Urban Drinking Water Security and Sustainability in Gujarat[1]

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1. Introduction

With rapid economic development, Gujarat has also experienced rapid urbanisation. The share of urban population has grown from 22% in 1901 to 37% in 2001, making it the third most urbanised state in the country. Trends over the last decade suggest that in 2011 the urban population is likely to be nearly 50% of the state's total population in 2011 (Dave 2010).[2] The recent McKinsey report (MGI 2010)[3] on India's urbanisation states that Gujarat will be 66% urban with 48 million urban residents in 2030.

One of the key challenges of urbanisation in Gujarat is provision of drinking water. A large part of the state is water stressed and has severe shortage of drinking water. In this paper, we attempt to show that with Narmada water reaching the interiors of Kachchh, North Gujarat and Saurashtra, and the Government of Gujarat's priority to this sector, there is now a possibility of drinking water security for urban areas of the state. Narmada has obviated the need to transport water by tankers and trains during the harsh summer months. However, with rapid growth of urban population and rising consumption of water due to change of life-style in urban areas, it is likely that the

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[1] "Mehta, Meera and Dinesh Mehta (2011): "Urban Drinking Water Security and Sustainability in Gujarat", in R. Parthasarathy, Ravindra H Dholakia (Eds): Sardar Sarovar Project on the River Narmada (Vol.3): Impacts so Far and Ways Forward, Chapter 25, pp. 727-743. Concept Publishing Company. New Delhi.

[2] An informal assessment from the initial house listing exercise for the 2011 Census suggests that urban population in the state may already be close to 50% in 2010. This would mean doubling of urban population in Gujarat from 18 million to 36 million in a decade. Times of India, Ahmedabad, September 23, 2010 and Dave Kapil (2010), "Half of Gujarat will live in cities", Daily News and Analysis, June 2.

[3] McKinsey Global Institute, India's Urban Awakening: Building Inclusive Cities, Sustaining Economic Growth, April 2010

drinking water stress will increase. The threat to water security is also partly due to inefficient water management and governance. In this paper, we focus on two major issues that affect sustainability of water – non-revenue water and cost recovery. For both these issues, we describe the current situation and discuss the potential ways forward to increase sustainability of urban water supply services. In describing the current situation, we use information from the studies under the Performance Assessment System (PAS) Project.[4]

2. Increasing Urbanisation in Gujarat

Gujarat's urban population of the state has been rising steadily since the formation of the state in 1960. The pace of urbanisation, as measured by the decadal growth of urban population, was significantly higher than the national average during the decade 1991-2001, and is expected to remain high in the next two decades as well.

In 2001, over 50% of the urban population in Gujarat resided in the seven cities that are classified as municipal corporations. This concentration of urban population increases to nearly 60% if urban agglomerations around these cities are taken into account. Nearly 40% of urban population of Gujarat resides in the three large cities of Ahmedabad, Surat and Vadodara.

Table 1: Urbanisation Levels and Growth Trends

Year	Gujarat			India		
	Urban Population (Million)	Share of Urban population (%)	Decadal Growth Rates (%)	Urban Population (Million)	Share of Urban Population (%)	Decadal Growth Rates (%)
1951	4.43	27.23		62.4	17.29	
1961	5.31	25.74	19.64	78.9	18.0	26.44
1971	7.49	28.06	41.05	109.1	19.91	38.22
1981	10.60	31.10	41.52	159.5	23.70	46.23
1991	14.24	34.47	34.34	217.2	25.71	36.09
2001	18.93	37.36	32.94	285.4	27.78	21.35

Source: http://udd.gujarat.gov.in/Default_files/UrbanScenario.htm

[4] See for more details on the project http://www.spcept.ac.in/pas_project.aspx?

In 2009, the share of the State's urban population in Municipal Corporations is estimated to be 58.4%. The smaller Urban Local Bodies (ULBs) which are classified as municipalities are divided into four categories based on their population size and local importance. Of these the smaller Class B, C and D towns, though large in number, have only one-fourth of the total urban population in the state.

Table 2: Distribution of Urban Population in Different Classes of ULBs in Gujarat

Category of ULB	Number of ULBs	Total Population in 2001 (in million)	% to total urban population	Population in 2009 (in million)	% to total urban population
Municipal Corporation	7	9.7	57.5	14.5	58.4
Municipalities					
Class A (more than 100,000)	18	2.4	14.0	3.8	15.4
Class B (50,000 to 100,000)	33	2.1	12.4	2.9	11.5
Class C (25,000 to 50,000)	44	1.5	8.7	2.0	7.9
Class D (less than 25,000)	64	1.2	7.4	1.7	6.8
Total	**166**	**16.9**	**100.0**	**24.8**	**100.0**

Sources and notes: 2001: Based on Census of India, 2001. It does not include the other 74 census towns with a population of 1.4 million which do not have urban local governments; 2009: projections using ratio method done in the PAS Project.

Gujarat has seen significant growth in income in the past few years. Its average annual per capita income at current prices in 2008-09, at Rs 49,251 is 23% higher than the national average, and shows an increase of 8.4% over the previous year.[5] Ahmedabad and Surat, the two main cities in Gujarat, figure prominently in the top

[5] Based on Directorate of Economics and Statistics (2010), "Key Statistics of Gujarat State 2009-10", Government of Gujarat, Gandhinagar, p. ix.

cities of India in terms of growth and average income. Surat's average household income in 2007-08 was next only to Mumbai's. "After adjusting for cost of living, the diamond hub of Surat is now the richest city in India. Between 2004-5 and 2007-8 Surat's middle class doubled in size and its low income category was reduced by a third (TRENDSNIFF, 2008)."[6] Along with the rise in income, Gujarat has done well to reduce urban poverty over the past decades. From a high share of poverty in 1973-74 at 53%, the share of the urban poor in total urban population has come down to 13% in 2004-05 (the national average is 28.3%). Particularly, over the last decade there is significant decline in urban poverty in the state (MHUPA and UNDP, 2009).[7]

Rapid rise in economic activities, rise in income and reduction in urban poverty has implications for drinking water demand. Underground water sources, the mainstay of drinking water supply in urban Gujarat, are overexploited. Narmada canal water has been a boon to ULBs in Gujarat in meeting the rising water demand.

3. Moving towards Water Security

Sources of water supply and treatment: In North Gujarat, Saurashtra and Kachchh, available water resources are less than the requirements. In absence of perennial sources of surface water, ground water used to be the main source for drinking water. With overexploitation of groundwater in these regions, the water table was being depleted at the rate of 3 to 5 metres per year and water had to be abstracted from depth of 300 metres. Hirway (2005) states that 87% of urban water supply was through groundwater and three-fourths of urban centres in Gujarat use groundwater **(Hirway, 2005)**.[8]

This situation has changed significantly since the Narmada canal based drinking water programme has been initiated. In 2009, only 35% of the ULBs depended exclusively

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[6] Based on a news report on NCAER (2008) as posted on http://trendsniff.com/2008/09/16/targeting-top-20-growth-cities-in-india/, downloaded on December 4, 2010.

[7] As reported in Ministry of Housing and Poverty Alleviation (MHUPA) and United Nations Development Program (UNDP) (2009), "India Urban Poverty Report 2009", Government of India. Table 1.9, p. 10.

[8] Hirway, Indira (2005), "Ensuring Drinking Water to All: A Study in Gujarat", Paper prepared for the 4th IWMI-TATA Annual Partners Research Meet, 24-26 February 2005.

on ground water as a principal source of water, while 18% are dependent exclusively on Narmada canal water. Nearly half of the ULBs use both Narmada canal water and groundwater.

Table 3: Source of Water Supply for ULBs (2009)

Source of Water Supply	Number of ULBs	% of ULBs
Bulk Water Purchase	30	18
Ground Water	59	35
Own Source (surface)	6	4
Mixed Sources	71	43
Total	166	100

Source: Based on surveys done under the PAS Project, 2009

The Municipal Corporations, where nearly 60% of the urban population of Gujarat reside, account for 73% of the total municipal water supply (see Table 4). Among the water sources, bulk water purchase from Narmada accounts for 46% of total water used by ULBs, while groundwater usage has dropped to 21%. However, in terms of quantum of water supplied to the ULBs from the Narmada canal, the Municipal Corporations use 71% percent of it. So far 72 ULBs receive water from the Narmada Canal, and another 19 have already been taken up.[9]

[9] Analysis based on information reported in Government of Gujarat (2010), "Statewide water Supply Grid in Gujarat", Mimeo. Downloaded from http://www.gwssb.org/pdf/narmadaprojects.pdf

Table 4: Source of water by size class of ULB (2009)

Category of ULB	Own surface sources (MLD)	Ground water (MLD)	Bulk water purchase (MLD)	Total water (MLD)
MC	1003.8	300.9	1072.0	2376.7 (72.9%)
A	20.5	86.3	215.9	322.7 (9.9%)
B	27.5	128.5	100.9	256.9 (7.9%)
C	14.8	81.4	63.9	160.2 (4.9%)
D	5.3	94.3	44.8	144.3 (4.4%)
Total (MLD)	1071.9 (32.9%)	691.4 (21.2%)	1497.6 (45.9%)	3260.9

Source: calculated from PAS survey; Note: Totals may not add up due to rounding.

Improving water security for ULBs dependent only on Groundwater: The 59 ULBs dependent only on ground water are mainly in central Gujarat and North Gujarat (see Table 5 for a full list of these ULBs). When the location of these ULBs is overlaid on the groundwater resource map of Gujarat (GWRDC)10 it shows that of these 59 ULBs, 10 ULBs are in critical and overexploited zones. These ten ULBs will need to be provided water from Narmada canal or other surface water source. There are 3 ULBs in high salinity region and they will need to shift to a mix of groundwater and surface water. All ULBs in Gujarat require undertaking serious efforts towards recharging ground water.

10 Source: http://www.gwrdc.gujarat.gov.in/Gwremaps/GWRE_B.K..htm

Table 5: List of cities in relation to ground water zones

Ground Water Category	Characteristics	No. of ULB	Name of ULB
Over Exploited (red) >100	Restricted for Ground Water Extraction	5	Idar, Patan, Thara, Tharad, Dhanera
Critical (Dark) 90-100	Not Advisable for Ground Water Extraction	5	Dholka, Mehmadabad, Deesa, Manavadar, Vanthali
Semi-Critical (Grey) 70-90	Need Caution for Ground Water Retraction	7	Bantawa, Savarkundla, Bavla, Viramgam, Kathlal, Keshod, Visavadar
Safe (White) < 70	Feasible for Ground Water Extraction	39	Halol, Bayad, Khedbrahma, Dabhoi, Savli, Bagasra, Anand, Anklav, Boriavi, Borsad, Karamsad, Oad, Petlad, Sojitra, Umreth, Vallabh V. Nagar, Devgadh Bariya, Salaya, Talala, Una, Chaklasi, Dakor, Kanjari, Kheda, Mahudha, Nadiad, Thasra, Rajpipla, Vijalpore, Kaalol, Kutiyana, Prantij, Talod, Bardoli, Mandvi, Tarsadi, Chotila, Karjan, Umargam
Saline TDS >2500 ppm	Blending of Ground Water and Surface Water as per need	3	Bhabhar, Patdi, Harij

Source: Based on analysis in the PAS Project

Access and coverage of water supply: In 2001, about 91% of urban population in Gujarat had access to piped water supply, exceeding the national average by almost 20% and ranking among the first three states in India in terms of access to water services **(Marie-Helene, 2006)**.[11] Access to piped water in Gujarat was improved by about 18% between 1991 and 2001 **(Census of India, 2001)**.[12] Results of the 58th round of NSS, 2002 provide a similar figure of 92% of population of the state having access to piped water supply, compared to the national average of 74%. It also reveals that only 7.5% of households in urban Gujarat depended on groundwater sources (handpumps, tubewells or borewells). This is much lower than the national average of 25% households). NSSO (2002) also reported that 48% urban households in Gujarat had drinking water facilities for their exclusive use (compared to 31% all-India average), 14% have shared facilities and the balance 38% use community facilities (compared to 55% all-India average).

The National Family Health Survey NFHS-3 conducted in 2005-6 and the District Level Health Survey DLHS-3 conducted in 2007-8 suggest a further improvement in coverage of water supply to about 95% of urban population in Gujarat. The NFHS-3 suggests that 82% of urban households in Gujarat have water taps in their house or in the yard. This is the highest among all states in the in the country (Mehta).[13]

The PAS Household level surveys conducted in 2009 also found that 82.5% urban households have access to municipal piped supply (with 63% percent households having individual connection and others having shared connections). As compared to the NSS 2002 survey, this suggests a significant improvement in level of water service in Gujarat. The PAS survey results based on the information provided by ULBs, suggests that 68% of households have water connection on their premises. Surprisingly, the variation across different size classes of cities is not very high. The Class A municipalities have a lower average than other classes of municipalities.

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11 Zerah Marie-Hélène (2006), "Urban Water and Waste Water", Chapter 7, India Infrastructure Report, IDFC notes that Gujarat is among the few states in India (other than Andhra Pradesh and Maharashtra) that ensure a better delivery mode and better service standards in water supply.

12 Census of India, 2001, Housing and Amenities Table, Gujarat

13 Mehta S S, "Access to urban water and sanitation to the poor in Gujarat and Maharashtra", a research report prepared for PAS project, (draft, mimeo), CEPT University

The PAS survey also collected information on access to water services of the slum dwellers. It revealed that while over 96% of slum dwellers have access to water supply, nearly 53% of slum households have a water connection on their premises. Again, the averages across different size classes of municipalities are quite similar. This suggests that in Gujarat many ULBs do not discriminate between a slum and a non-slum house in granting water connection.

Levels of water supply – many ULBs still insecure: Table 6 provides information on key performance indicators for water supply in the state. The average water supply of 77 litres per capita per day (lpcd) in Gujarat is much lower than the state's goal of 100 lpcd and the norms laid down by WHO of 135 lpcd. There is a wide variation across the ULBs. From Table 7, we see that 26 ULBs provide less than 40 lpcd, which is the norm for rural water supply schemes. At the higher end of this spectrum, only 10 ULBs provide more than 135 lpcd.

Table 6: Average Service Level and Performance Indicators by Type of ULBs in Gujarat

	State Average– all ULBs	Municipal Corporation	Municipalities			
			Class A	Class B	Class C	Class D
Coverage of HH Services (%)						
Water supply connections	68	71	54	74	67	68
WS connections in slums	53	58	54	56	47	53
Levels of Service						
Per capita water supply per day (lpcd)	77	123	71	78	71	78
Number of hours of supply/day	1.5	1.2	2.1	1.4	1.5	1.6
Number of days of supply/month	23	25	24	22	22	22

Source: Based on PAS Survey.

Table 7: Per capita water supply (LPCD) - Gujarat state

Category of ULBs	Ranges of LPCD					
	11-40	41-70	71-100	101-130	131-160	161-190
Corporations	0	1	1	1	3	1
Class A	1	8	9	0	0	0
Class B	7	7	9	10	0	0
Class C	8	13	16	5	1	1
Class D	10	22	13	12	4	3

Source: Based on PAS survey.

Thus, although Narmada canal has improved coverage and increased supply of water in ULBs, a large number of ULBs in Gujarat are still not secure in terms of their water requirement. With rapid growth of urban population, the quantum of water required from Narmada canal and other sources will have to increase manifold.

This low level of water supply is available to the residents only for a very short time. The average duration of supply in a day is 1.5 hours, and the average number of supply days in a month is 23. In some large cities, water is supplied only for 20 to 30 minutes in a day, and often every alternate day. The consequence of this is that urban residents have to incur large capital expenditure in constructing sumps and install pumps and overhead tanks to get water through the day. If the norm of 24x7 water supply (i.e. 24 hours of supply in a day for 7 days a week), is implemented, a large part of this private capital cost and operating cost would be reduced. However, this would require the ULBs to be efficient in their water supply operations.

In response to this situation, the Government of Gujarat has initiated a number of schemes under its new programme for Swarna Jayanti Mukhya Mantri Shaheri Vikas Yojana (SJMMSVY) to provide water through Narmada canal wherever possible and ensure adequate sources of water supply to meet the norms of 100 lpcd of water for all ULBs. Adequate funds have been allocated to meet these goals. While the Government of India has focused on larger cities, the state government has balanced

this by increasing allocation of funds to smaller municipalities.[14] Thus, over the next three to five years, Gujarat seems set to achieve the goal of adequate water supply along with full coverage of household access to piped water in all ULBs. .

4. **Improving Sustainability of Drinking Water Services**

While the goals of adequacy and coverage of drinking water supply are likely to be met in Gujarat, there are issues of sustainability of these goals. We examine below the non-revenue water and cost recovery as two important aspects of sustainability of drinking water services. These two parameters reflect drinking water management practices and have an important bearing on the overall service levels.

Extent of Non-Revenue Water (NRW): Non-Revenue Water is an important indicator for assessing the efficiency in service operation of a water supply system. NRW refers to water that has been produced but is "lost" before it reaches the customer. It refers to the amount of water produced that does not earn any revenues for the ULB. This "lost" water could be due to real losses (through leakages, also referred to as physical losses) or apparent losses (theft, illegal connections, free water etc.). High levels of NRW seriously affect the financial viability of water supply provision due to lost revenues, and increased operational costs adversely impacts the quality of the service provided.

[14] See the analysis in PAS Project (2011, forthcoming), "UWSS sector finance and monitoring system: a baseline assessment",

Table 8: Estimated Non Revenue Water among ULBs in Gujarat

Category of ULB	Non Revenue Water (%)
Gujarat state Average	30
Municipal Corporations	34
Class A	33
Class B	26
Class C	32
Class D	30

Source: Based on PAS Survey.

The average NRW across all classes of ULBs in Gujarat ranges between 26-34% indicating that nearly one-third of water is "lost" in distribution. The GoI 'benchmark' for NRW is 20% (MOUD, 2008).[15] The ULBs in Gujarat, due their inefficiencies are 'losing' nearly one-third of the water that they supply. If the NRW is reduced to the benchmark level of 20%, there would be an increase in water supplied to the consumers and an increase in revenue to the ULBs.

It must be recognised that NRW is difficult to estimate in a context where there are no measurements of flow at source of water or at major distribution points and consumer points. In the PAS survey, the NRW measurements are based on estimates of water supply and consumption. Better measurement of NRW can be done by conducting preliminary water audits. Our estimates of NRW are on the lower side, as we have made assumptions about water consumption at the consumer end. No ULB in Gujarat has water meters, nor do most ULBs in Gujarat conduct water audit to assess the quantum of NRW. In one municipality in Gujarat, where a preliminary water audit was undertaken recently, the NRW was estimated to be 44%, as against the 33% value derived under various assumptions.

[15] Ministry of Urban Development (MOUD), 2008, Handbook of Service Level Benchmarks, Government of India

In order to gauge a better assessment of 'real' NRW, it is essential for all ULBs to undertake at least such preliminary water audits. This will inform ULBs about how much water is being lost, and why. Reduction of NRW can be achieved by improved management practices of detecting leaks and repairing them quickly, identifying illegal connections and collecting revenue from them, and regular monitoring of NRW by establishing District Metering Areas (DMAs) and installing meters at supply points and at consumer end.

Recovery of operation and maintenance costs: Financial sustainability of a water supply system requires that ULBs cover their entire operation and maintenance costs. The extent of cost recovery for operation and maintenance (O&M) is defined as a percentage of total operating revenues from water supply-related charges to total operating and maintenance expenses on water supply. The total annual O&M expenses in water supply are estimated after excluding loan interest payment and depreciation. Cost recovery is estimated from the total annual operating revenues in water supply from local sources, excluding revenue grants. Such a 'full cost recovery' goal is also mandated for all ULBs that received grants under the JNNURM and UIDSSMT project of the central government.

Table 9: Percentage of cost recovery (O&M)

Category of ULB	Range of O&M cost recovery (%)				
	0-20	21-40	41-60	61-80	81-100
Municipal Corporations	1	1	2	0	2
Class A	3	7	3	3	0
Class B	3	8	10	3	3
Class C	8	13	10	4	2
Class D	11	13	13	9	5
Total	26	42	38	19	12
% of all ULBs	(19.0)	(30.7)	(27.7)	(13.9)	(8.8)

Source: Based on PAS Survey.

At the state level, the average cost recovery of O&M in water is 60%. Nearly 50% of the ULBs recover only 40% of their operating costs, while 9% recover more than 80% of their operational cost. The variation across size class of ULBs is not much. On the whole ULBs in Gujarat recover only 60% of their operating costs of water services. Even more disturbing statistics relates to collection efficiency. It suggests that ULBs in Gujarat collect only 50% of the billed water charges.[16]

Table 10: Cost Recovery and Collection Efficiency in Service Delivery

Parameter	State Average (all ULBs)	Muni-cipal Corpo-ration	Municipalities			
			Class A	Class B	Class C	Class D
% of O&M costs recovered through local taxes/charges	60	64	53	65	55	62
Collection efficiency of local taxes/charges for water supply (%)	50	51	53	51	54	45

Source: Based on PAS Survey.

An important component of Operational cost of water is cost of electricity. On an average, ULBs spend Rs. 2.4 per kilolitre on electricity charges related to water supply (electricity charges for operation of pumps at supply and distribution points). Compared to Rs 4 to 6 per kl charged for Narmada water, the electricity costs of water supply account for a significant part of O & M cost of water.

[16] In most ULBs in Gujarat, the water charges are collected as a part of annual property tax bill. This suggests that the overall revenue collection efficiency of ULBs in Gujarat is low.

Table 11: Cost of Electricity for Water Supply

Indicators	Average for all MC	Average for Municipality	Average for all ULBs in the State	Avg. for ULBs using only Ground water	Avg. for ULBs using Narmada water
Unit electricity cost (Rs per kl)	3.17	2.35	2.40	2.64	0.89
Electricity cost as % of total O & M expenditure	53.0	39.5	40.2	45.4	20.9

Source: Based on PAS Survey.

The electricity charges account for 40% of the total cost of water production at ULB level. For the municipal corporations, it is Rs. 3.2 per kl and constitutes over 50 percent of its operational costs. Narmada water has made a significant difference to the operating costs. The average electricity cost for the 59 ULBs using only ground water is Rs 2.64, as against Rs. 0.89 for cities using only Narmada water. One municipality that uses a mix of Narmada water and ground water has a very high cost of water production of Rs. 15 per kl of which electricity charges account for 40%.

Human resources capacity among ULBs: Another key dimension in sustainability of services in future requires addressing critical gaps in human resource capacities with ULBs. This is evident from the situation regarding availability of staff in Municipal Corporations and municipalities in Gujarat. In 2004 the urban development department had formed a special committee to review the minimum levels of staff required for different departments across municipalities by class.[17] The committee had specified the staff required for different types of ULBs. There are critical gaps in current human resource capacities available with ULBs. This is evident from the situation of many vacancies of sanctioned staff positions in Municipal Corporations and municipalities in Gujarat. For example, the PAS survey of ULBs in 2008-09

[17] According to GR No: NPM/1089/1122/R, UDD, Gandhinagar, Government of Gujarat on Minimum Standard and Criteria for Municipal Staff to be maintained at ULB level dated 22/1/2004 directed the municipal bodies to maintain a minimum number of staff for different departments.

showed that municipalities in general have only 50 to 60% of the 'sanctioned' staff. Even of the available staff, a large proportion is non-technical and often temporary or daily wagers.

In 2007, GoG has created three common state cadres for: (i) Municipal Accounts Officer, (ii) Municipal Health Officer and (iii) Municipal Engineer, over and above the existing state cadre of Municipal Chief Officer.[18] Yet, in many ULBs the position of a municipal engineer remains vacant which adversely affects service delivery.

While the numbers and capacity of human resources within ULBs is important for planning and service delivery, it is equally important to ensure that staff has the necessary incentives for improved performance. This is more difficult and is linked to both administrative processes and institutional/structural issues. Some of these issues are covered in the administrative and structural reforms under JNNURM. The administrative reforms highlight ways to reward good performance, importance of strengthening internal systems and processes, as well as citizen interface. These reforms also refer to the use of standardised service level benchmarks (SSLB) to periodically measure and report on them. Ideally these service levels can be linked to staff performance assessments.

Financial sustainability: One of the key challenges for ULBs in Gujarat is to make water supply financially sustainable. As we have seen, the cost of water supply in Gujarat is high and ULBs recover only about two-thirds of it from water tariffs and taxes. The usual response to such a situation is to raise tariff, but that is often not sufficient and solves only a part of the problem. What is required is to look at the entire gamut of operations and look for areas in which costs can be reduced and revenues enhanced.

As a demonstration of how this can be done, we look at the case of Kalol municipality. Kalol is located about 20 km by road from Gandhinagar about 30 km from Ahmedabad. It has a population of approximately 150,000 (111,700 as per 2001 census). It receives its water from both surface and ground water sources. The major

[18] As per the GR No: NPM-102005/2054-R, UDD dated 28/9/2007

source is Pratappura Water Treatment Plant set up by the Gujarat Water Supply and Sewerage Board (GWSSB) that takes about 12.5 MLD of water from Narmada Canal. Besides this, the 21 boreholes within the city are used to draw about 5 MLD of water. The municipality has 17,800 connections serving about 30,000 households. With the present estimated population, the supply requirement is about 23 million (assuming 135 lpcd). Thus there is a shortfall of 6 MLD of water.

A preliminary water audit suggests that the NRW in Kalol is 44%, which is much higher than the 33% reported by the ULB. It is thus possible to meet the shortfall of water in Kalol by reducing the NRW. Physical losses account for a major part of NRW and the municipality would benefit immensely from plugging all the leaks and monitoring flows in the system regularly.

Kalol municipality spends nearly Rs.37.5 million a year to operate and maintain its water supply and collects only Rs.830,000 a year. There is a large gap between its water related expenditures and corresponding receipt. As a first option, one can begin to look at ways to cut expenditure. If the physical losses are reduced (by plugging leaks), there will a saving of Rs. 6.4 million. Similarly, the energy costs can be reduced by Rs. 4.4 million through replacement of old and inefficient pumps at a few critical locations. On the revenue enhancement front, Kalol needs to improve its collection efficiency from 48% to 90%, identify and regularise illegal connections and start billing them and expand coverage in slums and in other areas. Our analysis shows that tariff revision should be the last option to be considered as this helps avoid passing on the ULB inefficiencies to its paying consumers.

5. Conclusions

Use of Narmada canal for drinking water has brought much needed relief to urban residents of Gujarat. There has been an increase in accessibility and better level of service in cities of Gujarat. With reduced dependence on ground water sources for drinking water, there has been a reduction in energy cost and rise in ground water table due to recharge.

However, it needs to be recognised that Gujarat is rapidly urbanising and the demand for water has been rising. With planned infrastructure investments in waterborne

sewerage system, the water requirements in cities will increase significantly. The current levels of supply of 77 lpcd will need to be augmented to meet the international norm of 135 lpcd not only for the present, but also for the future population. While it is possible that Narmada canal water will be available for the foreseeable future to meet the water demand, it is necessary to take adequate measures to ensure sustainability of the urban drinking water security that Gujarat is on course for.

While the level of funding for water sector investments in Gujarat may be sufficient in the short run to achieve the immediate objectives and targets of 100 lpcd set by the state government, there is a question for long term sustainability of these investments. At least three issues deserve close attention to improve the chances of long term sustainability: the need for adequate expenditure on O&M for Urban Water Supply services, extent of cost recovery at least of O&M (recurrent) costs to be able to operate the services effectively and generate at least an adequate surplus for immediate capital investment requirements, and adequate human capacity in the ULBs for good consumer responsive service delivery. The issue of adequate staff is also linked to appropriate institutional arrangements that provide incentives and opportunities to ensure good performance in delivery of water and sanitation services.

For financial sustainability of services it is important to recognise that water is an important resource and must be adequately priced. Narmada water that is available to ULBs in Gujarat is priced between Rs. 4 to 6 per kilolitre for ULBs. However, ULBs do not charge adequately for this precious and limited resource. More importantly, nearly one-third of water is 'lost' in supply and only two-thirds of the operating cost is recovered. In order to sustain investments in drinking water, focus will also need to be on improved management and governance. For example, in order to reduce wastage of treated water through physical losses, the state government needs to make it mandatory for all ULBs need to conduct at least a preliminary water audit and carry out basic leakage management measures along with metering. Metering would also help in demand management as shown in a few places in India.[19] Similarly energy

[19] While detailed studies are not available, anecdotal information from Navi Mumbai Municipal Corporation (Maharashtra) and Hubli-Dharwad Municipal Corporation (Karnataka) suggest that when backed by appropriate pricing consumer metering lowers water demand. Similar practice in a private residential colony in Ahemdabad also resulted in reduced water consumption and increased hours of supply.

audits are required for all ULBs to bring down energy consumption through viable small projects. For reducing NRW, it is also essential to identify all consumers for billing and regularization of illegal connections. Priority is also needed for adherence to service charters for consumers with a responsive consumer grievance redressal system. For effective planning and maintenance all ULBs need to develop asset management systems.[20] Only then, it will be possible to ensure that security for urban drinking water achieved at great costs is sustained for the future generations.

[20] Utilities and local governments in Australia and Canada have the best practices in asset management. While ULBs in Gujarat will take a long time to reach such levels, a start needs to be made. This also needs to be facilitated by supporting ULBs to first develop a good database on assets that will enable better maintenance and planning. Introduction of such practices will be essential to sustain the infrastructure created through the additional investments being made in the sector.

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