

## **Low Cost Rainwater Harvesting System: Context specific, User friendly and Affordable**

Kazi Rashed Hyder and Hasin Jahan, WaterAid in Bangladesh

Scarcity of potable drinking water an increasing problem in the coastal areas of Bangladesh. Especially in the south-west coastal belt, the shallow aquifer contains salinity, arsenic and iron and often is it hard to find any good water bearing aquifer at accessible depth. As a result, people often rely on Pond Sand Filters (PSF) which receives water from ponds through manual pumping and delivers through a filtration chamber making the water safe for drinking. But now-a-days, freshwater ponds are also not available for construction of PSFs due to horizontal saline intrusion. Further, PSFs require extensive operation & maintenance. Therefore, for collecting water for drinking, people are travelling up to 3-6km to collect water. This has impacts on women's safety, education of girls, health risks, and economy.

After the hit of cyclone Aila in May 2009, all water bodies were over flown by tidal surge in the coastal areas of Bangladesh. Therefore, the existing water sources both- surface and groundwater, became contaminated by either salinity or bacteria. People then were forced to drink unsafe pond water. Even to collect unsafe pond water, people have travelled several kilometers. As a result diarrheal diseases increased in the Aila affected areas.

One of the feasible options for drinking water in these areas is definitely the rainwater. But people are not used to collect and preserving rainwater properly in a hygienic manner. Another problem associated with rainwater is that it's not available throughout the year. So they have to depend on other sources as well.

After Aila, people struggled to reach remote locations with tankers and boats with emergency water supplies for the victims. A large number of poor people used to catch rainwater in plastic shopping bags by spreading the thin plastic sheets over any temporary structure. At that stage, WaterAid decided to upgrade this system to support the poor people at remote locations by promoting an affordable and user friendly system for rainwater harvesting.

Rainwater Harvesting System (RWHS) is basically a simple, technically feasible and socially acceptable system to capture and use rainwater for drinking purpose. It may be used at difficult hydro-geological areas which experience high rainfall such as coastal areas of Bangladesh.

The main limitations of conventional RWHS are - limited storage capacity of the tank and behavioral aspects. Usually rainfall occurs for maximum of 7 months in a year. Therefore, storage volume requires serving for at least the rest 5 months period when there will be no rain. Since the stored water will remain for quite a long time, it is essential to handle the stored water avoiding any contamination. In coastal areas, various storage systems from high cost household-based models to community based systems are available.

A catchment (proper roof) is required for harvesting rainwater alongwith sufficient land space to construct RWHS. But poorer people at remote areas usually have thatched roof of temporary in nature with limited homestead space. Therefore, it is difficult to address such poorer section of population through the mentioned system.

To address the poorer section of population at disperses locations, WaterAid took initiative to provide relatively low-cost household based RWHS consists of one big poly-fabric sheet (15'-00"x12'-00") and 4 to 6 big clay jars (800L- total capacity). Household can easily place this poly-fabric sheet over the thatched roof (sometimes gol pata) or at courtyard for harvesting rainwater and store the

collected water in the clay jars. The poly-fabric sheet is basically used for dual purposes- to collect rainwater and protect against trickling of water from the thatched roof. Total cost of a RWHS is about 2,000 BDT (poly-fabric sheet 1050/-, Motka including cover-4X200=800 BDT, carrying cost).

This type of RWHS is comparatively low-cost and easily movable. This is user friendly and the materials are locally available materials. The clay jars are good in storing water stores and keep water cool. Overall operation and maintenance are easy and low-cost as well.

But the main challenges remain with clay-jars. The clay jars are difficult to transport to remote places and storage capacity is very limited (each jar may contain maximum 200 litres). Therefore, the harvested water could only be used for drinking purpose for very limited period.