

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 8, Issue 6, June 2019

Comparison of the Drinking Water Consumption Situation of Two Distinctive Commercial Zones of Dhaka city

Mohsena Lopa¹, Subrata Chowdhury², Md. Hasnul Habib³

Lecturer, Department of Civil Engineering, Stamford University Bangladesh, Dhaka, Bangladesh¹

Assistant Professor, Department of Civil Engineering, Stamford University Bangladesh, Dhaka, Bangladesh²

Lecturer, Department of Civil Engineering, Stamford University Bangladesh, Dhaka, Bangladesh³

ABSTRACT: Water is one of the essential necessities of human. With the expanding demand for safe water and inefficiency of the concerned authorities for providing safe water due to some unavoidable situations, people are adopting alternative sources for safe drinking water. In this paper, it has been tried to find out the sources of drinking water types available for Dhaka city dwellers, its supply system and peoples' tendency to use DWASA water as drinking water in different Dhaka Metropolitan areas. This study also covers the average cost of users. It has been evident from the study that the propensity of using filter water and different water purification procedure is expanding. And as the cost is out of the range of lower income people, they suffer from various problems caused by impure and polluted water.

KEYWORDS: Drinking water, Water supply, Water purification.

I. INTRODUCTION

Using unsafe water causes several types of health hazards and it is the foremost imperative every day need. In the present framework of Dhaka city's water distribution pattern and existing treatment procedure of DWASA, it is not possible to distribute standard potable water to the consumers of DWASA. So the inhabitants of Dhaka city depend on numerous sources for safe drinking water. And as both the number of population and demand is on increase, it is becoming harder with the change of time. Water purification includes removing undesirable chemical and biological unwanted contaminants. Water purification is highly delicate and costly procedure except for boiling water.

II. LITERATURE REVIEW

For leading a healthy and sound life clean and safe water is the most significant need for humans. According to a survey of 2010, about 84% of the global population had access to water supplied by pipe (UNICEF,2010). It had been predicted that more than 2.8 billion people in 48 countries would suffer from water stress by 2025 and it would rise to 54 by 2050 (UNFPA,1997). Developing countries like Bangladesh will suffer from the crisis. For the cause of regular dumping in the rivers around Dhaka City and gradual decrease of raw water resources, treatment of these water to make it potable is so tough so DWASA primarily depends on ground water extraction (Biswas et al, 2010). In the existing infrastructure it is too tough to maintain the drinking water quality for the authority and dwellers of Dhaka. And as Dhaka is the most densely populated city of Bangladesh it will face one of the worst scenario of water crisis without proper utilization of its existing water sources, planning for future use and strict steps to keep the sources uncontaminated and usable. Several tests have been shown that the existing water quality is not even in any standard form of potable water. A study showed that 62% samples of house tap water, 60% pipeline water and 45.45% WASA pump water had gone beyond BDS standard and WHO Guideline for drinking water (Mahbub et al,2011). A study on

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 8, Issue 6, June 2019

TuragRiver showed all the contaminants are increasing day by day and it can't be acceptable as drinking water (Rahman et.al, 2012). These reports, news and unpleasant experiences of using untreated water compelled Dhaka city dwellers to search for alternative ways for drinking water sources.

III.METHODOLOGY

III.I Study Area

Dhaka city is located in the central region of Bangladesh on latitudes 23° 39' to 23° 54' North and 90° 20' to 90° 36' East. Dhaka has an area of 153192.12 Hectares (Plan, 2015). And two most densely populated commercial areas are Motijheel and Farmgate and the survey for this study is carried out in these two busy areas.

III.II Methods

This study is based on survey data performed in the mentioned areas of Dhaka city. The survey work includes field visits to the offices, restaurants, production and supply centres of different water supplying companies and vendors and interviews and survey of almost all types of stakeholders associated with the study. The questionnaire includes queries about age, gender, educational qualification, marital status, occupation, their causes of staying or migration to Dhaka, problems faced by them which are connected to water supply, their existing water supplier, number of co-workers at the workplace, monthly income of the worker, main source of supply water and drinking water in the workplace, if filtration is used or not, if used type of filtration procedure, monthly cost of water filtration, amount of bill of DWASA, if water is bought from the vendors, if used bill of vendors, quantity of water jars needed in one month, size of jars and name of the companies or vendors etc. The survey was conducted in the months of April 2014 to August, 2014 at Farmgate and Motijheel. Fifty offices and fifty restaurants were surveyed individually using the questionnaires having mentioned questions. All the costs are calculated in BDT. During preparation of this paper the exchange rate is 1 BDT is equivalent to 0.012 USD.

IV. RESULTS AND DISCUSSION

In the commercial areas like Farmgate and Motijheel monthly income of different type of office owners and business centres varies a lot. Only two offices and restaurants had been surveyed. And it is found in Fig. 1 that almost all of the offices of Motijheel area incomes more than 1 lakh taka monthly. And low income offices only 2% in Farmgate. It is evident that most of the offices are middle income to higher income offices.

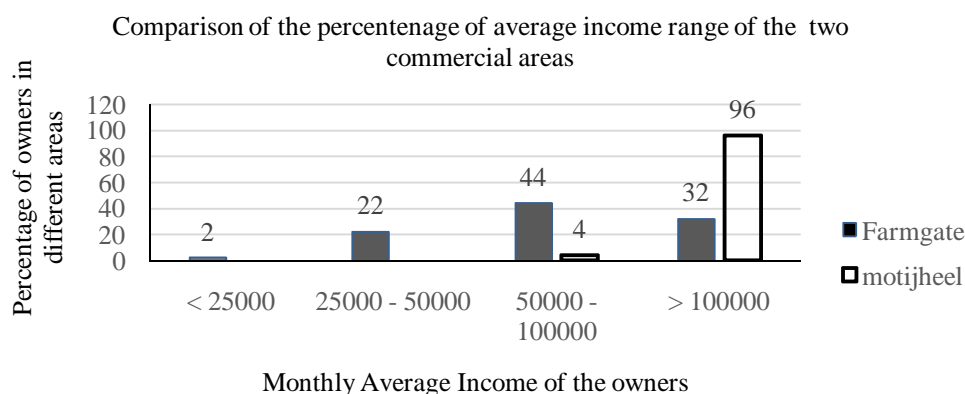


Fig. 1: Comparison of the percentage of average income range of the two commercial areas

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 8, Issue 6, June 2019

According to Fig. 2 most of the offices in Motijheel use supplied water by DWASA, almost 72%, and filters the water for drinking purpose while office employees and workers buy waters from different type of vendors and use them for drinking purposes without filtering. Basically low income people in Farmgate use DWASA water even without filtering (60%).

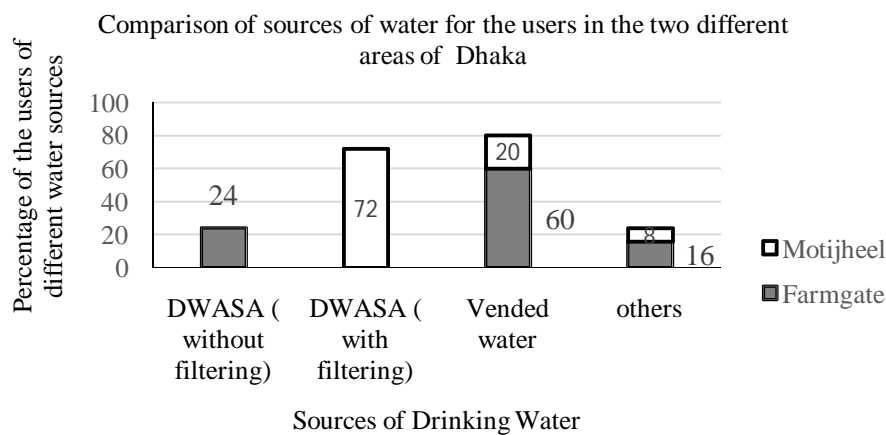


Fig. 2: Comparison of sources of water for the users in the two different areas of Dhaka

According to Fig. 3 in the surveyed areas for almost 58%-70% owners pays DWASA bill which varies from 500 BDT to 1000 BDT. Higher amount of bills like more than one thousand taka varies from 10-18%. So most of the offices pay average amount of water bill to DWASA.

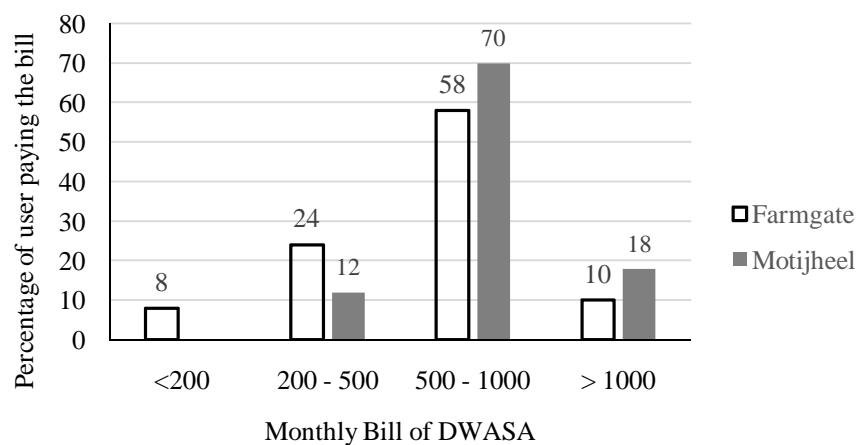


Fig. 3: Comparison of Monthly bill of DWASA

For running a hotel requires less people than most of the offices. According to Fig. 4 while only 8% offices has employed 1-15 people, is small scale office, 77% of the restaurants have less than fifteen workers. And no hotels have

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 8, Issue 6, June 2019

been found with more than 30 employees whereas 86% of the offices employed more than 30 workers. So, there are small to large scale workplaces in both commercial areas.

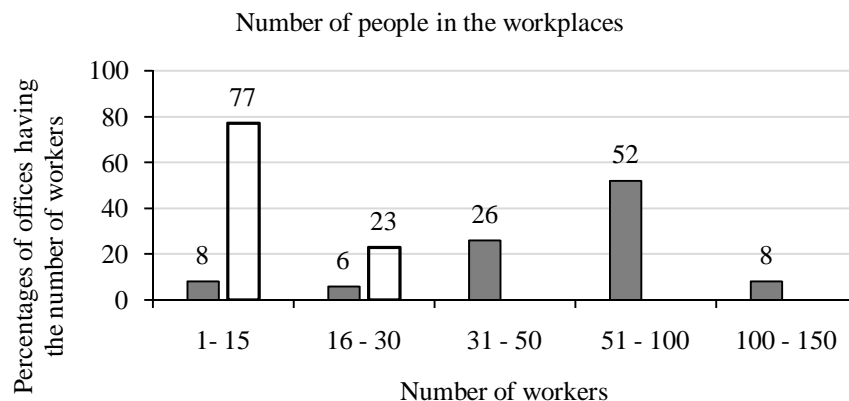


Fig 4: Percentages of offices having the number of workers in the office

These offices use filtered water for drinking as the supplied water by DWASA is found to be carrying bacteria, germs, smell and sediments. From Fig. 5 it can be assumed that the bills paid for buying filter water jars 70% of the users of Farmgate office workers pay one thousand to fifteen hundred BDT Per month and the percentage of the same criteria in Motijheel is almost 45%.

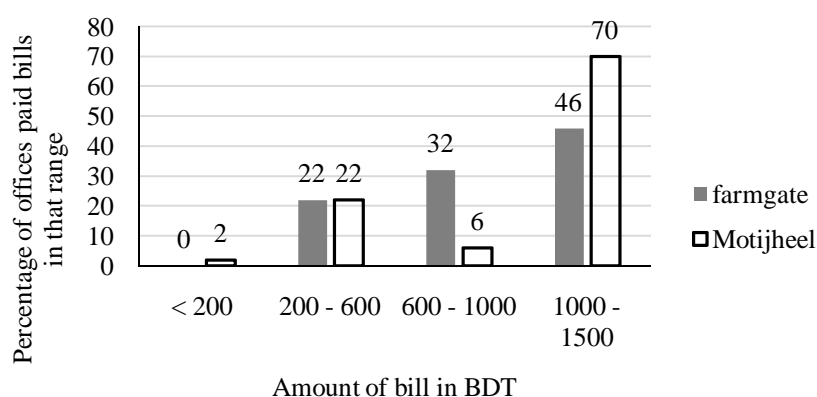


Fig 5: Percentage of offices paid bills in that range

In fig. 6 it represents the numbers of filtered water jars bought from different vendors. In Farmgate area in total of 200-400 number of jars are bought in 70% of the workplaces from different drinking water supply companies. And most of the offices at least order 60 or less number of jars in every month

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 8, Issue 6, June 2019

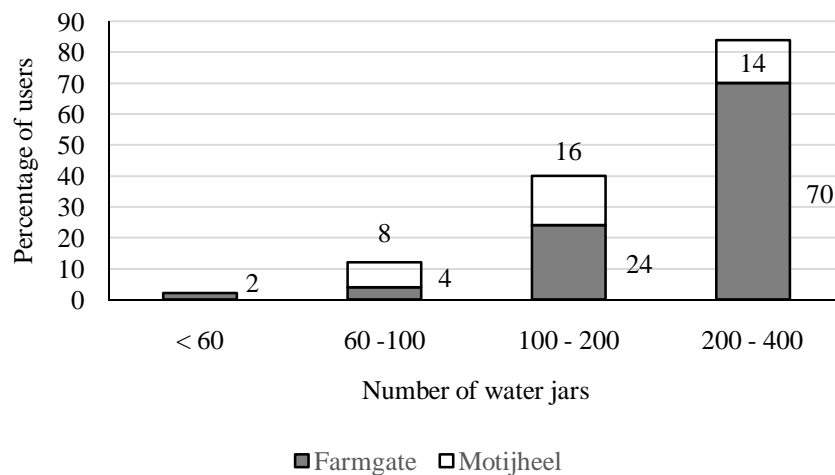


Fig 6: Percentage of number of water jars

These offices use filters for filtering the supplied water by DWASA for removing diseases producing germs and bacteria. Fig. 7 shows the initial installation cost of water filters. Table 1 and 2 shows different types of available filters and their monthly cost. It can be assumed that maximum offices pay 200 BDT to 400 BDT as monthly bill for treating water by different filtration method.

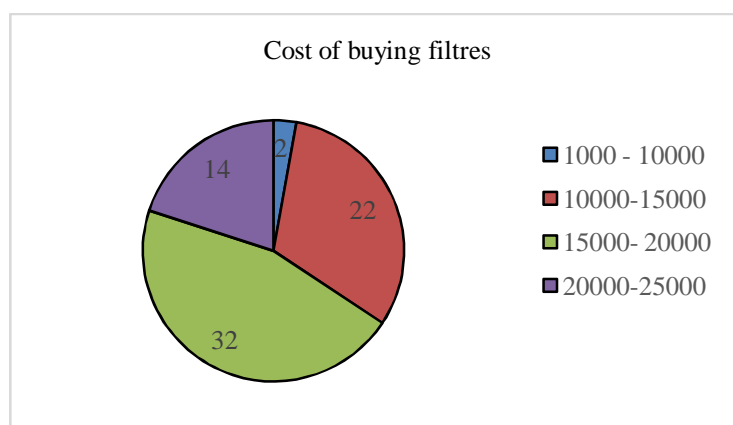


Fig 7: Cost for water filters

In Table 1 user of different type of filters and their percentage have been showed. Most of the offices and restaurants use chemical or reverse osmosis filter than UV filtration and general filter. Chemical filter gives safer and cleaner water than general filter.

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: www.ijirset.com

Vol. 8, Issue 6, June 2019

Table 1: percentage of users of different type of filters

Type of filtration method	Percentage
Chemical/ reverse Osmosis filter	56
UV Filtration	12
General Filter	32

In Table 2 monthly cost of water treatment by using filter is being analysed. The cost varies from 100 BDT to 1000 BDT. Almost 30% of the users pay bills from 200 BDT to 400 BDT. And user paying 600 BDT to 1000 BDT is only 12%.

Table 2: Percentage of payers of monthly bill for water treatment

Monthly cost of water treatment by filter	Percentage
100 -200	26
200- 400	30
400 - 600	14
600 - 1000	12

From overall analysis it is noticeable that most of the inhabitants, more than 70%, try to use filtered water or use different procedures to filter supply water. And offices having large number of employees generally prefer installation of water filter for purifying DWASA supplied water to buying filtered water jar from local vendors or companies whereas the opposite is found in low income offices and restaurants.

V. CONCLUSION

Though most of the supplied water of DWASA is either ground water or recycled river water, due to various types of problems during supply system, maintenance of water reservoirs it loses its credibility of pure potable water. So, different organizations and household dwellers purifies water in different ways. And from this study it has been found that most of the vendors who supply water do not filter the water in proper ways and even some of them supplies water without filtering. Restaurants generally prefers jars of filter water as they are easy to handle and deliver to the customers. All most all the corporate offices use different type of water purifiers and treatment processes to make the supply water potable. And it is noticeable that people have to pay both DWASA and other vendors at the same time to ensure proper drinking water. It causes an economic pressure on middle income people and almost unbearable for the low income restaurant and small scale tea-sellers of Dhaka to ensure safe drinking water for their customers.

REFERENCES

- [1] Plan, D.S., "Dhaka Structure Plan, 2016-2035", Rajdhani Unnayan Kartripakkha (RAJUK), 2015.
- [2] Biswas, A.K. and Tortajada, C., "Future water governance: problems and perspectives", International Journal of Water Resources Development, 26(2), pp.129-139, 2010.
- [3] Mahbub, K.R., Nahar, A., Ahmed, M.M. and Chakraborty, A., "Quality analysis of Dhaka WASA drinking water: Detection", Journal of Environmental Science and Natural Resources, 4(2), pp.41-49, 2011.
- [4] Rahman, A.L., Islam, M., Hossain, M.Z. and Ahsan, M.A., "Study of the seasonal variations in Turag river water quality parameters", African Journal of Pure and Applied Chemistry, 6(10), pp.144-148, 2012.
- [5] Hossain, B., Kabir, A.F.M.A., 2014, "An Environmental Study on Water supply in Some Commercial Areas of Dhaka City", B.Sc. thesis, Stamford University Bangladesh, Bangladesh.
- [6] UNICEF, "Facts for life", UNICEF, 2010.
- [7] UNICEF, WHO, UNFPA, "Guidelines for monitoring the availability and use of obstetric services", 1997.