Scientific Journal of Impact Factor (SJIF): 5.71

e-ISSN (O): 2348-4470
p-ISSN (P): 2348-6406

International Journal of Advance Engineering and Research Development

Technophilia-2018.

Volume 5, Special Issue 04, Feb.-2018 (UGC Approved)

Disribution of Water Supply for a City

Dhokare Ganesh S.[1], Kawde Omkar S.[2], Gavhane Pratik R.[3], Gandhi Rushikesh S.[4], Gadekar Shivam U.[5] , Maid Nilesh S.

[1,2,3,4,5]*(STUDENTS' Department of Civil engineering, Jaihind Polytechnic, Kuran*
6 Lecturer, Department of Civil engineering, Jaihind Polytechnic, Kuran

Abstract — *The Government of India (GOI) targeted a water connection rate for the entire population by the end of its Seventh Five-Year Plan (April 1985-March 1990). Whilst the bid resulted in an increase in the urban connection rate from 73% to 84%, per capita consumption in FY90/91 remained low at 148 liters per day. The Eighth Five-Year Plan again set its sights on achieving a 100% water connection rate and policies aimed at stabilizing living standards and improving health and sanitation were given pole position. New Bombay is a new town located near Old Bombay, and in 1991 its population was around 700 thousand. In the region, water was supplied by the City and Industrial Development Corporation of Maharashtra Ltd (CIDCO), which received bulk supplies totaling 100,000 cubic meters per day from Maharashtra Industrial Development Corporation (MIDC) and Maharashtra Water Supply and Sewerage Board (MWSSB). It was predicted that the population and demand for water in the region would grow in line with progress in construction.*

Solapur is a core regional city situated in southeastern Maharashtra where production centers on the garment industry. As of March 1991, its water service area embraced a population of some 620 thousand people, and a total of 100,000 cubic meters of water was supplied daily from the Ekrukh Water Tank and the Bhima River. The project undertaken in Solapur covered the city itself and nine villages in its environs. The population in the area was forecast to swell from 620 thousand (in 1991) to 1.3 million (in 2011), whilst peak demand for water was expected to surge from 101,000 cubic meters per day in FY90/91 to 186,000 cubic meters per day in FY10/11.

Keyword- *population, rehabitating*

I. INTRODUCTION

After complete treatment of water, it becomes necessary to distribute it to a number of houses, estates, industries and public places by means of a network of distribution system .The distribution system consists of pipes of various sizes, values, meter, pumps ,etc .The following are the requirements of a good distribution system.

According to global water supply and sanitation assessment report, 2000 , the percentage of people served with some form of improved water rose from 79% (4.1 billion) in 1990 to 82% (4.9 billion) in 2000. At the beginning of 2000 ,one sixth (1.1 billion people) of the world's population was without access to improve water supply.The majority of these people lives in asia and afriaca ,where 2 out of 5 africans lack improved water supply and 2000 coverage of water supply for the urban population and Ethiopia was 85% and 77% respectively. According to the millennium goal targets ,the African urban areas will be accessed for improved Water within 15 years from the year 2000.On the other hand ,in African largest cities only 43% inhabitants have house connections water supply services. The mazin problem that developing country are faced to provide access for their citizens is shorage of resources. Moreover ,the capacity of the citizens to pay for water that fully recovers the cost is very limited. For this reason many developing city are faced great difficulty to expand the service and rehabitating the existing aged pipes. Generally tariffs in developing countries are set well below the level needed to cover even operation and maintenance cost. Research has shown that low tariffs are set largely for political, rather than practical,purposes.

Limited institutional capacity is also one of the bottlenecks that hinder cities of developing countries for managing their infrastructure asset in general and water supply in particular. Besides to low coverage, water losses (physical loss) in urban water supply is accounted to more than 50% of the supplies that mainly arise from:

Leakage of pipes, joints and valves Over flowing service reservoirs and Waste of water through illegal connections and non-metered house connections. Although leakage is one of the major causes for loss of water in a network distribution system, the loss of water through illegal connections and non-functioning meters is also contributing a lot that needs a proper management and monitoring system. While developed cities have started using on-line continuous operation and monitoring service, the developing cities have great difficulties even to collect information on their previously performed operation and maintenance activities that could help them developing a strategy for the future. Many developed countries use water audit procedures to determine the efficiency of the system and to identify the location and magnitude of water losses. There is also a need for some type of database or information system such as GIS to enable analysis of flows in the networks and provide early warning or indication of leakage a lot that needs a proper management and monitoring system. While developed cities have started using

on-line continuos operation and monitoring service, the developing cities have great difficulties even to collect information on their previously perform operation and maintenanace activities that could help them developing a strategy for the future. Many developed countries use water audit procedure to determine the efficiency of the system and to identify the location and magnitude of water losses.

1) It should convey the treated water upto the consumers with the same degree of purity.
2) The water should reach to every consumer with the repaired pressure head.
3) Sufficient quantity of treated water should reached for the domestic and industrial used.
4) It should be economical and easy to maintain and used.
5) It should be safe against any future pollution.

II. WATER SUPPLY AND DISTRIBUTION

The city has started getting water supply in 1901. During the years between 1942 and 2001, many water supply projects have been implemented that the construction and upgrading of the Lagadadi dam and treatment plant, improvement of the distribution, ground water and spring development are among them (AAWSA, 2004).
Currently, around 220,000 m^3/day of water is produced from different sources that among the others are Gafarsa and Lagadadi treatment plants that have design capacity of two 400mm steel pipes and the Lagadadi line partly comprising of 1400 mm (6.8km) and other a combination of two parallel lines of diameter 900mm and 1200mm (11.5km) are the main transmission lines that convey water from the treatment plant to the respective reservoirs.
The existing water supply system has 17 pumping stations and 22 balance/storage reservoirs ranging in capacity from 100 to 20000m^3 with a total approximate storage capacity of 87000m^3. At present about 300 km^2 out of the 540km^2 total area of the city (56%) are served with water.

One of the difficulties faced by the water authority is determine the accurate water demand of the city as the consumpsion during the past years that should have been used as a based is far below the actual demand due to shortage of water.Keeping this in mind, the current situation as summarized by the water authority is as shown below (AAWSA,2004):

1) People having in-house services that are estimated about 4% of total population use water on average between 80 and 100 lit/cap/day, while the remaining population with access to safe drinking water (94%) are served by yard connection and use between 15 and 30 lit/cap/day.
2) Non domestic uses excluding industrial and industries water use are about 25 lit/cap/day and 7 lit/cap/day respectively. From the water used by industries about 40% is provided by the water authority while the remaining amount is produced by the industries themselves from deep wells.

III. Water Demand Management

Water demand is define as the volume of water requested by users to satisfy their needs. In a simplified way it is often considered equal to water consumption, although conceptually the two terms do not have the same meaning. In most developing countries, the theoretical water demand consideradly exceeds the actual consumptive water use.
Water demand management refers to any socially beneficial action that reduces average or peak water withdrawals or consumption from either surfaceor ground water, consistent with the protection or enhancement of water quality (Tate 2000). According to Rothert and Macy (2000), water demand management is the adaptation and implementation of strategy by a water institution to influence the water demand and usage in order to meet any of the following objectives: economic efficiency, social development, social equity (Mwendera etal., 2003).
The adaptation and implementation of a strategy by a water institution or consumer to influence the water demand and usage of water in order to meet any of the following objectives:
economic efficiency, social development, social equity, environmental protection, sustainability of water supply and services and political acceptability.

IV. CONCLUSIONS

This review gives an overview of hybrid water supply system and its impacts in the context of meeting the increasing water demand. It is important to note that hybrid water supply systems can have implication on the operation and performance of the existing centerlized infrastructure. This paper briefly discussed the possible impacts of hybrid water supply systems on changes in waste water and storm water quantity and quality. It also discussed the prospects and challenges of hybrid water supply systems. The literature survey

concluds that the interactions between decentralized and centralized systems are highly complex. Furthermore, implementations of hybrid water supply systems has other challenges including energy usage, operational performance , asset management , cost and public acceptance. This paper accordingly concludes that the water industry is in need of methodology to collectively asses the reliability, resilience, water quality, cost of sustainability of infrastructure to help determine when centralized , decentralized and hybrid solutions are the most appropriate.

REFERENCES

[1] AAWSA, 1997. Draft report on leak detection study for Addis Ababa Water Supply.
[2] AAWSA, 2004. Addis Ababa Water Authority, Draft Sectoral Development program: (August 2004)
[3] ADB, 1993 Managing Water Resources to Meet Mega City Needs, Proceeding of Regional Consultation.
[4] Ashton, C.H. and Hope, V.S.,2000. Environmental Valuation and Economic level of Leakage. \
[5] David, S. and George, P., 2003. Introduction to the practice of statistics.
[6] Farley, M. and Trow, S. 2003.Loss in water distribution networks: A practitioners guide to Assessment, Monitoring and Control.
[7] IRC, 1996. Contruction Innovation:defecting corrosion in water mains.
[8] IWA,2000. The blue pages, the IWA information sources on drinking water issues.
[9] Mitchell, V.G.,R.G.,M. and T.A.,M,.2000. Modelling the urban water cycle.
[10] Twort A.C., Raw F.M., Crowley F.M and Ratnayaka D.D., 1994. Water supply.