

***CHAPTER 04 - Digitized & Automated Systems and Services at Dhaka WASA***



**5.1 Web pages**

**5.2 Web portals**

অভ্যন্তরীন ই-সেবা

1. [পানি ও পয়ঃ সংযোগের আবেদনপত্র](http://newconnection.dwasa.org.bd/)
2. [ব্যক্তিগত গভীর নলকূপের জন্য আবেদনপত্র](http://deeptubewell.dwasa.org.bd/)
3. [ওয়াসা বিল সংক্রান্ত](http://app.dwasa.org.bd/index.php?type_name=member&page_name=acc_index&panel_index=1)
4. [ওয়াসা বিল অনলাইন পেমেন্ট পদ্ধতি](http://www.dwasa.org.bd/site/page/b4819e2a-fc55-44ac-b913-4eeaf0e9a826/%E0%A6%93%E0%A7%9F%E0%A6%BE%E0%A6%B8%E0%A6%BE-%E0%A6%AC%E0%A6%BF%E0%A6%B2-%E0%A6%85%E0%A6%A8%E0%A6%B2%E0%A6%BE%E0%A6%87%E0%A6%A8-%E0%A6%AA%E0%A7%87%E0%A6%AE%E0%A7%87%E0%A6%A8%E0%A7%8D%E0%A6%9F-%E0%A6%AA%E0%A6%A6%E0%A7%8D%E0%A6%A7%E0%A6%A4%E0%A6%BF)
5. [সাপ্লাই চেইন ম্যানেজমেন্ট সফটওয়্যার](http://27.147.238.114:9999/pridebook/#/login)
6. [Info of IT Return Submission under 108A](http://27.147.238.114:9999/pridebook/#/login)
7. [পিআইএমএস](http://123.49.52.54:16162/login)
8. [রেসিডেন্স (কোয়ার্টার) অ্যালোটমেন্ট এন্ড মেইনটেনেন্স ম্যানেজমেন্ট সফটওয়্যার](http://27.147.238.114:81/www/quarter/public/login)
9. [স্কাডা](http://www.dwasa.org.bd/site/view/internal_eservices)
10. [ডিজিটাল ম্যাপ](http://www.dwasa.org.bd/site/page/c4b37e89-74a8-4a25-b292-4d00db8aadc7/%E0%A6%A1%E0%A6%BF%E0%A6%9C%E0%A6%BF%E0%A6%9F%E0%A6%BE%E0%A6%B2-%E0%A6%AE%E0%A7%8D%E0%A6%AF%E0%A6%BE%E0%A6%AA-)
11. [ওয়েব মেইল](http://www.dwasa.org.bd/site/view/internal_eservices)
12. [ভূমি ব্যবস্থাপনা সফটওয়্যার](http://192.168.111.168/land_software/public/)
13. [ভেহিকেল ম্যানেজমেন্ট সফটওয়্যার](http://192.168.111.164/)
14. [Software for Public Information Division Usage](http://192.168.111.175/)
15. [ব্যাংক লিস্ট](http://www.dwasa.org.bd/site/page/ca07234e-b656-42bd-8762-2f57e1aa6fff/%E0%A6%AC%E0%A7%8D%E0%A6%AF%E0%A6%BE%E0%A6%82%E0%A6%95-%E0%A6%B2%E0%A6%BF%E0%A6%B8%E0%A7%8D%E0%A6%9F)
16. [Bottle Plant Management Software](http://27.147.238.114/login)
17. [ঢাকা ওয়াসার কেন্দ্রীয় ভাণ্ডার](http://store.dwasa.org.bd/)
18. [বেতন ও আয়কর সার্টিফিকেট](http://27.147.238.114:8282/wasa-reports/)

**5.3 Digital/Online Billing and Bill Payment**

**5.5 Accounting / AIS**

**5.5 GIS**

Geographical Information System (GIS)

Actual GIS activity started from April'2011. Following functions were implemented:

DMA and Water Network: A district metered area (DMA) is defined as a discrete area of a water

distribution network. It is usually created by closing boundary valves so that it remains flexible

to changing demands. However, a DMA can also be created by permanently disconnecting

pipes to neighboring areas. Dhaka WASA has already planning to build about 144 DMA using

GIS tools.

Water, Sewer and Drainage Networking Mapping: Many have characterized Geographic Infor-

mation Systems (GIS) as one of the most powerful of all information technologies because it

focuses on integrating knowledge from multiple sources and creates a crosscutting environ-

ment for collaboration. GIS is a system for the management, analysis, and display of geograph-

ic knowledge, which is represented using a series of information sets. In the present study, GIS

will be used to organize the data for usage in water distribution networks design, and analysis.

In addition, GIS is used as a tool for number of created applications for network management

such as identifying valves to be closed in case of pipe break, service area for treatment plants,

and network skeletonization. Finally, GIS is used to provide graphical display of results

obtained from both hydraulic simulation, and optimization models; linking tabular data with

eographic locations, and graphical drawing.

Deep tube well mapping: Deep tube well is the only source of underground water which

distributed to city dwellers. The Deep tube well position with information has been built in GIS.

Using these data, can help to provide comments before installation of new Deep Tube wells

both DWASA and private owned

Land Mapping: To proper management of WASA land, Land has been converted to digital

using GIS tools

Surface Water Transmission line Mapping: Dhaka WASA has four water treatment plant. Under

those surface water treatment plants, all transmission line has been converted in digital format

using GIS tools.

Base line Mapping: Baseline thematic mapping involves the compilation of varied data sourc-

s, ranging from satellite imagery to detailed information to planimetric data from the

:250,000 National Topographic database. Base map sheets overlain by various combinations

m toward resource management applications. Base

of thematic data are produced with an aim toward

line thematic mapping incorporates not only interpretations of ground cover data but topo

graphic information such as elevation contours and planimetry to provide an optimal tool for

resource management. This information may be portrayed in traditional map format, or as an

image-map, which is an excellent means of presenting spatial data to resource managers and

many other users. Dhaka WASA has built road, water body, house position, bridge, culvert and

also other utilities network.

House Connection mapping: Dhaka WASA has been determined to be with Digital Bangla

desh and progressing to step by step development to achieve the Goal. In this Stage, DWASA

has taken initiative to make Smart Metering. GIS mapping for House Connection can be the

first step to turn smart metering

Valve mapping: Valve point are using to proper maintenance for water service area. So it's

very important to know the location and related information of Valve. Mapping of Valve posi-

tion has been built in GIS including information to provide Better operation and maintenance.

Flow control, pressure sustaining and reducing valve are using in DMA management.

Bulk Meter mapping: Bulk meter are using to estimate inflow/ import and outflow/export

into adjacent DMA areas for calculation of water loss. So it's very important to know the loca

tion and related information of Bulk meter. Mapping of bulk position has been built in GIS.

Digital elevation modelling (DEM):

Ground elevation is the important component for water, sewer and drainage network Design

Ground elevation is extracting using stereo image and ground control point (GCP) from

Remote sensing technology. Mapping of ground level has been built in GIS.

LIC Mapping: As a part of the plan to bring all slum areas in Dhaka and Narayanganj city under

water distribution service, prepare GIS database for LICs - and already implemented to Kuril at

Zone 5 and Jilmara at Zone 4 covering about 20,000 and 2554 households respectively.

Piloting Zonal Mapping: Completed a few maps as a pilot work viz (1) water pipe line (2)

service connection (3) building structure (4) mouza (5) zonal boundaries (6) water bodies etc.

Billing information is being joined with these maps; as a result of which is possible to find out

connection status, non-metered household, connection type etc. for better understanding of

physical features of service areas.

A few works have been done:

Scan and digitize of about 1200 system maps on Water, Sewer and Drainage line.

Upload of all types of maps to DWASA website.

GPS survey Based mobile apps for water, sewer and drainage network.

Plans are underway to:

Develop GIS Based on Web Platform for Dhaka WASA.

. Integrate whole billing system with GIS.

. Integrate SCADA system with GIS.

District Metered Area (DMA) Approach and Non-Revenue Water (NRW)

Reduction in DWASA:

Dhaka WASA has already started establishing DMA concept which is new and

Innovative in the South Asia Region. Dhaka WASA has been providing dedicated

service for safe water to the city dwellers.

The first water treatment plant was established by Nawab Khaza Abdul Ghani in

Chandni ghat named "Dhaka Water Works" in the year 1874. Which is also the 1 st water

treatment plant in South Asia. From then the piped water supply was started in Dhaka

city.

Almost 144 years ago these pipe lines was constructed and became leaky causing 40-

45% of non-revenue water. Due to this leakage the water demand of city dwellers cannot

be fulfilled and on the other hand Dhaka water supply & sewerage authority (DWASA)

are not getting the revenue also. For example if the water production is 3.0 crore liter

which can fulfill the water demand of 200,000 people) per day but due to leakage 1.35

crore liter (which fulfill the water of 90,000 people) water is unaccounted for and only

1.65 crore liter (which fulfill the demand of 1, 10,000 people) can be supplied to the

households. So, producing 3.0 crore liter water for 2,00,000 people per day only

1 10,000 peoples are served. Due to this unaccounted-for water it become difficult to

supply water to the people causing water crisis and this become serious especially in

hot season.

The situation has become challenging to meet the rapidly increasing water demand in

parallel to the rapid urbanization & development of Mega City, Dhaka. With course of

time Dhaka WASA water supply system was moving towards unsustainable and

unmanageable state due to inadequate system water pressure, use of suction pump,

plenty of unidentified leakages and illegal connections, poor water quality, high system

loss 40% -45%.

So, it is clear that water supply system cannot be improved unless and until the Non-

Revenue Water (NRW) can be reduced.

For this purpose, a pilot project was initiated in 2007 under a TA project by Asian

Development Bank (ADB) in Manikdi area of the city where NRW was 45%. Under

the project 7 km water line was rehabilitated and 500 nos. of house connection was

shifted from old water line to new one. After commissioning it was observed that the

NRW became 12%. The consultant found similar circumstances across the system and

concluded the network needs rehabilitation to prevent significance loss of water.

To cope up the challenge to ensure safe water for the city dwellers with customer's

satisfaction in terms of water quantity, quality, system pressure; technically sustainable,

economically viable approach introduced through DWSSDP in 2011. Dhaka WASA

implemented the DWSSDP with financial assistance full for from ADB & GoB.

The project aims to ensure sustainable, more reliable and improved water supply

services through strengthening distribution networks and capacity building for better

operation & management of the network by introducing of District Metering Areas

DMAs) to ensure 24/7 pressurized water supply in the network at 1-bar or more, to

reduce the water loss to 15% or less, and Improve Water Quality. District Metered Area

(DMA) is a technical term to define a hydraulically isolated small area from big network

system with its own water supply system and distribution network for a community

which can be isolated from remaining network without affecting supply system of other

areas but with facilitating surplus water to adjacent water deficit areas. Dhaka WASA

started establishing DMAs in 7- Zones, with a target of about 145 DMAs. So far

established 54 DMAs and remaining 91 DMAs are in progressing. The amazing

achievement of established DMAs is becoming a great focus to the customer and Dhaka

WASA management.

What is DMA:

> DMA is a hydraulically isolated area.

Interconnectivity with adjacent DMAs with provision of export or import

facilities through DMA chamber.

Conjunctive use of ground water & Surface Water.

>

Controlling and monitoring water balance.

A

Maintain pressurized system for 24/7 water supply

Minimum NRW.

Criteria for selection of the DMA boundaries are:

Selection of area for establishment a DMA

At least one or more DTW with in the DMA

Surveyed and Model designed for selected DMA

Rehabilitate the existing whole network by HDPE pipe.

Upgrade the pumping station.

X All illegal house connection must legalized.

Under Dhaka Water Supply sector Development Project (DWSSDP) a total of 47 nos.

of DMA was established in 6 MODS Zone of D'WASA. In the project total 2456 km

of water line was rehabilitated and 1,06,662 numbers of house connection was shifted.

The average NRW became 5% and 5.4 million people are getting benefit from the

project.

Achievements of DMA establishment are:

Pressurized water supply for 24/7.

All illegal house connections are legalized.

Average Water loss (NRW) became 5%.

Assured portable water.

. No further use of suction pump.

. .

Reduced electricity cost of consumers & D'WASA.

.. Decreased health cost.

Increased of DWASA Revenue.

Water Supply provided in LIC/Slum Area.

-> Easy operation & maintenance.

The achievement not only benefited to Dhaka WASA only, it is now becoming an icon

in the South Asia Region. Thus, the high-level delegation from India and Srilanka team

visited the DMAs to share knowledge and experience to introduce the innovative

concept to their water supply system. Both the teams highly appreciated the lessons they

earned from the experience of DWASA and they planned to replicate the DWASA's

successful experience in their countries.

The ADB mission in September 2015 noted that Dhaka is the first City in South Asia

to have achieved such high level of performance in NRW reduction and 24/7 water

supply and has become a role Model for other cities in the South Asia.

Dhaka WASA expressed that next challenge would be to sustain DMA Management in

order to keep low NRW.

Pressure balancing in the water supply distribution network - A properly designed

water supply network demands a hydraulically balanced system to have reasonably

uniform pressure over the entire command area of the network. This will ensure even

distribution of flow to all the consumers. Present water supply distribution network

lacks in this aspect. With several areas having very low pressure in the pipeline, while

certain areas experience high water pressure. Consequently, flow available to the

consumers is not uniform. Installation of electronically controlled pressure control

devices (pressure reducing valves/pressure sustaining valves etc.) at strategic

locations will improve upon the pressure distribution in the network and in turn will

improve functional efficiency of the system.

> Providing continuous (24/7) water supply-Wherever water supply is not

continuous, consumers tend to hoard water an apprehension of delay in next supply

During next time of supply, they discard the old water hoard fresh water once again.

Consequently, in case of intermittent supply, water loss is much higher.

DWASA has planned to undertake the project of converting present practice of

ntermittent water supply system to continuous pressurized 24/7 water supply system

for the entire city.

. Use of energy efficiency pumping machineries- this will ensure reduced power

consumption at different locations; in turn will reduce the recurring operational cost.

. Water quality monitoring-DWASA's long term goal is to monitor and network water

quality in real-time, so as to detect contamination early and control its spread to mini-

mize impact to customers. There is a need to move away from depending on custom-

ers to act as sensors for water quality issues like discolored water, bad smell, pres-

ence of sediments, taste etc. Furthermore, in today's volatile social-political climate,

we need to be even more vigilant to deter and prevent acts of sabotage that may

threaten the quality of the water supply. As a part of water quality management,

DWASA plans to enhance chlorination system, regular water quality monitoring,

implementation water safely plans, water quality safeguard etc.

Another technical innovative approach introduced is the Trench Less Technology,

which brings the tremendous quick pipe installation progress with minimum distur-

bance to the city dwellers & traffic and reduced cost for road cutting, damage & resto-

ration. It added a dimension & technical viability of pipe installation in busy city like

Dhaka. When all Zones of Dhaka WASA will come under DMA system it will be a great

achievement in terms of technical sustainability, customer's satisfaction, economical-

ly viable water supply system. In the course of time sustainable DMA Management

capacity of Dhaka WASA will be enhanced to run the system smoothly.

The DMA approach not only facilitates Unaccounted for Water (UFW), but also helps

in maintaining assets for longer duration and enables better pressure management,

better water quality and continuous water supply. DMA Managers, Deputy Managers

and Licensed plumbers has already deployed for individual DMAs for installations of

fresh connections, carrying out necessary repairs also will be responsible for any

illegal connections in the area to keep the DMA sustainable

**5.6 MIS**

**5.7 Supervisory control and data acquisition (SCADA)**

**5.8 District Metered Area (DMA) / Water distribution network system monitoring, management and control with SCADA**

**5.9 e-Government Procurement (e-GP) System**

This is National e-Government Procurement (e-GP) Portal of the Government of the People's Republic of Bangladesh.

**About e-Government Procurement (e-GP) System**

National e-Government Procurement (e-GP) portal (i.e. [**https://www.eprocure.gov.bd**](http://www.eprocure.gov.bd/) ) of the Government of the People’s Republic of Bangladesh is developed, owned and being operated by the Central Procurement Technical Unit (CPTU), IME Division of Ministry of Planning. The e-GP system provides an on-line platform to carry out the procurement activities by the Public Agencies - Procuring Agencies (PAs) and Procuring Entities (PEs).

The e-GP system is a single web portal from where and through which PAs and PEs will be able to perform their procurement related activities using a dedicated secured web based dashboard. The e-GP system is hosted in e-GP Data Center at CPTU, and the e-GP web portal is accessible by the PAs and PEs through internet for their use.

This complete e-GP solution introduced under the Public Procurement Reform (PPR) Program is being supported by the World Bank and gradually used by all government organizations. This online platform also helps them ensuring equal access to the Bidders/Tenderers and also ensuring efficiency, transparency and accountability in the public procurement process in Bangladesh.

**Important Messages and Support Details**

* The eGP guidelines were approved by the Government of the People's Republic of Bangladesh in pursuant to Section 65 of the Public Procurement Act, 2006. As per approved guidelines, e-GP system has been introduced and implemented. The eGP system has been developed and introduced in two phases.

* In the first phase, e-Tendering has been introduced on pilot basis in the CPTU and 16 other Procuring Entities (PEs) under 4 (four) sectoral agencies, namely: Bangladesh Water Development Board (BWDB), Local Government Engineering Department (LGED), Roads and Highways Department (RHD) and Rural Electrification Board (REB). The system rolled out to 291 PEs of those 4 sectoral agencies is now expanding to all the PEs of the government up to Districts and sub-Districts level.

* In the second phase, e-Contract Management System (e-CMS) has been developed and introduced and implemented. eCMS is a complete electronic contract management system which provides platform for preparation of work plan and its submission; defining milestone, tracking and monitoring progress, generating reports, performing quality checks, generation of running bills, vendor rating, generation and issuance of completion certificate.

**5.10 Digital/Online Portal for office work management. nothi.gov.bd or For Dhaka WASA - https://dwasa.nothi.gov.bd/ Working with digital/online/paperless documents, letters, files etc.**

**5.11 Bottle Water Plant**

**5.12 Inventory Management**

**5.13 Land asset management**

**5.15 Water ATM**