# Water Demand Management of Rajshahi City Corporation

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## Introduction

Urban areas are increasingly facing problems of providing water services for the growing population. But the water resources remain constant. So, for a sustainable city, water demand management is very essential. Rajshahi is an old city in Bangladesh [1]. With the passes of time the area of Rajshahi City Corporation (RCC) increases as well as its population. As a result, the demand of water also increases than the past. According to BBS 2011, the total population is 449756 and the density of the population is 4068 per square kilometer [2] [7] [8].

Ground Water, Surface water, rain water are the main sources of water in RCC. Ground water is pumped through tube-well, deep tube-well etc. about 93% of the people in RCC use underground water by using tube-well or deep tube-well (supply through pipe line). On the other hand, a few percent of people use surface water as their domestic or agricultural purpose**.** Though rain water is a vital part to fulfil the agricultural demand, there is no rain water harvesting plans in RCC to meet domestic water demand.

Table 1: Water uses in RCC

| Water use | Demand Category |
|---|---|
| In stream water use | Fish and wild life habitat, recreation, aesthetic view, navigation, sediment transport (Gangis river, Rajshahi) |
| Withdrawal water use | Domestic, Irrigation, Industrial, commercial, livestock. |

## Water Supply and Demand Scenario of RCC

The total water production by Rajshahi WASA is 71.64 mld (71640 cubic meters / day). 68.64 mld water is extracted from underground water and only 3.00 mld of water is from surface water. The total water supply through pipeline network provided by Rajshahi WASA is 632.50km. The number of water supply subscriber is 35120. The total water demand is 97.64 mld (97640 cubic meters / day) but 71.74 mld water is supplied by Rajshahi WASA. However, to supply this water Rajshahi WASA demand a charge from the household of Rajshahi city. The water average tariff (Demand) by Rajshahi WASA is 2.79 taka/cubic meters (125 taka/water connection). The average water tariff (earning) by the authority is 1.84 Taka/cubic

meter. Annual maintenance cost for water supply is 1500.00 lakh taka and annual water bill demand by Rajshahi WASA is 726.17 lakh taka. But yearly income of Rajshahi WASA is only 479.27 lakh taka [3]. So, government gives a huge subsidy to the Rajshahi WASA for supplying water in RCC.

On the other hand, within 2035, about 3 lakhs people might be added as a new citizen in RCC. So present water demand (97640 cubic meters / day) will surely increase in recent future. To meet this water demand Rajshahi WASA has taken some project and proposed some important projects so that they can ensure customer satisfaction and adequate water supply for future generation. Recently some activities are taken to ensure and meet the present water demand by the concerned authority. Rehabilitation of Water Supply System and Fresh Water Project Phase – (ii) have been taken to increase average daily consumption from 66.35 lpcd to 100 lpcd, to increase water supply efficiency as well as to supply drinking water 24 hours for the slum dwellers. On the other hand, concerned authority (Rajshahi WASA) has also proposed some future project aiming at: to increase water coverage, average daily consumption & water quality through water resource management, to ensure customer satisfaction according to water demand up to 2035 through increasing population coverage by water supply from 71 % to 100 %, to increase average daily consumption from 65 lpcd to 140 lpcd & improving water quality by producing 200 MLD potable water [3].

## Demand Management through Water Pricing

### *Groundwater Pricing*

This type of pricing is preferable for agricultural sectors. For the domestic use, such types of water pricing will hamper the basic rights of water for poor. About 98% of total water is supplied from ground water in RCC. Charges for groundwater are currently not properly established in this region. Moreover, charges are not volumetric and such policies have also contributed to water wastage and misuse. Groundwater management should include tariffs that cover the energy costs of retrieving the water and the installation of meters. Options to make volumetric charging easier could include increase block approach—selling water to water companies by volume and leaving them to arrange distribution and charging amongst their clients according to usage. It would be much easier to implement changes in groundwater pricing if the public were better informed about the environmental and fiscal issues involved, and the risk of unsustainable consumption resulting from over-extraction from groundwater resources [4].

### *Volumetric Pricing*

This type of pricing is suitable for agricultural and industrial purpose. With volumetric water pricing, the charge is based on the amount of water delivered. All water units are priced the same independent of the use, and consumers pay proportionally to their water consumption. The economic optimal pricing rule requires that price should be set equal to the marginal cost of providing the water, and it requires accurate measurement of water through meters. The advantage of this pricing method is that it encourages farmers to limit their water use. Also, it is easy to

understand in the sense that you pay for the quantity of water delivered to the supply station [4] [5].

***Block Pricing***

Block pricing involves varying the water price when water use for a set time exceeds a set volume. If high water charges are a concern, an increasing block charge can be used. The price of the first block can be set below O&M costs. The second and later blocks are raised to higher rates that cover O&M costs and reflect the marginal cost of operations [6] [4].

**Demand Management through Non-market Measures**

Demand management through non-market measures are more effective than the water pricing. The demand can be managed through:

***An Increasing Water Use Efficiency***

Water use efficiency can be increased by:

- Practicing ADW for rice irrigation
- Drip irrigation
- Cropping pattern based on the product value per unit of water
- Raising awareness among consumers about the importance of water conservation.

Provide information and consulting services.

**Technical Measures**

Technical is an essential tool for effective management of water demand. The demand of water supply in RCC is increasing day by day but the water is not available to meet this demand. In this circumstance technical improvement is very essential. By technological improvement waste water can be re used. As a result, the pressure will decrease from existing supply. However, technical measures are:

- Decreasing water supply pressure
- Changing supply schedule.
- Water recycling and reuse etc.

***Increasing Institutional Capacity***

Increasing institutional capacity is also a very important tool to manage the water demand. Institutional capacity can be increased through:

- By introducing improved technology
- Training
- Direct initiatives by governments and water suppliers by providing services, installing conserving equipment, fixing leaks.

## Conclusions

The concern authority tries to recover the deficit demand through different projects but still there is a huge shortage of water supply in RCC. Now it is a big challenge to give 100% water supply. On the other hand, proper water pricing could be a good strategy for the future generation to make the best use of water. To ensure the proper use of water concern authority should monitor regularly.

## References

[1] F. Magni and F. Musco, "Towards Climate Proof Cities _," *Sustain. Resil.*, p. 123.

[2] I. Faridatul and S. Jahan, "People's Perception Regarding the Development of Community Facilities: A Case Study of Rajshahi City Corporation," *J. Bangladesh Inst. Plan. ISSN*, vol. 2075, p. 9363.

[3] "Rajshahi WASA - "রাজশাহী মহানগরবাসির পানির চাহিদা পূরণের জন্য রাজশাহী ওয়াসা বিশুদ্ধ পানি সরবরাহের জন্য অঙ্গীকারাবদ্ধ।." [Online]. Available: http://rajshahiwasa.org.bd/. [Accessed: 16-Oct-2018].

[4] M. Ahmad, "Water pricing and markets in the Near East: policy issues and options," *Water Policy*, vol. 2, no. 3, pp. 229–242, 2000.

[5] M. Montginoul, "Analysing the diversity of water pricing structures: the case of France," *Water Resour. Manag.*, vol. 21, no. 5, pp. 861–871, 2007.

[6] M. Barclay, C. Holderness, and D. Sheehan, "The block pricing puzzle," 2001.

[7] Bangladesh Bureau of Statistics (BBS) (2011), Bangladesh Population Census 2011, Zila: Rajshahi. Dhaka, Bangladesh, Government of the People's Republic of Bangladesh.

[8] Bangladesh Bureau of Statistics (BBS) (1991), Bangladesh Population Census 1991, Zila: Rajshahi. Dhaka, Bangladesh, Government of the People's Republic of Bangladesh.