feasible.

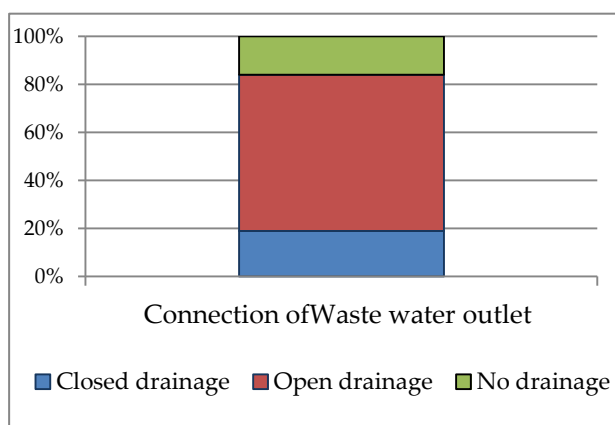
The problem is more social than technical, a strong IEC should be able to persuade residents to appreciate value of individual toilets and share part of construction costs.

However, the Council must also simultaneously undertake community mobilization and awareness campaigns in order to ensure that the community toilet blocks are maintained/ managed properly. similar arrangements with CBOs can be looked at with respect to community toilets. 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. Local CBOs (like the Mahila Bachhat Gad-MBGs) need to be roped into this exercise to ensure participation by all communities. 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.

It is proposed that the PMC will move towards achieving ODF status within the next five years. The detailed phasing and implementation plan are discussed in the next chapter. Simultaneously, the Council will have to undertake revenue augmentation measures like increased collection efficiency of sanitation taxes, levy charges for maintenance of community toilets, etc.

4.3 SEPTAGE AND SULLAGE MANAGEMENT

Septic tanks are emptied by the ULB. The ULB charges Rs 1500 for the HHs within the ULB and outside the ULB. On an average 200 septic tanks are cleaned annually. The ULB has one septic tank emptier which dumps the waste on open dumps near a slaughter house in Parbhani.



SANITATION SYSTEM: Waste water disposal system in Parbhani comprises of open drain network, which are not cleaned on periodic basis.

According to Census 2011 only 20% of the Households are connected to covered drainage network in the city and 19% of the Households are not connected to any kind of drainage network.

A good alternative option to gravity sewerage for Parbhani would be Settled Sewerage System. (Also called small bore sewerage). Only effluent from septic tanks, kitchen and bathroom would flow in the sewer system since solids are retained in septic tanks. This system ensures separation of solid and liquid, only liquid will flow in pipes allowing gentler gradient, smaller pipe diameters, evading of manholes resulting in significant cost reduction. Settled sewer pipes can be installed at shallow depths below existing drains (0.5 – 0.75 m).

As septic tank effluents, effluent from kitchen and bathrooms are solids-free the sewer is designed differently from conventional and simplified sewers (which convey all the wastewater solids). Each

house or a small group of neighboring houses has a septic tank which discharges into the settled sewer. The minimum sewer diameter is 75mm and the sewer gradient closely follows the ground slope, with the flow in the sewer alternating as necessary between open channel flow and pressure flow. The cost for implementation of settled sewerage for Parbhani is Rs 39 Crores. . Details added in annexure

4.4 SUMMARY OF PROPOSED ACTIONS/ INTERVENTIONS

Table 17- Issues and Solutions _ Sanitation

SN	SNAPSHOT OF SANITATION ISSUES	PROBABLE SOLUTIONS
1	Non availability of water supply for sanitation and waste management	Water Augmentation and Improvement in water supply mechanism
2	Non functionality of existing community toilets	Refurbishment of existing toilets, and awareness creation among citizens
3	Gap in demand of toilets	Construction of individual, group and toilets with necessary IEC measures on use of toilet facilities
4	Lack of safe disposal of waste water	Construction of settled or (small bore) sewerage network and STP.
5	Poor maintenance of existing open drains	Cleaning and maintenance of open drains on regular basis
6	Open defecation	Assured access to water, access to functional individual/ community toilets, public awareness

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 PMC 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.

In order to make PMC OD free, it is proposed that provision of both individual and community toilets are undertaken. In instances where space and affordability is not an issue, individual toilets can be constructed. However, where space is a major constraint, construction of community toilets can be opted for. A summary of the improvements required and costs is given below.

The Council also has to prepare a Septage Management Plan to ensure safe and proper disposal of septage, and streamline its operations.

Table 18- Summary of Actions

Activity	Description	Status/ Next steps
Strategies for ODF	Provision of individual or community toilets	Preparation of DPR needs to be undertaken
	Undertake IEC activities	
Strategies for Septage Management	Construction of Settled sewerage network and STP	DPR

Photo Plate No 4: Solid Waste Management in Parbhani



Slaughter house close to open dumping sites



Secondary storage point in the city



Open dumps



Composting site in Parbhani



Secondary storage point in the city



Open drains in the city



Open drains in the city



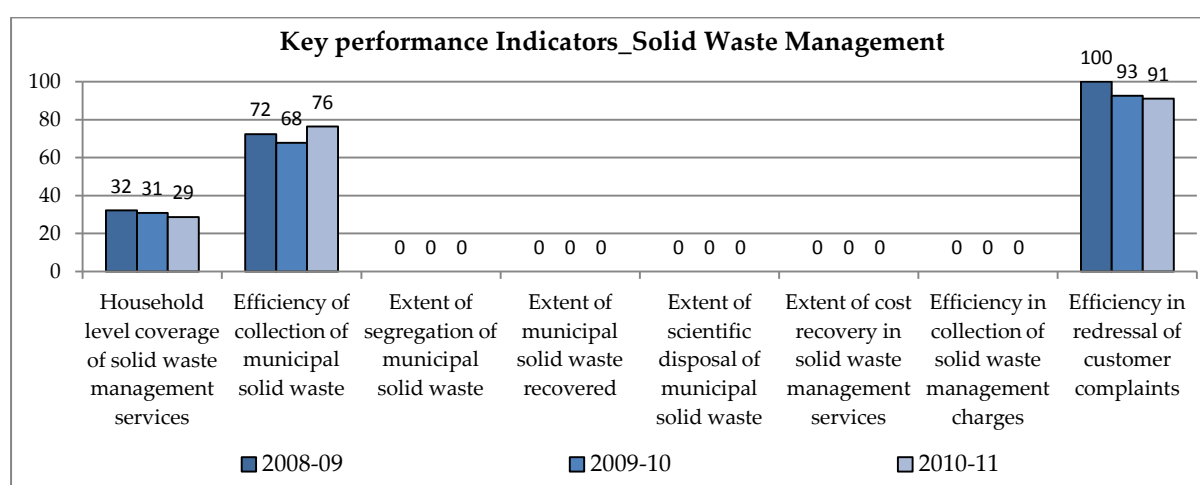
Quarry site that can be used for land fill site

5 ASSESSMENT AND PROPOSALS FOR SOLID WASTE MANAGEMENT

5.1 SOLID WASTE MANAGEMENT

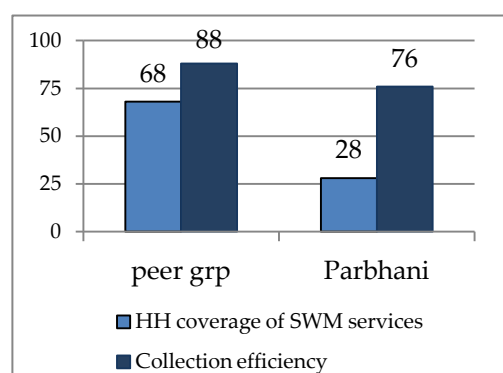
All solid waste management services of solid waste are managed by the Parbhani Municipal Council. Only 52 MT of waste is collected out of 71 MT generated. Irregular collection of waste result in overflowing bins creating nuisance points.

The Household level coverage of SWM services is very low in Parbhani Municipal Council; the reliability grade of the same is C as the records are from the number of wards served. The collection efficiency of solid waste has marginally increased and the reliability grade of the same is D. The customer complaints related to Solid Waste Management is kept manually and is not redressed 100% within 24hours.



Graph 18-SWM _ Key Performance Indicators

Parbhani has mounds of garbage all over the city. Due to severe financial crunch in the PMC, most of the municipal employees have wage dues of 4-6 months. Sanitary workers apparently are not keen on work resulting in garbage heaps and clogged drains. The PMC financial crunch apparently is due to inability of PMC to introduce property tax as is being urged by the state. This has not happened due to councilor's resistance and inadequate revenues. Unless the political economy and city management improves, the city will continue to be insanitary.



Graph 19-SWM_HH level Coverage and Collection Efficiency

Municipal solid waste collection and transport services in Parbhani by PMC are inadequate. Roadside drains are mostly choked with plenty of littering in town and garbage heaps at road corners. Existing disposal site (4.2 ha area) on Dhar road is a dump and it shares space with 2 slaughterhouses which were flooded during consultants field visit. The Dhar road is a dump is almost filled up to ground level. Municipality has obtained another new site (2.4ha) on Borwand road (12 km from city centre).

There are two sites with PMC for disposal of waste. The old site on Dhar road (6 Ha. Area) at the edge of the city is almost filled. It also shares the premises with two slaughter houses. PMC should convert Dhar road dump to Sanitary Landfill and close the site properly. New site (2.4ha) on Borwand road, 12 km from city centre is primarily dedicated to under construction aerobic composting plant (capacity 1800MT/y) and RDF unit (capacity 1200MT/day). The project is on PPP basis with M/s Hydroair Techtonics of Mumbai being the private sector partner. Total cost of project is Rs. 75 million of which 75% is to be contributed by Hydroair and 25% by PMC. Profits generated after Hydroair pays off the Rs.37.5 million project loans would be shared on 50%:50% basis. Construction is stopped for last 6 months since reportedly municipality hasn't paid its share of 25% to the firm. When operational, this facility would be processing 20 MT/day of garbage, leaving the remaining 51 MT to be land filled.

6 SUMMARY OF PERFORMANCE IMPROVEMENT PLAN FOR PARBHANI

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.

6.1 SUMMARY OF PROPOSALS

Taking into consideration both cost estimations, estimated cost for Parbhani for moving towards 24 x 7 and making it ODF by providing individual toilets is around Rs. 262 Cr. Project for augmentation of water supply of 206 Cr. is already in the pipeline with the DPR prepared.

Table 19- Summary of PIP Costs

ACTION	COST IN CRORES	CURRENT STATUS
WATER SUPPLY : Towards 24 X 7 system		
24X 7 Water Supply	Rs 184	Water Augmentation already proposed and sanctioned under UIDSSMT.(104 crores). 40% work is completed. Majorly covers the actions required for 24X7 WS
Replacement of connections with meters	Rs 6.3	Project can be proposed under MSNA
Other minimal cost actions (Water supply - plugging of leakages replacement of pumping machinery)	Rs 1.6	Project can be proposed under MSNA
SANITATION : Towards ODF		
Refurbishment of CTs before building individual toilets	Rs 0.1	
ODF city	Rs 21	Preparation of DPR required
Settled sewerage system (Details added in annex)	Rs 28	Preparation of DPR required
Other minimal cost actions -Sanitation - construction of septic tanks for existing toilets)	Rs 0.9	
Total Cost Parbhani Municipal Council	Rs 246	

Policy interventions like fixing of water supply timings, encouraging citizens to take connections to reduce illegal connections, drive for the collection of arrears will help in the betterment of Water Supply system in Parbhani. Regular cleaning of open drains should also be taken on top priority.

Other costs for actions which require minimal cost for Water Supply and Sanitation is 2 Cr.

Further detail surveys and technical studies will be required to arrive at exact cost for up-gradation in Parbhani's performance in terms of service delivery.

6.2 PHASING AND STEPS TO IMPROVEMENT

In order to carry out the improvements suggested above, PMC has to improve its current financial position. The suggestions for improvement are based on analysis of the BAU and interventions required to improve the BAU scenario.

The business as usual scenario is based on the hypothesis that the past trends in key financials of PMC 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.

The following table indicates the investible surplus projected for 10 years from 2011-12;

Table 20: Projected investment capacity- business as usual scenario (Rs. In Crores)

Year	Revenue surplus (other than WS, WW and SWM)	Revenue surplus for WS, WW and SWM	Debt servicing	Capital surplus after receipt and expenditure	Investible surplus/ (need for external funds)
Budgeted					
2010-11	6.27	(3.86)	-	30.97	33.38
2011-12	3.26	(7.43)	-	3.90	(0.27)
Projected					
2012-13	3.46	(10.92)	2.55	8.69	(1.31)
2013-14	3.67	(11.49)	2.33	9.69	(0.47)
2014-15	3.88	(12.09)	2.02	9.67	(0.56)
2015-16	4.11	(12.72)	0.01	9.64	1.01
2016-17	4.34	(13.39)	0.01	9.60	0.53
2017-18	4.57	(14.08)	0.01	9.54	0.02
2018-19	4.82	(14.81)	0.01	9.47	(0.54)
2019-20	5.06	(15.58)	0.01	9.38	(1.15)
2020-21	5.32	(16.38)	0.01	9.28	(1.80)
2021-22	5.58	(17.22)	0.01	9.16	(2.50)

From the above table it is clear that unless PMC is not able to add to its revenue income, it would need to depend on external funding just to finance its operations and routine capital expenditure.

In the above business as usual scenario, the additional revenues that would be generated because of the operationalizing of the water supply project under implementation have not been considered, although the capital expenditure has been considered as part of the business as usual scenario. It would therefore be proper to add the revenues and also add the incremental O&M for the project under implementation to get a more accurate picture of the investible surplus.

Table 21: Assumptions for simulation of impact of project under implementation

S. No.	Item	Assumption
1.	Design population	4,75,26 (2023)
2.	Current population	307,191 (2011)
3.	Current coverage of population	34%
4.	Current covered population	1,04,380 (2009)
5.	Targeted coverage	90%
6.	Annual increase targeted	30%
7.	O&M expenses as a % of capex	1.5%

The following table provides the revenue and cost implications of the UIDSSMT project under implementation and the investible surplus considering the net effect of the project.

Table 22: Investible surplus incorporating the net impact of UIDSSMT project under implementation (Rs. In Crores)

Year	Investible surplus	Incremental revenues	Incremental costs	Net effect	Net investible surplus
Budgeted					
2010-11	33.38	-	-	-	-
2011-12	(0.27)	-	-	-	-
Projected					
2012-13	(1.31)	-	-	-	(1.31)
2013-14	(0.47)	-	-	-	(0.47)
2014-15	(0.56)	-	-	-	(0.56)
2015-16	1.01	0.23	0.19	0.04	1.05
2016-17	0.53	0.54	0.44	0.10	0.63
2017-18	0.02	0.95	0.78	0.17	0.19
2018-19	(0.54)	1.49	1.22	0.27	(0.27)
2019-20	(1.15)	2.19	1.80	0.39	(0.75)

Year	Investible surplus	Incremental revenues	Incremental costs	Net effect	Net investible surplus
2020-21	(1.80)	3.10	2.54	0.56	(1.24)
2021-22	(2.50)	4.28	3.51	0.77	(1.73)

PMC has an investible surplus of Rs 3348 lakhs and a deficit of Rs 27 lakhs for the years 2010-11 and 2011-12 respectively. The completion of the UIDSSMT water supply project, PMC would have a deficit of Rs 446 Lakhs over a period of ten years from 2012-13. This impact is a result of the additional O&M expenditure and the additional revenues possible generated through the project.

Investment capacity after revenue enhancement measures

It is extremely critical that PMC undertakes revenue enhancement measures as otherwise it would need to resort to external resources to fund its internal operations as well. Some of the steps that can be potentially 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
 - o Increase in collection efficiency should be proportionate to the increase in coverage of water supply connections, identification of illegal connections

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 23: Assumptions for simulation of revenue enhancement

S. No.	Item	Assumption
1	Property tax	Current collection efficiency: 74% Targeted collection efficiency: 95% Annual increment (over 5 years): 4.2%
2	Increase in water supply tariff	Based on the proposed tariff
3	Increase in collection efficiency of water charges	Current collection efficiency: 33% Targeted collection efficiency: 95% Annual increment (over 8 years): 10%

The following table presents the incremental revenues because of the revenue enhancement measures

Table 24: Investible surplus after revenue enhancement actions (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	33.38	-	-	-
2011-12	(0.27)	-	-	-
Projected				
2012-13	(1.31)	-	0.69	(0.62)
2013-14	(0.47)	0.42	1.44	1.39
2014-15	(0.56)	0.90	2.32	2.67
2015-16	1.01	1.46	3.38	5.85
2016-17	0.53	2.11	4.62	7.26
2017-18	0.02	2.85	6.08	8.94
2018-19	(0.54)	3.07	7.79	10.33
2019-20	(1.15)	3.32	8.84	11.01
2020-21	(1.80)	3.59	9.75	11.54
2021-22	(2.50)	3.87	10.77	12.15

Thus as can be seen from the above simulation, the investible surplus can be gradually improved through revenue enhancement measures. The revenue enhancement measures, shall generate an additional surplus of Rs 7051 Lakh for PMC over a period of ten years from 2012-13.

Table 25. Phase 1 of PIP for PMC (2013-2018)

Proposed improvement areas	2013	2014	2015	2016	2017	2018
Water supply						
Consumer surveys for entire city						
Periodic surveys at source, treatment and consumer end						
Identification and regularization of illegal connections						
Water augmentation and improvement in water supply mechanism						
Policy level interventions (pre/post improvement in Water Supply mechanism)						
Installation of bulk flow meters and meters at consumer end						
Conduct water audit and leak detection surveys						
Undertake hydraulic modeling for entire water supply network						

Levy telescopic rates for water supply						
Sanitation (including sewerage)						
Refurbishment of CTs (5 No.)						
Preparation and Implementation of Septage Management Plan						
Preparation of DPR						
Improve collection efficiency of sanitation tax						

Once the revenue augmentation measures and process improvements are in place, it is proposed that PMC can begin its capital intensive projects for making the city ODF from 2018.

- Augmentation of Water supply in Parbhani will help PMC move towards 24X7. PMC has augmentation proposals under UIDSSMT for network refurbishment and augmentation which is ongoing with 30% work completed as discussed in the earlier section. This includes Water Audit, and Refurbishment of old network.
- After the UIDSSMT project is in place, Parbhani can look at 24X7 Water Supply. Conducting consumer survey for metering of WS connections can begin in 2013 which the ULB can fund themselves Actions like plugging of leakages and metering of connections need to be done This can be undertaken under the Nagar Uthan scheme. This improvement is proposed to be completed within 4 years.
- PMC can also refurbish a selected 5 (10 seats each) community toilets in 2013-14 before the construction of individual toilets, which will cost Rs 0.5 lakhs.(Rs 10,000 per toilet seat)
- PMC also needs to construct septic tanks for the existing toilets that do not have proper septic tanks will cost 0.5 Crores

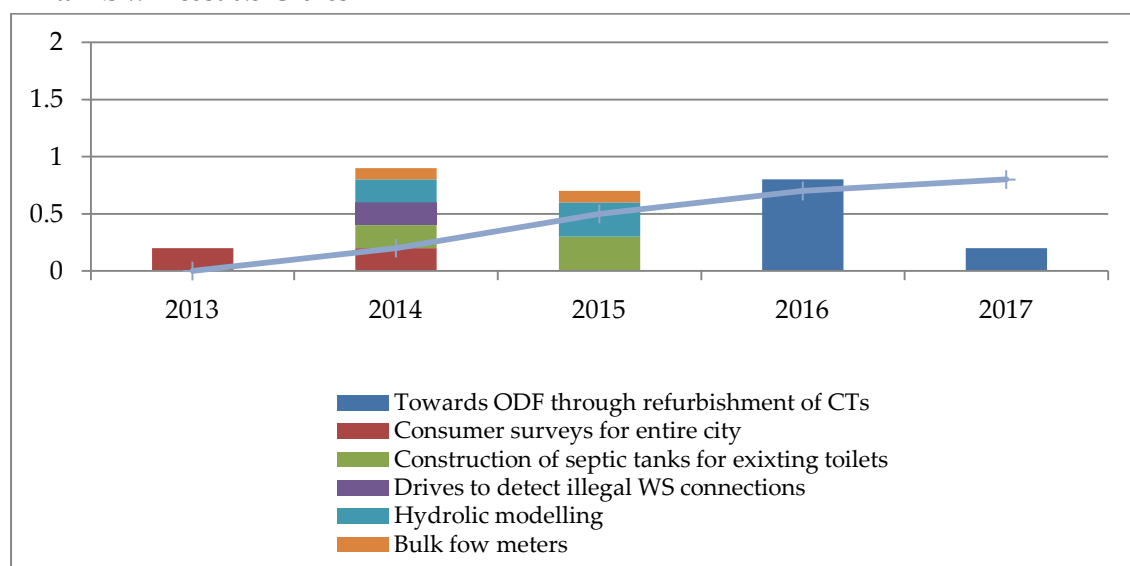


Figure 9. Phase 1: Proposed phasing of water and sanitation projects, after undertaking revenue enhancement measures

Phase 2 of PIP in PMC- 2018 to 2022:

- Starting from 2018, PMC can begin construction of individual and community toilets as the investible surplus from 2018 is substantial. As issues in existing community toilets were observed in terms of operation and maintenance, it is proposed that PMC refurbishes these community toilets before initiating construction of new community toilets.
- Existing community toilets can be refurbished and the maintenance of the same can be given to NGOs and CBOs. 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.
- PMC can go in for construction of individual toilets simultaneously. Construction of individual toilets will be completed in five years, while community toilets will be completed by four years.
- The other actions like IEC campaigns etc can take place before 2017.

Table 26-Sources of revenue to fund ODF in PMC (in Rs. Crores)

Implementation of ODF for PMC	2018	2019	2020	2021	2022
Total cost - ODF Plan	5.35	3.21	5.35	4.28	4.28
Investible surplus after implementation of other projects	1	1	1	1	2
External funds required	4.35	2.21	4.35	3.28	2.28

In order to realise the targets set for improving water supply and sanitation in PMC, 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. PMC has to focus its attention on improving policies related to services, financial sustainability, and accountability to the consumers

6.3 INSTITUTIONAL IMPERATIVES TO ACHIEVING PROPOSED IMPROVEMENTS

In order to realise the targets set for improving water supply and sanitation in PMC, 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 water supply and sanitation services, in other instances it is the improper regulation of the existing policies. PMC has to focus its attention on improving policies related to services, financial sustainability, and accountability to the consumers.

Mobilisation of external support: Additionally, PMC 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 as implementation of proposals related to 24X7 requires high technical skills, PMC needs to also bring external support through Project Management Consultants (PMC). Arrangements should be made with PMCs for continued support throughout implementation of the 24X7 project, both immediate and long term.

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

Table 27. Institutional improvements proposed for PMC

Area of improvement	Suggested improvements
Across all sectors	
Human resource management	PMC needs to employ additional resources, either internal or external.
Equity in service delivery	PMC needs to introduce policies to improve water supply and sanitation services. Some incentives and schemes should be introduced for slum dwellers to avail new connections.
Financial sustainability	As in the case of increase in water supply tariffs, provisions to introduce tariff for sewerage, sanitation, septage management need to be introduced.
Consumer redressal system	Methodical management of the consumer redressal system should be introduced
Sector specific	
Water supply	Based on discussions with the city officials a comprehensive reporting mechanism needs to be worked based on targets/ improvements achieved.
Sanitation (including sewerage)	Policy provisions to bring about involvement of private sector in areas of septage management, and sanitation services to slum settlements needs to be implemented.

Performance monitoring through regular setting of targets and use of performance indicators: In order to ensure that PMC 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 progress.
- Setting of targets (for own department as well as private service providers) and corrective action if required.
- Decisions on policy, resource allocation and incentives/ penalties.
- Operational decisions and plans.

Constitution of the PIP taskforce: The first step towards implementation of the proposed projects should be to constitute a PIP taskforce comprising of key technical staff for water supply and sanitation.. 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 of the institutional structure is shown below.

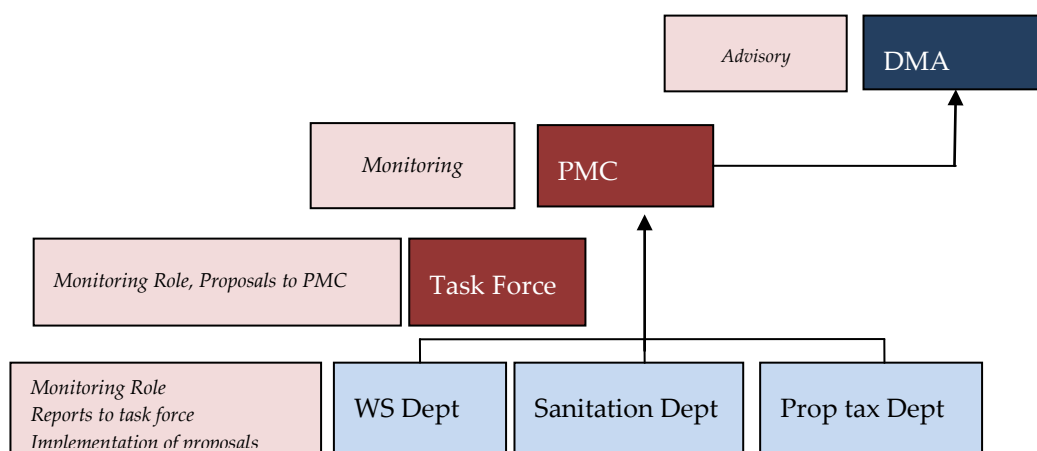


Figure 10- Institutional Structure

Performance monitoring through regular setting of targets and use of performance indicators: In order to ensure that PMC 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 progress
- Setting of targets (for own department as well as private service providers) 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 2023, it is necessary for PMC 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/ penalties to internal and external staff based on their performance needs to be implemented. Given that PMC should look to external agencies for support in PIP, the monitoring process should also include review of these agencies. A possible performance monitoring framework is suggested below.

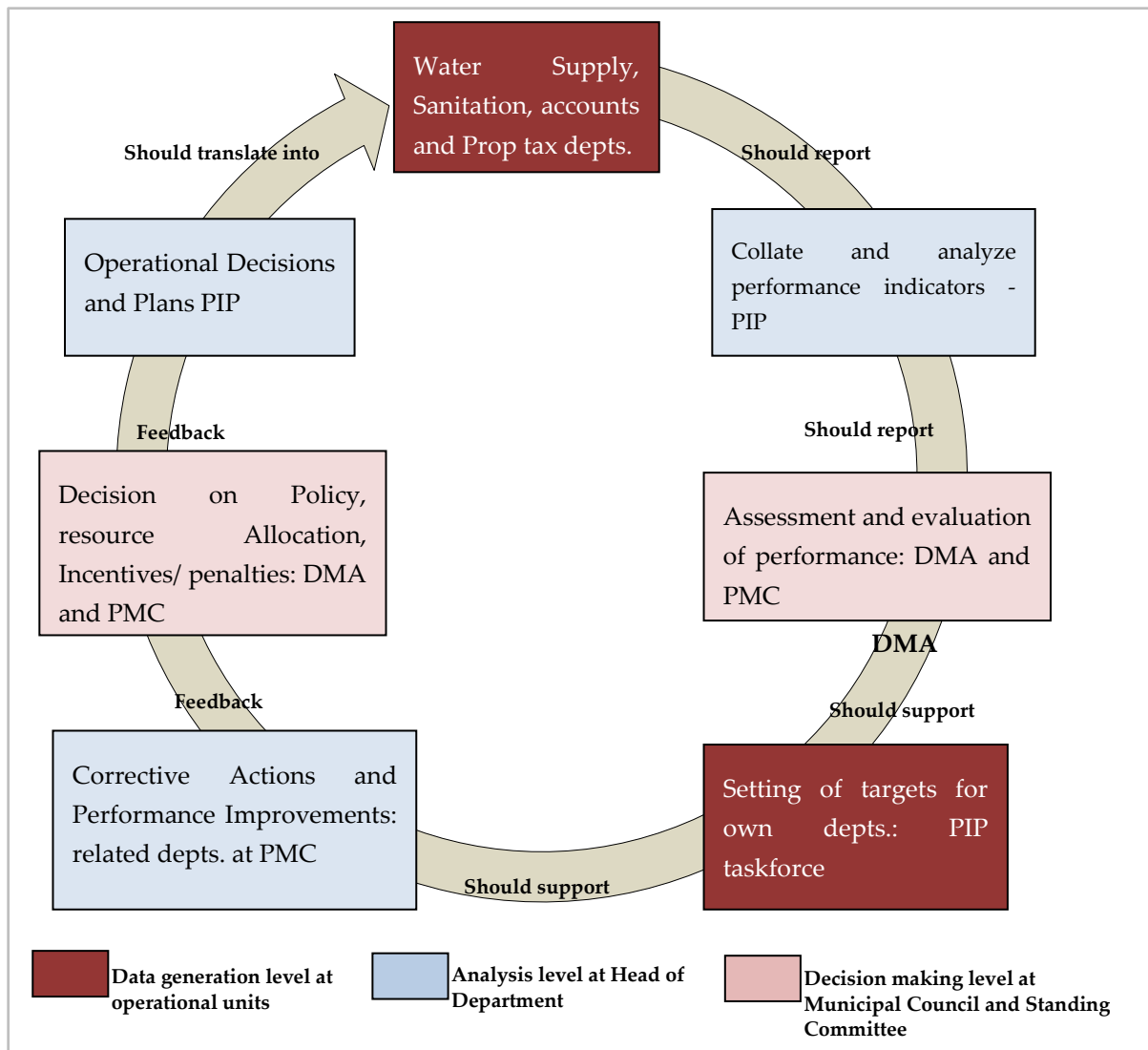


Figure 11- Performance monitoring framework proposed for PMC. Adapted from MoUD website: <http://www.urbanindia.nic.in/programme/uwss/slb/slb.htm>

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ANNEXURES

ANNEX.1: TOILETS IN SLUMS

Sr. No	Name of Slum	Notified /Non Notified	Pop 2001	No of HH	No ind. toilets	Scheme	CT	No of seats -M	No of seats -F	Total no. of seats	Present cond.	No of seats funct.	Est. HH without ind. toilets	Est. pop defecating in open
1	Marathwada Plot	Y	2635	527								0	527	2635
2	Gulshana baug	Y	1800	360	38	LAY						0	322	1610
3	Bhim Nagar, Kranti nagar	Y	5204	1041	51	VAMBAY	2	13	5	18	Demolished	0	990	4949
4	Kadrabad plot	Y	1673	335								0	335	1673
5	Shankar Nagar	Y	556	111			1	0	8	8	Demolished	0	111	556
6	Ambedkar Nagar	Y	396	79	10							0	69	346
7	Sakhla Plot	Y	5388	1078	70							0	1008	5038
8	Kalabawar	Y	4667	933	88	LAY						0	845	4227
9	Marathwada Plot	Y	1334	267	48							0	219	1094
10	Rahul Nagar	Y	2495	499	88		2	4	4	8	Not in use	0	411	2055
11	Milind Nagar	Y	597	119			1	4	4	8	Demolished	0	119	597
12	Annabhau Sathe Nagar	Y	300	60	12							0	48	240
13	Sanjay Gandhi Nagar	Y	3068	614	110	LAY	1	4	0	4	Not in use	0	504	2518

Sr. No	Name of Slum	Notified /Non Notified	Pop 2001	No of HH	No ind. toilets	Scheme	CT	No of seats -M	No of seats -F	Total no. of seats	Present cond.	No of seats funct.	Est. HH without ind. toilets	Est. pop defecating in open
14	Peth Mohalla	Y	805	161								0	161	805
15	Nagsen Nagar	Y	606	121								0	121	606
16	Gandhi nagar, dhar road	Y	3495	699	88		1	0	10	10	Demolished	0	611	3055
17	Sagar Nagar	Y	1116	223								0	223	1116
18	Gaddi Mohalla	Y	695	139	12							0	127	635
19	Ithalapur wadi	Y	1857	371	104	LAY	1	8	0	8	Demolished	0	267	1337
20	Anand Nagar	Y	1136	227	40							0	187	936
21	Panchsheel Nagar	Y	999	200	38							0	162	809
22	Ajmer coloney	Y	443	89	16							0	73	363
23	Ajjiya nagar	Y	995	199	18							0	181	905
24	Sant gadge baba nagar	Y	1044	209	36							0	173	864
25	Indira gandhi nagar	Y	836	167	32							0	135	676
26	Vidhya nagar (part)	Y	363	73	12							0	61	303
27	Lahuji nagar, Mochi galli	Y	729	146	10		2	6	6	12	In use Functional	12	136	679
28	Gautam nagar	Y	861	172	18		1	4	4	8	Demolished	0	154	771
29	Charmakar galli, jijamata road	Y	547	109	32							0	77	387

Sr. No	Name of Slum	Notified /Non Notified	Pop 2001	No of HH	No ind. toilets	Scheme	CT	No of seats -M	No of seats -F	Total no. of seats	Present cond.	No of seats funct.	Est. HH without ind. toilets	Est. pop defecating in open
30	Kalabawar(remain ing)	Y	2244	449	30	LAY	1	4	4	8	Demolished	0	419	2094
31	Pakeza Mohalla	Y	884	177	40	LAY	1	0	8	8	Not in use	0	137	684
32	Juna nandkhada road- west	Y	848	170								0	170	848
33	Kadrabad Plot	Y	430	86	25	LAY						0	61	305
34	Shankar nagar	Y	306	61	12							0	49	246
35	Rajiv gandhi nagar	Y	689	138	24							0	114	569
36	Bhuddha Wada	Y	167	33	7							0	26	132
37	Sarfaraz Nagar	Y	837	167	20							0	147	737
38	Kadrabad Plot- (in front of masjid)	Y	430	86	16	LAY						0	70	350
39	Musa Engineering-	Y	176	35	7	LAY	2	0	20	20	Demolished	0	28	141
40	Rahim nagar	N	2338	468	32	LAY	1	5	5	10	Not in use	0	436	2178
41	Siddharth nagar	N	923	185	32		1	8	0	8	In use- Functional	8	153	763
42	Vikas Nagar	N	473	95	16							0	79	393
43	Bharat Nagar	N	940	188	34							0	154	770
44	Savitribai Phule nagar	N	76	15								0	15	76

Sr. No	Name of Slum	Notified /Non Notified	Pop 2001	No of HH	No ind. toilets	Scheme	CT	No of seats -M	No of seats -F	Total no. of seats	Present cond.	No of seats funct.	Est. HH without ind. toilets	Est. pop defecating in open
45	Vishwas Nagar	N	1092	218	38							0	180	902
46	Priyadarshini nagar	N	1364	273	48							0	225	1124
47	Khandoba bazar-vangi road	N	1335	267	28	LAY	1	2	0	2	Demolished	0	239	1195
48	Ambabhavani nagar	N	605	121	22							0	99	495
49	Prabhuddha nagar	N	348	70	12							0	58	288
50	Mahatma Phule nagar	N	293	59	10							0	49	243
51	Sewak nagar	N	693	139	16							0	123	613
52	Kadrabad, 2	N	831	166	20	LAY	1	6	0	6	Demolished	0	146	731
53	Jhillaahikari karyalay	N	547	109								0	109	547
54	Shivaji college-rear area	N	448	90	16							0	74	368
55	Vanji naka (near)	N	1616	323	148	LAY						0	175	876
56	Ajinta nagar	N	785	157	28							0	129	645
57	Bhayya saheb ambedkar nagar	N	404	81	18							0	63	314

Sr. No	Name of Slum	Notified /Non Notified	Pop 2001	No of HH	No ind. toilets	Scheme	CT	No of seats -M	No of seats -F	Total no. of seats	Present cond.	No of seats funct.	Est. HH without ind. toilets	Est. pop defecating in open
58	Pakeza Mohalla (part)	Y	1694	339								0	339	1694
59	Khaza garib navaz ali	Y	2674	535	39							0	496	2479
60	Khaji baug servey no.584	Y	2953	591	80							0	511	2553
61	Mangesh coloney and servey no.582	Y	1211	242	28							0	214	1071
62	Sarfaraz nagar-(north side)	Y	1192	238	30							0	208	1042
63	Charmakar galli	Y	1311	262	28		1	0	8	8	Demolished	0	234	1171
64	Mangalwara	Y	1358	272								0	272	1358
65	Harsh nagar (Vanji road)	Y	843	169	24							0	145	723
66	Uday nagar(part)/Hanuman nagar	Y	4192	838	88							0	750	3752
67	Sarfaraz nagar (part)	Y	2472	494	48							0	446	2232
68	Nehru nagar (part)	Y	1950	390	18							0	372	1860
69	Bhuddhya nagar, jintur	Y	1099	220								1	220	1099

Sr. No	Name of Slum	Notified /Non Notified	Pop 2001	No of HH	No ind. toilets	Scheme	CT	No of seats -M	No of seats -F	Total no. of seats	Present cond.	No of seats funct.	Est. HH without ind. toilets	Est. pop defecating in open
	road													
70	Datta nagar	Y	1090	218								2	218	1090
71	Ekbal nagar	Y	4001	800								3	800	4001
72			96802	19360	2053	0	21	68	86	154	0	26	17307	86537

ANNEX.1: LAND OWNERSHIP IN SLUMS

S No	Name of Slum	Land Ownership
1	Marathwada Plot	Semi Govt
2	Gulshana baug	Semi Govt
3	Bhim Nagar, Kranti nagar	Govt
4	Kadrapad plot	Semi Govt
5	Shankar Nagar	Semi Govt
6	Ambedkar Nagar	Semi Govt
7	Sakhla Plot	Private
8	Kalabawar	Private
9	Marathwada Plot	Private
10	Rahul Nagar	Private
11	Milind Nagar	Semi Govt
12	Annabhau Sathe Nagar	Semi Govt
13	Sanjay Gandhi Nagar	Semi Govt
14	Peth Mohalla	Private
15	Nagsen Nagar	Semi Govt
16	Gandhi nagar, dhar road	Govt
17	Sagar Nagar	Private
18	Gaddi Mohalla	Private
19	Ithalapur wadi	Semi Govt
20	Anand Nagar	Private
21	Panchsheel Nagar	Private
22	Ajmer coloney	Private
23	Ajjiya nagar	Private
24	Sant gadge baba nagar	Private
25	Indira gandhi nagar	Private
26	Vidhya nagar (part)	Private
27	Lahuji nagar, Mochi galli	Private
28	Gautam nagar	Private
29	Charmakar galli, jijamata road	Private
30	Kalabawar(remaining)	Private
31	Pakeza Mohalla	Private
32	Juna nandkhada road	Private
33	Kadrapad Plot	Private
34	Shankar nagar	Private
35	Rajiv gandhi nagar	Private
36	Bhuddha Wada	Private

S No	Name of Slum	Land Ownership
36	Bhuddha Wada	Private
37	Sarfaraz Nagar	Private
38	Kadrapad Plot-(in front of masjid)	Private
39	Musa Engineering-	Private
40	Rahim nagar	Private
41	Siddharth nagar	Private
42	Vikas Nagar	Private
43	Bharat Nagar	Private
44	Savitribai Phule nagar	Private
45	Vishwas Nagar	Private
46	Priyadarshini nagar	Private
47	Khandoba bazar-vangi road	Private
48	Ambabhavani nagar	Private
49	Prabhuddha nagar	Private
50	Mahatma Phule nagar	Private
51	Sewak nagar	Private
52	Kadrapad, 2	Private
53	Jhillaahikari karyalay	Private
54	Shivaji college-rear area	Private
55	Vanji naka (near)	Private
56	Ajinta nagar	Private
57	Bhayya saheb ambedkar nagar	Private
58	Pakeza Mohalla (part)	Private
59	Khaza garib navaz ali	Private
60	Khaji baug servey no.584	Private
61	Mangesh coloney and servey no.582	Private
62	Sarfaraz nagar-(north side)	Private
63	Charmakar galli	Semi Govt
64	Mangalwara	Semi Govt
65	Harsh nagar (Vanji road)	Semi Govt
66	Uday nagar(part)/Hanuman nagar	Semi Govt
67	Sarfaraz nagar (part)	Semi Govt
68	Nehru nagar (part)	Semi Govt
69	Bhuddhya nagar, jintur road	Semi Govt
70	Datta nagar	Semi Govt
71	Ekbal nagar	Semi Govt
72		Semi Govt

ANNEX.2: ASSUMPTIONS FOR SIMULATION OF REVENUE ENHANCEMENT

S. No.	Item	Assumption
1	Property tax	Current collection efficiency: 74% Targeted collection efficiency: 95% Annual increment (over 5 years): 4.2%
2	Increase in water supply tariff	Based on the proposed tariff
3	Increase in collection efficiency of water charges	Current collection efficiency: 33% Targeted collection efficiency: 95% Annual increment (over 10 years): 6.2%

ANNEX.3: INVESTIBLE SURPLUS AFTER REVENUE ENHANCEMENT ACTIONS (RS. IN LAKH)

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	33.44	-	-	-
2011-12	(0.32)	-	-	-
Projected				
2012-13	(0.23)	-	0.68	0.45
2013-14	0.62	0.41	1.17	2.21
2014-15	0.54	0.90	1.75	3.20
2015-16	2.11	1.46	2.43	6.01
2016-17	0.34	2.10	3.24	5.69
2017-18	(0.17)	2.84	4.18	6.85
2018-19	(0.74)	3.07	5.29	7.61
2019-20	(1.36)	3.31	6.58	8.54
2020-21	(2.02)	3.58	8.09	9.65
2021-22	(2.74)	3.87	9.85	10.98

ANNEX.4: COST OF SETTLED SEWERAGE

Parbhani _Cost for Sanitation	
Individual toilets	
Total number required	16835
To be constructed under ILCS 8000	
To be constructed under special funds for SC 2000	
Net required number of toilets	6835
Cost per toilet	Rs.12000
Total cost of individual toilets	82020000
Assuming a pipe septic tank (see photos) of dia 1400 mm is shared by 3 toilets, number of septic tanks needed	2278.333333
cost of septic tanks @ 13000 each (pipe septic tank of 1400 mm dia) =	29618333.33
Cost of toilets + septic tanks =	111638333.3
Settled sewerage network	
Calculate length of roads =	137.5km
Length of sewer line = $137.5 \times 2 \times 0.8 =$	206 Km
UPVC 75mm dia secondary sewer length =	164.8 Km
RCC NP2 trunk sewer length (av. Dia 750mm)=	41.2
Excavation	
UPVC 75mm dia secondary sewer =	6427200
RCC NP2 trunk sewer (av.Dia 750mm)=	8034000
Pipe cost	
UPVC 75mm @ Rs.58.75/m=	9682000
RCC NP2 750mm dia@ Rs. 1742.5/m	71791000
Junction boxes	
Number of junction boxes =	7420
Junction box cost @ 7000 / unit =	51940000
Pumping stations 2 nos @ 200 lakhs each =	40000000
Rising mains 2km length DI K-7 @ Rs.8000/m=	16000000
STP cost	
Quantity of sewage for 350000 pop. @60 l sewage/capita=	24 MLD
Since settled sewerage BOD is low, ASP & similar high tech STPs ruled out	
Consider Facultative Aerated Lagoon	
Land required @ 0.4ha/mld =	10Ha
Cost @ 35 lakhs / MLD =	84000000
Total cost of sewerage	Rs 39 Crores

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.

CEPT-AIILSG team would like to acknowledge the support provided by Parbhani Municipal Council for this document. The team is especially grateful to the Chief Officer and other staff members of PMC who have assisted us in the PIP exercise.

PAS Project

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