

Concern



**'PROMOTION OF ALTERNATIVE WATER  
OPTIONS IN THE COASTAL ZONE OF  
BANGLADESH'**

Universal

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## **Outline of the presentation**

- Introduction
- Coastal Zone of Bangladesh – a playground of climate change
- Effects of Climate Change in Coastal Zone of Bangladesh
- Disaster – the most unfortunate effect
- Water and Sanitation – lacking with permanent solutions in disaster preparedness
- Disaster Friendly Water and Sanitation
- Basis of the presentation
- Objectives
- Alternative solutions in water supply
- Achievements so far
- Sources



### **Coastal Areas in Bangladesh – a playground of climate change**

- Area: 39,300 sq. KM
- 27% of the total country
- 30 million people
- 22% of the total population
- Three distinct nature of coastal zones: eastern, central and western

## **Effects of Climate Change in Coastal Zone of Bangladesh**

- Frequent Natural Disasters (cyclone, flood, droughts, landslides, river erosion)
- Sea level rise
- Increasing level of saline intrusion
- Reducing cultivable lands
- Narrowing safe drinking water sources
- Health hazards and death toll
- Trauma
- Ecosystem damage
- Gradual increase of 'Climate Refugee' – 4.5 million people  
(Temporary Displacement, Permanent Local Displacement, Permanent Internal Displacement, Permanent Regional Displacement, Permanent Inter-Continental Displacement)
- Poverty as a crude burden

















### **Disaster – the most unfortunate effect**

- Cyclone in 1991
- Flood in 1988, 1997, 1998, 2004, 2007
- Barkol Earthquake in 2003
- Land Slide in 2007, 2010
- Cyclone SIDR in 2007
- Cyclone AILA in 2008





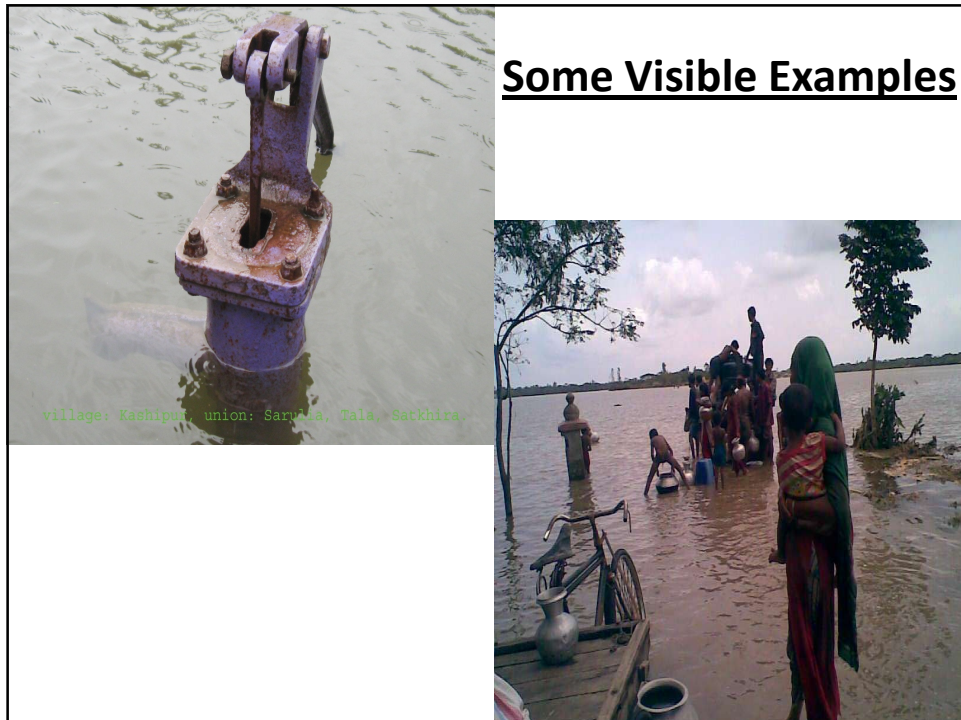




### **Water and Sanitation – lacking with permanent solutions for disaster preparedness**

- Over 90% WASH facilities get damaged during disaster.
- Over 80% cyclone shelters are lack with adequate WASH facilities.
- Water borne diseases' trend rises up to 4 times (12% - 38.7%).
- Water borne diseases claim 24% death and 65/1000 of  $\leq 5$  children death.
- About US\$ 666.67 million spent for treatment & transport for diarrheal disease
- One disaster prone district losses around US\$ 69652 for damaging water options per annum.
- One disaster prone district losses around US\$ 266,864.67 for damaging latrines per annum.
- Negative impacts on social dignity of women & girls on defecating.









**Some Visible Examples**



**Some Visible Examples**








**Disaster Friendly  
Water and Sanitation**

*Concern*


*Universal*


**Implementing Partners:**


SPACE

**Donors:**





Department of Foreign Affairs  
An Roinn Gnóthai Eachtracha



EUROPEAN COMMISSION  
Humanitarian Aid



FOR A BETTER URBAN FUTURE



### **Basis of the Program**

- Frequent natural disasters due to climate change
- Visible negative impacts on WASH due to disasters
- People's suffering with safe drinking water and sanitation during/after disasters and on regular basis
- Ensuring respect on national WASH legislation
- Lack of integration in between WASH & disasters among actors
- National losses due to damaging WASH technologies as well as treatment cost for water borne diseases.

### **Objectives**

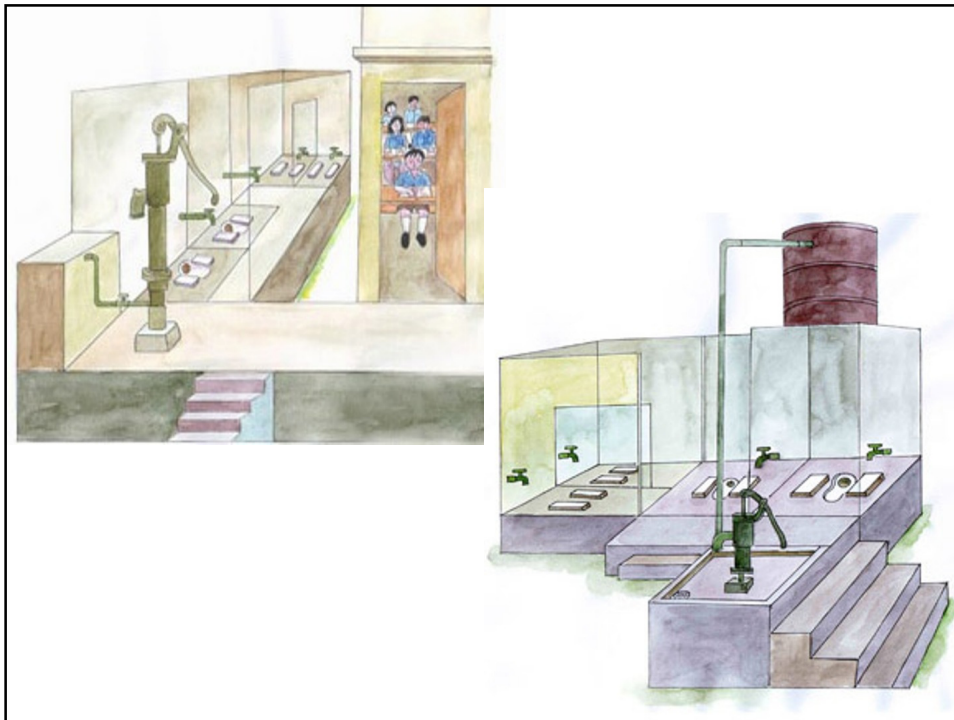
- **Promoting disaster friendly WatSan concept and technology at micro and macro level.**
- **Ensuring access to adequate water and sanitation facilities for people living in climate threatened areas (flood and cyclone prone).**
- **Building awareness and strengthening capacity of the community and relevant public – private stakeholders.**
- **Knowledge management & dissemination.**



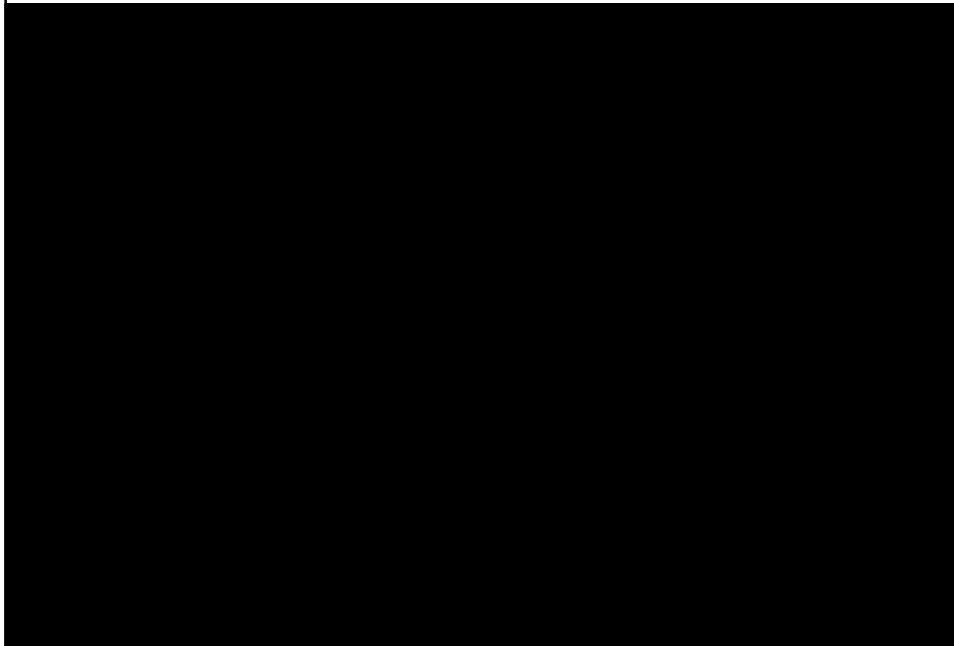
### Alternative Management with Water Supply

- Schools Based as these are used as shelters during disasters;

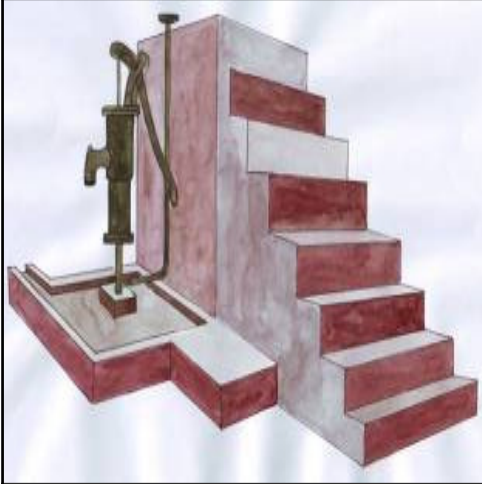




## Community Based



**Tube well with Raised & Normal Combined Platform**

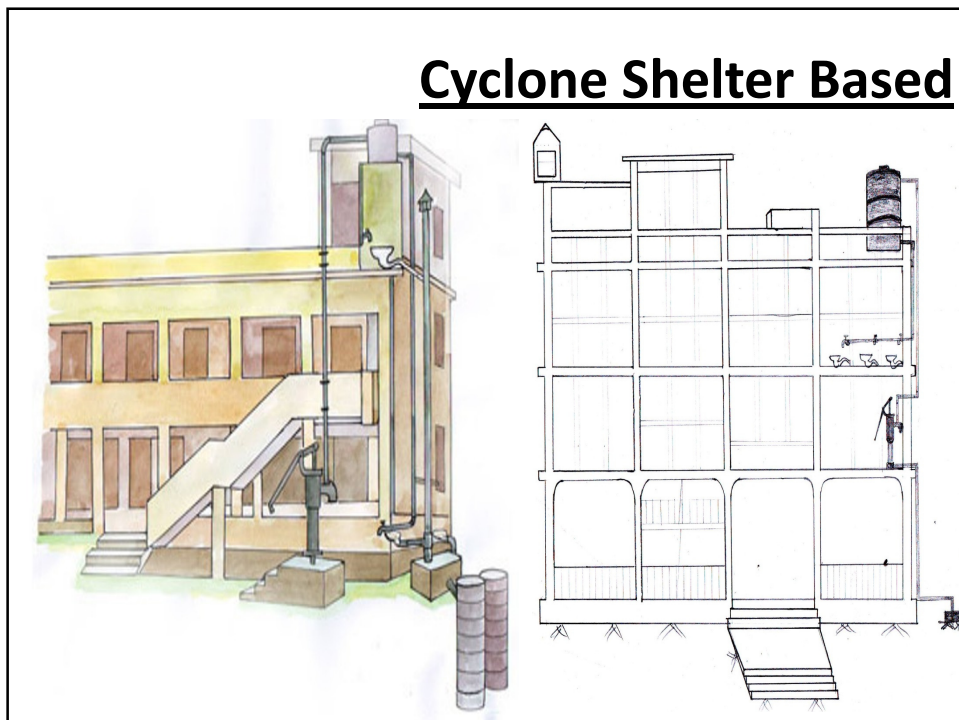
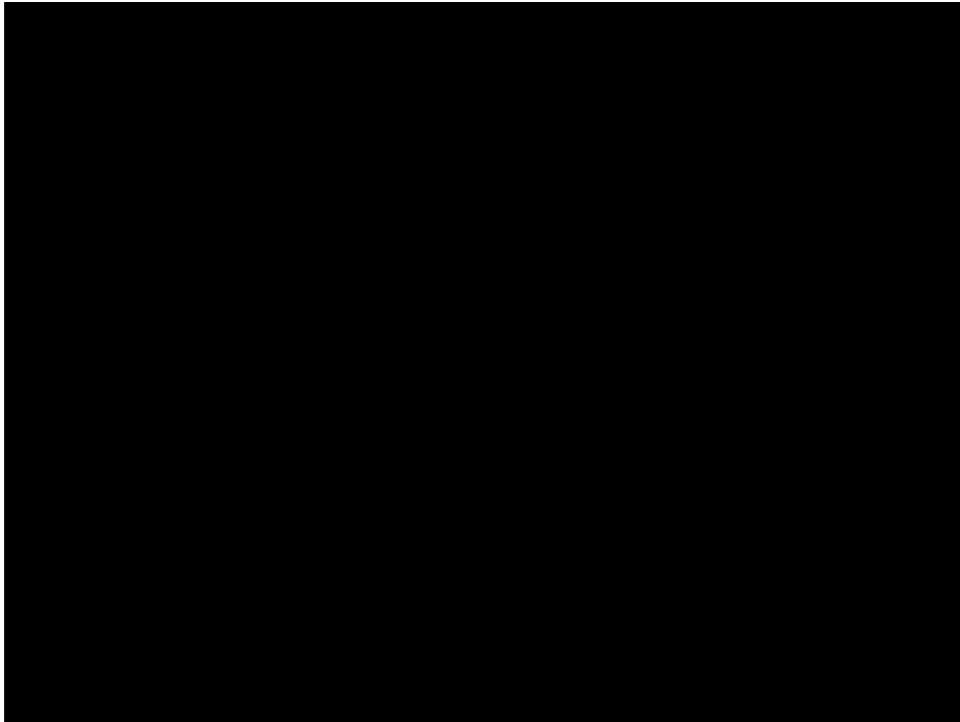


Raised and normal combined platform at normal period



Raised and normal combined platform during flood









1. Semi-Rotary: hand pump works as substitute of Jet pumps where no electricity is required to lift water to the overhead tank to be used for sanitation and drinking purposes. This pump can be used mainly in shelter for water lifting purpose.

2. Tube well uses additional valve at discharge-end to create an option to lift the water at an upper water tank (usually 20-30 feet above the surface). The Piston Pump also can be used as normal hand tube well and without electricity. Using this pump, water can easily be lifted to the overhead tanks for use and drinking purposes. A piston reciprocates up and down or back and forth to displace water in a cylinder. Flow of water into and out of the chamber is controlled by valves.

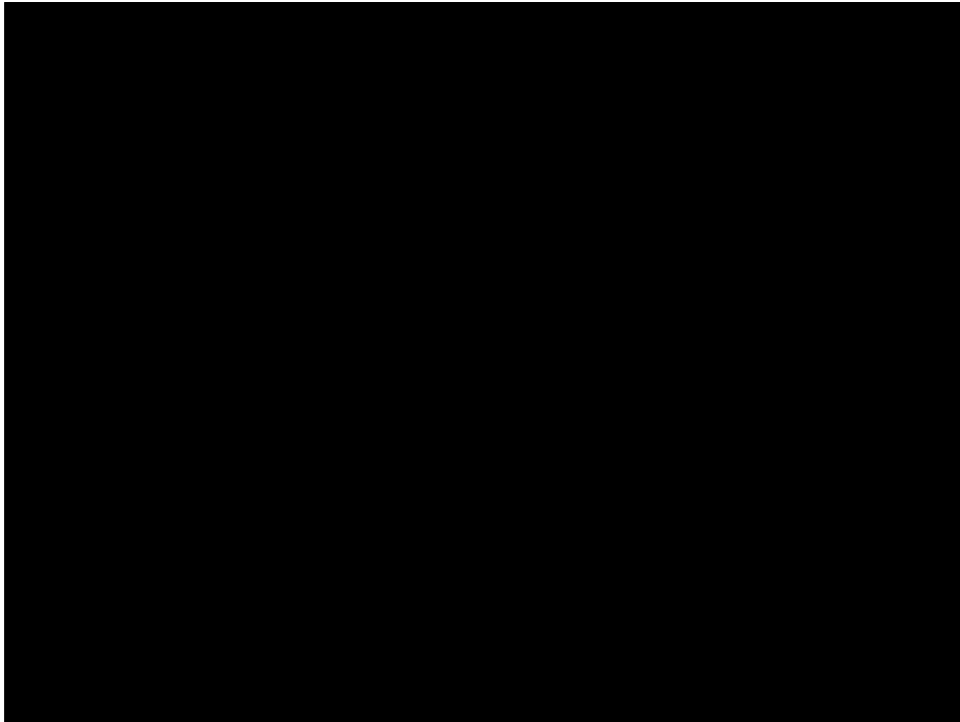


**Semi-Rotary Hand Pump**



**Piston Pump**





## Ponds Sand Filter (PSF)







## Rainwater Harvesting System







## **A Solution with RW During Emergencies**



**Bamboo Kits for RWH (US\$ 5 - 6)**



**Vessels for RWH (US\$ 12 – 15)**



**Polythene bag for RWH**



**Regular Households' Utensils for RWH**

### **Chulli Water Purifiers (CWP)**

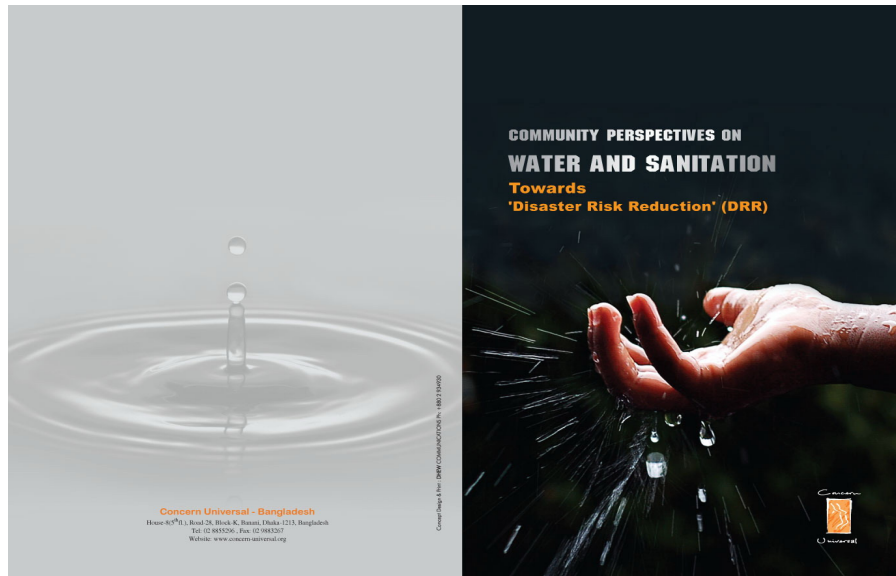
Chulli Water Purifier utilizes existing heat sources used by the household for cooking to completely destroy all pathogens found in water. This allows the household to easily purify available surface water for drinking. It incorporates a simple aluminum coil which is easily built into the traditional mud cooking stove used throughout Asia and many other countries. In Bangladesh, this cooking stove is called "Chulli". While cooking, temperatures easily reach over 300°C. A plastic bucket with 15 kg of normal sand is used to filter the input water taking out algae and other turbidity causing matter. The water then simply flows through the aluminum coil (4 coils) and is exposed to the heat of the fire where it is vaporized in the coil and exits the system through the output pipe and plastic faucet at 68 to 70°C. The system provides about 30 liters of clean, safe water per hour for a household.



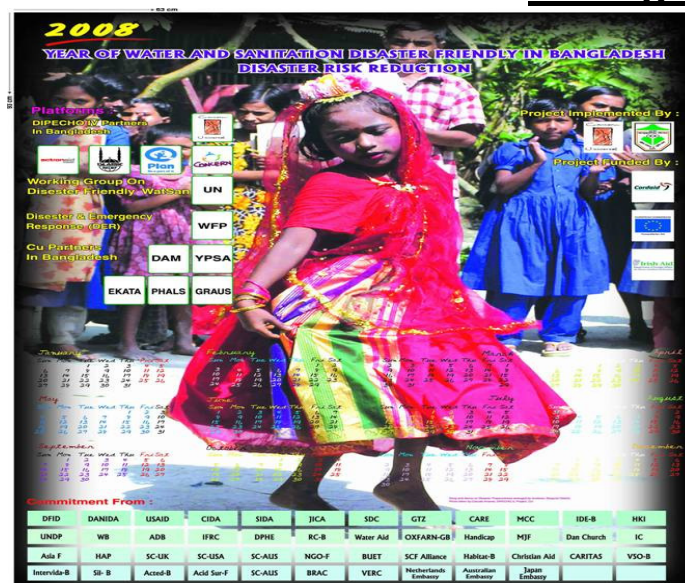
### **Achievement so far**

- Directly benefitting about 554400 disaster threatened people
- Directly benefitting about 80,000 school students on regular basis.
- Water options installed 1095
- Latrines installed 987
- Developed a video on 'Disaster Friendly WatSan'
- Received good recognition from policy makers, actors and donor community.
- Invited for presentation by:
  - (i) The 3rd International Dry Toilet Conference in Finland, August 9 - 15, 2009.
  - (ii) World Water Week - 2010, in Sweden, September 5 - 11, 2010.
  - (ii) Deltas in Times of Climate Change, Netherlands, September 29 - October 1, 2010.
- Developed websites for wider dissemination.

## Conducted a study on 'community perspectives on water & sanitation towards disaster risk reduction'



## Developed consensus & commitments among actors



## Sharing knowledge & best practices through national conference



## Developed 'Disaster Friendly WatSan Technology Album'





## **Sources**

- Practical experience on implementing several disaster friendly WASH projects in Bangladesh since 2007
- Study Report: Community Perspectives on Water & Sanitation towards Disaster Risk Reduction
- Progotir Pothey 2007 (UNICEF)
- <http://www.concern-universal.org.bd>

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