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## Promoting urban rainwater harvesting in Dhaka, Bangladesh

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**DELIVERING WATER, SANITATION AND HYGIENE SERVICES  
IN AN UNCERTAIN ENVIRONMENT**

**Promoting urban rainwater harvesting  
in Dhaka, Bangladesh**

*Mukherjee, S. & Hyde, K. R. Bangladesh*

**BRIEFING PAPER 1661**

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*With rapid population growth and Unplanned urbanisation water has turn into a scare resource in Dhaka city. This city will visage a severe water crisis to meet its increasing demand in near future. Present water supply depend on 87% groundwater extraction with groundwater table depletion at a rate of 2.81meter/year. No management initiatives revealed to protect groundwater recharging. WaterAid follows an approach to reach academics, researchers, urban planners, civil engineers, architects and policy makers for promoting rainwater harvesting through collective action. As immediate result, 4 universities adopted contents of rain water harvesting in course curricula, initiated 4 piloting researches by different institutions, urban planners and architects are engaged in construction designing to adopt rainwater harvesting, and changes adopted in the national building codes.. This paper denotes WaterAid initiatives and sign of impact to promote urban rainwater harvesting in Dhaka city.*

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**Introduction**

Bangladesh faces shortage of potable water especially in the urban areas due to over extraction of groundwater as well as inefficient water management. In Dhaka city, groundwater table is depleting at a hasten rate but no attention so far has been given on recharging groundwater or efficient management of water. The scenario is no different in other cities. The situation aggravates further due to unplanned urbanization with rapid population growth. The city authorities are not being able to meet water demand of the increasing population.

Dhaka, the capital city of Bangladesh, with more than 15 million populations is stumbling with its increased water needs day by day. Population projection shows that the population of the city will be 32 million in 2035. Current water supply trend in Dhaka city depends on 87% groundwater extraction with groundwater-table depletion trend at 2.81meter/year. It predicts that the groundwater table will be declining down to 120 meters by 2050 from the present status.<sup>1</sup> Present water production capacity of DWASA is 2307MLD whereas supplied quantity 2149 MLD against a daily demand of 2250 MLD<sup>2</sup>This gap between supply and demand will be accelerating by turns to meet increased demand of future generation in Dhaka city.

A recent study shows<sup>3</sup> that the city has been extending with an annual rate of 3.5 % along with its unplanned expansion to accommodate huge population influx of more than seven million<sup>4</sup> people per year. Such urban sprawl exerts immense pressure on the infrastructures of the city. The city inhabitants, therefore, are deprived of basic amenities of urban life where water supply has appeared as the most critical issue. At present, water demand has surpassed the water supply where 25 percent of the total population of Dhaka city has no direct access to potable water. The study also shows that Dhaka city will suffer from acute water crisis with a gap of 704MLD including DWASA prospective plan<sup>5</sup> for increased water supply in 2050. Another study shows<sup>6</sup> that rainwater harvesting is a more likely alternative resource to supply a portion of water demand in Dhaka city. A portion of the harvested water can be used for groundwater recharge. So the potentiality of Rainwater Harvesting is high for Dhaka City. The study also calculated the installation of rainwater harvesting will increase only 0.5% of the cost of the building which is very much affordable as water is one of the few important elements for human survival only whose availability is more importance

than its cost. Rainwater harvesting will recharge 108 MCM per year which is equal to 31% of the deficit Dhaka faces every year<sup>7</sup>. Another study refers, Monsoon usually lasts from May to October and occasional rainfall in November. During this period it gets plenty of water that could reduce the dependency of groundwater for at least 6 months. It is estimated that rainwater harvesting system could supply more than 15%<sup>8</sup> of Dhaka's thirst with an annual average rainfall of 2,200 mm.

In this situation, rainwater harvesting could be a good option for urban areas for meeting at least non-drinking purposes like toilet flushing, car and floor washing, washing clothes and utensils, gardening, etc. Apart from those essential usages, recharging groundwater could save our environment. If rainwater could properly be used for groundwater recharge, we might be able to reduce water congestion during rainy season.

### **WaterAid initiative**

WaterAid an international NGO has been operating in Bangladesh since 1986 as one of the lead actors in the WASH sector and is well experienced in innovating, scaling up and managing large sector projects targeting poor, vulnerable and the excluded. The geographic focus of WaterAid Bangladesh includes urban slums, hard-to-reach areas and eco hazardous zones such as hill tract and hillocks, dry and arid barind tract, salinity prone coastal zones, haor and flood-prone chars keeping an eye over the climate change implications.

With a long-term vision to contribute to the management of water crisis in Bangladesh, WaterAid Bangladesh priorities 'promotion of urban rainwater harvesting' as one of its critical agenda since 2010. Centre for Science and Environment (CSE), India has been actively involved in this endeavour under a partnership agreement with WaterAid to promote Urban Rainwater Harvesting (URWH). Under this initiative, WaterAid and CSE are jointly building capacity of the sector professionals on URWH, working on inclusion of relevant course contents into curricula of technical institutions and piloting a number of action research projects.

### **WaterAid approach**

WaterAid follows a multi-stakeholders approach to promote urban rainwater harvesting in Dhaka city. Following are the details:

- **Approach-1:** Target academics, researchers, urban planners, architects, civil engineers, implementers and policy makers to transfer knowledge and technical know-how through offering training fellowship on urban rainwater harvesting.
- **Approach-2:** Establish a resource pool through trained fellows in sector to provide knowledge and technical know-how on rainwater harvesting.
- **Approach-3:** Develop strategic partnership with different institutions to initiate demo pilot project on rainwater harvesting to create evidences for wider learning.
- **Approach-4:** Develop strategic partnership with private and public universities to adopt rainwater harvesting contents in their course curricula.
- **Approach-5:** Advocate with policy makers to influence policy to adopt changes in national building codes and execute accordingly.

### **Intervened activities**

- **Training fellowship programme:** WaterAid offered training fellowship to sector professionals working in different sectors e.g. civil engineers, urban planners, architects, academicians, water-sanitation service providers, NGO activists and GoB officials for wider dissemination of knowledge and technical knowhow to promote urban rainwater harvesting.
- **Resource pool formation in WaSH sector:** WaterAid encouraged training fellows to initiate a common platform for collective learning and contribute in WaSH sector to promote urban rainwater harvesting.
- **Constructed rainwater harvesting demo plants:** WaterAid constructed demo plants of rainwater harvesting at recognized places e.g. educational institutions and NGOs in Dhaka city for transferring technical knowhow among students, researchers, implementers and other relevant stakeholders.
- **Sector advocacy for policy changes:** WaterAid initiated advocacy with policy makers to have changes in national building code in favour of promoting urban rainwater harvesting.

- **Action research on promoting urban rainwater harvesting:** WaterAid signed Memorandum of Understanding (MoU) with 4 potential private and public universities to initiate action research on rainwater harvesting.
- **Wider networking among sector professionals:** WaterAid facilitated process to develop an informative website for wider networking of sector actors to promote rainwater harvesting in urban Bangladesh.

### **Achievements so far**

**Trained professionals for wider dissemination of knowledge and technical knowhow:** A total of 142 professionals in water, sanitation & hygiene (WaSH) sector awarded training fellowships and received advanced level training on Urban Rainwater Harvesting and Decentralised Wastewater treatment and reuse in collaboration with Centre for Science & Environment (CSE), India.

**Creation of “Rain Forum” to promote institutionalisation:** With an aim to promote urban rainwater harvesting a forum evolved in 2011 through a collective initiative of training fellows awarded WaterAid training fellowship programme. This forum initiated a working group and developed a website [www.rainforum.org](http://www.rainforum.org). The working group is now working on establishing a wider network through using website.

**Establishment of resource pool in the sector:** A resource pool consists of civil engineers, urban planner, architects, academics and policy advocacy professionals belong to Rain Forum contributes on promoting rainwater harvesting. The forum working group is trying to scaling up of rainwater harvesting in Dhaka city. This forum organised and conducted twobatches of training courses on urban rainwater harvesting for university students and practitioners working in water, sanitation & hygiene (WaSH) sector. A total of 54 architects at the national level trained on rainwater harvesting by the forum facilitators’ team so far. More than five individual initiatives are ongoing at real estate sector in designing private constructions where the rain forum members are contributing.

**Construction of demonstration rainwater harvesting plants to transfer technical knowhow:** Four rainwater harvesting demonstration plants were constructed in three recognized institutions in Dhaka city and one demo plant at NGO level in Dhaka city for wider dissemination of knowledge and transferring technical knowhow among the students, researchers, academics, implementers and policy makers.

### **Acknowledged sectoral leadership promoting urban rainwater harvesting**

- WaterAid continues its sector capacity building initiatives promoting urban rainwater harvesting through offering training fellowship programme in collaboration with Centre for Science & Environment (CSE), India that added value in sectoral leadership. WaterAid organised first Bangladesh Rainwater Convention in June 2012 which came up with *Dhaka Declaration* to be followed by the sector actors.
- Bangladesh National Building Code revised and adopted changes in its clause to promote rainwater harvesting in construction designing under the leadership of WaterAid.

### **Components worked well and why**

- Training fellowships of WaterAid worked as a motivating factor to engage sector professionals in activities that promotes rainwater harvesting.
- Demonstration rainwater harvesting plants worked as an evidence for practical learning for the practitioners and the students.
- Rain Forum enhanced institutional capacity in sector to share technical knowhow of urban rainwater harvesting.

### **Ongoing and future activities (till 2016)**

An action plan has been developed under WaterAid sector capacity building initiatives to promote urban rainwater harvesting in urban Bangladesh. Following are some major activities under the action plan:

- Establish knowledge centres (Rain Centre) on rainwater harvesting in reputed public and private universities in different districts of Bangladesh.

- Inclusion of relevant course contents on rainwater harvesting into course curricula of technical institutions and universities in Bangladesh.
- Establish demo plants on rainwater harvesting in another 3 (three) metropolitan cities in Bangladesh.
- Initiate action research with reputed universities on promoting rainwater harvesting in Bangladesh
- Concurrent follow up of *Dhaka Declaration* to promote urban rainwater harvesting and groundwater recharging.

## Conclusion

Over the period of time since 2010, WaterAid endeavour creates evidences to promote urban rainwater harvesting through enhancing capacity of sector professionals in water, sanitation & hygiene (WaSH) sector. A resource pool developed through forming a forum called “Rain Forum” to transfer knowledge and technical knowhow to promote rainwater harvesting in this sector. WaterAid Bangladesh achieved a sectoral leadership to promote urban rainwater harvesting acknowledged by sector actors through its sector capacity building initiatives. The sector advocacy initiative contributed to influence national policies to have changes in national building codes. We hope the future initiatives of WaterAid will add value in water, sanitation & hygiene (WaSH) sector and will create mass awareness among city dwellers to promote rainwater harvesting in other cities towards a green Bangladesh.

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## References

- <sup>1</sup> Unnayan Onneshan (2011) “*Water Supply Dhaka City-A Murky Future*” available at <http://www.unnayan.org>
- <sup>2</sup> DWASA official data-Sep 2012
- <sup>3</sup> Unnayan Onneshan (2011) “*Water Supply Dhaka City-A Murky Future*” available at <http://www.unnayan.org>
- <sup>4</sup> Bangladesh Bureau of Statistics (BBS-2009), *Statistical pocketbook, Dhaka* available at: <http://www.bbs.gov.bd>
- <sup>5</sup> Unnayan Onneshan (2011) “*Water Supply Dhaka City-A Murky Future*” page-20 available at <http://www.unnayan.org>
- <sup>6</sup> ICETCESD (2011) “*Potentiality of Rainwater Harvesting in Dhaka City A Greener Approach*” available at <http://www.academia.edu>
- <sup>7</sup> ICETCESD (2011) “*Potentiality of Rainwater Harvesting in Dhaka City A Greener Approach*” available at <http://www.academia.edu>
- <sup>8</sup> Islam M M, Chou F N F and Kabir M R. (2010) “*Feasibility and acceptability study of rainwater use to the acute water shortage areas in Dhaka City, Bangladesh*”. *J. of Nat Hazards*, 56: 93-111. Available at: <http://www.indiaenvironmentportal.org.in/files/RainwaterusinDhakacity.pdf>.

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## Key words

Sector Capacity building, Urban Rainwater Harvesting, Unplanned urbanisation

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