Water, Women and Climate Change: A Review on Dhaka Metropolitan City, Bangladesh

Samira Hossain[1] and Ataur Rahman[2]

[1]Master of Philosophy Student, Western Sydney University, Sydney, Australia
[2]Associate Professor, Western Sydney University, Sydney, Australia
Corresponding author's E-mail: samirahossain2012@gmail.com

Abstract

Climate change is affecting the water cycle in many different ways such as by increasing flood risk, and duration and severity of droughts. Bangladesh is one of the worst affected countries by climate change. In Dhaka city, the capital of Bangladesh has numerous water problems such as frequent flooding, water logging, intermittent and contaminated water supply, declining groundwater level, contaminated surface water in the nearby rivers, poor drainage network and polluted stormwater runoff. In this city, about six million people live in slums where there is no piped water supply. Women generally fetch water for these six million people. In this paper we review how these women are affected by water related problems and how climate change is likely to affect them in future in relation to household water management. The existing literature has tended to focus on the challenges faced by women due to climate change in rural areas. Adequate research on the everyday life experience specific to water use and management in urban context is needed to address the research gap. Hence, it is recommended to conduct further research on how women in Dhaka city, in particular those who live in slum areas, will be affected by climate change induced water problems.

***Keywords*:** Social water use, gender, vulnerability, floods, urban water

1. INTRODUCTION

Water is a basic need connected with the very survival of human beings. It plays a pivotal role in economic and social activity as well. In fact, water and society is deeply interlinked. However, climate change has emerged as a growing distress in water resources management all over the world. According to the Intergovernmental Panel on Climate Change (IPCC) "Human influence on the climate system is clear and recent anthropogenic emissions of greenhouse gases are the highest in history. Recent climate changes have had widespread impacts on human and natural systems" (IPCC, 2014). Climatic change results in a variety of direct problems, including increased frequency of extreme weather events, flooding, storms, drought, desertification, increases in sea temperatures, heat and cold waves, the melting of glaciers and permafrost. It is now regarded as a human issue, where the livelihoods of numerous communities are threatened and their security is at stake (Dankelman et al., 2002). In terms of climate change, cities are documented as one of the most important battlefields as they possess higher concentration of population, economic activities and material and energy consumption (Roy, 2009).

For Bangladesh, the water sector is one of the most climate sensitive sectors. This is because water and water resources are closely linked with climatic factors and the most damaging effects of climate change are predicted to be floods, salinity intrusion, and droughts. Water is deeply related to social fabrics of Bangladesh. In fact, water has affected its society and development significantly. However, water related disasters cause deaths to thousands of people affecting its society badly (Rahman, 2016). It is estimated that by 2025, almost two thirds of the world's population are likely to experience some kind of water stress, and for one billion of them, the water shortage will be severe and socially

disruptive (WEDO, 2003). According to the National Adaptation Program of Action (NAPA) of Bangladesh, water related impacts of climate change will likely be the most critical for Bangladesh – largely related to coastal and riverine flooding, but also enhanced possibility of winter (dry season) drought in certain areas (MoEF, 2005). Climate change has significant impacts on fresh water sources, affecting the availability of water used for domestic and productive activities (MoEF, 2011). Moreover, the consequence of the increased frequency of floods and droughts are far reaching, particularly for vulnerable groups, including women who are responsible for water management at the household level (UN Women, 2012).

In Bangladesh, like many developing countries, women and girls take the responsibility of managing and securing water for the households and the families. They often bear the sole burden of fetching water for their families and spend considerable amount of time every day transporting water from distant sources (Khosla and Pearl, 2003). Many houses in Bangladesh are not connected to piped water and hence water has to be collected from nearby piped water sources, tube wells, ponds, canals and rivers depending on water availability and proximity (WEDO, 2008). The water from distant sources is rarely enough to meet the full water needs of the household, for example, there may not be enough water for adequate shower and washing.

Although Bangladesh is known as one of the most vulnerable countries under the climate change (ADB, 1994; Huq et al., 1996; CCC, 2009) there have been limited pragmatic studies on climate change impact on water resources in Bangladesh, in particular in urban areas. There exist many developmental challenges in Bangladesh, such as poverty, gender and structural inequalities, and inadequate infrastructure. Along with climate change these problems will further aggravate the vulnerability of the poor, and women in particular. Most of the existing literature on water, gender and climate change focuses on the challenges faced by poor women of the rural south coastal belt of Bangladesh. However, more detailed, contextually grounded understanding is needed focusing on urban women's differential vulnerability in relation to men under the same exposure to hydrological hazards, which are likely to be intense under climate change. Therefore, this research aims to highlight the vulnerabilities of women in relation to climate induced water stress in Dhaka city of Bangladesh through focusing on women's everyday life experience specific to water use and management.

2. LINKING WOMEN, WATER AND CLIMATE CHANGE FOR DHAKA

Dhaka has an estimated population of 17 million and a population density of 19,000 per square kilometer (fourth largest in the world). About half a million people migrate to Dhaka from the rural areas of Bangladesh each year (UNEP, 2005; World Bank, 2007) and this number has been increasing due to numerous social, economic and environmental factors. Dhaka city is frequently flooded due to inadequate drainage systems. Slums are situated in the low-lying flood prone sections of the city. The peripheral rivers in Dhaka city have undergone major pollution due to uncontrolled discharge of domestic wastewater and industrial sewage. The groundwater table is rapidly declining due to large scale water abstraction and low groundwater recharge. Therefore, in the long run, ground water will not be a viable option for the major water source in the Dhaka city. More than one-third of its population live in slums, i.e. about 6 million slum dwellers are not serviced by piped water and hence they have to collect water from common places (e.g. community taps) or open sources. Women are generally responsible to collect water and carry out household water management tasks (e.g. fetch water, boil water and serve water to family members) in Dhaka.

There is growing body of evidence in climate change literature that demonstrates that impacts of climate change are not gender neutral (CANNON, 2002; WEDO, 2008; Ahmad, 2012). Women are affected disproportionately by climate change. Climate change magnifies existing gender inequalities by reinforcing the disparity between women and men. Figure 1 illustrates how climate change induced water stress may impact women. Climate change will increase frequency and severity of droughts, which will result in water scarcity. Women will need to travel longer distance to collect water during water scarcity. Another impact of climate change will be increased flooding, which will restrict

freshwater availability and increase water logging. This will affect mobility of women in collecting water for the families.

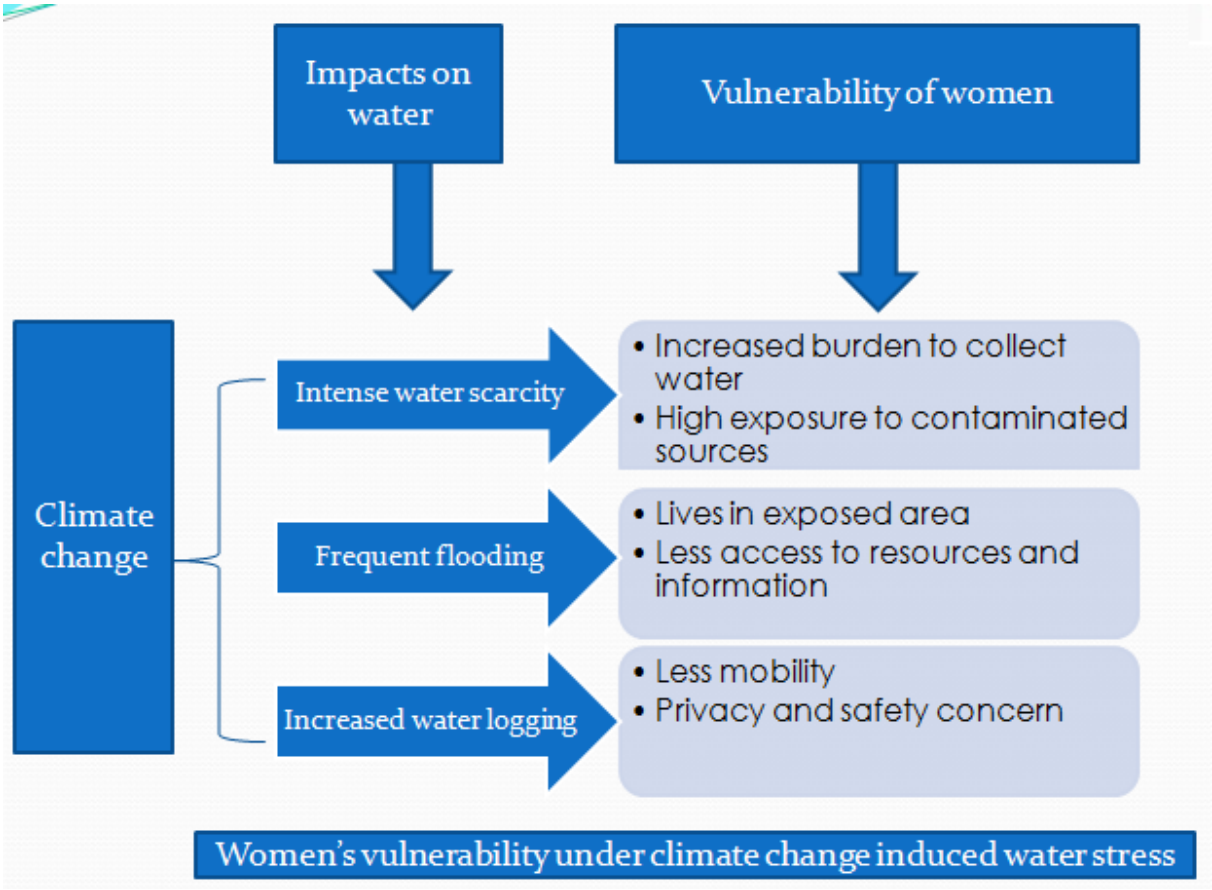

Figure 1. Climate change induced water stress vs. women

In a patriarchal society of Bangladesh, many social and cultural norms govern men and women action in relation to water. The roles and responsibilities of women are confined mainly in domestic sphere and tasks such as cooking, cleaning , providing care - all of these require varying amounts of clean and potable water (Sultana, 2009).

Table 1 is prepared as a part of this study, which illustrates how women in Dhaka City are linked with water and climate change. It shows that women carry the major responsibility in household water management in Dhaka such as collection of water and boiling. Climate change will increase water-related problems as listed in Table 1 which in turn will affect women more than men. Since Bangladesh is one of the most vulnerable countries due to climate change, women in Dhaka, particularly who live in slum will be highly affected by climate change compared with many other countries.

There has been hardly any study that has examined how women in Dhaka city will be affected by climate change related water problems. The magnitude of this problem is not small since women are responsible to collect and provide water to six million slum dwellers in Dhaka city.

Table 1. Link analysis among water, women and climate change in Dhaka city

			Link with women
Water	Opportunities	High average annual rainfall of about 1854 mm	
		Rainwater harvesting is mandatory in all new residential houses	
		Per capita water usage rate is low compared to developed countries	
	Limitations	About 80% of rainfall occurs during five months: May to September	
		Frequent flooding	Water collection by women becomes difficult
		Groundwater level is rapidly declining, in particular, during droughts, water availability reduces	
		High water logging during rainy season	Women's health is affected
		Surface water in the nearby rivers is highly contaminated	
		Contaminated surface water is often used for bathing and washing by slum dwellers	
		Six million slum dwellers do not have piped water at their living huts	Women are mainly responsible to fetch water in slum
		Piped water supply is intermittent	Women has to collect and reserve water in household
		Piped water is highly contaminated, which needs boiling before drinking	Women are responsible to boil water
		Water loss from piped water supply is 29%	
		Higher impervious area generates greater runoff increasing flood risk	During flood, fresh water collection becomes difficult
		Highly polluted stormwater runoff	Affects women's health
		Poor wastewater collection and treatment facility	
		Poor drainage.	
Climate change	Opportunities	Nil	
	Limitations	Dhaka is low lying that will increase water logging problem	This will increase mosquito problems, affecting women's health
		Sea level rise will affect Dhaka's drainage, which is a relatively flat city, leading to more floods	Collection of water by women during floods is more difficult
		Flood frequency and severity will increase	
		Drought duration and frequency will increase, which will reduce water availability	Women has to make sure there is enough water for everybody
		Temperature will increase, which will increase water demand	

3. CONCLUSION

Climate change has significant impacts on fresh water sources, affecting the availability of water used for domestic purposes. In the predominantly patriarchal societies, in which women of Dhaka live in, their main roles and responsibilities are within the confines of the domestic sphere and include daily tasks such as cooking, cleaning, washing clothes, and providing child and elderly care, all of which require varying amounts of clean and potable water. Climate change will amplify women and girls challenge to fulfil the demand of household water provision. The existing literature has tended to focus on the challenges faced by women in rural areas. Adequate research on the everyday life experience specific to water use and management in urban contexts is needed to address the current research gap. No research has been done before on how climate change will affect water availability in Dhaka and how it will affect women. It is recommended to carry out further research on how women in Dhaka

city, in particular those who live in low lying slum areas, will be affected by climate change induced water problems.

REFERENCES

ADB (1994). Climate Change in Asia: Bangladesh Country Report, Asian Development Bank (ADB), Manila.

Ahmad N (2012). Gender and Climate Change in Bangladesh The Role of Institutions in Reducing Gender Gaps in Adaptation Program . Social Development Working Papers 126.The World Bank.

Cannon T (2002). Gender and Climate Hazards in Bangladesh. Gender and Development 10: 45–50.

CCC (2009). Climate Change, Gender and Vulnerable Groups in Bangladesh. Climate Change Cell (CCC), DoE, MoEF; Component 4b, CDMP, MoFDM. Month 2009, Dhaka

Dankelman I (2002). Climate change: learning from gender analysis and women's experience of organizing for sustainable development. R. Masika (ed) Gender, Development and Climate Change. Oxfam. Oxford.

Fisher J (2006). For her it's the big issue: putting women at the centre of water supply, sanitation and hygiene. Water, Sanitation and Hygiene: Evidence Report. Water Supply and Sanitation Collaborative Council (WSSCC). Available at: https://dspace.lboro.ac.uk/2134/9970.

Huq S, Ahmed AU and Koudstaal R (1996). Vulnerability of Bangladesh to Climate Change and Sea Level Rise in T.E. Downing (Ed.) Climate Change and World Food Security, NATO ASI Series, I 37, Springer- Verlag, Berlin, Hiedelberg, 1996, pp. 347-379.

Institute of Development Studies (2008). Gender and Climate Change: mapping the linkage, a scoping study on knowledge and gaps. Available at: www.bridge.ids.ac.uk/reports/Climate_Change_DFID.pdf.

IPCC (2014). Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland.

Khosla P, Pearl R (2003). Untapped Connections: Gender, Water and Poverty. WEDO, New York.

MoEF (2005). National Adaptation Programme of Action (NAPA) Final Report. Ministry of Environment and Forest, Government of the People's Republic of Bangladesh, Dhaka.

MoEF (2011).Climate Change and Water in Bangladesh Information Brief. Ministry of Environment and Forest, Government of the People's Republic of Bangladesh, Dhaka.

Nishat A , Mukerjee N , Hasemann A , Roberts E (2013). Loss and Damage from the Local Perspective in the Context of a Slow Onset Process: The Case of Sea Level Rise in Bangladesh. BRAC University Centre for Climate Change and Environmental Research, Dhaka.

Rahman A (2016). Social hydrology. In: Handbook of Applied Hydrology, edited by V P Singh, McGraw-Hill.

Roy M (2009). Planning for sustainable urbanisation in fast growing cities: Mitigation and adaptation issues addressed in Dhaka, Bangladesh." Habitat International, 33(3), 276–286.

Roy S, Jahan I, Zaman M (2014). Urbanization and Microclimate Change of Dhaka City. Available at: http://www.bip.org.bd/SharingFiles/journal_book/20140427161155.pdf.

Sultana F (2009). Fluid lives: Subjectivities, gender and water in rural Bangladesh. Gender, Place and Culture, 16(4), 427-444.

United Nations Development Program UNDP (2006). Resource Guide Mainstreaming Gender in Water Management. Aavailable at : http://www.undp.org/content/dam/aplaws/publication/en/publications/environment-energy/www-ee-library/water-governance/resource-guide-mainstreaming-gender-in-water-management/IWRMGenderResourceGuide-English-200610.pdf.

UNEP (2005). Dhaka City State of Environment Report 2005, United Nations Environment Programme, Bangkok.

UN WOMEN (United Nations Entity for Gender Equality and the Empowerment of Women) (2012). Annual Report 2012-23. Available at: www.unwomen.org

WEDO (Women's Environment and Development Organization) (2003). Common Ground, Women's Access to Natural Resources and the United Nations Millennium Development Goals. WEDO, New York.

WEDO (Women's Environment and Development Organization) (2008). Gender, climate change, and human security:Lessons from Bangladesh, Ghana, and Senegal. Available at: http://www.wedo.org/wp-content/uploads/hsn-studyfinal-may-20-2008.pdf.

World Bank (2007). Dhaka: Improving Living Conditions of Urban Poor. Bangladesh Development Series. Paper No.17. World Bank, Dhaka.

Zimmermann K (2012). Resilient cities 2: cities and adaptation to climate change, proceedings of the Global Forum 2011. Dordrecht: Springer.