



IMPROVING THE COST RECOVERY OF WATER SUPPLY IN PATAN MUNICIPALITY, GUJARAT

Performance Assessment System

Prepared by: Urban Management Centre, Ahmedabad



The Urban Management Centre (UMC) is a not-for-profit organization based in Ahmedabad, Gujarat, working towards professionalizing urban management in India and South Asia. UMC provides technical assistance and support to Indian state local government associations and implements programs that work towards improvement in cities by partnering with city governments. UMC builds and enhances the capacity of city governments by providing much-needed expertise and ready access to innovations on good governance implemented in India and abroad. UMC is a legacy organization of International City/County Management Association (ICMA) and hence is also known as ICMA-South Asia. See more at www.umcasia.org



PAS, a five-year action research project, has been initiated by CEPT University with funding from the Bill and Melinda Gates Foundation. PAS aims to develop better information on water and sanitation performance at the local level to be used to improve the financial viability, quality and reliability of services. It will use performance indicators and benchmarks on water and sanitation services in all the 400-plus urban areas of Gujarat and Maharashtra. UMC and the All India Institute of Local Self Governance are CEPT's project partners in Gujarat and Maharashtra, respectively. More details are available on www.pas.org.in



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Acronyms and Abbreviations

ARV	Annual rental value
ASCI	Administrative Staff College of India
BPL	Below the Poverty Line
CAA	Constitutional Amendment Act
CAGR	Compound Annual Growth Rate
GoI	Government of India
GOG	Government of Gujarat
GUDC	Gujarat Urban Development Company
JNNURM	Jawaharlal Nehru National Urban Renewal Mission
SLB	Service Level Benchmark
MoUD	Ministry of Urban Development
NRW	Nonrevenue water
O&M	Operation and maintenance
ULB	Urban local body
WDS	Water distribution system
DCB	Demand Collection Balance statement
WSP	Water and Sanitation Program
UMC	Urban Management Center

Units of measure

Kl	kiloliter
Kld	kiloliter per day
kWh	Kilo watt hour
Lpcd	litre per capita per day
Mld	Million litre per day
OR	Operating Ratio

1. Introduction and Background to the Study

Performance Assessment System (PAS), is a seven-year action research project, being implemented by Urban Management Centre in Gujarat in partnership with CEPT University with funding from the Bill and Melinda Gates Foundation.

The PAS program funded by The Bill and Melinda Gates Foundation, has three main components: Performance Measurement, Performance Monitoring and Performance Improvement.

The aim of the PAS program is to measure, monitor and improve performance of municipal water supply and sanitation services in 400 ULBs in the states of Gujarat and Maharashtra. The project is monitoring and assessing the performance of all 167 cities in Gujarat over the last five years. UMC is working with the ULBs on various performance improvement and information system improvement initiatives.

Improving financial viability of water and sanitation services is a key objective of the PAS program. The first step towards improving financial viability is to assess the current levels of cost recovery and tax collection efficiencies of urban local bodies. UMC reviewed cost recovery in four cities - Anand (Class A), Patan (Class A), Siddhpur (Class B) and Dwarka (Class C). The study has attempted to calculate cost recovery for the water supply sector by identifying the accrued income and expenditure of these cities. The major task in identifying expenditure items was to locate unpaid electricity bills and bulk water purchase bills. After having identified the “real” cost recovery, the study presents recommendations for cities to enhance cost recovery. This report highlights the findings of the assessment and recommendations for Patan Municipality.

2. What is cost recovery?

Cost recovery in service delivery is one of the largest challenges that Indian cities face. It can be simply defined as the financial state in which revenues for a service are at least equal to the expenses for providing the service¹.

India’s Jawaharlal Nehru National Urban Renewal Mission (JNNURM) requires urban water service providers to recover the costs of their services through “reasonable user charges”.

TYPES OF COST RECOVERY

Operational Cost Recovery

Revenues are at least the operational expenditure (Followed in India)

Full Service Cost recovery

Capital maintenance expenditure and cost of capital are also to be recovered (Followed by International countries)

Full Environmental Cost Recovery

External cost of a service including environmental damages (Followed by some European country)

¹Water and Sanitation program, World Bank, March 2011

Internationally, the trend is for tariffs to cover the full costs of water supply and sanitation, including capital replacement and costs of environmental damages. National policy frameworks for cost recovery:

The Government of India's (GOI's) JnNURM program has advanced mandatory reforms, which require that ULBs fully recover the cost to operating and maintaining service delivery over theseven year Mission period. This prescription is augmented by the Thirteenth Finance Commission, which has also recommended that urban local bodies (ULBs) in India prioritize service delivery and institute benchmarks for essential civic services. Part of the benchmarking framework, are two major indicators: 1) pegging cost recovery at 100% and 2) pegging the efficiency of collection at 90%: the Government of India has specified these as concrete benchmarks. Additionally, PAS Program's Performance Improvement Plans (PIPs) also aim to service delivery financial viability (e.g. by making improvements more efficient, reforming tariffs, and collecting more dues).

Cost recovery is important for ULBs:

- for financial sustainability
- for better future budget estimation and operation
- to provide a basis on which to fix tariffs without compromising on the quality of service.
- to have stable revenue stream which would help prevent cash flow or financing difficulties for the utility.

2.1. Ways of Improving Cost Recovery

Cost recovery could be improved by increasing revenues and by reducing expenditures. Areas for improving cost recovery also should include operational and tariff-related factors that impede cost recovery by ULB, especially low service coverage; high water losses and nonrevenue water; inefficient billing and collection; and high staffing levels.

Hence, while the tariff reforms that include setting adequate tariffs and improving tariff practice are in progress, the ULB could improve cost recovery considerably by introducing more efficient operational practices. **The revenue stream** could be increased first, by improving the efficiency of collecting dues and then if required by increasing tariff rates. Some of the other operational factors that could lead the increase in revenues include:

- *enhancing the service coverage:* A higher service coverage means a larger revenue base for the ULB. Many cities do not have a good coverage of individual water supply connections to slums and slum-like areas and supply water through standposts. Many surveys have reconfirmed the fact that slum dwellers are willing to pay for individual

municipal services. Extending municipal infrastructure to slums and providing individual water connections could be provided at marginal costs. Additionally, like many cities in Maharashtra have initiated, community standposts could be made chargeable and some amount could be levied on user groups.

- *Identifying and regularizing illegal connections.* The PAS-SLB database shows cities admitting to have illegal connections and that a few have also initiated drives to regularize these. In the year 2011-12, 83 cities from Gujarat reported to have conducted surveys to identify illegal connections, only 5% connections were reported as illegal. Only four corporations reported undertaking surveys in 2012 compared to over seventy municipalities. Class B municipalities also reported regularizing 60% of the illegal connections identified. Regularized connections would add to the revenue base.
- *By improving tax collection efficiencies:* The Service Level Benchmark framework calculates cost recovery based on tax demand raised by the ULB. This assumes that the ULB has an efficient tax collection system in place and that it will be able to collect almost 100% of the tax demand. However, it has generally been seen that the average tax collection efficiency of municipalities is 64%. There are several deficiencies in the tax collection system of ULBs, some of them being- no timely bill degeneration and dispatch, no incentives for early payments and no disincentives for late payments like penalties of interest on payments, no decentralized collection systems. Many ULBs also do not send reminder notices to tax defaulters.
- *Rectifying how consumers are classified for payment purposes:* for example, a non-BPL consumer currently classified as BPL, a commercial consumer classified as a domestic consumer. This could be done through the property tax assessment surveys that ULBs conduct annually.
- *Amendments to water tariffs:* water supply needs to be charged appropriately. Currently, the GR no. UDD/NPL/4510/C file-1/M dated 21.04.2010/clause 99 and 104 state that ULBs could charge up to Rs. 600 of fixed annual water charge²s. These are levied along with the property tax bill on an annual basis. The PAS-SLB database for year 2013 shows that 135 cities only charge Rs. 600 per annum while only 6 cities charge more.

The **operating expenditure** could be reduced by improving operational efficiency (through no-cost or low-cost actions or through substantial capital investment). A substantial one-time

²In Gujarat, water supply is not metered and hence ULBs levy a fixed charge. The charge level per unit remains the same whatever the volume of water consumed.

capital investment would include, for example, replacing sections of the water supply network. Some of the other initiatives that could lead the reduction in operating expenditure include:

- *Reducing Non-Revenue Water (NRW) from real losses³*: Non-revenue water means the water that is produced by the ULB, but does not fetch any revenues. This includes water that is lost in transmission and distribution through leakages and theft, free water connections provided in the city. PAS-SLB database for year 2011-12 shows that almost 24 % of water produced in the ULBs is non-revenue water. The water audits conducted by the PAS team in ten cities also show that almost 30-50% of the water produced is NRW. Hence any reduction in water lost in the system would enhance the water supply.
- *Reducing inefficiencies in energy consumed*: Analyzing the various components of expenditure among various classes of cities, it can be seen that electricity charges constitute the largest component. 70% of all expenses towards water supply in municipal corporations are energy costs. This is followed by expenses of staffing. Any increase in energy efficiency in water supply would greatly impact cost recovery. of Rs. 30.53 lakhs

3. Calculating real cost recovery

Cash-based v/s accrual-based accounting system:

Although ULBs in Gujarat have initiated a double-entry accrual based accounting system, it has been running parallel to an on-going cash-based accounting system. The double-entry accounting system was set up with support from the “Gujarat Municipal Accounting Reforms Project (GMARP)” of the Gujarat Municipal Finance Board. ULBs continue to operate on a cash-based accounting system up until such time as the State Government legalizes the use of the double- entry accounting system.

Current-day municipal practice operates exclusively on a cash-based system, where the ULB books the actual price of the service to be paid for in its records. Any gaps (owing) in actual payment could alternatively be booked as a liability across an entire year (not only per project). And the same strategy could be applied to expenditures, not simply incomes. The actual settlement of any claims or payments could then happen internally. Given the fact that cities currently follow a cash-based accounting system, it is impossible to correctly gauge shortfalls,

³ Real (or physical) losses are leakages from all parts of the water supply system and are mostly caused due to poor operations and maintenance.

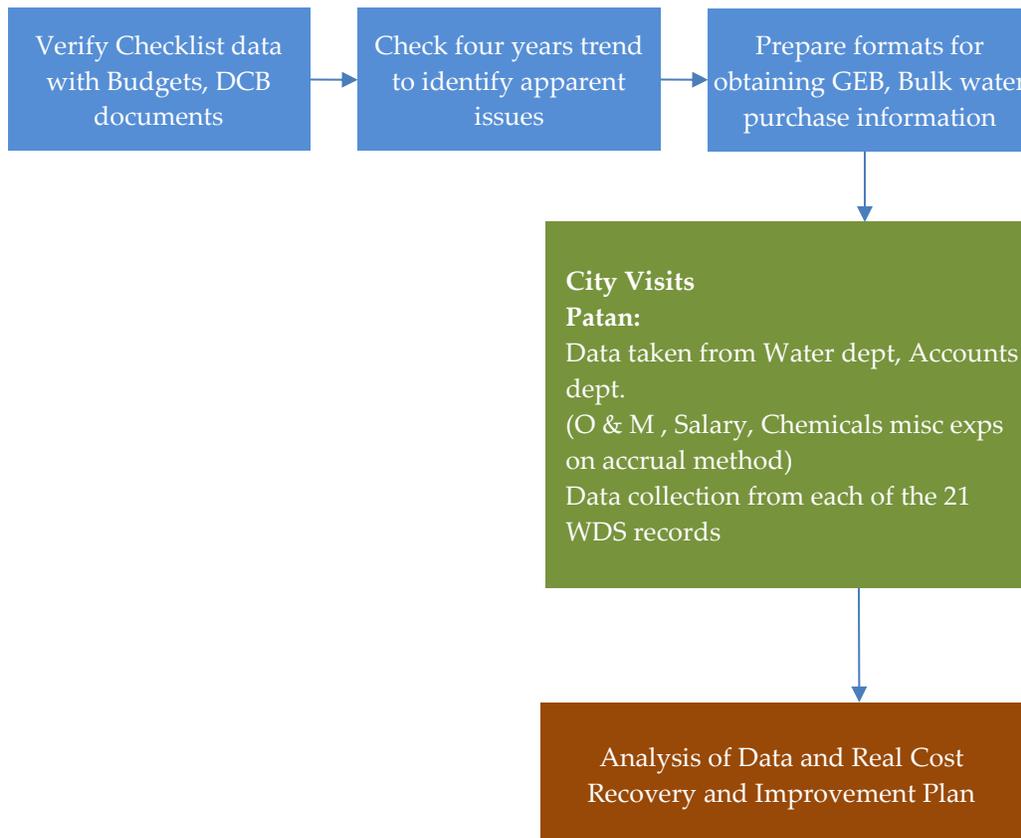
and outlays. The finance data for the PAS checklists is obtained from the budget documents and demand collection balance (DCB) statements, which are maintained on a cash basis.

As a result, it becomes difficult to ascertain revenue income and expenditure data on an accrued basis. The present study has attempted to calculate cost recovery for the water supply sector by identifying the accrued income and expenditure of Patan Municipality.

The major task in identifying expenditure items was to locate unpaid electricity bills and bulk water purchase bills. These together accounts for almost 86% of the ULB's total operational expenditure of water supply. The study team collected bills from the water supply register of the Gujarat Electricity Board (GEB), and bulk water purchase bills.

To identify unpaid GEB bills, the study team analysed the GEB register that has data of electricity units consumed at each water distribution station. Bills received from the Gujarat Water Supply and Sewerage Board (GWSSB) for bulk water procurement were similarly collated and compiled.

The following chart summarizes the framework for collecting finance data from these cities.



The following table shows the difference in data collected from the budget documents (cash basis) and the data collected from actual bills and registers (accrual basis). It can be seen that there is a huge variation of almost 112% in electricity expenses while the ULB had not paid any amount to GWSSB for bulk water purchase. Considering all heads put together, the ULB is yet to pay an amount of Rs. 387.34 lakhs towards all outstanding dues. Figure 3 shows that the cost recovery calculated considering accrual income and expenditure actually comes to 45% as compared to a cost recovery of 72% based on cash based accounting system.

Table 1: expenditure amounts based on cash and accrual basis, in lakh INR

Expenditure Head	Cash basis In lakh Rs.	Accrual basis In lakh Rs.
Establishment expenses	38.93	38.93
Electricity expenses	144.00	305.34
Repair & Maintenance	10.00	20.00
Bulk water Purchase	0	216.00
Total	192.93	580.27

Source: Nagarpalika Books, Register, Budget documents and Demand Collection Balance (DCB statement)

Actual tax collection v/s tax demand:

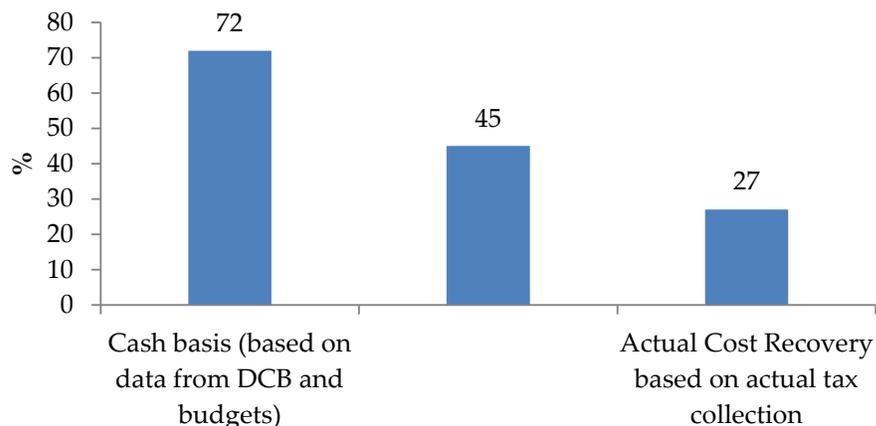
The Service Level Benchmark framework calculates cost recovery based on tax demand raised by the ULB. This assumes that the ULB has an efficient tax collection system in place and that it will be able to collect almost 100% of the tax demand. However, it has generally been seen that the average tax collection efficiency of municipalities is 64%. There are several deficiencies in the tax collection system of ULBs, some of them being- no timely bill degeneration and dispatch, no incentives for early payments and no disincentives for late payments like penalties of interest on payments, no decentralized collection systems. Many ULBs also do not send reminder notices to tax defaulters. The Patan Municipality has been able to collect Rs. 163.6 lakhs out of a total demand of Rs. 273.12 Lakhs while it has an outstanding tax arrears demand of 389.93 lakhs. The collection efficiency of Patan Municipality is 60 % for year 2010-11.

Calculation on tax Demand = (Total water supply tax demand (**Bill raised**)/ Total operational expenditure-Accrual method) *100

Calculation on Actual tax recovery
(Total actual water supply tax recovery/Total operational expenditure-Accrual method) *100

If we factor in actual tax collection of the ULB, the cost recovery further dips to 27%. **This shows that the ULB is able to recover only 27% of costs incurred in supplying water to citizens.**

Figure 1: Varying Cost recovery based on varying data methods



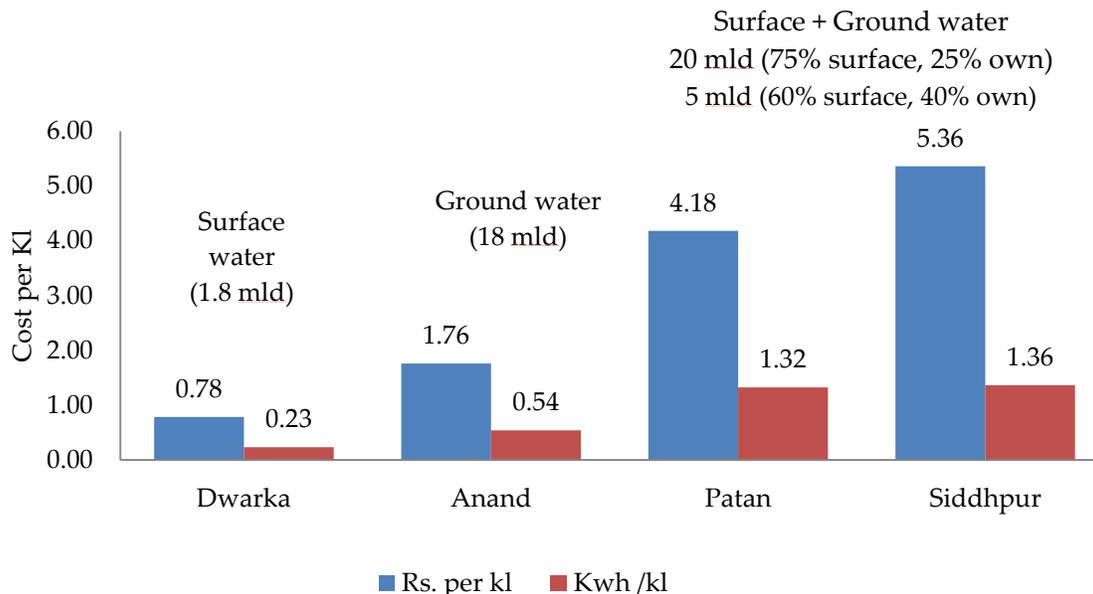
4. Actual cost of production of water

The cost of production of water has been shown in Table 2. The cost has been calculated considering the total revenue expenditure on water supply divided by the total annual water produced by the ULB.

Table 2: Calculation of Cost of production of water

	Anand	Patan	Dwarka	Siddhpur
Total cost per annum (in lakhs) (A)	209.69	606.13	58.18	178.32
Daily expenditure (B= A/365)	0.57	1.66	0.16	0.49
Water produced per day in kilolitres (C=MLD *1000)	18000	20000	1800	5000
Cost per kilo liter per day (B / C)	3.19	8.30	8.86	9.77

Figure 2: Energy Cost - Kwh and cost per kilo liter



Source: Electricity register and bills of Municipality

As compared to cities of Dwarka and Anand, Patan, incurs an energy expenditure of Rs. 4.18 per kilo litre of water produced. This is due to the high energy consumption per KL of water it produces. As compared to other A class cities, Patan utilizes 1.32 KWH energy for every 1000 litres of water it produces. This shows possibilities of improvements in energy efficiency by undertaking energy audits.

The energy expenditure for water supply is 50.38% which is very high of Rs. 305.34 lakhs per annum and since 1st Jan 1996, the city has an outstanding energy bill of Rs. 34 crores approx.

Based on discussions with ULB officials, there has been no energy audit conducted for the Municipality at least in the last four to five years.

There was an initiative of undertaking a “Walk through Preliminary energy audit” in 63 cities in 2008 by GUDC GoG and IL&FS Ecosmart Ltd. to invite Energy Services Companies (ESCOs) to take up implementation of Energy Conservation Program in the municipalities of Gujarat.

However, Patan Municipality was not been included in the same.

5. Improving Cost Recovery in Patan

The following table illustrates the services level benchmark indicators for finance for Patan for years 2008-09 to 2011-12.

Table 4: Finance Service level benchmark Indicators

Sector and Indicators	2008-2009	2009-2010	2010-2011	2011-2012	Average
Water supply					
Cost recovery in water supply services(%)	63	52	72	81	67
Efficiency in collection of water supply related charges(%)	64	63	60	57	61
Wastewater					
Extent of cost recovery (%)	45	198	190	59	123
Efficiency in collection of sewerage related charges(%)	66	68	69	67	68
Solid Waste Management					
Extent of cost recovery in SWM services(%)	17	28	25	26	20
Efficiency in collection of SWM related charges(%)	52	55	54	50	65

Sources: PAS data, based on supportive documents Budget and DCB documents provided by the Nagarpalika

When it comes to water supply, Patan demonstrates an average collection efficiency of 67% over a 4-year period and an average collection efficiency of 61%. This is higher than the average of all 18 Class A cities in Gujarat, which stands at 54% for the year 2011-12.

Patan Municipality's rate of arrear tax collection is also low. Over the past four years, the municipality has been able to collect only 12% of the total arrear demand (Rs. 1450.38 lakhs).

Water supply forms a significant component of the annual expenditure of the ULB. It accounts for 53% of the ULB's annual revenue expenses. Based on the methods discussed earlier in section 2.1, the following section discusses improvements that Patan Municipality could achieve in its water supply cost recovery:

Increasing Revenue Income

The Municipality could enhance its revenue income through:

1. Improving its tax collection efficiency from the current 60 to 100%

2. Reducing physical losses in the system by 30%
3. Converting existing community stand posts to group connections

Each of these sections have been discussed in detail in the following sections:

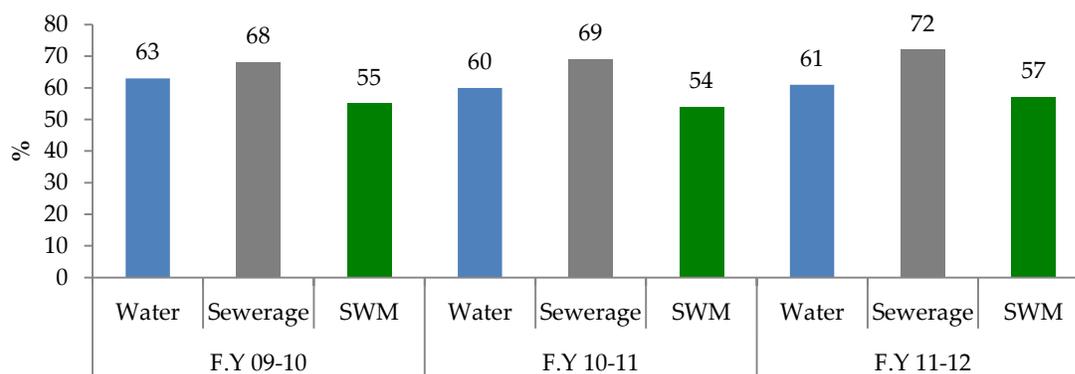
5.1.Improving collection efficiency

In the financial year 2010-11, the municipality collected 60% of the billed taxes. Patan, still needs to recover Rs. 109.46 lakh taxes from citizens.

Looking at collection efficiency across sectors for the last three years, we see that the sewerage department has recovered more – i.e., between 68 to 72 % -- as compared to other sectors.

The ULB’s arrears collection is also worth analyzing: normally, when a taxpayer comes to pay taxes for current year and if s/he has arrear taxes pending to the ULB, their payment are booked to arrears. However, tax clerks follow no guidelines or standard procedures. Consequently, Patan has been able to collect only about 12% of its arrears, on an average, over the previous 3 years.

Figure 3: Tax Collection Efficiency across Sectors

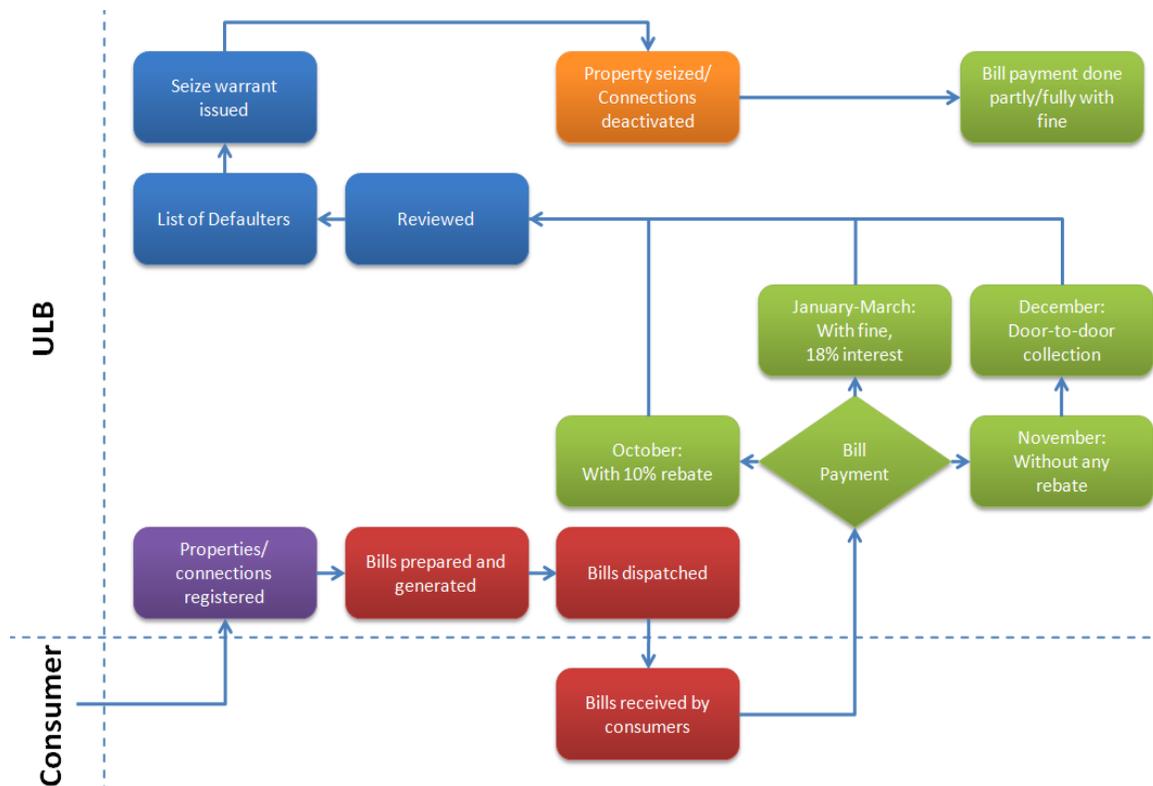


Source: Three years DCB statement, Patan Municipality

Since water tax is part of the consolidated property tax of the ULB, the general property tax collection process of the ULB was reviewed.

Figure 4 **Error! Reference source not found.** shows the general tax collection practice prescribed by the Gujarat Municipalities Act 1963 and shows the process from registration of a property to property tax bill generation, dispatch and collection.

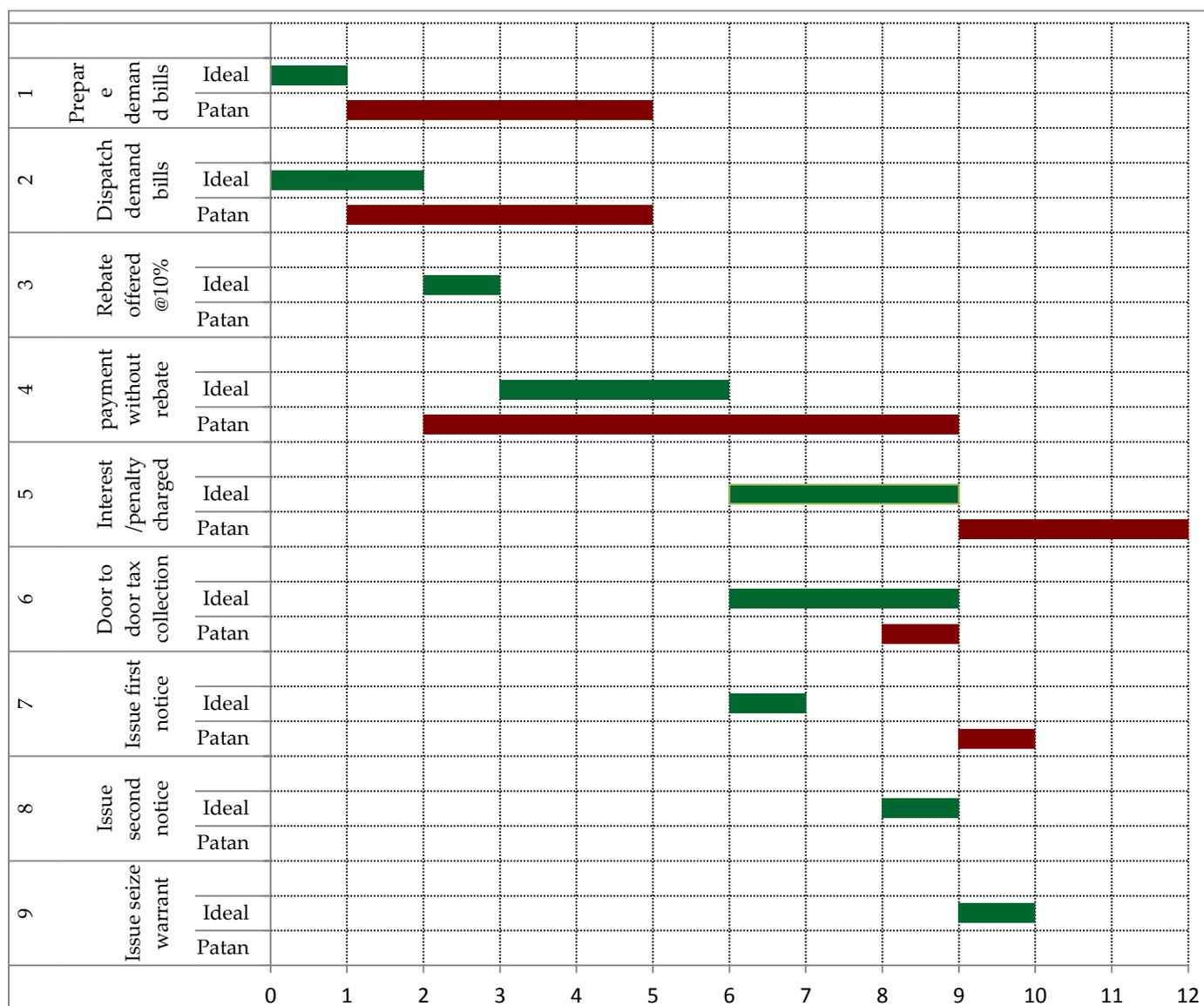
Figure 4: Typical tax collection process ULBs in Gujarat



Many ULBs across the country have achieved more than a 90% collection efficiency by dispatching property tax bills on time, following up on them rigorously, collecting taxes door to door, and placing banners proclaiming the names of the highest defaulters in public places; these are in addition to deploying other strategies not mentioned here.

Figure 5 **Error! Reference source not found.** shows the analysis of Patan’s timeline to collect property taxes. We can see that Patan generates bills and dispatches them over a prolonged period of time. Citizens are given no incentive to pay their taxes early. There is a three-month delay in the period when penalty or interest on taxes is to be charged. This also prolongs the time that it would take to send taxpayers a first notice. Moreover, the ULB does not have a procedure to either send out a second notice or remind citizens, nor does it also issue warrants or seal notices. The ULB appears not to be serious about collecting taxes on time, without these procedures in place.

Figure 5: Comparison of Tax Collection Process



This study recommends that Patan improve collection efficiency by:

- Preparing and consolidating bills early, and dispatching them in April
- Providing a sizeable, well-defined rebate period, and giving past defaulters equal incentive
- Levying an interest of 15-17% after the regular payment period
- Making several door-to-door visits by ULB staff to remind citizens, and to collect on arrears owed

- Assigning specific staff and teams to collect payments door-to-door collection, working toward concrete targets
- Issuing multiple notices and seize warrants as early as possible
- Publicly displaying notices and defaulters' lists

5.2. Increasing coverage in slum areas

About 22.23 % of the city's 1,25,502 lives in slums and slum like areas based on PAS-SLAB data, about 80% of slum households have access to individual water supply. The slum survey conducted by UMC's PAS team in 48 slum pockets revealed that water supply distribution network exists in all slums. Therefore, assuming that the municipality undertakes a dedicated drive to provide individual connections to slum households. Making a moderate assumption that the ULB is able to provide connections to only half the remaining 20% properties that have not been covered represents a potential annual revenue of Rs. 3 lakhs.

5.3. Converting stand posts to group connections

While the Municipality's first priority should be to extend individual water supply connections to all slum dwellers, there are 52 stand posts located across the city and in and around slums. These are free stand posts and are being provided to slum dwellers where there are few individual connections.

These stand posts could be converted to group connections. A group connection essentially means that it is a dedicated connection for a group of families and these are charged at a subsidized rate.

It is recommended for Patan that each stand posts be shared by groups of 15 families⁴ each and at a yearly group charge of Rs. 1200 (given that a 1- inch connection to water is charged @Rs. 1200 per year by the ULB for residential use). This amounts to Rs. 7 per family month, an

Figure 6: Community Standposts in Patan



⁴“Urban water stand post”, Report by Water Aid Bangladesh, <http://www.wateraid.org/~media/Publications/urban-water-point-guidelines.pdf>; Accessed in Dec 2012.

amount considered affordable. Paying this nominal cost to procure municipal water would also ensure that these families take responsibility for maintaining stand posts and eventually helping to reduce leaks.

The idea is already in practice; the Government of Maharashtra, for example, has successfully initiated this by issuing a GR (2010/letter no 132/ Water supply -22 of Sujal Nirmal Abhiyan). **A procedure such as this will fetch the Patan Municipality additional annual revenue of Rs. 1.82 lakh.**

Operational guidelines to convert chargeable posts, mentioned in the GR (2010/letter no 132/ Water supply -22 of Sujal Nirmal Abhiyan):

- Conduct meetings with the beneficiary group to make them procedurally aware. Identify potential user groups, promote an understanding of water and convince them to share water charges.
- Establish user groups so that they share charges.
- Issue the connection in the name of the group's leader, so that the group as a whole then shares charges.

5.4. Charging previously free connections

By “free” connections, this study refers to authorized connections given by the ULB to religious and educational institutions and charitable organizations, etc. According to data provided by the ULB, there are 20 such free authorized connections in the city. These free connections could also be converted to chargeable basis, additionally fetching the ULB annual revenue of Rs. 0.12 lakhs.

Operational guidelines to convert authorized free connections to chargeable connections:

- Obtain a resolution by the General Board to levy charges to free authorized connections such as religious institutions, social institutions, government and public places.
- Meet with trusts, temples, schools, etc., in order to convince them to support the charges

5.5. Regularizing illegal connections

According to data provided by the ULB, there are roughly 100 illegal connections in the city. However, the city needs to undertake an intensive exercise to identify illegal connections and to take measures to regularize them. Doing so will bring in an annual revenue for 0.6 lakhs.

Operational guidelines to regularize unauthorized connections:

- Undertake a special drive to identify the number of illegal connections; create an action plan for it; rope in licensed plumbers for assistance
- Issue a public notice about regularizing illegal connections. The city could decide to levy penalties or regularization charges.
- Resolution in general board meeting for charging water taxes to all properties

Initiatives to regularize illegal connections across the country.

The Tamil Nadu State government in the year 2012 directed all urban local bodies except Chennai to permit regularisation of unauthorised household water connections after collecting the connection deposit amount, which will be twice the present rate. The order was issued by the Municipal Administration and Water Supply (MAWS) and covered 9 municipal corporations (excepting Chennai), 148 municipalities and 561 town panchayats. The order stated that regularizing water connections should be done in three months and that the local bodies should send a report to the Directors of Municipal Administration and Town Panchayats.

The Delhi Jal Board (DJB) in 2011 has introduced a liberalised scheme which gives consumers holding unauthorised water connections a chance to have their connections regularized (unauthorised water connections would be regularised subject to legal and technical feasibility and conformity with the DJB's rules, regulations and policies). The ULB will recover a penalty at the rate of Rs 500 per connection, instead of the earlier Rs 3,000. A service charge will be levied for six months in the respective category, instead of three years. Once illegal connections are regularized, the DJB would then benefit consumers by providing rebate schemes applicable to surcharges on water and sewerage development charges.

The Jasdan Municipality resolved to charge water taxes to all properties irrespective of the fact that they had individual water connections or not. The properties which did not have individual water connections requested the ULB to remove the tax and had to prove that they didn't have a connection. The municipality officer would then check to see if a connection existed, and then take appropriate action.

5.6.Reducing Revenue Expenditure

Energy annual expenditure of Rs. 305.34 lakhs is the second highest expenditure in the municipality's revenue expenditure towards water supply. To maximize efficiency and lower expenditure ceilings, experts in the sector of 'Energy' suggest that even a walk-through energy audit would help to save 10% of the energy costs related to water supply. Just a 10% reduction in the cost of consuming energy will therefore save the municipality Rs. 30.53 lakh annually.

The following table summarizes the revenue potential of the operational improvements discussed above. The ULB can improve cost recovery from 27% to 50% by adding revenue of Rs. 138.7 Lakhs (this figure represents a total of all the improvement increments visible in **Error!**

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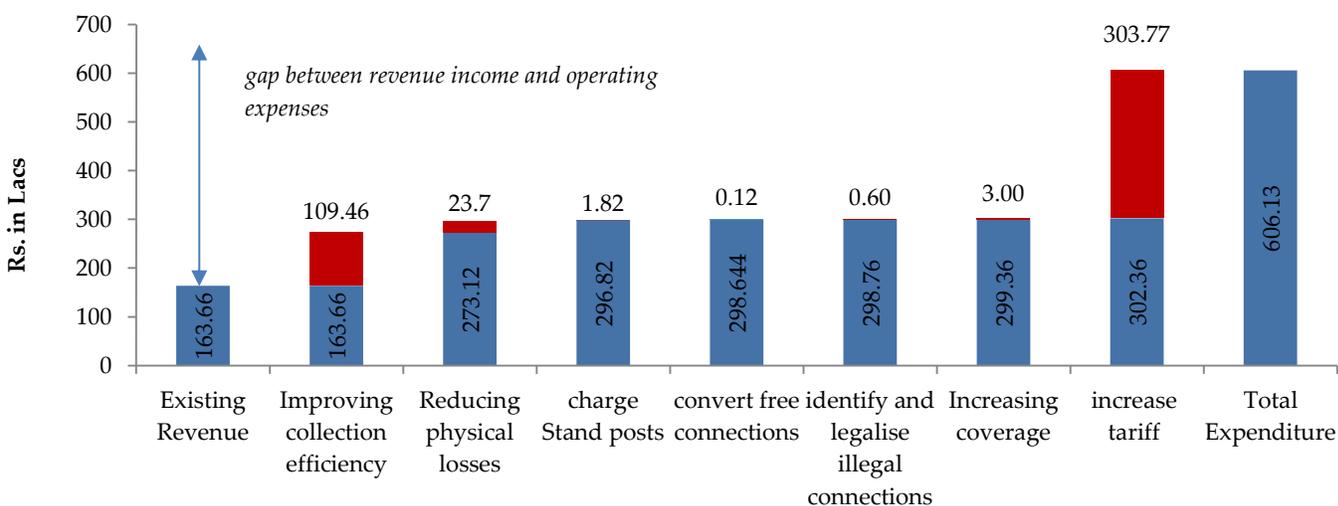
Table 5: Revenue potential of operational improvements

Heads	Rs. In lakhs
Improving collection efficiency @100%	109.46
Reducing leakages physical loss @30%	23.70
Stand post chargeable (1" connection)	1.82
Free connections (Temple, Masjid, School)	0.12
illegal connections	0.60
Increasing consumer base in slums @50%	3.00
Increasing consumer base in city @100	0.00
Total revenue improvement (A)	138.70
Total existing revenue (B)	163.66
Improvements for increasing revenue income (A/B)	85%

Sources: PAS project data, based on supportive documents Budget and DCB documents provided by the Nagarpalika.

By initiating all these above strategies, in addition to reducing revenue expenditure, revenue income increases from Rs.163.66 lakhs to Rs. 302.36 lakhs. This is still only 50% of the total annual operational expenditure of Rs. 606.13 lakhs. Hence, the ULB could look at an option to revise tariff to a 100% cost recovery target. So the ULB would have to charge a tariff of Rs. 1536 per individual connection instead of Rs. 600 per annum.

Figure 7: Bridging the gap between operating revenues and expenditure



6. Conclusions

Based on the amount of revenue generated through each option, the ULB could prioritize the actions. A suggestive prioritization based on amounts of revenues generated is as follows:

Table 6: Prioritization of Actions

Sr. No	Aspects to improve	Ordering/ Priority
1	Improve collection efficiency from current 60 to 100%	1
2	Conduct an energy audit to achieve 10% reductions in energy expenditure	2
3	Reduce existing leakage and wastage of physical loss	3
4	Increase coverage to slum households	4
5	Convert stand posts on a chargeable basis	5
6	Legalize illegal connections	6
7	Charge previously authorized free connections	7
8	Revise tariffs	8

Annex 1: Exploring revenue improvements in Municipalities of Anand, Sidhpur and Dwarka

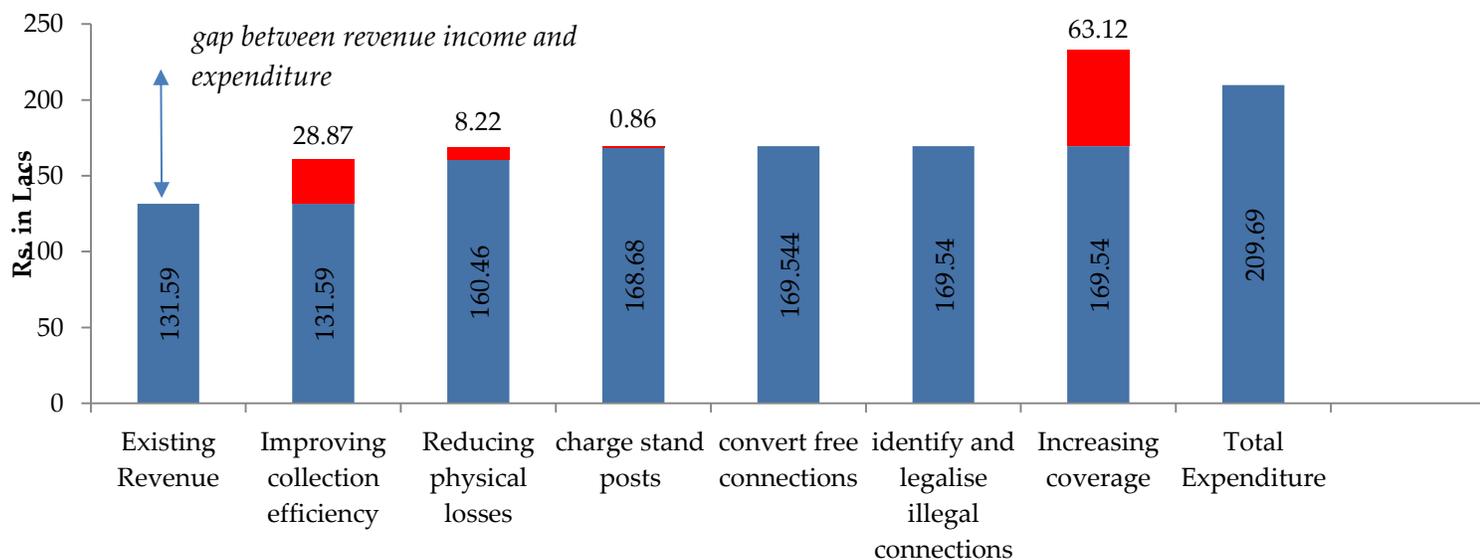
Using the same methodology as described in the report, strategies and recommendations for improvements in three additional cities were worked out.

The following table shows the prioritization of different actions for these different cities:

No	Aspects to improve	Anand	Siddhpur	Dwarka
1	Improve collection efficiency	3	1	3
2	Conduct an energy audit to achieve 10% reductions in energy expenditure	2	3	9
3	Reduce existing leakage and wastage of physical loss	5	2	2
4	Increase coverage in city	1	6	1
5	Increase coverage to slum households	4	5	5
6	Convert stand posts on a chargeable basis	6	4	4
7	Legalize illegal connections	8	9	6
8	Charge previously authorized free connections	9	7	7
9	Revise tariffs	7	8	8

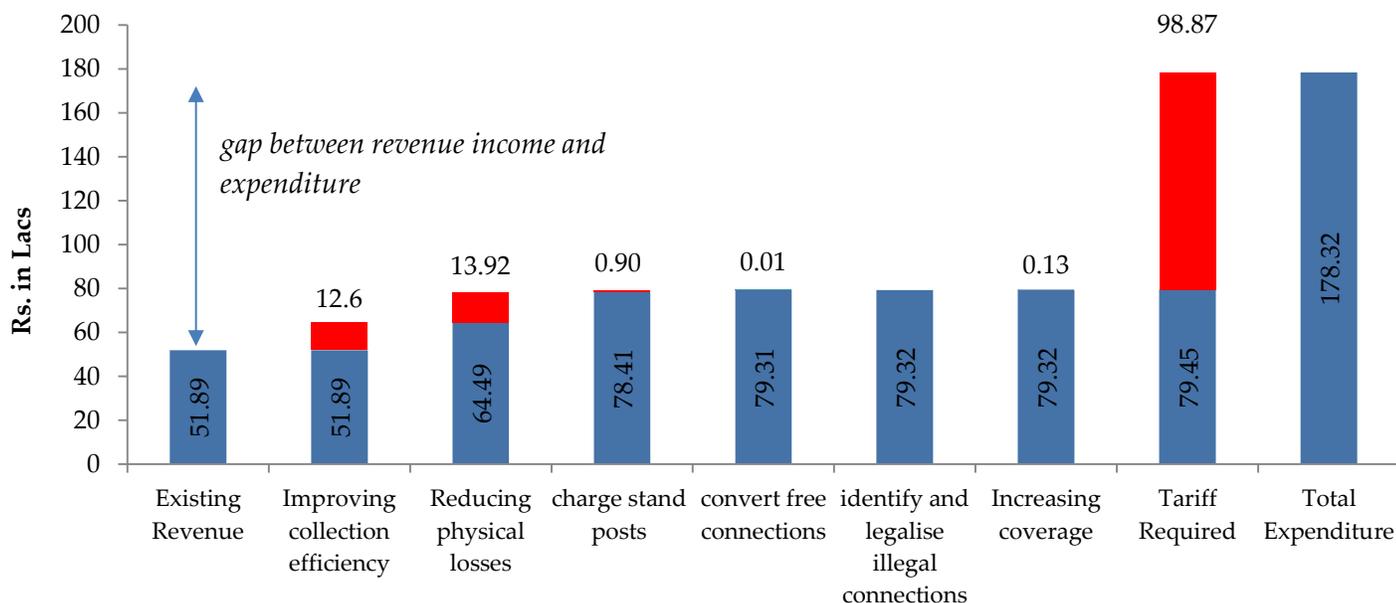
Improving Cost recovery-Anand

In Anand, with these improvements, the ULB is able to meet the revenue expenses. There is no need to increase the tariff in case of Anand Municipality.



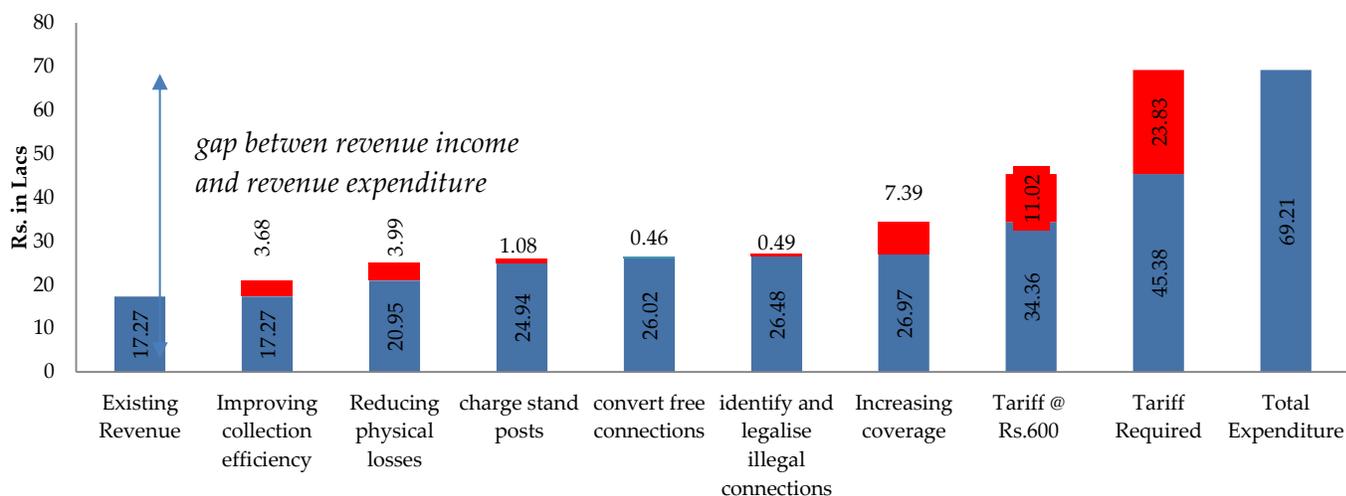
Improving cost recovery in Siddhpur

In Siddhpur, additional to other improvements, the ULB will have to double the tariff from the current Rs. 600 to Rs. 1250 so as to be able to achieve 100% cost recovery in the water supply.



Improving cost recovery in Dwarka

In Dwarka, additional to other improvements, the ULB will have to increase the tariff from the current Rs. 600 to Rs. 879, so as to be able to achieve 100% cost recovery in the water supply.



Annex 2: Revenue potential of operational improvements for all four municipalities

Heads	Dwarka	Anand	Patan	Siddhpur
Improving collection efficiency @100%	3.68	28.87	109.46	12.6
Reducing likages physical loss @30%	3.99	8.22	23.70	13.92
Stand post chargeable (1" connection)	1.08	0.86	1.82	0.90
Free connections (Temple, Masjid,School)	0.46	0.00	0.12	0.01
illegal connections	0.49	0.00	0.60	0.00
Increasing consumer base in slums @50%	0.63	12.34	3.00	0.07
Increasing consumer base in city @100	6.76	50.78	0.00	0.06
Total revenue improvement (A)	17.08	101.07	138.70	27.56
Total existing revenue (B)	17.27	131.59	163.66	51.89
Improvements for increasing revenue income (A/B)	99 %	77 %	85 %	53 %

Annex 3: Water Supply Register of the Gujarat Electricity Board, Anand

Sl. No.	Meter No.	Description	Value
1	00992/30001/0	સામાન્ય મીટર	2
2	00992/30002/0	સામાન્ય મીટર	3
3	00992/30003/0	સામાન્ય મીટર	20
4	00992/30004/0	સામાન્ય મીટર	23
5	00992/30005/0	સામાન્ય મીટર	25
6	00992/30006/0	સામાન્ય મીટર	20
7	00992/30007/0	સામાન્ય મીટર	26
8	00992/30008/0	સામાન્ય મીટર	27
9	00992/30009/0	સામાન્ય મીટર	28
10	00992/30010/0	સામાન્ય મીટર	29
11	00992/30011/0	સામાન્ય મીટર	30
12	00992/30012/0	સામાન્ય મીટર	31
13	00992/30013/0	સામાન્ય મીટર	32
14	00992/30014/0	સામાન્ય મીટર	33
15	00992/30015/0	સામાન્ય મીટર	34
16	00992/30016/0	સામાન્ય મીટર	35
17	00992/30017/0	સામાન્ય મીટર	36
18	00992/30018/0	સામાન્ય મીટર	37
19	00992/30019/0	સામાન્ય મીટર	38
20	00992/30020/0	સામાન્ય મીટર	39
21	00992/30021/0	સામાન્ય મીટર	40
22	00992/30022/0	સામાન્ય મીટર	41
23	00992/30023/0	સામાન્ય મીટર	42
24	00992/30024/0	સામાન્ય મીટર	43
25	00992/30025/0	સામાન્ય મીટર	44
26	00992/30026/0	સામાન્ય મીટર	45
27	00992/30027/0	સામાન્ય મીટર	46
28	00992/30028/0	સામાન્ય મીટર	47
29	00992/30029/0	સામાન્ય મીટર	48
30	00992/30030/0	સામાન્ય મીટર	49
31	00992/30031/0	સામાન્ય મીટર	50
32	00992/30032/0	સામાન્ય મીટર	51
33	00992/30033/0	સામાન્ય મીટર	52
34	00992/30034/0	સામાન્ય મીટર	53
35	00992/30035/0	સામાન્ય મીટર	54
36	00992/30036/0	સામાન્ય મીટર	55
37	00992/30037/0	સામાન્ય મીટર	56
38	00992/30038/0	સામાન્ય મીટર	57
39	00992/30039/0	સામાન્ય મીટર	58
40	00992/30040/0	સામાન્ય મીટર	59
41	00992/30041/0	સામાન્ય મીટર	60
42	00992/30042/0	સામાન્ય મીટર	61
43	00992/30043/0	સામાન્ય મીટર	62

Annex 4: Calculating electricity bills and consumed units for each consumer number at each of 42 water distribution station, Anand

