Project Report supported by Japan Water Forum Fund 2013

Summary

1. Name of the organization: Shushilan
2. Country: Bangladesh
4. Project time-period: Six Months
5. Description of the water issues/ objectives of your activities:

Safe drinking water in Shyamnagar Upazila has long been an acute problem where both surface water and ground water sources are equally affected by the salinity problem. It is the single most significant problem in the coastal belt of Bangladesh especially in south-western coastal region. In the recent past two devastating cyclones (SIDR 2007 and Aila 2009) and storms induced a change in the level of water salinity increased in this area.

On the other hand, existing rainwater collection systems is not maintain hygienic and scientifically sound. They collect rainwater mostly from roof (tin, thatched, cement roof), cloth and polythene in coastal area of Bangladesh. But in all cases the roof surface remain dusty, infested with mites and insects and particularly for the thatched roofs, there are every possibility of decaying materials accumulated from months together during the dry period. The thatched roofs quickly decomposed in every year and the people will not capable to change the thatched roofs. When rain is coming they will collect the water in the thatched roofs. Thus the harvested rainwater will get all washed materials to be collected for drinking. Rejecting the initial harvest might remove some of those contaminations, but there is no guarantee that subsequent harvests do not have any contaminants. Due to these, the main objective of the project is to set up pitcher technology at community level for preservation rainwater through scientific testing as per WHO standard.

6. Description of your activities with the JWF Fund:

The activities of the project were executed through selection of household by conducting Baseline Survey and by installation and disseminate of modem pitcher technology at community level. 12 households were selected finally based on their demand, interest to small share the cost of installation. The selected households were involving during installation of pitcher technology so that they can handle this technology of their own.

The pitcher was developed by locally skill and experience potter/mason according to guideline which has been designed by the Shushilan. The design of indigenous pitcher technology was developed for making the technology affordable for the community people as well as suitable. The shape and size of the pitchers was larger as well as durability was increased for sustainability. Moreover cement laminated pitchers was used in preservation of harvesting rainwater all over the year for longevity, durability and user friendly. The project was develop two types of catchment system such as tin roof and roof through pipe catchment and bamboo polythene/cloth catchment) for use and harvesting of rainwater.

Indeed, rain sets in Bangladesh in the middle of June and lasts up to the middle of September. Due to these, the rain is not come during the project period. So that collection, preservation and scientific testing
are equally hamper due to unavailable natural rainfall. Shushilan has encore interest to continue the project with necessary supports knowing which stage is the most vital to run or to sustainability of the technology. Most importantly, the local people thought it will be better option for them for safe drinking water as they expect during 1980s.

7. The number of direct beneficiaries (persons) of your project:
Under the project, Shushilan install 12 modern pitchers in 12 household of Dhankhali village, of Shyamnagar sub-distinct of Satkhira district under Bangladesh. The direct users of the pitcher are more than 75 people. Moreover, among the community inside of the pitcher also be used this pitcher at the hardcore period of time.

Project Description

1. Name of the organization: Shushilan
2. Country: Bangladesh
3. Area: Shyamnagar Sub-district
4. Details of the Project-site: Address of the site as well as maps are required if possible.
The Dhankhali village is one of the highly salinity affected village under Munshigonj union in Shyamnagar Upazila of Satkhira district of Bangladesh. The total households and population of the village are 614 and 1912 respectively (BBS, 2011). About 1451 male and 1461 female has been lived in the village and the sex ratio is 99.

Project Site: Munshigonj Union to selected Dhankhali village

5. Project time-period: (October 2013 to March 2014) Six Months
6. Project manager
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   Title: Team leader
   E-mail: bakuluzzaman@gmail.com
   Phone: +88028158209
   Fax: N/A

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7. Name of the project or activity: Installation of 12 Rainwater Harvesting Devices through Pitcher Technology.

8. Description of the water issues/ objectives of your projects or activities:
Salinity in water has been a typical environmental issue not only for Bangladesh but also for all maritime nations of the world (Islam et. al, 2012)\(^2\). One of a study reveals that about 19.9% of the disease among the total diseases events is skin diseases. Those households are using the unprotected water for drinking, bathing, washing and other daily activities; they are suffered from different water borne diseases. Further iron, arsenic, concentrations of fecal coliform and bacterial components are found in drinking water.

Moreover, People has to fetch potable water from the fresh water ponds often situated far from the tidal rivers and only women members have to fetch water sometimes from several kilometers far from their houses. As an alternative source, many households have been practicing harvesting of rainwater from the unhygienic rooftop catchment areas, setting of Pond Sand Filter (PSF) and Tube-well. But the systems have been some problems in terms of harvesting technique, storage, avoiding from filth and dirt and from contamination caused by vectors and pathogens. There has been very limited supports to mitigate drinking water problem in the remote coastal area of Bangladesh but the initiatives were not user friendly, technically sound and nor cost-effective. Promotion of existing rainwater collection system has become an important issue to fulfill the demand of drinking water in the coastal areas. Frequent natural disasters mean that the traditional ponds or surface water bodies become inundated with sea water making these unsuitable for any form of human use. At present, coastal populations are mainly dependent on natural sources such as rain water and pond water for drinking purposes. There are few tube-wells in the pockets of deep aquifer which in most cases are hard to reach.

Shyamnagar is the remotest coastal upazila under Satkhira district of Bangladesh. The people live here in a landscape strongly influenced by the adjacent mangrove and tidal inundations both diurnally and fortnightly. The settlement areas also have tidal influence during the high-tides and the ground water aquifer has salinity problem too influenced by the adjacent tidal rivers. Thus the problem of drinking water persists almost round the year and people try to get relief partially by harvesting the rainwater during the summer. The average range of rainfall in Satkhira district is 2200-2800 mm per annum which makes rainwater harvesting quite feasible. Improving the rainwater harvesting technology, making better storage facility for extended supply period, quality control and cost-effectiveness for both installation as well as maintenance to avoid contamination is worth looking from project point of view. In this context improving pitcher technology with modern scientific testing of water as per WHO guideline is a good

potential water supply option of drinking in the coastal areas especially in Shyamnagar upazila under Satkhira district of Bangladesh. The objectives of the project activities were-

- To set up the pitcher technology at the community level for preserving rainwater in order to ensure its purity.
- To identify the preservation time limit of harvesting rainwater and test the water quality through scientific testing as per WHO standard.
- To disseminate the technology at the community level.

9. Description of your activities with the JWF Fund:
9.1 Baseline Survey (FGD and KII) for Household Selection:
Baseline survey was completed within two weeks after the final approval of Japan Water Fund. This was a comprehensive study based on questionnaire focusing the target village and their household heads in the Dhankhali village of Shyamnagar upazila of Satkhira districts to identify the household. Shushilan with its expert survey team was conducted the study and developed questionnaire for baseline survey. The fieldwork was led by the Field Coordinator and main work done by the 2 data collectors. Before this, the Project Manager also recruited, trained, assigned, equipped, supervised, and compensated all enumerators and qualitative field workers to carry out the survey and required number of FGDs and KII. The survey team with expert executed for all field operations, including logistical arrangements for data collection and obtaining the consent of respondents. Shushilan was contact local officials and village leaders to explain the project and obtain community consent for the baseline survey. The team was obtained maps, lists and other community records as required.

Shushilan was collected 50 questionnaires at field level in Dhankhali village of Shyamnagar upazila. The project teams were also conducted 8 FGDs and 20 KII. The concerned ward member was provided list of household containing name of head of household, father/husband’s name, land owned and occupation of the household. From the list, 30 to 35 sample households were selected representing various land-holding and occupation groups and at least 5 of the sample households will be female-headed. The field coordinator was supervise and be responsible for quality assurance and timely execution of the data collection. Then the data was analyzed by the project manager and finally 12 household were selected for this project.

9.2 Pitcher development:
The project was constructed 15 numbers of pitchers by the assigned Potter/Mason group as per the Contract Agreement. Although, Pitcher is very sensitive that’s the broken possibility of the pitcher is so high. As a result, extra three pitcher has been made. The quality was assured by selecting skill and experience potter/mason. Quality of the construction works is very important for the sustainability of the pitcher. Concerned personnel was followed the quality of all the materials, the construction steps of the different components of the pitcher like; construction of main tank/reservoir and cover, joining of wall, placing of wire mesh, Ferro-cement laminating of pitcher, fitting & delivery pipes, setting of gutter and
flushing pipes, fixing the net in place etc. After the completion of the construction works of the pitcher concerned personnel was inspect the total works, he was taken necessary corrective measure if there is any deviation with design and drawing.

At the installation stage, the households were selected prior to baseline survey, FGDs and interview. It was also install based on different household size and social class like hardcore poor, poor, middle and upper classes concerning which class will sustainable use of pitcher regarding operation and maintenance and interest of the activity. 12 pitchers were installed based on above mention criteria. The pitchers size were 1.1 Meter in height and .9 meter diameter with a probable water holding capacity of 700 liters. , the Pitcher size of the round shape (locally called Chakty) for making the pitcher’s mouth and structure for making the body was reshaped and developed. Secondly, quality of mud was collected for making the pitchers durable. Thirdly, the pitchers were incorporated of plastic tap to easy use of pitcher water. However, both sides of the pitcher wall were laminated with white cement to increases longevity and bacterial protection against possible contamination due to porosity. The white inning of cement in the pitcher wall is help to identify any changes in water color, insects, mosquito etc. in the preservation water.

9.3 Capture of Rainwater:
Two types of catchment system was developed and used for harvesting of rainwater under this project. Firstly, four strong stands made by bamboo poles were used for hoisting the rectangular clothes or polythene with strong ropes to harvest rainwater during rain. The accumulated rainwater is collect by a bucket and preserve in the pitcher after filtration by plastic hand filter. Secondly, in another way, the rain water is harvest directly from tin roof through pipe. A plastic or tin shade was developed to use the down side of the tin roof with fully hygiene condition. And roof is used for the catchment of rainwater same way. Harvested water is transferred through pipe into pitcher.

9.4 Scientific Test of Water:
Rain water from the pitcher will be sample and/or be taken aseptically and transport to the laboratory within 4 hours or preserve the sample water between 2-8ºC before and after transport of laboratory in accordance with WHO guideline. All analysis of water quality parameters will carry in a renowned water testing authority (Iccddr’b, DPHE, BCSIR or Science Libratory) as per standard Methods of WHO guideline.

9.5 Lesson Learning Workshop
Through the project period a lesson learning workshop was arranged at union level involving all levels of stakeholders, government representative, community representative, beneficiaries and local civil society. The workshop was discussed about what lesson has learned by the project and what will do to get available pure drinking water over the year.

10. Involved stakeholders:
The selected households were participated during planning, installation area selection at their house, materials collection, design and implementation of the pitcher technology. The team of Shushilan were conducted FGD, KII with the proposed households to plan, select installation area, availability of materials, and design of the pitcher technology. The households were provided their suggestion as to
where the technology could be set up at their house. They will provide information on the availability of materials at their area which was easy for them to collect as well.

11. Methodology of your projects or activities:
The project was followed by participatory bottom up approach where standard pitcher technology was installed through active participation of local community as a whole or by need assessment through questionnaire, community and local leader consultation.

12. The number of direct beneficiaries of your projects or activities:
The project was covered 12 households through installation of pitcher technology at each household level at Dhankhali village under the Shaymnagar sub-district. Total 75 final beneficiaries whereas 50% is male and 50% is female, will be covered as direct beneficiaries under this project.

13. Achieved outcomes of your projects or activities:
Pitcher technology has been impacted society as a whole where people had got pure drinking water over the year as they expected since 1985s. Besides, this technology reduces water borne diseases like hepatitis, diarrhea, cholera, dysentery etc. and there is a major developmental impact in the society such as to decrease gender discrimination especially lessening the disturbance of female education because in our society women and girls do all the household chores and all household water is collected by them. Lack of safe drinking water and salinity intrusion, all pockets of sweet water is destroyed, that’s why people have to collect safe drinking water very far from their house. It takes huge time (more than 2-3 hours per day) to collect safe drinking water and hampers the education and working time of the women and girls. In addition, in the case of water carrying and latrine cleaning about 80% female member of household is responsible where male has negligible participation. Due to this women’s water carrying burden is declined and they have contributed in economy. And there is also a major developmental impact for the people to reduce the physical stress for water collection from long distance.

14. Pictures and questionnaires

A. Site photographs before your project (at least 1 picture)

B. Site photographs during the course of construction of your project (at least 1 picture)
C. Site photographs at the completion of your project (at least 1 picture)

A. Site photographs of your educational activities (at least 3 pictures)

B. Questionnaires for the participants
1. Name : ..............................................................................................................
2. Address : ...........................................................................................................
4. Number of family member : Male : Female :
5. Age limitation : 0-14 15-50 51-70

6. Drinking water sources : Ponds Tubwell PSF RW Others

7. Useable drinking water duration : Ponds water: ............ months ,
   Tubwell water:.......... months, PSF water: .......... months.
8. If other, such as : ............... Duration: ............ months.
9. Cost for collecting drinkable water per day: .........TK, Per month: ..........TK,
10. How many distance they cross for collecting drinkable water? ...........m/km

11. Tubwell water arsenic free? : Yes No

   If no, why they drink? : .................................................................
12. What problem they running with to drink this water? : .........................
13. Ponds / PSF water safe? : Yes No

   If no, why they drink? : .................................................................
14. What disease/problem come out to drink this water ? : .........................

   ............................................................................................................................
15. How many members infected by water related disease? 
16. Is rain water safe? : Yes No If no, why? : .................................
17. How many month it will be preserved :
18. If the preservation period not more than 3 months why and what problem create?

   ............................................................................................................................
19. Any alternative idea about safe drinking water : Yes No

   If yes, what and how? .................................................................

15. Conclusion, such as lessons learned, remaining issues for future activities.
Safe drinking water was the carrying need in Dhanthali Village to fulfill their minimum requirement
regarding drinkable water. The present project has open to new practices that may impact largely among
the community. This technology is cost effective and easy to maintenance that’s why people might be
more interest as an alternative option of pure drinking water over the year. More likely, some people
among the community have to adopt this technology of their own initiative following the present
activities because this technology easy affordable, cost effective and easy to maintenance. This
technology is also environmental friendly because no chemicals are requiring to preserve water with this
technology throughout the year. The technology is very favorable of women, girls old age, disability and children. Hardcore poor have to need subsidy to disseminate the technology during installation time investment. But lower middle class people are easily expense a little money to do these. It is also needed to put the pitcher in safe place or needed to use carefully because the concrete made pitcher is very sensitive. The people of coastal

**Working Scope in Future:**
- Need to participatory action research to demonstration the technology
- Month wise water data collection and scientific testing round the year especially in June to September
- The neighbor people of Dhankhali and coastal peoples are more demand of this modern pitcher day by day.
- The coastal community raise of their voice for more project of modern pitcher or extension of this project
- Need to improve and more locally useable pitcher technology manual
- Cost ratio analysis between pitcher and existing ones

### 16. Table of actual expenditures of your project/activity with the JWF Fund.

<table>
<thead>
<tr>
<th>Item</th>
<th>Content</th>
<th>Unit cost (US$)</th>
<th>Quantity</th>
<th>Amount (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household &amp; Installation Area selection, FGD, KII and others</td>
<td>Meetings, Discussion</td>
<td>20</td>
<td>5</td>
<td>100</td>
</tr>
<tr>
<td>Pitcher</td>
<td>12 Nos</td>
<td>57</td>
<td>12</td>
<td>686</td>
</tr>
<tr>
<td>Pitcher equipments</td>
<td>Bulti, stands, hand pump, tap, mouth cover of pitcher, cloth and Catchments etc</td>
<td>15</td>
<td>12</td>
<td>180</td>
</tr>
<tr>
<td>Scientific test</td>
<td>Cloiform, faecal coliform, faecal streptococci, total aerobic bacterial count, Pseudomonas spp., and the chemical parameters are pH and residual chlorine</td>
<td>25</td>
<td>12</td>
<td>300</td>
</tr>
<tr>
<td>Travel cost</td>
<td>Monthly</td>
<td>25</td>
<td>6</td>
<td>150</td>
</tr>
<tr>
<td>Stationeries and Mobile bill</td>
<td>Monthly</td>
<td>25</td>
<td>6</td>
<td>150</td>
</tr>
<tr>
<td>Documentation</td>
<td>Whole time</td>
<td>300</td>
<td>1</td>
<td>300</td>
</tr>
<tr>
<td>Workshop</td>
<td>One time</td>
<td>300</td>
<td>1</td>
<td>300</td>
</tr>
<tr>
<td>Local contribution if any (Community and organizational)</td>
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<td></td>
<td></td>
<td>6,66</td>
</tr>
<tr>
<td>Amount request to the JWF fund (up to 1,000US$)</td>
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<td>Amount Contribution to the Shushilan</td>
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<td></td>
<td>1,166</td>
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<tr>
<td>Total cost of completing the project</td>
<td></td>
<td></td>
<td></td>
<td>2,166</td>
</tr>
</tbody>
</table>

**Note that:** Due to unavailability of natural rainfall, Shushilan cannot expense scientific testing of pitcher water. But Shushilan committed to Japan Water Fund to collect the rain water during rainfall period (July to September) and scientific test and analysis of these collected data.