

AN EXPLORATION ON SMART WATER MANAGEMENT SYSTEM FOR SURAT

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Abstract: Water being a very important and crucial natural resource it is need to give an attention towards optimum use of water and minimum waste. Existing system of water supply are having many issues and leakage is major among that. Existing water supply system need to get an updated as there is a scope of being smart in water management so that most of the issue of system can be addressed efficiently and timely. Smart water management is use of sensors and technology for real-time monitoring. For real time monitoring SCADA can be the one option. More than that GIS mapping, Creation of DMA, deployment of sensors are the possible way to upgrade an existing sytem in to a smart one.

Keywords: Smart water management, Real time monitoring, SCADA, sensors ,DMA

1 INTRODUCTION

Water is one of the most important natural resource and water scarcity is the most challenging issue at global level.as per the report of United Nations-The Millennium Project, 3 billion people could face water scarcity by 2025.Water resources in India are also exhausting due to rising population and increased water consumption in urban areas. Existing system of water supply is facing problems like higher rate of leakage, poor maintenance, poor costumer service, and poor quality of water. As per Smart Cities Mission Statement & Guidelines prepared by MoUD, India. Smart water management consist Smart meters & management, Leak detection and preventive maint., water quality monitoring.

Present research paper describes existing issues in water supply system and their possible smart solutions in context of surat city

2 WATER SUPPLY SYSTEM IN SURAT

Surat municipal corporation has spent about 1300 cr. Rs. For water supply infrastructure since 1995. It has been seen drastic increase in water supply. In 1995 it was 180 MLD where as in 2014-15 it was about 980 MLD. At present SMC is serving about 97 percent of its total populated area and 95 percent of its population.Population covered under piped network is around 95 %. Source of Water is River Tapi. Present installed capacity of

Water Works (6 Nos.): 1300 MLD. Present gross daily average water supply: 980 MLD. Total storage capacity of all WDS & WW: 7076 Lacs Liters.

SMC has performed very well in completing various projects under JnNURM and Swarnim Jayanti Mukhya Mantri Shaheri Vikas Yojna. Till date almost all the projects are completed 100%. NRW(non revenue water) cell was established for reducing level of NRW to the 15% for that leakage mapping was initiated and that leakage mapping had reduced leakage complaints.



Figure 1: Leakage mapping of all zones, Surat

Source: www.suratmunicipal.gov.in

3 ISSUES IN EXISTING SYSTEM OF WATER SUPPLY AND POSSIBLE SMART APPROACH

In existing system of water supply Of Surat city, many problems like poor asset management, aging of water supply infrastructure, poor maintenance and break fix, poor customer service are prevailing. Only 2-3 Hours/day of water supply is provided for most of the city area. Numbers of metered connection in Surat is very few so it is difficult to measure actual water loss but it is high as 20-30% as per SMC officers. Every year about 6000-7000 complaints are registered by consumer regarding leakage and service provided.

In existing system of water supply, there has been an approach of providing excess of infrastructure to meet the higher demand. Where smart water management meets water demand by increasing efficiency. Smart water management enables collection of data and their use for any problems in supply network thus it enables information sharing. Some issues are mentioned below with possible smart approach.

Issues in water supply system	Smart approaches
Manual data collection and lack of access	SCADA for real time monitoring and analysis.
Inadequate supply of water	forecasting of variation in demand through real-time monitoring and meet required demand
Insufficient pressure	Smart booster pumps which can operate by itself for creating sufficient pressure
Unauthorized connections	Sensors for ghost pipe detection
Leakage and pipe bursting	Pre detection by sensors
Quality of water	Water quality sensors
Consumption of water	Smart water meters

Smart water management system allows real time monitoring of data so that in case of variation in demand of water we can accurately forecast future demand and provide water according to that. Smart pumps are enable of self-operating system which can reduce manual operation. Sensors can be deployed in distribution network for pre-detection of pipe bursting and leakage event. It is also helpful in detection of ghost pipe which decreases NRW.SMC has equipped SCADA (Supervisory Control And Data Acquisition) at all water treatment plan for online monitoring, data collection and automatic operation. But SCADA is not present in distribution network. Use of SCADA in distribution network can be helpful in operation of valve, and receive data from sensors.

4. CONCLUDING REMARKS

Surat Municipal Corporation has done very well in area of water supply system. Almost 95% of population is covered with water distribution network. Installation of SCADA was very advanced initiative from SMC in the direction of smart water management. But only one newly merged zone i.e. New North zone is provided with 24*7 water supply. First initiative in direction of smart water management should be providing 24 hour water supply and metering of all connection in entire city area. For real-time monitoring of entire water supply system sensors are required and for collection of data from sensors and analysis of that data SCADA is most helpful system.

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