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waterAid transforms lives by improving access to safe water, hygiene and sanitation in the world's poorest communities. We work partners and influence decision makers to maximise our impact.

Rain Water Harvesting System

Using the nature, for the future

WaterAid

Background

Bangladesh is a flat and low-lying country situated within the delta formed by Ganges and Brahmaputra rivers. The approximate annual average rainfall is 2300 mm which is almost 3 times more than that of world's annual average (800 mm) rainfall.

The average annual rainfall varies from a maximum of 5,690 mm in the northeast part of the country to minimum of 1,110 mm in the western part. About 80% rainfall takes place during the monsoon in Bangladesh. It is a matter of great regret that such enormous potentiality of using rainwater mostly remains unutilized.

Context

Despite the fact that the city of Dhaka receives annual average rainfall of 2150 mm, a severe water crisis has been observed in many parts of the city over the last couple of years. Yet this large amount of rainfall is unutilized and drained out through storm sewer. Currently, there is a supply deficiency of almost 30 million liters per day in this city. Moreover, over extraction of groundwater is resulting declination of watertable at a rate of 3 m per year which is aggravating the situation further.

Rainwater Harvesting System (RWHS)

Rainwater harvesting is a process of capturing rainwater, storing it for future use or recharge the groundwater artificially.

RWHS usually consists of two components: storage and artificial recharging.

Why Rainwater Harvesting?

- To reduce domestic water crisis
- To reduce surface runoff and thus reduce the water congestion (urban flooding).
- To provide a better solution for water management
- To reduce declining of groundwater scenario
- To use for drinking purpose during extreme events (flood, cyclone or salinity intrusion, etc.).

Rain Water Harvesting System at PWD Head Office

Public Works Department (PWD) is a government organization involved in infrastructure development. A RWHS has been installed at its head office premises to supply rain water for toilet flushing.

It is estimated that a portion of roof top of the main building may harvest about 0.6 million liters of rainwater per year. The harvested rainwater will be used for the specified toilets.

Shortcomings of RWHS

- In case of extreme rainfall event, excess rainwater will be directed to the storm sewer system
- With the variation of soil characteristics, infiltration rate varies and these impact designing of a RWH system
- Size of storage tank will be enormous if the rainwater is expected to be stored for using round the year

Ways Forward

- Water quality monitoring of harvested rainwater will be done periodically
- Performance of the systems will be monitored to see the efficiency in the long run
- Users acceptance and satisfaction will also be monitored

Rain Water Harvesting System at IUB

Rain Water Harvesting System at VERC

Village Education Resource Centre (VERC) is a national non-government organization working for women and children. A RWHS has been installed at its head office premises for supplying water to the training centre and the head office.

It is estimated that the roof top of the building may harvest about 0.61 million liters of rainwater per year. The harvested rainwater will be stored into the existing underground reservoir.

A portion of harvested water will be filtered and recharged at a depth of 70 ft or more into the aquifer.

Rain Water Harvesting System at BUET

Rain Water Harvesting System at BUET Premises

Bangladesh University of Engineering and Technology (BUET) is the oldest and the most prestigious Engineering institution in Bangladesh. A RWHS has been installed at the Auditorium of BUET. The rooftop of Auditorium and cafeteria rooftop are used as the catchment for capturing rainwater and provision has made to store the water and use for flushing toilets at auditorium and cafeteria. Excess amount of water will be diverted to the recharging system. A total of two recharge wells have been constructed for artificial recharging. Rainwater will pass through desilting and sand filtration chamber before entering into the recharge wells. Finally filtered water will be recharged at a depth of 45 ft or more. It is expected that about 0.85 million liters (per annum) of water will be recharged into the aquifer.

It is estimated that about 1.43 million litre per annum rainwater will be harvested by the RWHS. A total of four PVC tanks of 1000L capacity each have been used for water storage.

Rain Water Harvesting System at VERC

Rain Water Harvesting System at IUB

Independent University, Bangladesh (IUB) is a renowned private university in Dhaka city situated at Bashundhara residential area. Every year, the university spends a large amount of money to extract groundwater using generator and pump to meet the requirements of the students and faculties. A RWHS has been constructed at the academic and gymnasium building of IUB.

This RWHS has both the storage facility and recharging system. It is estimated that a total of 0.9 million liters of rainwater will be harvested per annum in this plant. The captured rainwater pass through desiltation and filtration chambers before it is stored in the existing reservoir situated on the rooftop of administration building. The stored water will be used for flushing toilets and other usages, except drinking.

A portion of harvested water will be filtered and recharged at a depth of 110 ft or more into the aquifer. It is expected that around 1.34 million liters of water will be recharged into the aquifer Every year.
RWHS at IUB will reduce energy consumption and conserve groundwater.

Rain Water Harvesting System at PWD

Challenges

- Uneven distribution of rainfall throughout the year
- Larger storage requirement to satisfy demand during the dry season
- Perception of high construction cost
- Lack of public awareness
- Absence of government policy to support RWH
- Rigorous operation and maintenance

WaterAid's Stance

WaterAid, n UK based international organization promotes accessibility to safe water, sanitation and hygiene to the world's poorest communities. In order to promote urban rain water harvesting, WaterAid in Bangladesh organizes exclusive training on Urban RWH in collaboration with Centre for Science and Environment (CSE), India to facilitate technology transfer and capacity building about RWHS among sector actors in Bangladesh.

Demonstration projects of RWHSs have been constructed at Bangladesh University of Engineering and Technology (BUET), Public Works Department (PWD), Independent University Bangladesh (IUB) and Village Education Resource Centre (VERC) by WaterAid.

The trained participants formed a voluntary forum titled- Rain Forum to promote urban RWH.