Dhaka Water Supply and Sewerage Authority: Performance and Challenges

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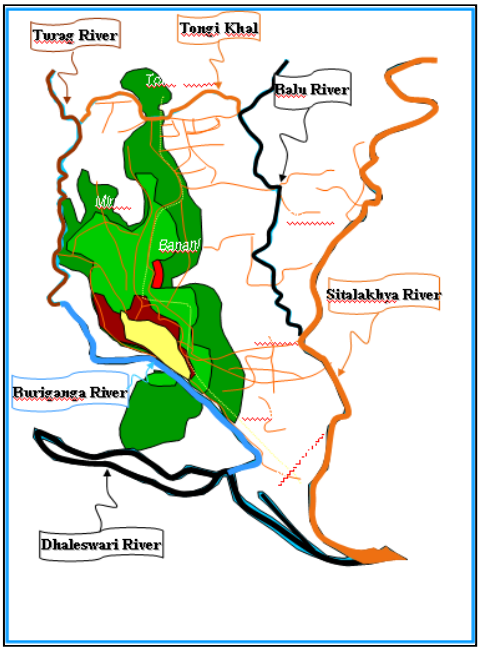
1. Introduction

Dhaka Water Supply and Sewerage Authority (WASA) is a service oriented autonomous commercial organization in the Public sector, entrusted with the responsibility of providing water supply, sewerage disposal (wastewater), and storm water drainage services to the urban dwellers of the fast-growing metropolitan Dhaka, the capital of Bangladesh. It covers more than 360 sq. km service area with 12.5 million people with a production of almost 2110 million liters per day (MLD). Dhaka WASA faces a number of challenges. These include unplanned city development and informal settlements, transitioning to using surface water instead of groundwater, and large investment funding. But Dhaka WASA has a number of notable achievements including significant increase in water production and productivity, improved service quality, increased revenue, reduction of non-revenue water, and provision of water supply at low cost.

2. History of Dhaka WASA

The history of the Dhaka city goes back more than 400 years. At the Beginning of the 16th century, the Mughals, in fact the first, established Dhaka city, and it was then 10 Sq. km in size. Under British rule it grew to 22 Sq. km and kept expanding during the Pakistan period to 50 Sq. km. Now it is 350-465 Sq. km in area, and this rapid growth is main challenge for Dhaka WASA. Dhaka city's current population of 12.5 million people is expected to expand to 21 million by 2025 and to live in an area of about 1,000 Sq. km.



Dhaka lies on the banks of the Buriganga River in central Bangladesh. The expansion of Dhaka city was mainly in and around the river Buriganga. The canals within the mega city Dhaka and the rivers surrounding the city were acting as natural drainage system, water reservoir, and the river route. These canals were Begunbari khal, Segunbagicha khal, Kallayanpur khal, Dholai khal etc. The surrounding rivers are the Buriganga, the Shitolakhya, the Balu, the Turag, and the Dhaleshari.

Since 1953 development of the Dhaka city was guided by The Town Improvement Act, 1953. In 1959, a master plan was developed showing an area 320 Sq. km having 0.575 million people, and is called first master plan of the mega city Dhaka. After the independence of Bangladesh in 1971, migration of people to Dhaka city from urban and rural areas were very high. At the same time the demand for housing, water, electricity, and gas increased tremendously. In this situation the town improvement plans of 1959 failed to meet the demand and felt for another master plan. On this background another master plan was developed in 1996, and is called 2nd master plan of Dhaka city. In this plan, the estimated area was 590 Sq. km and population was estimated 10 million. But the current population of Dhaka City is 12.5 million, which is 2.5 million more than the estimated plan.

Actually, the potable drinking water supply was started in Dhaka City in the year 1874, and that year Nabab Khaja Abdul Ghani established a water treatment plan in Chadnighat near the bank of the river Buriganga. After that period the piped water was supplied to city people in the limited way and also sanitation system.

After British rule, the then Pakistan government established Department of Public Health Engineering (DPHE) for rehabilitation of damaged water, drainage, and sanitation system for rural and urban people.

Dhaka WASA was established in the year 1963 as an independent organization, under the East Pakistan ordinance XIX. In 1989, the drainage system of Dhaka city also handed over to Dhaka WASA from DPHE. Again in the year 1990, Water, Drainage, and Sewerage services of Narayangonj city handed over to Dhaka WASA.

Based on the tremendous geographical expansion and population growth over the last two decades, Dhaka WASA's activities have been reorganized by Dhaka WASA Act, 1996. According to this Act, Dhaka WASA is operating as a semi-autonomous organization under a Board, and the line ministry is the Ministry of Local Government, Rural Development and Cooperatives (LGRD&C).

Ever since its creation in 1963, Dhaka WASA has been continuously expanding its service domain and upgrading its level of services to keep pace with the growing demand.

3. Function of Dhaka WASA

Currently Dhaka WASA is functioning with newly approved "Table of Organization & Equipment (TO&E)" and guided by a Board. The Dhaka WASA Board consists of 13 members including Chairman, and it is made for formulating policy and providing overall guidelines. A Managing Director and four Deputy Managing Directors including Chief Engineer & Commercial Manager head the executive management of Dhaka WASA. The managing director is the chief executive of the organization, and the top-level positions of the organization were reorganized by the WASA Act, 1996.

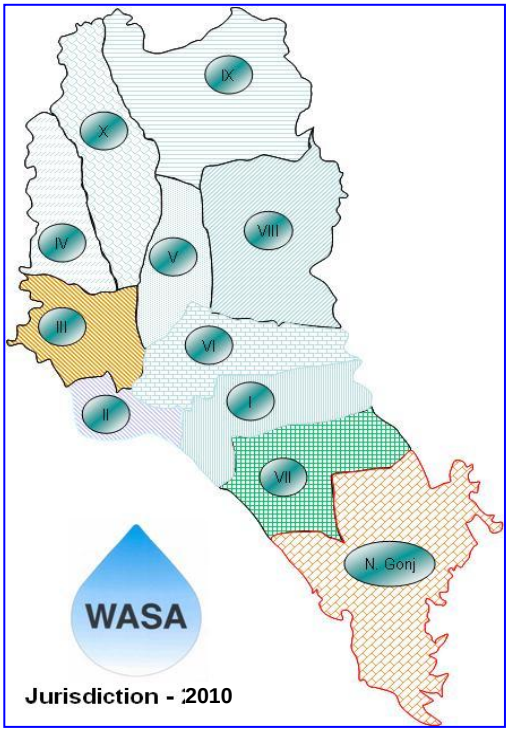
The organizational structure of Dhaka WASA is divided into four wings along with the Office of the Chief Executive (Managing Director), and they are Administration, Finance, Operation & Maintenance, and Research, Planning, & Development.

According to current organogram total manpower in Dhaka WASA is 4,431. But as of June 2011 the number of manpower reduces to 3,294. The present organogram based on service requirement and considering the geographic expansion of the City was approved in 2009.

The current water supply staff position and its hierarchy at the utility are reflected into the present organogram. Actually all services (Water Supply, Sewerage, and Drainage System) of Dhaka WASA is correlated, and the ratio of manpower engaged in two main streams are Water Supply System (87.6% of total manpower) and Sewerage System (13.4% of total manpower).

Service Area

The service area of Dhaka WASA covers more than 360 square km with a population of about 12.5 million. At present the service area of Dhaka WASA extended to Mirpur and Uttara in the North and to Narayanganj in the South.



For better operation, maintenance, and customer care, the total service area of Dhaka WASA is divided into 11 geographic zones, which includes 10 in Dhaka City and 1 in

Narayanganj. There is an office for each zone, and this office carries out the responsibilities of engineering, maintenance, and operation as well as revenue activities. So that the respected consumers can obtain all possible services and counseling from one place.

Mission and Main Responsibilities

The mission of Dhaka WASA is to provide safe and sufficient water for drinking, industrial and commercial use, to ensure sanitation and good hygienic condition through proper disposal of domestic and other sewerage, and to ensure efficient storm-water drainage system in Dhaka city.

The main responsibilities of Dhaka WASA are:

a) construction, operation, improvement, and maintenance of the necessary infrastructures for collecting, treating, preserving, and supplying potable water to the public, industries, and commercial concerns;

b) construction, operation, improvement, and maintenance of the necessary infrastructures for collecting, treating, and disposing domestic sewerage and other sewerage; and

c) construction, operation, improvement, and maintenance of the necessary infrastructures for storm water drainage facilities of the City.

4. Major Challenges

Dhaka WASA faces numerous challenges while providing Water Supply and Sewerage services in fast growing Dhaka city, and they are briefly described below:

a) Mega City in developing country: *A mega city is usually defined as a metropolitan area with a total population in excess of 10 million people. Some definitions also set a minimum level for population density (at least 2,000 persons/square km).* According to these definitions, Dhaka is identified as one of the mega city in developing countries. It has population of over 10 million, and also the population density (persons per sq km) of Dhaka city is 30,000. However, for Low Income Community (LIC) people the population density increases to 220,000 which is more than 7 times compared to that of Dhaka city. Mega city itself is a greatest burden as well as enormous challenge for the developing countries, and this is also a big challenge for Dhaka WASA to meet the need of water demand of this mega city.

In a time of rapid urbanization, Dhaka is the world's fastest growing mega city. Each year the flow of migrants into Dhaka city, leaving the rural and other urban areas to try to make a living in the big city, is too high. Most of these migrants are LIC people. By 2025, the total Population in Dhaka city is estimated to be 21

million of which LIC 8 million (approximately 44%). The LIC people will be more crowded in Dhaka city in informal settlements.

b) **Unplanned City development and growth:** The rapid growth of Dhaka city also causes high demand for water along with housing, electricity, and gas. Due to tremendous geographical expansion and population growth over the last two decades, the City was developed in a very unplanned manner, and as such the planning for the Dhaka WASA activities is modified time to time to meet Dhaka's fast-growing demand for water, and still this is one of the challenges for Dhaka WASA.

c) **Switching to surface water from ground water extraction:** Dhaka WASA has almost 100% water coverage and the water demand in Dhaka city is 2.25 million cubic meters per day (2250 MLD), which slightly exceeds the present supply of almost 2.11 million cubic meters per day (2110 MLD). At present 87% of the supplied water is from ground water abstraction from Dhaka WASA's 605 deep tube wells. The remaining 13% water comes from surface water treatments.

   The upper and lower aquifers of Dhaka city are about to exceed its withdrawal limit. Ground water depletion is occurring at alarming rate. In most places the layer of ground water has been decreasing by two to three meters each year due to lifting of ground water. Dhaka WASA has to change its focus to using surface water instead of underground water because abstracting ground water is no longer ecologically viable. The ground water aquifer inevitably and urgently needs to be recharged through rain water harvesting.

   However, treating surface water is much more technically complex and expensive than using groundwater. Treating surface water became a great challenge for Dhaka WASA because the large rivers nearest to Dhaka city are also quite polluted due to indiscriminate discharge of domestic waste water and industrial effluent. The water quality situation would further deteriorate if no pollution control measures in Dhaka watershed is undertaken. In Dhaka WASA 10-year plan treating surface water and intending to divert water from less polluted rivers 17 km and 45 km distant are also planned.

d) **Non-Revenue Water (NRW):** In the early 1990s, Dhaka WASA was struggling to meet water demand, a struggle that stemmed in part from rising unaccounted-for water losses and poor performance in revenue collection. In Dhaka, there is substantial portion of NRW and system loss which is not billed, and this is due to leakage and illegal connections.

   The reduction of NRW is one of the challenges for Dhaka WASA. The rehabilitation and optimization of Dhaka WASA's water distribution network is required to minimize losses and to enable 24-hour pressurized water supply. Dhaka WASA also needs provision of water quality assurance and control measures to address this challenge.

e) **Informal settlements or Low Income Community (LIC) areas:** In Dhaka city more than one third of its population lives in the informal settlements, majority of which are located in legal and illegal lands with insufficient housing and sanitation. Due to rising population, the absolute number of informal settlement (LIC) dwellers has been increased tremendously.

Dhaka WASA serves the majority of the LIC dwellers, many of whom have unauthorized connections. However, a significant number of the more vulnerable LIC dwellers often have minimal or no access to water services. The existence of huge informal settlements without water network facilities is also a big challenge for Dhaka WASA.

Dhaka WASA has undertaken a number of water and sanitation projects to tackle this issue. A project for providing water to different LIC areas through community-based organizations with the assistance of the local and International Non-Government Organizations (NGOs) has been taken. This proactive service provision to Low Income communities will provide Dhaka WASA a valuable opportunity to increase revenue and reducing NRW. On the other hand, this will also have a positive impact on the lives of the urban poor in Dhaka, by significantly reducing the costs they pay for water and improving the access to water services.

f) **Low or uneconomical tariff:** At the moment Dhaka WASA provides the cheapest water in the world. The price of 1 cubic meter/1000 liter of water is only US$0.08. Provision of water at low cost to the city dwellers is listed as one of the achievements of Dhaka WASA. While this is extremely affordable, it is also a great challenge to Dhaka WASA since it wishes to introduce a public-private partnership, which would entail setting an economic price.

In November 2011 the metered residential tariff was 6.6 Taka (US$0.09) per cubic meter. For households with sewer connections the tariff was 13.2 Taka (US$0.18) per cubic meter. Unmetered residential water connections were billed 128 Taka (US$1.72) per month. The commercial, industrial, and institutional tariffs are more than three times higher. In 2010 the total revenues were the equivalent of about US$70 million per annum which cover about 25% more than the operating costs of the utility (operating ratio of 0.79). Dhaka WASA is trying to reduce the operating ratio from 0.79 to 0.70 by the end of this year.

The major concern faced by Dhaka WASA due to low tariffs is that it results in insufficient revenue to cover the costs of supplying water. Full cost recovery is essential for successful management of water supply. The appropriate water tariff is very much required for Dhaka WASA to balance the benefits and costs of water usage, and to ensure sufficient revenue for the long-term financial sustainability of the water supply business. However, low revenues limit the utility's capacity to make a higher contribution to investments.

g) **Large Investments:** Dhaka WASA needs massive investment to treat surface water in order to replace the abstraction of groundwater as it is becoming no more viable. Treating surface water requires huge investments, and this is a great challenge for Dhaka WASA.

   At present Dhaka WASA is running one large and three small water treatment plants with the assistance of large investments and assistance from the funding agencies. There is also a great need for more investments in establishing more treatment plants in order to meet the fast-growing water demand in Dhaka city.

Considering all these identified challenges Dhaka WASA faces, the following key challenges have been prioritized to address immediately in providing the improved water services to the Dhaka WASA customers:

- Reduction of NRW
- Increase of Billing and Collection Efficiency
- Reduction of Operating Expenses
- Rehabilitation of Water Distribution Pipelines
- 100% Metering of Distributed Water
- Full Implementation of On-Line Billing System

5. Opportunities and Steps taken to address the challenges

Despite the huge challenges, Dhaka WASA does have a significant progress. The utility in charge of Water Supply and Sewerage services in Dhaka city, Dhaka WASA, addresses the challenges with a number of measures.

a) **Dhaka WASA Turnaround Program 2010-2012:** While the rate of development and achievement on different fronts of Dhaka WASA over the years had not been observably uniform, in recent times, especially over the last 18-24 months, some pragmatically designed programs have been initiated by the present management that brought in encouraging results on some key areas. Such efforts have been topped up by a well-thought-out "**Dhaka WASA Turn Around**" program that specifically identified areas of improvement, followed by appropriate action programs for their realization.

   Dhaka WASA has undertaken the "Dhaka WASA Turnaround Program 2010-2012", where it has asked for institutional reform for capacity building, promoting transparency in all activities, establishing a new chain of command for accountability, and improving its operating ratio.

   The program also fosters customer service excellence by building a staff mentality that customers are the masters and Dhaka WASA people are the servants.

Some significant areas displaying laudable achievement in the last two years or so are portrayed below:

i. **Reduction of Non-Revenue Water (NRW):** Like many other Water Supply service providers across the globe, Dhaka WASA as well had to combat the issue of NRW over last few decades. At one stage, a couple of years back, it was above 40%. Over the last few years, NRW progressively came down and stood at around 35% about two years back. It is worth pointing that Dhaka WASA entered into a 5 year performance agreement (2008-2013) with the government to progressively reduce the NRW. Keeping this target in the forefront, certain effective measures (like reduction of leakage, accurate billing, metering, etc) have produced some excellent results, and the current NRW stands at around 29%. Dhaka WASA, through its ongoing projects and improvement of service quality, contemplates bringing the NRW further down to 25%, which is felt to be close to the lowest that is normally achievable in a developing country like Bangladesh.

ii. **Increase of Revenue income**: Dhaka WASA's principal source of revenue is essentially its collection of water supply and sewerage charges. While efforts had always been there to raise and expand the revenue net, last Fiscal Year alone has very encouragingly displayed around Taka 1 billion rise over the preceding year (climbed from Taka 4 billion to current Taka 5 billion, hence an observable 25% rise). Main contributing factors behind this achievement had been increased efforts of timely and correct billing, introduction of on-line bill paying system, expansion of outsourcing of bill collection, raising the production of water, metering, regularization of illegal connections, reduction in NRW, and certain others including annual tariff adjustment with inflation. Dhaka WASA is committed to put in place an efficiency culture in its overall service provision. The explicit rise in its revenue income will increasingly help it stand more firmly on its own feet, make it function as a strong public service enterprise, and importantly, enable it sustain its operation on a commercial footing.

iii. **Operational efficiency**: Dhaka WASA, despite being a public service enterprise, stands to operate on a commercial footing. Its operating ratio had been around 0.9 two years back. Currently it has been brought down to 0.79. Through efficient management on all fronts, the management plans bringing it further down to 0.70 by the end of 2012, which shall be a significant achievement.

b) Capacity Building and Institutional Strengthening: Dhaka WASA is making extensive efforts to maximize and optimize on its available resources and adopting proven technologies to ensure better water services for Dhaka city people. Different initiatives have been taken to strengthen institutional capacity of Dhaka WASA which has focused on the institutionalization of sound financial

management, efficient billing, revenue collection, and customer record systems. Its accounting system has been modernized and fully computerized. Its central database provides speedy retrieval and production of required information for the management to make timely decisions. Efforts are on to expand production of water, largely through increasing use of surface water and less ground water (conjunctive use). Incidentally, Dhaka WASA has already evolved an investment plan of US $1.6 billion for switching from ground to surface water. One salient area is provision of water to the informal settlements (recipients without permanent holding numbers) which is being ensured as a part of Government's commitment of basic services to the urban poor.

Dhaka WASA emphasizes the organization to be viewed as a public sector enterprise with adequate autonomy so that it can make quickest of decisions regarding its service delivery and as well, to meet emergency conditions. Importantly, Dhaka WASA has put in place an effective grievance redressed mechanism and complaints/queries by the customers are met with extreme urgency. In 2010 Dhaka WASA has set up "*Help-Desk*" and "*Complaint Cell*" in the head office and zonal offices.

Training facilities of Dhaka WASA have been upgraded, and the training module is being revised to meet the organization needs. As a continuous process a series of comprehensive training is being provided to all levels of Dhaka WASA staff to optimize operational performance.

Dhaka WASA now has the sole responsibility of providing Water Supply and Sewerage services to the Dhaka dwellers. It has built up a substantial public awareness raising mechanism using different media and commonplace mechanisms in recent times which stands to ensure transparency, accountability, and rights and responsibilities of the organization, inasmuch those of Dhaka WASA's customers. Dhaka WASA website is upgraded and contains regularly updated data and information on water and sewerage related issues. And given the raised skill, capacity, and commitment of the organization in totality, Dhaka WASA firmly believes to provide increasingly better services to its fast-expanding clientele-base in the near future and beyond.

c) Benchmarking Initiatives: *Benchmarking is a management technique that enables organizations to compare performance and processes in order to identify good practice and results.* On the other hand, Benchmarking is a very powerful monitoring tools and useful techniques for analyzing the outcomes of an organization. Organizations use this information as critical input into their continuous improvement practices as it enables them to identify better ways to conduct their affairs and produce superior performance.

Local Government Division, Ministry of Local Government, Rural Development & Co-operatives with the support of Water & Sanitation Program, World Bank has introduced this Benchmarking Technique. As one of the Water and Sewerage

service providers of Dhaka city, Dhaka WASA introduced “Benchmarking” technique to improve its performance.

A committee consisting of the Dhaka WASA senior staff members along with the Managing Director is working in this initiative. The Benchmarking committee would cater the World Bank (WB), Asian Development Bank (ADB), and South Asian Water Utilities Network (SAWUN) in matter of Benchmarking and Monitoring of “Program for Performance Improvement (PPI)” of Dhaka WASA and related fields. The committee keeps liaison with all concerned stakeholders.

d) Utility’s view to overcome the challenge and add to more values: Presently Dhaka WASA is working on Water Supply, Sewerage, and Storm-water Drainage services. On the other hand, Dhaka City Corporation (DCC) is working on Surface-water Drainage system. Total storm water and surface water drainage system may be handled to DCC or Dhaka WASA, so that Dhaka WASA can fully concentrate on Water Supply and Sewerage as well as Drainage system. At the same time some tariff may be introduced for drainage service.

It will improve the efficiency of Dhaka WASA in maintaining Water Supply and Sewerage of the city as well as reduce the manpower and operating cost. Simultaneously, total Water Supply and Sewerage network can be operated through centrally computerized system like SCADA to monitor and act accordingly. Enhancing water price is also an important tool to reduce the water demand as well as wastage of water i.e. NRW.

e) Investment Plans: To meet growing water demand, and to reduce dependence on groundwater, Dhaka WASA decided to build surface water treatment plants. Dhaka WASA plans to substitute surface water for groundwater through the construction of four large water treatment plants until 2021 at a cost of US$1.8 billion. They are “*Saidabad Phase II*”, “*Saidabad Phase III*”, “*Padma/Pagla*”, and “*Khilkhet*”. The treatment plants will draw water from more distant and less polluted rivers up to 60 km from the city. The four plants are expected to have a combined capacity of 1.63 million cubic meters per day (1630 MLD) surface water, compared to a 2010 supply of 2.11 million cubic meters per day (2110 MLD) that is mainly from groundwater.

At this moment out of four plants Dhaka WASA has a water treatment plant under construction, with a water treatment capacity of 2.25 million cubic meters per day (2250 MLD), and Dhaka WASA has $250 million in Danish development assistance. The $1.8 billion allocated in Dhaka WASA investment plan for developing water sources will give them an additional 1.6 million cubic meters per day (1600 MLD), which will allow to eventually draw 70% of the water supply from surface water, and the remaining 30% from groundwater. Currently Dhaka WASA has six ongoing investment projects, including one to construct boreholes for deep tube wells, and the Dhaka Water Supply Sector Development Plan to completely replace the water pipelines using Asian Development Bank funding.

Under another World Bank project Dhaka WASA plans to increase the drainage coverage from the current level of 38% to 100%.

Besides water Dhaka WASA also look after sewage treatment through one large sewerage treatment plant, though it only provides 30% coverage since most households have their own septic tanks. Dhaka WASA is also responsible for storm water drainage and is able to cover 38% of the city.

Dhaka WASA has 300,000 domestic and commercial connections. This may seem low, but in most of the areas of Dhaka each connection may serve up to 1,000 households. So this is how Dhaka WASA can serve a city of 12.5 million people.

Generally, the quality of ground water being pumped into the water supply network of Dhaka is good. The quality deteriorates, however, as it moves through the piped network. The problems stem from a number of sources. Leaks affect the hygienic conditions of the pipes and connections. To a greater degree, the system's low and sometimes negative pressure caused by consumers using suction pumps or service connections installed at the bottom of underground tanks, causes contamination of the water within the network. Considering the rapid expansion of the city with the high rate of population growth and other infrastructure developments, there would be huge demand for piped water in near future.

Based on the current and future needs Dhaka WASA has planned to rehabilitate the old water pipelines as well as to set up new water pipelines in different parts of the Dhaka city. During the last one year, 51.6 kilometer new water lines and 44.8 kilometer rehabilitation lines were set up to ensure safe water in Dhaka city. In addition, during dry season of the year, the current treatment plant cannot work optimally and require pre-treatment facilities. Meantime, one new pre-treatment plant has recently started its production experimentally, and this will ultimately ensure better quality water during the dry season.

Water quality aside, the reliability of supply is severely hampered by intermittent power supply to the water pumps, some of which do not have backup generators. Dhaka WASA has procured and set up 200 new permanent generators, besides 260 old generators, to keep water pumps operative during power outage, and is providing "duel connection" in 204 water pumps to ensure uninterrupted power supply to the water pumps.

6. Achievements of Dhaka WASA

There are a number of key achievements that reflect Dhaka WASA’s commitment to better customer service in Dhaka city, and they are:

- A fully computerized billing system.
- Monthly billing on time.

- 24-hour payment ability via SMS.
- 96% of bills sent out, and 92% of bills received.
- Almost continuous water supply 24 hours per day 7 days a week.

Dhaka WASA introduced a computerized billing system including the ability of customers to pay bills via SMS. Through this system and other measures revenues increased by 25% in a year and a half from 2009 on, while tariffs were adjusted only about 5% in July 2010.

Dhaka WASA has eleven revenue zones. It sets a zone-wide annual target for billing, collection, and reduction of non-revenue water. In at least three revenue zones utility staff are in charge of billing and collection directly, while in the other revenue zones this is outsourced and done by an employees' cooperative, the Employees' Consumers Supplies Cooperative Society Ltd. (ECSCSL), under contract with the utility.

Besides the advances in customer service, Dhaka WASA also has a number of key successes. Dhaka WASA now offers improved service delivery and the revenue recovery has risen 92%. It achieved a substantial reduction of water losses and an increase in revenues so that operating costs are more than covered. In 2009 the NRW was 34% but has since fallen to 29%, and Dhaka WASA is confident of reaching its 2012 target of 25%. Another positive sign is the increased revenue, up 20%, or $14.5 million, in the last 1.5 years. Finally, Dhaka WASA operational ratio is down to 0.79, with a near-term target of 0.70, which besides funding operations and maintenance will allow Dhaka WASA to make larger investments in the water future of Dhaka.

For all these achievements Dhaka WASA got a "*Performer of the Year Award*" at the Global Water Summit 2011 in Berlin.

7. Demand for Technological Solutions

Increasing demand for water supply cannot be met as the ground water abstraction is showing strong signs of rapid depletion. In the future Dhaka WASA plans massive investment to replace dwindling groundwater resources with treated surface water from less polluted rivers located up to 60 km from the city.

Dhaka city does have scarcity of land. It is very much needed to build more Water as well as Sewerage treatment plants. But Dhaka WASA has to find better technical solution. Since space in Dhaka city is very expensive, all those future treatment plants have to be compact, and to be built in small space.

In addition to that, Dhaka WASA also needs technical and financial support in finding ways and means of pollution control in the Dhaka water shed. The peripheral rivers surrounding Dhaka city are definitely good source of water if pollution control measures could be implemented.

8. Conclusion

Since Dhaka city is rapid growing in area and population it is a great challenge for Dhaka WASA to ensure water of adequate quantity and quality round the year. The ground water table is rapidly declining due to large scale abstraction. Therefore, ground water is no longer a viable option. Dhaka WASA needs sufficient funds for establishing more surface water treatment plants, and rehabilitation of water pipelines as well as 100% metering.

Changing attitude of Dhaka WASA people towards ownership and business (water has its value, nothing is free) is also essential. Attaining all these parameters Dhaka WASA would become a successful organization in near future.

Another important area is computerizing all system information and development of model for system analysis. Dhaka WASA is developing a Geographic Information System (GIS) based Management Information System (MIS) on computer where all information would be available and archived. Dhaka WASA is also developing a water distribution system model of the city area. This will greatly enhance Dhaka WASA's capacity for system evaluation, operation, and planning.

Dhaka WASA is working in close partnership with NGOs and Community Organizations in managing the water supply situation in the informal settlements. Such cooperation would be extended to other parts of the city in future.

Finally, steps for converting Dhaka WASA as a fully corporate body in the public sector are undergoing. This would make this organization a more dynamic entity in the Public sector.