

# **WATER RESOURCE MANAGEMENT IN DHAKA CITY: CHALLENGES AND PROSPECTS**

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## **INTRODUCTION**

Bangladesh, being a tropical and having vast alluvial plain sloping southward, from the Himalayas to the Bay of Bengal, facilitating naturally flood basins of major three rivers the Ganges, the Brahmaputra and the Meghna. It is a country of fertile soil, sun and abundant fresh waters from rivers, marshes, rains and easy access underground, made this country attractive for living and densest in human population in the world. Bangladesh for its location in the confluence of those three rivers, its drainage discharge from upper catchment stands 15 times larger than its surface area. Bangladesh receives average over 2000mm rainfall annually. The mighty river systems bring fertile silt and almost three times extra water from their upper catchments ie, from India, Nepal, Bhutan and China. Bangladesh, including 57 trans boundary, has over 230 rivers mostly the tributaries and distributaries of those three rivers, generally flows southward make a combined system to the Bay of Bengal. When there are over flow in these three rivers simultaneously, causing Bangladesh to suffer catastrophic floods, like happened in 1988 and 1998. The speciality of the water system in Bangladesh is that, it remains very active in the wet season from June to September each year making availability of abundant water including recharge of ground waters (aquifers). On the other hand, the country suffers acute water shortage in the dry season, specially from the month of March to May each year.

Dhaka is located in the central region of flat deltaic region of Bangladesh surrounded by the distributaries of three international rivers. The existing city is bounded by river Turag in the west and north, Balu in the east and Buriganga in the south. The greater Dhaka is surrounded by the rivers Dhaleswari in the west and south, and Sitalakha in the east. Because of urbanization and industrialization the waters of Turag, Balu, Buriganga, as well as Shitalakha have become over polluted and health hazard for human beings. Dhaka, after becoming the capital of independent Bangladesh, has grown faster covering over 360 sq Km with present population of approx 155 million. Dhaka Water Supply and Sewerage Authority (DWASA) is entrusted with the responsibility of providing water supply, sewerage disposal and storm water drainage services to the urban dwellers.

To meet the growing water demand by Dhaka city dwellers, DWASA has become over dependent on underground water source by extracting 82% of total capacity which is beyond the water recharge capacity for Dhaka. As a consequence, the ground water table in-and-around Dhaka is falling down by 7-10 ft annually, which is a red alarm for sustainable water supply for the dwellers.<sup>1</sup> On the other hand, because of unplanned urbanization, poor policy compliance and encroachment of rivers, canals, low lands of the capital by vested corner crated manmade obstruction against storm water discharge from capital causing the dwellers to suffer enormously.

To ensure the sustainable fresh water supply for growing dwellers of capital, maximum surface water is to be exploited and strict compliance of policy must be ensured. For fresh water supply, awareness programme and some cultural change must be made. Accordingly, all stake holders must be brought into the system of sustainable water management concept, and simultaneously make the actors of policy breaker accountable and bring them into justice. The stern pilot programme and policy action must be adopted without any mercy for the sake of our next generations to survive and live healthy in terms of fresh water availability and water loggings effect. This study aims to highlight fresh water management in Dhaka city excluding the part of water loggings or surface water runoff due words limitation and vastness of the subject.

## CONCEPT ON WATER ISSUE

### Water right and water policy

Historically all civilizations were born, flourished, survived and developed around some dependable fresh water sources. Therefore, water became the basic necessity for a community for drinking, washing, cooking and living. As such one has a right to access minimum quantity of water<sup>2</sup>. In Bangladesh the water right may be considered under basic need of 'food' which is constitutionally defined as,

*'It shall be fundamental responsibility of the State to attain,, through planned economic growth a constant increase of productive forces and a steady improvement in the material and cultural standard of living of the people, with a view to securing its citizens through the provision of the basic necessities of life, including food, clothing, shelter, education and medical care'.<sup>3</sup>*

1. Information provide by Garrison Engineer (Air), BAF Base Bashar, Dhaka Cantonment
2. Haque, M. Inamul, Water Resources-Management in Bangladesh, p18
3. Bangladesh Constitution, Article 15, clause (a)

## Water Perspective - Bangladesh

Bangladesh is a tropical country located in the North East Indian sub continent and in the central region of the flat deltaic plain of three international major rivers namely the Ganges, the Brahmaputra and the Meghna which play a distinct role in the regional water system. There are over 250 rivers<sup>4</sup> including 57 trans boundary rivers (03 with Myanmar and 54 with India), making mostly interlinked system, carries the water to Bay of Bengal<sup>5</sup>. Dhaka, the capital city of Bangladesh is located generally at the central area, near convolution of those three main rivers, frequently experiences catastrophic floods in the peak wet seasons<sup>6</sup>.

The close circle of Dhaka city is influenced by the rivers Buriganga in south, Turag in west and north and Balu in the east. The outer circle of greater Dhaka city is influenced by the river Dhaleswari in the south and west, and Shitalakha in the east. All these rivers are directly tied with the water flow of great rivers the Ganges and the Bhramaputra. The close circle rivers are extremely polluted and their water is totally undrinkable. A large swathe of the Buriganga River which is the lifeline of the capital has turned pitch-black with toxic waste, oil and chemicals flowing into it from industrial units. The theme in 2015 for World Water Day was 'Water and Sustainable Development', under the leadership of UNESCO.<sup>7</sup>



Environmentalists at Dhaka on World Water Day 2015, Source : DHAKA TRIBUNE, March 23, 2015

4. Pant, Water politics on Nepal's fresh water, SIRDUP, Kathmandu, p51
5. Khan, Trans Boundary water issue in South Asira, p5
6. Bahauddin & Hossain, Water Research and Management, p13
7. EFE/EPA/ABIR ABDULLAH

## National Water Management Plan

National water policy for Bangladesh was approved by GoB in March 2004 with 25 years plan; short term 2000-2005, medium term 2006-2010 and long term 2011-2025. The policy has considered different challenges in the water sector and aimed three objectives as rational and prudent use of water, people's quality life related to water and preservation of aquatic and water dependent ecosystem.<sup>8</sup> The 25 years water management policy included 84 programmes in eight groups of which two groups included town and rural areas and major cities.<sup>9</sup>

## Surface Water Resources

The river system of Bangladesh facilitate on average 1,106 cubic km water to cross border out of which 54% is contributed by the Brahmaputra, 31% by the Ganges and 15% by the tributaries of the Meghna and other minor rivers.<sup>10</sup> About 10-15% land of Dhaka city comprised of surface water mainly from the rivers, lakes and other water bodies. There were about 35 natural canals within Dhaka city<sup>11</sup> but most of them are now encroached or polluted to a level that cannot be used even for general washing.<sup>12</sup> Beside the rivers, Bangladesh experiences average 2,320 mm annual rainfall varies from 1,110 mm (North West) to 5,690 mm (North East).<sup>13</sup>

## Ground water resources

Bangladesh is considered rich in ground water resources, having the water layer available within few meters to 30 meter distance throughout the country<sup>14</sup>. Ground water is recharged annually mainly by the rainfall, flooding and stream flow in the rivers by penetrating earth surface. However, with the increased urbanization, industrialization and irrigation in agriculture, the annual water extraction from underground surpassed the recharge capacity, causing the water table to fall every year throughout the country, and at alarming rate in the capital which is 6-8 ft annually.<sup>15</sup> DWASA estimates the annual water table is depleting

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8. Rasheed, K.B Sajjadur, Water Resources Management, p107-108

9. Rashed, op cit, p108

10. Banglapedia, 2006

11. Khan, 2001

12. Report by Unnayan Onneshan-The Innovators, Water Supply of Dhaka city : Murky Future, p11

13. FAO, 2010

14. Banglapedia, 2006

15. Unnayan Onneshan Report, 2010, p11

by 10 ft, with roughly five feet of an annual recharge.<sup>16</sup> The ground water use of selected Asian cities is stated in the table below:

<b>Table 1 : Reliance on Groundwater : Selected Asian Cities<sup>17</sup></b>			
<b>Cities</b>	<b>Population in Million</b>	<b>Groundwater Use in %</b>	<b>Consequence</b>
Bandung, Indonesia	2.4	75	Excessive Abstraction, Land Subsidence
Bangkok, Thailand	11.5	9	Excessive Abstraction
Ho Chi Min, Vietnam	7.4	35	Water Level Decline, Saline Intrusion
Hyderabad, India	7.8	30	Water Level Decline
Kathmandu, Nepal	2.5	55	Excessive Abstraction, Rapid Decline
Lahore, Pakistan	8.0	100	Rapid Decline, Pollution
Tokyo, Japan	13.3	30	Excessive Abstraction, Land Subsidence
Yangon, Myanmar	4.7	50	Excessive Abstraction
Dhaka, Bangladesh	12.5	76	Excessive Abstraction, Water Level Decline, Pollution
<b>Source : UN World Water Day Report – 2015, Chapter 1, p4</b>			

The side effects of ground water over extraction are not only barrier to sustainable water supply but also a threat for eco system of the concerned area. This is the high time for the affected area to adopt a sustainable water management system and rely more on either or combination of treated, surface and groundwater (Within annual recharge level).

16. Dhaka Tribune, May 05, 2015

17. [www.unesco.org/images/0023](http://www.unesco.org/images/0023)

## Future water demand and supply

The population of Dhaka city grew in average 5.6% after 1990 and stood 26<sup>th</sup> largest and 10<sup>th</sup> most populous city in the world in 2004. The projected population of Dhaka city would be 20 million by 2020 and 25 million by 2025 million if the present trend is continued.<sup>18</sup> The increase of urban slum population is higher than the average urban growth in Bangladesh which is compared and shown in the table below:

<b>Table 2 : Slum to Urban Population Ratio (Study Year 2009)<sup>19</sup></b>			
<b>Countries</b>	<b>Population in Million</b>	<b>Slum to Urban Population Ratio in %</b>	<b>Remarks</b>
Iraq	30.1	52.8	
Nepal	26.55	58.1	
Bangladesh	150.0	61.6	Majority live in greater Dhaka
Source : World Water Day-2015, Facing the Challenges - Case Studies and Indicators			

## WATER MANAGEMENT STATE IN DHAKA CITY

### Physical and demographic development

After the independence of Bangladesh in 1971, its capital Dhaka got the momentum in terms of political, economic, industrial and commercial hub of the country. The population of Dhaka started increasing almost at an annual rate of 5.6% making it a Mega city by 2001. The population of Dhaka city is now approaching 15 million and it is estimated that, with the present expansion rate, by 2025 the population of Dhaka city would reach to 21 million.<sup>20</sup> Due tremendous geographical expansion and population growth in last two decades, Dhaka city has developed in a much unplanned way, forcing to pollute the natural water in one way, and on other way creating huge demand of fresh water from underground.

18. Towhid, Report on Causes and effects of water logging in Dhaka city, 2004, p27

19. World Water Day-2015, Facing the Challenges - Case Studies and Indicators, p35 (www.unesco.org)

20. Khalid Md. Bahauddin & Nasir Hossain, Integrated water management for mega city : A case study of Dhaka city, Bangladesh, Water Resource Management, Vol 3, No 3, 2013, p13

## Water supply and situation

The first piped drinking water system in Dhaka was established in 1874 by Khwaja Abdul Ghani, the aristocrat, who ruled Dhaka under the British colonial authorities. The system was fed by water treatment plant in Chadnighat near the bank of river Bruiganga.<sup>21</sup> At present the DWASA now provides piped water for over 12.2 million dwellers of Dhaka city which meets almost 90% of the demand. The state of population without improved water and sanitation of Bangladesh is compared and shown in the table below:

<b>Table 3 : Population Without Access to Improved Water and Sanitation</b>			
<b>Countries</b>	<b>Population in Million</b>	<b>Without Access to Improved Water in %</b>	<b>Without Access to Improved Sanitation in %</b>
India	1,236.6	7.4	64
Indonesia	246.8	15.1	41.2
Nepal	27.5	11.9	63.3
Pakistan	179.2	8.6	52.4
Bangladesh	154.7	15.2	43.0
Philippines	96.7	8.2	25.7
Source : unesco.org (World Water Day-2015, Facing the Challenges - p49)			

Despite sanitation development in last two decades in most of the Asian developing countries, still almost half (Except Philippines) the population are yet out of improved sanitation. For Bangladesh the situation is slightly better but yet to achieve significant sanitation for reaching the Millennium Development Goal (MDG) as well as status of middle earning country.

## Role of DWASA

DWASA is a service oriented autonomous commercial organization in the public sector and entrusted with the responsibility of providing water supply, sewerage disposal and storm water drainage services to Dhaka city dwellers. DWASA has now 4431 manpower of which 87% engaged for water supply and rest 13% for sewerage system.<sup>22</sup> The DWASA service is shown in table 4:

21. Public information dept, DWASA, Date March27, 2014

22. Khan, Engr. Taqsem A, Article DWASA: Performance and Challenges, p1



<b>Table 4 : DWASA Services</b>	
Water Supply	Description
Total Coverage (Population)	93%
Demand Quantity	2,250 MLD
Production Capacity	2,420 MLD
Supplied Quantity	2,063 MLD
Deep Tube Well	675 Nos.
Surface Water Treatment Plant	04 Nos.
Length of Water Line	3,036 Km
Public Standpipes	1,643 Nos.
Source : DWASA report 2014	

DWASA provides water for drinking, industrial and commercial purpose to DCC (Now DCC South and DCC North) and its adjoining areas including Narayanganj and adjacent Dhaka city. Along with DWASA, some NGOs and few other Aid groups are also assisting in water supply mainly in slum and very low income areas. It may also be mentioned that, numerous private underwater pumps are also established to be self sufficient for its own requirements. The DWASA distributes the water to the consumers through supply pipelines and some water vans, where pipelines are not available. It has network of water supply pipelines approx 3,036 km spread over a coverage area of 470 sq km, and there are as over 215,000 connections for the consumers within the coverage area.

## **CHALLENGES OF WATER MANAGEMENT IN DHAKA CITY**

### **Over Exploitation of Groundwater**

Dhaka geologically is under the category of the Pleistocene terraces, mostly composed of the Modhupur clay deposits whose thickness varies from 8-45M with an average of 10M in the city. The underlying layer is known as Dupi Tila, composed of sand particles that are considered in the main aquifer of Dhaka city, with a thickness of 100-200M (Unnayan Onneshan, p14). The aquifer piezometric level of Dhaka city is continuously going down at a rate of 2-3M annually due to over extraction of ground water. The city's ground water level has dropped about 20M in seven years since 1993, which is even higher after 2000, the worse case at



Mirpur area stands 3.2M per year.<sup>23</sup> Out of three known aquifers underground, the 1<sup>st</sup> layer of aquifers is almost ineffective, therefore, DWASA now digging down the water pump beyond 700ft below the ground to extract water. Even, due to excessive underground extraction for agriculture use in the rural areas, water wells have been eliminated and the manually operated tube wells mostly go in operative in dry season. Unless the ground water use can be brought down to its annual recharge level, the water table will continue going down beyond red line threatening supply of water for drinking and domestic use, as well as irrigation.

## Unplanned Urbanization

Dhaka city has experienced significant urban growth during last 50 years. The land use has undergone radical changes since 1971 when Dhaka became the capital of the new sovereign state of Bangladesh.<sup>24</sup> Change in land use alters the physical characteristics of an area, which in turn brings changes in hydrological regime. But no master plan was made or implemented for planned development of the city. Dhaka city had excellent natural drainage system even 40 years ago. With rapid expansion of the city, the natural drainage system had been intervened and in some places destroyed. Latest satellite image revealed the concrete buildings occupied 40% area of Dhaka city in 2000, which has increased to 56% area in 2013.<sup>25</sup> One of the main factors that are responsible for modification in hydrological responses of the city is increased in impervious area.<sup>26</sup> It has reduced infiltration of water for aquifer recharge causing ground water level to deplete faster.

## Water Pollution

Along with unplanned urbanization, Dhaka city has unorganized rapid industrialization in last two decades. There is no clear-cut sectionalisation among the administrative, commercial, residential and industrial zones in Dhaka city. Several chemical factories and chemical stores have been established within the heart of residential area, specially in old Dhaka. Also many commercial organizations have been established within residential area like, Dhanmondi, Banani, Gulshan or even at Uttara. The industries are discharging untreated effluent into rivers surrounded the capital. The industrial waste along the belts of

23. The daily Star, 2010

24. Chowdhury, Rahman, Bala, Islam, *Op Cit*, p 9.

25. The Daily Prothom Alo, Dated May 17, 2015

26. Water logging in Dhaka City-Socio Economic Impacts and Mitigation Options, NDC IRP, p20

Dhaka, Tongi, Savar, Joydebpur and Narayanganj are the main polluters of rivers like Turag, Balu, Sitalkhya, Buriganga and Bangshi. The major polluting industries are chemicals, Tanneries, paper and pulp, sugar, food processing, tobacco, textile, dying, hydrocarbons etc. Approximately 80,000 tonnes of human waste is generated daily but only 1,600 tonnes (2%) is treated at Pagla treatment plant near the capital, and the rest eventually ends up in rivers.<sup>27</sup> In the dry season the stagnant water of these rivers get so badly polluted that, water becomes almost unfit for use by humans or any aquatic lives.

### **Poor Quality of Service/Sanitation**

About 70% of the population of Dhaka city have adequate sanitation and 39% are served by sewer networks. Only one sewage treatment plant exists at Dhaka with a treatment capacity of 49,000 domestic connections which is too small for a megacity. Over 25% of the population lack adequate sanitation mostly in the slum and poor areas. Prof Dr Mohammad Ali, who has carried out the first liver transplant in Bangladesh, said excessive accumulation of heavy metals through regular consumption of contaminated food and water might damage brain, liver, kidney and the nerves. The contaminated water could cause deadly hepatitis A and E and typhoid, and eventually lead to liver failure, particularly in children and pregnant women.<sup>28</sup> In a recent study it is found that, more than 7,000 children under five years, die from diarrhoea while waterborne diseases cause nearly a quarter of total deaths.<sup>29</sup>

### **Probability of Salt Water Intrusion**

The over extraction of ground water lowering its level and increasing the probability of intrusion of saline water towards further north threatening the central part of the country. It is natural that, when ground water level goes below the sea level, the saline water flows inwards during tidal surge in different rivers including underground intrusion. The same effect is already acute in the southern coastal area of Bangladesh. In the 70s, a depth of 300-450 ft was enough for DWASA to install tube wells at Dhaka; but now required depth is 500-1000ft and accordingly, the installation cost has also gone very high. The properties of the aquifer, the soil that holds the water, are being damaged gradually. The soil might

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27. The daily Star Dated March 22, 2015

28. Prof Dr Mohammad Ali, founder secy gen, national liver foundation, The Daily Star, dt March22, 2015

29. Water Aid Bangladesh

become compact and its capacity to hold water might be lost in future.<sup>30</sup> Over extraction of ground water in Dhaka city area will definitely invite saline water towards affected aquifers in long term. As such DWASA must keep the ground water extraction within annual recharge level.

## Impact of Growing Water Business

The first mineral water with brand name 'Aqua' started marketing in mid 80s at Dhaka on experimental basis, with lot of suspicion and risk factor. However, the demand of such bottled mineral water was so exciting and flourishing that, immediately several private companies started investing in the bottled/potable water sector. According to Pran-RFL Group marketing director Kamruzzaman Kamal, the mineral drinking water market size in Bangladesh is around Tk 2.5 billion. The market leader of drinking water is *Fresh*, which is owned by the Meghna Group, holds almost 32% of the total Bangladeshi market. *Mum*, owned by the Partex Group, holds the second position in the drinking water market by covering 20%. The third is Acme which holds 5%, *Pran* holds 4% and *SPA*, owned by Akij Group holds 4% market share. There are around 20 players in the organised market who produce and market drinking water on a large scale. Additionally about 30 companies have area-based market in the capital and elsewhere in the country. Industry insiders said the bottled water market is growing at a rapid rate of around 20%. At this growth rate, Taka 2.5 billion market is estimated to overtake existing soft drinks market soon.<sup>31</sup> The potable water would ease out the life of economically solvent families but general people would remain dependent on supply water.

## Degradation of Water

Industrial effluent, residential and commercial waste, hospital waste, untreated sewerage disposal, slum settlers, agro chemical waste, water transport pollution etc continuously polluting water in and around Dhaka city. About 1,800 factories are established in and around Dhaka city which mostly situated on the bank of rivers causing serious pollution of river waters. The government issued an ultimatum to set up Effluent Treatment plants (ETP) by October 31, 2006. Only 89 of these factories are having in-house ETP. Most of the waste of rest of the factories directly or indirectly enters into the nearby rivers or in nearby water

30. Tawfique Ali, the Daily Star, dt March 22, 2015

31. The Financial Express, March 22, 2014

bodies causing toxic pollution and degradation of quality of fresh waters.<sup>32</sup> Strict compliance of the rules related to ETP must be ensured for the sake of safe water supply at Dhaka.

### **No Practice of Rain Water Harvesting**

Rainwater harvesting is the accumulation and deposition of rainwater for reuse on-site, rather than allowing it to run off. Its uses include water for garden, livestock, irrigation and other domestic use with appropriate treatment. It is also used for indoor heating for houses in winter, or even for drinking by human beings. The rainwater is substantially free of salinity effect and other salts, and mostly contains rich minerals. It can be of independent water supply under any restriction on main water supply system. In the coastal belt of Bangladesh, few families do preserve and use rain water in traditional methods. Brazil has the largest rooftop rain water harvesting practice. The Diola people of Senegal and Guinea-Bissau regularly use homebrew rainwater harvesters made from local organic materials. The students of Monterrey Institute of Technology and Higher Education at Mexico City are given practical knowledge on Rainwater capturing, subsequent treatment and storage system.<sup>33</sup> Bangladesh can adopt similar rain water harvesting practice soon.

## **PROSPECTS OF WATER MANAGEMENT IN DHAKA CITY**

### **Abundant Water Sources**

Thanks to Mughal rulers who established Dhaka city most probably based on abundant water sources in all around and the most nearest groundwater aquifers, Dhaka's numerous lakes, marshy lands and rivers. The first layer of aquifer with abundant water was available within 100 ft distance at Dhaka. Despite some effect of climate change, Dhaka experiences annual about 2000mm rainfall. The so called unplanned urbanization, scattered industrialization and greedy land developers have tortured the entire inner cordoned rivers, lakes and marshy lands of Dhaka city which can be halted. On the other hand, the DWASA has already malnourished the first layer of aquifers by over exploiting groundwater which can also be re nourished by increasing dependency on surface water. The rainwater harvesting, water recycling, water storage and water reservoir system

32. [www.thedailystar.net/2007/05/14](http://www.thedailystar.net/2007/05/14) 'Owners' Apathy Over Waste Treatment Plant, at

33. Wikipedia, Rainwater harvesting

can ensure sustainable water management for the growing Dhaka city. Overall, there is no shortage of water sources around Dhaka city, rather rational and modern management of water resources can ensure sustainable supply of water for Dhaka city dwellers.

## **Increasing Dependency on Surface Water**

Recently DWASA has undertaken project for surface water treatment plants to be completed by 2021. The projects include Saidabad Phase II and III, Pagla and Khilkhet projects with the cost of USD1.8 billion.<sup>34</sup> These four treatment plants would use the water drawing from upstream and less polluted area of rivers Padma and Shitalakkhaya/Meghna at a distance of 27 and 34 Km respectively.<sup>35</sup> The project of Saidabad Phase II has already been in operation by groundwater and awaiting for surface water from Meghna. On the other hand, surface water for Pagla project from Padma is now under long technical study. The recent feasibility study for water treatment project of Sayedabad phase III revealed the alarming facts that, water of Shitalakkhya (initial plan), may no longer be treatable because of developing industrial contamination.<sup>36</sup> The alternate option remains open as the river Meghna which would be far expansive because of greater distance. WASA is now restudying both the options. Despite higher cost, it would be wiser to bring water from Meghna river considering sustainability.

## **Increased Operational Efficiency**

DWASA presently has four water treatment plants, 675 deep tube wells and 3,036 km length of water lines by which it has the ability to cover 93% population under water coverage network. Though DWASA is a public service enterprise but stands to operate on commercial footing, means self sustained agenda. It has successfully brought down the operating ratio from 0.90 to 0.70 during the turnaround period. At present the operating ratio has further come down to around 0.70 which is a significant achievement. DWASA has undertaken project of total US\$1.8 billion for switching from ground to surface water dependency.<sup>37</sup>

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34. Interview with Md Ataur Rahman, Joint Secretary, Deputy MD (Admn), DWAS on February 21, 2015

35. Interview with Mr David M Khan, P.E. CFM, Senior Specialist, Water Research Planning Division, Institute of Water Modelling, H-496, Rd-32, New DOHS, Mohakhali on April 19, 2015

36. Dhaka Tribune, Dated May 05, 2015

37. Khan, A Taqsem, DWASA : Performance and Challenges, p10

## **Bifurcation of DCC for Better Services**

The government on 29 November 2011 dissolved the Dhaka City Corporation by the Local Government (City Corporation) Amendment Bill 2011 passed by the Parliament of Bangladesh on November 23. Accordingly the DCC was split into two corporations, DCC North and DCC South, with the southern wing holding more territory than the north. Each corporation has a self-governing entity, thus giving the city of Dhaka two mayors. The government believes that, bifurcation would ensure better quality of civic services including water, sewerage, drainage, waste clearing etc to the citizens of the city.

## **DCC Election for Empowering Mayors**

Dhaka municipal election was suspended for nearly three years instead the GoB appointed Additional Secretaries as CEOs of DCC to run the routine administration. However, despite criticism of election credibility, there have been now two public representatives in DCC (North) and DCC (South) offices. They have also been given the status of State Minister and a handful budget is allotted immediately for some new development works in respective area. Their offices are now quite active and likely to make some positive improvements in better water management in collaboration with DWASA.

## **RECOMMENDATIONS**

For the sustainable fresh water supply at the capital city, following recommendations are made:

- a. Water has to be officially considered as scarce, valuable and vital element of people's essential need, accordingly aware them about their right.
- b. The water management at the capital has to be undertaken with due priority, under a master plan as sustainable programme by integrating all stake holders like RAJUK, PWD, DCC, DWASA, DMDP etc.
- c. DWASA must be fully dependent on use of surface water so as to maintain the balanced ground water table (Equal annual recharge).
- d. Preserve and create artificial reservoirs/catchment points, wet lands, lakes and ponds in-and-around Dhaka city to hold rain/flood water and use that surface water after necessary treatment.

- e. Vigorously observe International Water Day (March 22) every year in the offices, residences and educational institutions for judicious use of water and to reduce wastage. A chapter on water issue may be introduced in the school syllabus of environmental science subject.
- f. Utilize government's land as well as acquire/lease/purchase low lands to use as water reservoirs/water bodies either for treatment or to recharge aquifers. Re excavate existing water bodies as needed.
- g. Recover natural drains and canals from illegal occupation under a pilot project; assistance of Army Engineering Corps may be sought.
- h. Modernize waste management through scientific methods; recycling, converting to composite fertilizer, reverse treatment etc are to be prioritized.
- j. Production, marketing and use of plastic and polythene bags must be officially band in Bangladesh considering its poor decompose quality which restricts water infiltration to aquifers.
- k. Introduce and enforce law for mandatory rainwater harvesting system for all major constructions including its full compliance for government buildings.
- l. Make mandatory provision of minimum 5-10% land to be converted as water bodies within land development projects of private and government urbanization agencies.
- m. Establish exclusive chemical processing zones similar to export processing zones to reduce indiscriminate water pollution in and around Dhaka city.
- n. Enforce 100% compliance of establishing Effluent Treatment Plants for different water polluting factories.
- p. Enforce law against indiscriminate earth filling by land developers, specially to preserve the designated wet lands, natural canals and rivers banks.

## **CONCLUSION**

After Dhaka has been established as the capital of Bangladesh, its population is increased in manifolds standing now over 15 millions. The population of Dhaka city is still increasing at a faster rate, specially due to internal migration and fortunate seekers arrival. The demand of supply water is also increasing at a parallel rate. But the production and supply of fresh water could not be kept at pace with the demand, specially during the hot and dry season. Because of the pollution, DWASA is unable to treat surface water from nearby surrounding rivers



like Buriganga, Turag, Balu or Shitalkha. Therefore, DWASA remained dependent on groundwater extracting 78% of its total water supply, and only rest 18% comes from surface source of water. Due to excessive withdrawal, the decline of ground water level of upper aquifer by 8-10 ft every year, and the pollution of river water, are threatening the production of required water for the dwellers of Dhaka city. In addition to excessive abstraction, the other causes of decline of ground water level is insufficient recharge due to illegal filling of wetlands, low lying areas, canals and river banks. The main causes of pollution of river are industrial pollution and inadequate sewerage treatment capacity of Dhaka city. The solid waste and the plastic material disposal at the rivers surrounding Dhaka are severely hampering the recharge of aquifers, threatening the sustainable water supply.

DWASA has taken a turn around project in hand with few development actions, some of which have already started giving the dividends. But it's turning to surface water projects are going too slow and some technical and financial impediments are threatening the implementation of the project. On the other hand, DWASAs project of shifting extraction of ground water from Dhaka to Savar and Singair, may be a temporary relief to its central aquifers, but questions remain how far it will be sustainable and/or what will be side effect to continue relying on ground water and from so nearby aquifers?

During last 50 years, Dhaka city has experienced significant urban growth and the city had excellent natural drainage system even 40 years ago. After the devastating flood of 1998, the government realized the exigency of the problem and undertook Dhaka city flood protection project with high priority. Accordingly, the western embankment (Mirpur-Tongi Beribadh) is constructed and the western Dhaka city is positively relieved from moderate flood; but unfortunately, the construction of Dhaka city eastern embankment (Demra-Tongi Beribadh) has not yet been prioritized by the government causing frequent flood in east Dhaka.

As development of any one sector would not solve the problem of water management in totality, there is a need to have an integrated master plan for water supply, sewerage disposal and storm-water drainage. The above plan needs to be integrated with DMDP of RAJUK to keep pace with the city development. The water short fall is likely to continue further and lead to a continued crisis in future urban life of Dhaka city dwellers unless multiple stern actions are implemented under the master plan.

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