Regional workshops on improving water supply service efficiency through preliminary water audit and enhancing water use efficiency through wastewater reuse

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GUJARAT MUNICIPAL FINANCE BOARD

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C-WAS Center for Water and Sanitation

pas performance assessment system

Regional workshops on improving water supply service efficiency through preliminary water audit and enhancing water use efficiency through wastewater reuse

4th, 5th, 6th and 10th October 2017

Ahmedabad, Surat, Rajkot and Vadodara

Report on Workshops

Centre for Water and Sanitation

CEPT University

Ahmedabad

Background

Performance Assessment System (PAS) is an action research programme, initiated by the CEPT University, Ahmedabad, with funding from the Bill and Melinda Gates Foundation. Since 2009, PAS has supported development of tools, methods and processes for performance assessment and improvement in delivery of urban water and sanitation services. Implementation of the PAS online module, which began with the states of Gujarat and Maharashtra has now been extended to Telangana, Chhattisgarh, Assam and Jharkhand, covering 900+ cities of India. The PAS programme aims to work with national, state and local governments to measure, monitor and improve urban water supply and sanitation services in India.

CEPT with Gujarat government's support implemented SLB-PAS system in all cities of Gujarat. Every year, city officials entered information related to water supply and sanitation (WSS) services in online SLB-PAS module. Currently, PAS portal hosts nine years of WSS information for cities of Gujarat. PAS has also supported selected cities to prepare performance improvement and information system improvement plans. PAS team presented the analysis of nine years UWSS results and support provided to the cities and state for improvement to the principal secretary of Gujarat on 22nd August, 2017. One of the suggestions from this meeting is to organise regional capacity building workshops on various improvement areas like access and coverage, efficiency in service operation, financial sustainablity, water security, etc. In these workshops, need to sensitise chief officers and city engineers to prioritise the service level improvement. Therefore we have selected two thrust areas: improving water supply service efficency through preliminary water audit and enhancing water use efficiency through wastewater reuse. The improvement areas suggested by GoG were in line with the various ongoing programmes and schemes like AMRUT mission, SMART cities and Revised scheme of 14th Finance Comission (FC).

These workshops were organised by Gujarat Municipal Finance Board (GMFB), Government of Gujarat in partnership with Center for Water and Sanitation (C-WAS), CEPT Univesity. Workshop invitations were sent to 170 cities of Gujarat of which officials from 103 cities participated in the workshop. This report is a summary of all four regional workshops organised at Ahmedabad, Surat, Rajkot and Vadodara. It also inclues recommendations for urban water supply and sanitation service level improvement based on discussions with participants.

Objective of the Workshop

The principal objective was to develop in house capacity of Gujarat ULBs for improving water supply services efficiency. It is expected that after completion of this workshop, participants would become conversant with preliminary water audit methodology and various types of municipal wastewater reuse.

A brief summary of various sessions are given below:

Opening remarks

The regional workshops were conducted under the chairmanships of shri. B. C. Patani, IAS (chief executive officer), shri. N. H. Darji (dy. director, Stat.) and shri. V. C. Patel (dy. director, grant and finance) of Gujarat Municipal Finance Board. In opening remarks, Shri Patni mentioned that large amount of funds are given to ULBs for basic and infrastructure facilities through various development schemes. The focus now has to be on efficiency in service delivery. He mentioned that various projects like AMRUT, SMART cities, etc. emphasises on efficiency and financial sustainability of water supply and sanitation services. New schemes of performance grant of 14th Finance Commission is also linked with the performance. The thrust area for new schemes of performance grant is on improvement of service levels in UWSS sector and therefore cities has to allocate resources in areas where service level needs to be improved.

Workshop began presentations by CEPT University.

Overview of water supply services in Gujarat

This first session covered an analysis of water supply services based on service level benchmarks information entered by ULB officials on online SLB-PAS module for the year 2016-17. Comparative analysis for the indicators like water supply coverage, per capita water supply, continuity, non-revenue water, cost recovery and collection efficiency of water supply tariff was shown. The presentation highlighted that over last 8 years, 40 percent more water supply quantity at source has increased whereas lpcd at consumer end has increased by 27 percent. Increased dependency of bulk purchase and ground water sources and service level variations across different regions were also discussed.

There is a lack of metering in water supply system in Gujarat and, even bulk flow meters at source and water distribution stations were absent. This causes a barrier for equitable water distribution and network management. Financial sustainability of the sector and its linkages with the current tariff were discussed briefly. It was highlighted that more than 80 percent ULBs were charging minimum water tariff as per government of Gujarat's GR issued in 2011. And after that there has been no change in tariff level whereas expenditure increased every year. Presentation also highlights the need of real time / updated system for operation and maintenance of water supply and sanitation. More than 30 percent of revenue expenditure is incurred in these sectors whereas there is no system for O&M monitoring. Indicative dashboard was illustrated for water supply services based on current initiative of e-governance module of water supply O&M monitoring in Nadiad. The following topics were highlighted during discussions as key areas for improvement. Universal access to household level water supply connections.

- Improve water quantity data reliability at sources, distribution station and at consumer end by installing bulk flow meters and water meters.
- Reduce expenditure and increase water tariff for financial sustainability.

Preliminary Water Audit

This session focused on the various components of Non-Revenue water, causes of water losses and improvement areas for immediate action and for long term action. Water audit methodology and various steps were explained briefly. The example and results of preliminary water audit in a few cities of Gujarat and Nagpur (first city who received financial support for water audit in JNNURM) were presented. The participants were made aware about simple and easily doable measures for NRW measurement and reduction without enormous capital investments. These were:

- Identification of water losses in main trunk lines, transmission lines and distribution network using portable ultrasonic flow meters. Measure inlet and outlet flow simultaneously in a pipeline to calculate losses. Instrument can be easily obtained on rent or can be purchased by ULB.
- Identify leakage in storage tanks by measuring drop in water level in fully filled tank using level indicator for a few hours.
- Calibrate pump discharge capacity and measure actual water quantity based on pumping hours. Calculate actual water withdrawal from sources and reached at water distribution stations.
- Identify free supply points in various government buildings, institutions, religious places, etc. and estimate quantity by installing water meters temporarily.
- Convert stand posts into group connections.
- Introduced scheme of voluntary disclosure of unauthorized water supply connections. Involve plumbers for identification of unauthorized connections and provide incentive for the same.

A group exercise was conducted to familiarise participants about resources requirement to carry out preliminary water audit exercise for their cities. In this hands on exercise, participants were asked to prepare schematic diagram of water supply system and then identify bulk flow measurement points. At the end of exercise, approximate financial cost for bulk flow meters installation were discussed.

Wastewater Reuse

This session focused on strategic planning for the wastewater reuse based on recently launched wastewater reuse policy of Government of Gujarat. Gujarat is the first state in India who has implemented underground sewer network projects in many cities through the state scheme. Wastewater is viewed as resource and state's vision is "Universal coverage of underground drainage network with at least 40 percent of wastewater to be recycled by using

advance, proven and sustainable technology in all towns and cities of Gujarat state". Presentation discussed the objectives, suggestions and priority areas of wastewater recycling policy. It was followed by some successful national and international examples of reuse of wastewater for industrial, agriculture and drinking water. Involvement of private sector in wastewater reuse was also discussed. At the end of presentation, various steps for planning wastewater reuse were discussed, these are:

- Identify potential users for treated wastewater reuse in a city
- Assessment of appropriate treatment technology to attend certain quality standards for potential users
- Cost assessment and identify financial sources
- Construction and operation of wastewater reuse treatment project

Review by GMFB

In the final session, GMFB officials took city wise review on status of various grants utilisation and submission of related documents like utilization certificate, etc. GMFB had shared standard templates for 14th finance commission performance grant. Cities were asked to send these to GMFB urgently.

Region wise overview of discussions around various issues are captured below:

Region 1: North Gujarat Region.

The north region workshop was the first in series held at Ahmedabad on 4th October 2017. It was planned for the 39 ULBs (37 municipalities and 2 municipal corporations) from the 7 districts (Ahmedabad, Gandhinagar, Mehsana, Patan, Sabarkantha, Arvalli). From these 39 city officials from 18 ULBs were present in the workshop. List of the participants is attached in annexure.

Workshop sessions were interactive and participant shared their initiatives and experiences. Overview and challenges in existing system along with areas where further improvements are required were also discussed.

Overview of existing system and initiatives in WSS:

- Water supply coverage in this region is fairly good and most of the cities supply daily water to the consumers.
- There is no metering at sources, treatment plant, distribution stations and consumer end which will hamper the identification of leakage or contamination in the water supply network.
- There is no accountability of quantity of water supplied to free connections in cities.
- Participants also highlighted that illegal connections are one of the major issue in water and sewerage system.

- Kadi Nagarpalika submitted detailed schematic diagram of entire water supply system and requested CEPT to provide support for updating water supply and sewerage maps.
- Participants mentioned that many farmers are currently using their treated / untreated wastewater in agriculture purposes. But there is no formal system and accountability of quantity reused.

Area of improvements:

- Identification of water losses in the trunk and transmission lines of water supply network based on water meters reading or calibrated pump discharge. If cities don't have bulk meters than immediately cities can calculate water losses (from sources to treatment plant, treatment plant to distribution station) based on calibrated pump discharge and hours of pumping.
- Need to assess water leakages in underground storage tanks using drop test method.
- Introduce metering for at least commercial, industrial, institutions and at bulk consumers.
- Estimate quantity of free supply by installing temporary water meters.
- Need to map unauthorised connections and drive to make a regularisation.
- Establish a formalised system at city level for reuse of wastewater in agriculture. Identify potential reuse of wastewater in public parks and gardens.

Photo Grid 1 Workshop for North Gujarat Region at Ahmedabad

Region 2: South Gujarat Region.

The south Gujarat region workshop was held at Surat on 5th October 2017. It was planned for the 23 ULBs (22 municipalities and one municipal corporation) from the 6 districts (Surat, Valsad, Navsari, Narmada, Tapi and Bharuch). 29 city officials from 18 ULBs attended the workshop. List of the participants is attached in annexure. In this workshop, Surat Municipal Corporation, which is a proactive in transforming the urban services, presented their initiatives of improving efficiency in water supply and wastewater. These initiatives are replicable to other cities. :

- Robust system for water quality testing which includes online water quality monitoring system and consumer water quality monitoring system as per CPHEEO and WHO guidelines.
- Leakage mapping and creation of NRW cell to actively reviewed identified water leakages and find out solutions daily at zone and department level.
- Involvement of private sector participation to control O & M expenditure and introduce operational efficiencies in treatment plants, distribution stations, valve operations, etc.
- Regular energy audit of all pumping machineries in water supply and sewerage system.
- Implementation of 24x7 water supply in new north zone with consumer end metering along with volumetric tariff in around eighteen thousand connections.
- Treated wastewater reuse in Pandesara industrial area and proposed projects to supply treated wastewater in other industrial areas.

Workshop sessions were interactive and municipal officials shared their initiatives and experiences. Overview and challenges in existing system along with areas where further improvements are required were also discussed.

Overview of existing system and initiatives in WSS:

- Water availability is comparative good in this region because of the perennial rivers Tapi and Narmada catchment, higher ground water table and bulk water purchase from Narmada canal based system. This resulted into daily water supply with higher per capita in all cities of this region.
- Water supply network coverage in this region is good but some cities have lower connection rate because many households are depend on ground water.
- Many cities like Ankleshwar, Vyara, Navsari mentioned that slum areas have lower individual water supply connections and tendency to have free water supply though stand posts.
- Navsari has locally prepared sensor based water level indicators and installed in underground and elevated storage tanks. This will help to reduce overflows in tanks.

With the use of this water level indicators, officials are calculating water quantity distributed in various zones.

Area of improvements:

- Convert stand post into group connections or provide individual connections to slum households.
- Organise connection mela to connect households that don't have municipal connections and uses their own bore well but situated in water supply network area.
- Installation or repairing water level indicators in storage tanks to reduce overflow in the tank. This will also help to assess leakages in storage tanks.
- Introduce water metering at consumer ends; initially in the commercial, industrial, institutional, etc. connections with volumetric tariff.
- Cities have shown interest to conduct water audit and energy audit. They requested to provide support for development of terms of reference for agencies to carry out water audit in their respective cities.
- There is a potential to reuse wastewater in industrial areas in this region. Need to do market assessment analysis to identify potential users within industrial areas.

Photo Grid 2 Workshop for South Gujarat Region at Surat

Region 3: Saurashtra and Kutch Region.

Saurashtra and Kutch region workshop was the third on series held at Rajkot on 6th October 2017. It was planned for the 71 ULBs (67 municipalities and 4 municipal corporations) from 12 districts (Rajkot, Bhavnagar, Jamnagar, Junagadh, Surendranagar, Amreli, Kutch-Bhuj, Botad, Devbhoomi-Dhwarka, Gir Somnath, Porbandar and Morbi). 42 city officials from 35 ULBs participated in the workshop. List of the participants is attached in annexure.

Workshop sessions were interactive and municipal officials shared their initiatives and experiences. Overview and challenges in existing system along with areas where further improvements are required were also discussed.

Overview of existing system and initiatives in WSS:

- All the rivers in Saurashtra and Kutch regions are non-perennial. These regions are very sensitive on water related issues, and it is reflected in service levels of the cities. Many cities are providing lower per capita water. Only few cities supply daily water to consumer in these regions.
- Participants highlighted that there is a wide variation in even distribution of available resources within city. Management of water supply system is difficult due to lack of metering at sources, distribution stations and consumer ends.
- Issues of unauthorised connections is also discussed by officials.
- Participants also raised an issue of lack of technical manpower to operate and maintain water supply system.
- Bhavnagar Municipal Corporation has done mapping of all infrastructures on GIS which includes all water supply and sewerage system pipelines, street lights, solid waste bins, etc. Capital or maintenance work bill will be passed after its entry in GIS database, this system will regularly update the digitised database.
- Rajkot Municipal Corporation has installed real time water losses monitoring system, it is continuously monitor dam/GSR/ESR water level using ultrasonic type water level sensor and inlet / outlet flow using full bore electromagnetic flow meter. It also continuously monitors residual chlorine in main supply lines at head works by using chlorine analyser sensor.
- These regions are water stressed and currently many farmers are using untreated wastewater. Participants mentioned that very high potential of reuse of treated wastewater in agriculture sector.

Area of improvements:

- Install bulk flow meters with automatic meter reading system in various sources, treatment plants and distribution stations to distribute water sources efficiently and equitable.

- Need to assess water leakages in underground storage tanks using drop test method, repair leaking valves in water supply network.
- Introduce water metering at consumer ends; initially in the commercial, industrial, institutional, etc. connections with volumetric tariff.
- Need to map unauthorised connections and drive to make a regularisation.
- Recruit technical manpower in cities to implement water supply and sanitation reforms and for better management of existing system.
- Many cities have underground sewerage system but treatment plant is yet not functional. Need to focus on treatment plant operationalization to supply treated wastewater in agriculture sector.

Photo Grid 3 Workshop for Saurashtra and Kutch Region at Rajkot

Region 4: Central Gujarat Region.

Central Gujarat region workshop was the fourth and final in a series held at Vadodara on 10th October 2017. It was planned for the 37 ULBs (36 municipalities and Vadodara Corporation) from 8 districts (Vadodara, Kheda, Anand, Dahod, Panchmahal, Chhota-udaipur and Mahisagar). 45 city officials from 32 ULBs were present in the workshop. List of the participants is attached in annexure.

Workshop sessions were interactive and municipal officials shared their initiatives and experiences. Overview and challenges in existing system along with areas where further improvements are required were also discussed.

Overview of existing system and initiatives in WSS:

- Water availability is comparatively good in this region because of the perennial river Mahi catchment, higher ground water table and bulk water purchase from Narmada canal based system. This resulted into daily water supply with higher per capita in all cities of this region.
- Participants raised an issue of political pressure to provide free water supply by tankers. They also mentioned that there is a need of state level resolution / policy to implement actions related to reduction of free supply and tariff revision.
- Officials from Vallabhvidhya nagar, Petlad and Borsad showed interest to install domestic meters and requested to provide guidance of consumer end metering, covering following aspects:
  - Which type of meters should be installed?
  - Can it be operated on saline water also?
  - Are meters need any regular O & M?
  - What should be the volumetric tariff for different users like residential, commercial, institutional, etc.?
- City officials suggested that a mandate from state for installation of domestic meter will be advantageous to implement metering policy at city level.
- Nadiad Nagarpalika mentioned their future plan of wastewater reuse for industrial purpose.

Area of improvements:

- Cities have shown interest to conduct water audit and energy audit. They requested to provide support for development of terms of reference for agencies to carry out water audit in their respective cities.
- Install bulk flow meters with automatic meter reading system in various sources, treatment plants and distribution stations to measure and distribute water sources efficiently.
- Estimate quantity of free supply by installing temporary water meters.
- Introduce water metering at consumer ends; initially in the commercial, industrial, institutional, etc. connections with volumetric tariff.
- Many cities have underground sewerage system but treatment plant is yet not functional. Need to focus on treatment plant operationalization to supply treated wastewater in agriculture sector.
- There is a potential to reuse wastewater in industrial areas and agriculture in this region. Need to do market assessment analysis to identify potential users for the city.

Photo Grid 4 Workshop for Central Gujarat Region at Vadodara

Conclusion

- Due to lack of bulk flow meters in water supply system, calculation of quantity of water supplies from water distribution stations is unknown. There is an immediate need to install bulk flow meters in various sources, treatment plants and distribution stations to measure and distribute water sources efficiently and equitably.
- Participants have shown positive response to install water meters at consumer end. It was discussed that initially meters should be installed in all commercial, institutions and bulk connections and later on in residential connections. They also mentioned that a mandate from state for installation of domestic meters will be advantageous to implement metering policy at city level.
- To achieve universal coverage of water supply, state has to direct cities to convert stand post into group connections or provide individual connections to slum households.
- Need to connect all households covered in existing water supply network area along with regularisation of unauthorised connections.
- Water audit and energy audit should be mandatory for all cities
- Cities have shown positive response towards wastewater reuse planning as most of the cities are in to the phase of sewage treatment plant construction.

For further support on any of components of training programme, the participants were requested to formally communicate the kind of support required by the urban local body to CEPT team and GMFB. The CEPT team assured all possible handholding support in partnership with state urban development department.

Annexure

Annexure 1: Workshop Agenda

Improving water supply service efficiency through preliminary water audit and enhancing water use efficiency through wastewater reuse

Organised by
Urban Development and Urban Housing Department of Gujarat
Gujarat Municipal Finance Board (GMFB)
C-WAS, CEPT University

Workshop Agenda

Objective: To develop capacity of ULBs for improving efficiencies of water supply services and wastewater reuse. Participants will be acquainted with preliminary water audit and policies related to wastewater reuse.

Session Time	Description of the activities in the session
10.30 – 11.00	Registration
11.00 – 11.10	Welcome address and Introduction
11.10 – 11.30	Overview of water supply services in Gujarat
11.30 – 12.00	"Water Audit" effective solution to enhance the WS service delivery
12.00 – 12.45	Group Exercise on standard water balance chart in a city
12.45 – 13.30	Wastewater reuse
13.30 – 14.00	UDD/ GMFB / GUDM review
14.00 – 15.00	Lunch

Annexure 2: List of Participants

North Gujarat Region

Sr. No.	Name of the ULB	District	Name of the person	Post
1	Dhandhuka	Ahmedabad	Mr. Y. J	Accountant
2			Kadodiya	Engineer
3	Bopal Ghuma		Jatin Shah	Clerk
4	Pethapur	Gandhinagar	A.G. Raval	Accountant
5	Vijapur	Mahesana	S.V.Prajapati	Deputy Accountant
6			Harshad P Patel	Engineer
7	Kadi		Parmar Mahesh B	Engineer
8			Thakar Nikhilesh R	Computer Operator
9	Visnagar		Sudhir H	O.S.
10			Vikram S Patel	Accountant
11	Harij	Patan	Amit J Dave	Operator
12	Patan		Patel Kirtikumar	
13	Radhanpur		Bhojak Vikrambhai	Engineer
14	Palanpur	Banaskantha	Barot Pankaj	C.O.
15			Patel Rahul N	Assistant
16			Chaudhari Haidar Ali	Clerk
17	Disa		Jigar J Patel	Chief Officer
18	Thara		J B Maheta	Chief Officer
19			Hitesh J Solanki	
20	Dhanera		Chintan V Chaudhary	Chief Officer
21			Rajubhai P Solanki	Supervisor
22	Bhabhar		Mali Babuabhai	Engineer
23	Khedbrahma	Sabarkantha	Savitriji Soni	Chief Officer
24	Prantij		Vishal B Patel	
25	Modasa	Aravalli	Mihir Kadia	Engineer
26	Bayad		Mahendr R Patel	Deputy Accountant
27	GUDM		Chintan Bhagat	Deputy Manager

South Gujarat Region

Sr. No.	Name of the ULB	District	Name of the person	Post
1	Surat	Surat	Nilesh Patel	Executive Assistant
2	Mandvi		Jayesh Sompura	Engineer
3	Bardoli		B N Parikh	Chief Officer
4			P R Patel	Engineer
5	Kansad		Patel Gaurav C	Engineer
6			J K Chandva	Chief Officer
7	Tarsadi		Gaurav Patil	Planning Assistant
8	Sachin		Chandrakant Timber	Clerk
9	Kadodara		M Vasava	Chief Officer
10	Umargam	Valsad	Chandra H Bhoi	Engineer
11			Pritesh I Bari	Pump men
12	Pardi		Gulabbhai C Patel	Supervisor
13			Usamgani A Shekh	Water works Supervisor
14	Dharampur		Parixit Lad	Engineer
15			Dipesh K Thakkar	Auditor

16	Vijalpore	Navsari	Aniket C Desai	Engineer
17	Gandevi		Jaya J Mehta	Chief Officer
18			Dhaval P Rathod	Engineer
19	Navsari		Raju K Gupta	City Engineer
20			Rajesh Gandhi	Drainage Engineer
21	Rajpipla		Bhavesh Vasava	Chief Officer
22			Prahalad Panchal	Surveyor
23	Vyara	Tapi	Shailesh B Patel	Chief Officer
24			Sanjay Panchal	Supervisor
25	Songadh		B M Chaudhari	Chief Officer
26			Naginbhai Patel	Supervisor
27	Jambusar	Bharuch	Madhav K Makvana	Supervisor
28			Vinubhai	Clerk
29	Ankleshwar		R.H.Patel	City Engineer

Saurashtra and Kutch Region

Sr. No.	Name of the ULB	District	Name of the person	Post
1	Rajkot	Rajkot	A.K.	Accountant
2			Y.K.Goswami	Engineer
3			M. H.	Engineer
4	Bhavnagar	Bhavnagar	B.M. Aovani	Deputy Engineer
5			C.C.Devadiya	Engineer
6	Junagadh	Junagadh	Bhavesh M	Additional Engineer
7	Jetpur	Rajkot	Bharat P.	Chief Officer
8	Upleta		Anita Pandya	Chief Officer
9			Dalsadi M	
10	Bhayavadar		Mukesh B Patel	Head Pumpmen
11	Jasadan		G G Antani	Chief Officer
12			S B Raval	Engineer
13	Dhoraji		Hardik M	Engineer
14	Gondal		H K Patel	Chief Officer
15			Pratik S Kotecha	
16	Vallabhipur	Bhavnagar	K K Bhatt	Clerk
17	Kalavad	Jamnagar	J J Chauhan	Chief Officer
18	Sikka		N K Pandav	Chief Officer
19	Jam Jodhpur		Ashvin Vyas	Chief Officer
20	Bhuj	Kutch	Mehul Jodhpura	Chief Officer
21	Rapar		Mehul Jodhpura	Chief Officer
22	Bhachau		Mehul Jodhpura	Chief Officer
23	Kodinar	Gir Somnath	B B Visoi	Chief Officer
24	Veraval		Mukesh Pandya	Clerk
25	Una		B B Visoi	Chief Officer
26			Pankaj K	
27			Nilesh M	
28	Manvadar	Junagadh	P D Nandasan	Chief Officer
29	Visavadar		G N Patel	Chief Officer
30			R R	Operator
31	Keshod		D P Mandaliya	Clerk
32	Mangrol		Yunus v	Accountant
33	Thangadh	Surendranagar	J C Lamba	Supervisor
34			Sanjaybhai	Operator

35	Limbdi		P K Kotecha	Chief Officer
36			P Chavda	Supervisor
37	Damnagar	Amreli	Amit G	Clerk
38	Bagasara		Bhavna Goswami	Chief Officer
39	Lathi		B D Seji	Chief Officer
40	Rajula		R K Parikh	Chief Officer
41	Jafrabad		K M Koladiya	Chief Officer
42	Babra	Rajkot	D J Talaviya	Engineer

Central Gujarat Region

Sr. No.	**Name of the ULB**	District	**Name of the person**	**Post**
1	Vadodara	Vadodara	Prashant Yadav	Deputy Engineer
2	Thasra	Kheda	Parth Goswami	Chief Officer
3	Chaklasi		K K Prajapati	Chief Officer
4	Kanajari		Vishal	Clerk
5			Bharat	Surveyor
6	Kapadvanj		Upen G	Chief Officer
7	Kheda		Bijal Solanki	Chief Officer
8	Dakor		A K Patel	Chief Officer
9			Parmar Prakash	Engineer
10	Nadiad		Chandresh Gandhi	Assistant Engineer
11			Chandrakant Vaghela	Assistant Engineer
12	Mahemdabad		Avinash Chauhan	Clerk
13			D. P.	Chief Officer
14	Kathlal		K K Parajapati	Chief Officer
15	Boriyavi	Anand	Dineshbhai	Clerk
16			Vipul T	
17	Khambhat		Chauhan Birendrasinh	Assistant
18	Anand		Vijaybhai Soni	Engineer
19	Anklav		B P Vasava	Chief Officer
20	V.V.Nagar		Patel Roshani D	Chief Officer
21			Shalin Parikh	Assistant
22	Umreth		Pradip P Panchal	
23	Aod		Jitendra L Puri	Chief Officer
24			Hemant D	Engineer
25	Petlad		Hiral Thakkar	Chief Officer
26			Mahesh Patel	Assistant
27	Sojitra		C B Rabari	Chief Officer
28			V H Mahida	Engineer
29	Borsad		Nikunj N Parmar	Engineer
30	Karamsad		C B Rabari	Chief Officer
31			Hemesh J Patel	Clerk
32	Jhalod	Dahod	M H	Engineer
33			Sabbi A Saiyad	Supervisor
34	Kalol	Panchmahal	M A Solanki	Chief Officer
35	Godhara		A R Pathak	Chief Officer
36			Bhadresh Pandya	Deputy Engineer
37	Chotta Udepur	Chotta Udepur	Mahesh Parmar	Manager
38	Karjan	Vadodara	D N Shah	Chief Officer

39	Padra		Mukesh K Patel	Over Seer
40			Jitendra K Rathava	Clerk
41	Dabhoi		Patel Smit B	Engineer
42	Balasinor	Mahisagar	Vinay B Gaikwad	Planning Assistant
43	Santrampur		M V Joshi	Chief Officer
44			N R Pargi	Accountant
45			P G Bhatia	Clerk

The Center for Water and Sanitation (C-WAS) at CEPT University carries out various activities – action research, training, advocacy to enable state and local governments to improve delivery of services. In recent years C-WAS has focused its work on urban sanitation.

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