Bangladesh CTCN-TA Project

Stakeholder Consultation Report

April 2019

Contents

List of Tables

List of Figures

1. Introduction

1.1 Background and Scope of Stakeholders of TA Project

Due to sea-level rise, saline water intrusion is increasing in the coastal region of Bangladesh significantly while fresh water flow from the upper riparian countries is gradually decreasing. As a result, most of the land areas are becoming saturated with saline water, and potable water is becoming scarcer. Collecting fresh water is becoming a major task for the women and children in poor households. Technical assistance is required to install desalination plants or other desalination technologies at affordable prices in the households.

The first activity of the TA is to engage the relevant stakeholder of Bangladesh. Stakeholder engagement is one the most important ingredients for successful project delivery. Stakeholders can be defined as people or groups who are directly or indirectly affected by a project, as well as those who may have interests in a project and/or the ability to influence its outcome, either positively or negatively.

In this project, the stakeholder engagement is planned in two phases. First phase is to engage the national level stakeholders. The objectives are to introduce the project to relevant stakeholders, understand the challenges and problems they are facing, and collect input from their previous experiences and on-going efforts. Also, it is to gain consensus on key issues and thus increase the ownership of the project. To this end, an inception workshop was organized in Dhaka where relevant public and civil society stakeholders were invited. The second phase is to engage the district level stakeholders. This is also to introduce the project to the local stakeholders who are the direct beneficiaries of the project, capitalize on stakeholders' experiences, and gain stakeholders' consensus on key issues to make them more involved in the project. The district level meeting, initially planned in May but delayed due to Ramadan and Monsoon season, was organized at Khulna Division in September 2018. Local government officers and NGOs were invited and consulted.

2. Government Institution Stakeholders Meeting

2.1 CTCN-TA Inception Workshop Stakeholders Meeting (March 2018)

The workshop invited more than 40 national level stakeholders from the government, governmental technical agencies, research institutes, international organizations, and NGOs. The list of the organizations are as follows:

Table 1. List of Inception Workshop Participants

Type	Name
Government	Ministry of Environment and Forests
	Department of Environment
	Department of Public Health Engineering (DPHE)
Finance institutions	Palli Karma-Sohayak Foundation
	Bangladesh Climate Change Trust(BCCT)
Research and academic institutes	International Center for Climate Change and Development (ICCCAD)
	Center for Natural Resource Studies(CNRS)
	Bangladesh University of Engineering and Technology(BUET)
	Jagannath University
	Center for Environmental and Geographic Information Services (CEGIS)
International organizations	UNDP
Local communities	Khulna, Koyra
NGO	Action Aid
	Bangladesh Rural Advancement Committee (BRAC)
	Bangladesh Unnayan Parishad (BUP)

The workshop included a thorough discussion of the options and challenges to address the sustainable, low-cost housing and water technology issues in coastal Bangladesh. During the workshop the stakeholders came up with a number of valuable outcomes. The outcomes of the workshop have taken two distinct shapes recommendations and decisions.

The participants put forward some recommendations for consideration by the responsible authorities:

1. The CTCN technical team should consult with PKSF, particularly its management professionals and local officials who were engaged in preparing this CTCN TA proposal. They are believed to have valuable ground level experience on the issues concerned.
2. Some community people have traditional knowledge and wisdom about low-cost housing and water purification technology which will be highly valuable in identifying the viable and sustainable

technologies for the two sectors at the household level. They need to be actively engaged in this TA project.

3. Already there are many housing, and water purification technologies which are in practice at the community level. These technologies can be carefully checked whether they fit into a household level.

4. Concerned government agencies, donor agencies, and even local NGOs have carried out research addressing housing and water problems existed in the coastal region of the country. The research reports should be carefully reviewed. Consultation of the existing literature will help develop a better understanding to find the better technology solutions to the problems.

5. Technology solutions may vary from region to region. Most probably, the viable housing and water technologies of Khulna, Satkhira, and Bagerhat might be different from those of Chittagong and Cox's Bazar just because of variation in geomorphology. It should be kept in mind while carrying out a site visit and community consultation.

6. Consultation meeting may be held with the media people of the coastal region. Sometimes they write investigative reports on water purification and housing problems. They might have valuable knowledge and experience on the issues concerned.

7. There might be a consultation meeting with the representatives of the local NGOs who are working for a long time to address the water and housing problems of coastal Bangladesh. They have valuable practical knowledge and documentation. These might have highly useful in this project.

Figure 1. CTCN-TA Inception Workshop Meeting

2.2 DoE, PKSF Managing Public Officials Meeting (July 2018)

The water sector of the CTCN-TA project focuses on proposing a solution for household water desalination and purification technology applicable to the southern coastal region of Bangladesh. However, it was necessary

to identify the ongoing drinking water support programs of Bangladesh government agencies in the southern areas of Satkhira and Bagerhat or of community Village or region-based institutions, and to consider additional factors reflecting the current situation in the flooded areas. Therefore, a meeting was held in the Department of Environment (DoE) conference room with representatives of the DoE and the Palli Karma-Sahayak Foundation (PKSF), the key stakeholders of the CTCN-TA project. In particular, in addition to introducing the CTCN-TA project with the stakeholders in charge, additional opinions and requirements for the field were discussed along with the details of the empowerment training and the scope of the participants.

Table 2. List of DoE Meeting Attendees

Type	Name	Gender
DoE (Department of Environment)	Mirza Shawkat Ali, DoE Director	
	Dilruba, DoE assistance	
PKSF (Palli Karma-Sahayak Foundation)	Fazzle Rabbi Sadeque Ahmed, PKSF Director	
GAT (Glory & Tech Co., Ltd.)	Mr. Dong Jin YANG, Research Director	
	Ms. Jiwon KIM, Researcher	
GTC (Green Technology Center)	Ms. Rywon YANG, Researcher	

Local officials in Bangladesh who attended the meeting were key stakeholders already involved in the CTCN-TA project at the Inception Workshop and proposed the direction of the project. Therefore, the researchers of GAT and GTC from Korea mainly discussed the direction of the CTCN-TA project rather than a detailed explanation of its content. Thus, in addition to exploring solutions for the ongoing CTCN-TA household water desalination and purification project, Korea's representatives proposed the need for a community-based public drinking water facility that can remove various harmful substances from groundwater considering that in the groundwater of Satkhira and Bagerhat, there are various substances problematic to drinking water such as iron, arsenic, and ammonia, in addition to salts. This is in addition to domestic water purification technology focusing on desalination.

In particular, Jiwon Kim, a researcher, presented examples of providing safe drinking water to local villagers and maintaining public drinking water facilities that were constructed by GAT, a participant in the CTCN-TA project, as the village-level drinking water facilities in rural areas of Cambodia, Myanmar, and Vietnam where public water supply is not available. She suggested that Bangladesh should also establish a drinking water supply system using household water purification equipment and the villages' public water facilities.

Fazzle Rabbi Sadeque Ahmed, a director of PKSF, noted that many public drinking water supply facilities had been installed or are currently being installed in Bangladesh. Even though drinking water supply facilities have been installed, at least 90 per cent of them are not being operated due to lack of proper maintenance for various

reasons. Mr. Ahmed also advised to carry out a redundancy review for current projects because the Department of Public Health Engineering (DPHE) is progressing various public and household drinking water supply projects in the regions of Satkhira and Bagerhat. In particular, he stated that it would be better to focus on the household level desalination technology solutions needed for Bangladesh's coastal areas, and that if new technologies are introduced, then yet another complex procedure would be needed for the actual users—the local residents—to learn and use the new technology or equipment.

Figure 2. DoE, PKSF Stakeholders Meeting

Mirza Shawkat Ali, a director of the DoE, stated that not only the CTCN-TA project but also the public drinking water supply projects are good projects, and that unlike household water purifiers, the public water facilities should be installed in public places such as schools and made available to many local residents. Jiwon Kim, Researcher of GAT explained that all public drinking water facilities installed in other countries such as Cambodia are mainly installed in schools because of the accessibility to local residents and the ease of maintenance.

Dilruba, a DoE assistant, stated that because people in Bangladesh need safe and clean drinking water, they need household water purifiers as well as public drinking water facilities. She inquired as to whether all the harmful components of the groundwater in the southern coast of Bangladesh could be removed and how they are removed.

Jiwon Kim explained that public drinking water facilities installed in Cambodia and Myanmar are composed of treatment filters for each hazardous substance in groundwater and can be purified by combining filters for each hazard component. For example, the iron and manganese components in the groundwater in Bangladesh can be removed with manganese dioxide filters, arsenic with iron oxide + arsenic adsorbent filters, and turbidity and microorganisms with hollow fiber filters. Particularly, salt components can be removed with

reverse osmosis filters. Kim further pointed out that it is important for this drinking water to meet the drinking water standards of the water quality tests of accredited institutions and for the facilities to be under constant maintenance.

In addition, the GTC's researcher Rywon Yang suggested that the CTCN-TA project stakeholders should be trained in empowerment training in November and December 2018. Directors Fazzle Rabbi Sadeque Ahmed and Mirza Shawkat Ali cited their busy schedules during Bangladesh general elections in December and expressed their preference for empowerment training in November.

In addition, they agreed that the participants of the empowerment training would include the central government officials in charge of the CTCN-TA project, local government officials and NGOs living in Khulna, Satkhira, and Bagerhat, and local residents. The Bangladesh BUP was recommended as the overall organizing agency for the empowerment workshop, and was tasked with planning the workshop location, recruitment, contacting the participants, and invitations. The detailed proceedings would be discussed at a future time.

Table 3. Main Opinions of DoE Meeting Attendees

Comments Number	**Comments Received from Government officials**
1	Fazzle Rabbi Sadeque Ahmed, PKSF Director Water purifying technology for the community already exists and there have been many experiences of a community-based system, but 90% are not working. Also, because DPHE (Department of Public Health Engineering) plans to support drinking water at the village level in the Satkhira, Bagerhat region, redundancy in the water support project at a community level should be checked.
2	Fazzle Rabbi Sadeque Ahmed, PKSF Director The technology that is the most needed in the coastal areas of Bangladesh is a water purifier for home use. When a new technology comes in, it takes a long time to learn it, and there are many complicated procedures such as technical support, adaptation, and acceptance by residents.
3	Mirza Shawkat Ali, DoE Director This is a good project because there is a need for constant maintenance. A proper site for the construction of the water supplies would be public sites such as schools. Jiwon Kim, Researcher of Glory & Tech Co., Ltd. All water supply facilities that Glory & Tech Co., Ltd. has done were placed in schools due to the convenience of maintenance. Therefore, Glory & Tech Co., Ltd. is also

	planning to build the facilities in schools in Bangladesh.
4	Dilruba, DoE assistance All filter options are included in one filter. Jiwon Kim, Researcher of Glory & Tech Co., Ltd. One filter has one purification system. Glory & Tech Co., Ltd. combines the different filters depending on the initial water quality

2.3 DoE Khulna Division Regional Managing Public Officials Meeting (September 2018)

Khulna division is one of the eight divisions of Bangladesh. It comprises administrative districts, namely Bagerhat District and Satkhira District. With the coordination of the Department of Environment in Dhaka, the local level kick-off meeting was held on the 11th of September 2018 at the Department of Environment Khulna Division Office. The objective of this meeting was to introduce the TA project to the local stakeholders. The objective, activities, implementation plan and expected outcomes were explained to the participants of the meeting. Also, the expectation of the participants was shared and discussed. The participants were as following:

Table 4. List of DoE Khulna Division Meeting Attendees

Type	Name	Gender
DOE Khulna Division Office	Md. Habibul Haque Khan, Director of DOE Khulna Division Office and the staffs	
NGF (Nowabenki Gonomukhi Foundation)	Mr. Sadar Zia Uddin	
	Mr. SM Mahabub Alam	
KICT	Dr. Tae hyeob SONG	
	Dr. Chansoo JEON	
GAT	Mr. Dong Jin YANG	
	Ms. Jiwon KIM	
	Mr. Woo-seok LEE	
Rodem Foundation	Mr. Du-suck HONG	
	Mr. David Halder	
CTCN Media team	Mr. Mohammad Hasan	

The Nowabenki Gonomukhi Foundation (NGF) participated in the kick-off meeting and the site survey conducted after the meeting.

Md. Habibul Haque Khan, the Director of the Department of Environment Khulna Division Office, welcomed the project. Md. Khan explained that in urban areas the provision of safe water is a challenge. The increasing prevalence of droughts is affecting surface water and shallow tube wells and the situation might deteriorate

with the climate change. Meanwhile, the coastal areas are affected by the salinity intrusion from rising sea levels which limits the availability of fresh surface and groundwater. Therefore, tube well is not appropriate due to the excess salinity of the groundwater. Deep tube well might contain fresh water, but it has a high concentration of iron and arsenic. Therefore, the local residents rely on the rainwater and pond water which contains virus and bacteria. The problem of drinking water is not only for the people with low-income but for all the communities in the region. In Khulna Division, many water supply improvement projects are being carried out. While there is extensive support available in strengthening the climate resilience of the region, many projects focus on the urban and peri-urban areas. Md. Habibul Haque Khan insisted that there should be additional focus on the rural area of the Khulna Division.

Figure 3. DoE Khulna Division office Stakeholders Meeting

Md. Habibul Haque Khan expressed his full support. He also added that he wishes smooth implementation of the TA and from the outcome of the TA, he expects the people of the coastal area could have improved access to clean and safe water and living environment.

The Nowabenki Gonomukhi Foundation is a non-profit management organization accelerating finance for the rural community. It is a partner organization of PKSF with experience in providing clean water to coastal areas of Satkhira and Bagerhat District. Mr. Uddin and Mr. Alam of NGF informed about the activities they carried out in the Satkhira and Bagerhat district. They set up water treatment plans for purifying water and serving pure drinking water to the habitants of the Satkhira district. The water purifying plant was established using reverse osmosis process. The technology was tested by BUET and certified by BSTI. NGF has been monitoring marketing and maintaining the project and machines for more than 4 years.

The meeting was concluded with active participation of the attended stakeholders. Following were the key considerations identified during the meeting to be taken into account during the implementation of the TA:

1) There are high demands in the coastal region, especially in the rural area, for easily applicable and manageable water treatment technology and housing technology.

2) Many NGOs are active in installing water treatment facilities in the rural areas of the coastal zone.When selecting the project sites for potential piloting, the ongoing and existing projects need to be considered in order to avoid duplication or collision.

3) The problem of water quality in the coastal zone is not limited to its salinity but also related to iron, arsenic, and other impurities. Though some of these problems are not directly related to the climate change issue, these issues amplify the overall health problem caused by water.

4) The past and on-going projects have faced various obstacles during the implementation: absence of the source of financing to cover the operating and maintenance (O&M) cost; capacity and experience to conduct the O&M; risk of low social acceptance to new technology; and low public awareness on the water quality.

2.4 DPHE Managing Public Officials Meeting (November 2018)

A separate meeting was held with Md. Saifur Rahman, management engineer for Groundwater Circle at the DPHE. The participants from GAT and GTC heard from Md. Saifur Rahman an explanation on the Bangladesh government-level drinking water supply support projects in Satkhira and Bagerhat. The redundancy and interference of the ongoing southern coastal drinking water support projects in Bangladesh with the CTCN-TA project were confirmed.

Table 5. List of DPHE Meeting Attendees

Type	Name	Gender
DPHE (Department of Public Health Engineering)	Md. Saifur Rahman, Superintending Engineer	
GAT (Glory & Tech Co., Ltd.)	Mr. Dong Jin YANG, Research Director	
	Ms. Jiwon KIM, Researcher	
GTC (Green Technology Center)	Ms. Rywon YANG, Researcher	
	Ms. Sookyoung LEE, Researcher	

Figure 4. DPHE Stakeholders Meeting

Md. Saifur Rahman stated that rainwater harvesting systems and reverse osmosis (RO) water purification systems are typical examples of underground saline water damage mitigation projects currently being implemented in the Bangladesh coastal areas where public water is not provided. Thus, in the case of rainwater harvesting devices, national support and funds are provided for each household; the RO system requires high and maintenance costs and expertise. Md. Saifur Rahman stated that maintenance is mainly managed by village-level organizations (primarily NGOs). To this end, Rahman added that the DPHE has also conducted a variety of fundraising activities to supply and install water treatment devices in the southern part of Bangladesh. The fundraising activities are listed below. The following table shows the amount of official funds for various drinking water equipment supplied to regions of Bangladesh without public water supply.

Table 6. Official Funds of Bangladesh Drinking Water Facilities (Source: DPHE Website)

	Drinking water equipment type	Funds per device (Taka)
1	Shallow Tubewell	1500.00
2	Deep Tubewell (No. 6 Pump)	7000.00
3	Tara (Shallow)	2500.00
4	Tara (Deep)	7000.00
5	Ring Well	3500.00
6	Pond Sand Filter (PSF)	4500.00
7	SST/VSST	2500.00
8	Rain water harvesting system	1500.00

Md. Saifur Rahman stated that drinking water facilities are currently severely lacking in Satkhira and Bagerhat, and that both require the supply of household water purification equipment and additional public drinking water facilities through the CTCN-TA project. Thus, he stated that it is necessary to provide safe drinking water to residents in the southern part of Bangladesh through more drinking water support programs, as well as through drinking water support projects at the central government level. He also hoped that these support projects would be extended to the eastern regions of the southern coast of Bangladesh, such as Cox's Bazard, which would require extensive budgetary resources and support.

3. Regional Stakeholders Meetings

3.1 Sathkira, Bagerhat Regional Residents Meeting

In June 2018, a satisfaction survey regarding drinking water use was conducted for residents of 30 households in each of Satkhira and Bagerhat. The majority of residents in the Satkhira area, which has relatively poor facilities and higher salt content in the groundwater, expressed dissatisfaction with drinking water use. They were distrustful of drinking water and requested the installation of new drinking water facilities. On the other hand, Bagerhat residents' satisfaction with existing drinking water facilities was relatively high.

Table 7. Water use satisfaction of Satkhira and Bagerhat

District	Satisfied households	Unsatisfied households	Total
Satkhira	1	29	30
Bagerhat	27	3	30

In mid-September 2018, we visited Satkhira, a district in which satisfaction with drinking water was low and invited 20 residents from 10 villages in Tala Upazila to participate in a survey on the status of drinking water use. Most local residents wanted to receive safe drinking water at an inexpensive price. The residents who participated in the survey are as follows.

Table 8. List of Participants in Satkhira District, Tala Upazila Survey

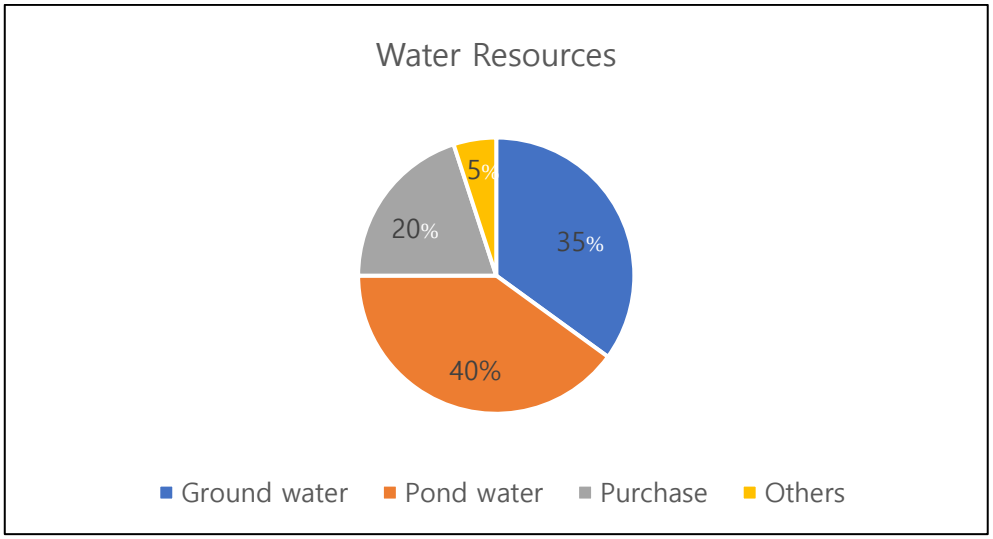
No.	Name	Address
1	Khoken mondol	Kheshora
2	Misty Sarkar	Kheshora
3	Prosanto Sarkar	Balia
4	Nilu Sarkar	Balia
5	Jarman Shingh	Shreemonto Kathi
6	Nira Sarkar	Shreemonto Kathi
7	Mikel Sarkar	Fotepur
8	Alomger Hossen	Fotepur
9	Komol Sarkar	Solua
10	Usha Sarkar	Solua
11	Shanti Das	HoriDhali
12	Sonaton Das	HoriDhali
13	Biplop Das	Khanidiya
14	Rampodo Das	Khanidiya
15	Biplop Sarkar	Khanpur

16	Kunju Sarkar	Khanpur
17	Bappi Sarkar	Tali Kupi
18	Gobindo Das	Tali Kupi
19	Joydeb Das	Muragacha
20	Robin Das	Muragacha

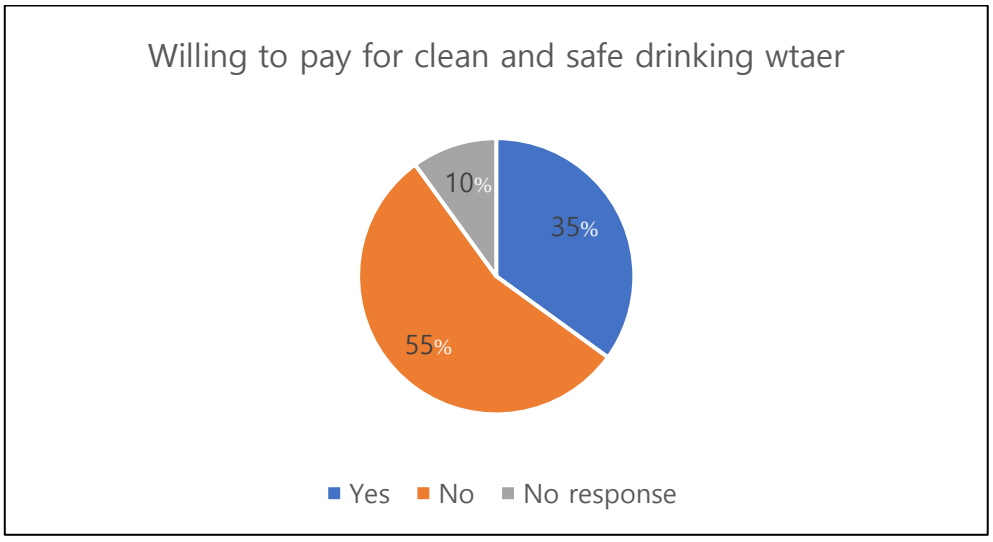
Figure 5. Satkhira District, Tala Upazila Regional Village Residents Meeting

The results of the residents' survey showed that most residents hoped to receive safe drinking water and be able to buy drinking water at inexpensive prices or receive continuous support.

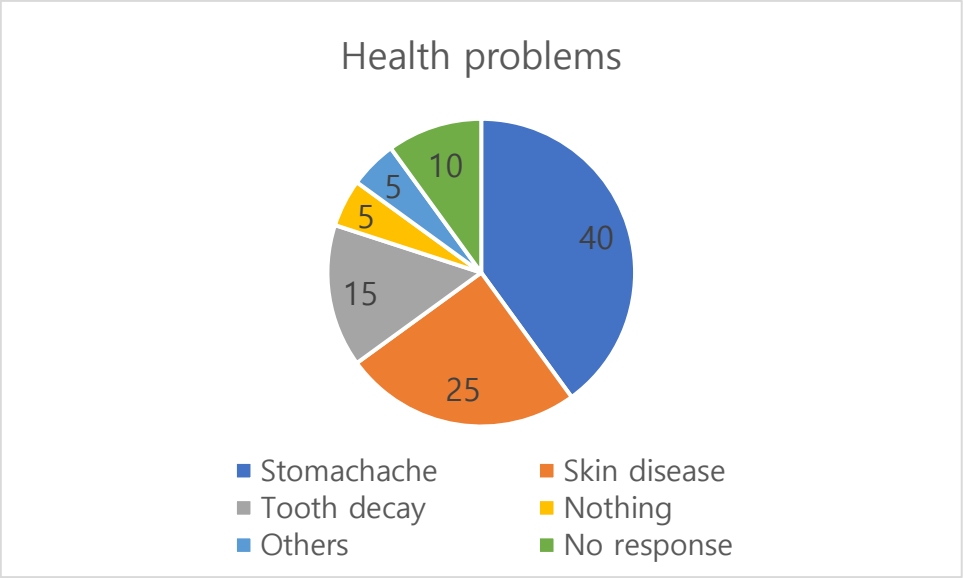
First, the main water source of the Satkhira region is underground water. It is used by the residents of the Satkhira region as drinking water source using Shallow Tube Well. Some use bottled water directly. Very few have used rainwater as the source of drinking water. It was found that local people purchased 60 to 180 liters of drinking water per month and paid for it an average price of 60 to 180 Taka per month. The residents thought drinking water was expensive and wanted to be cheaper.



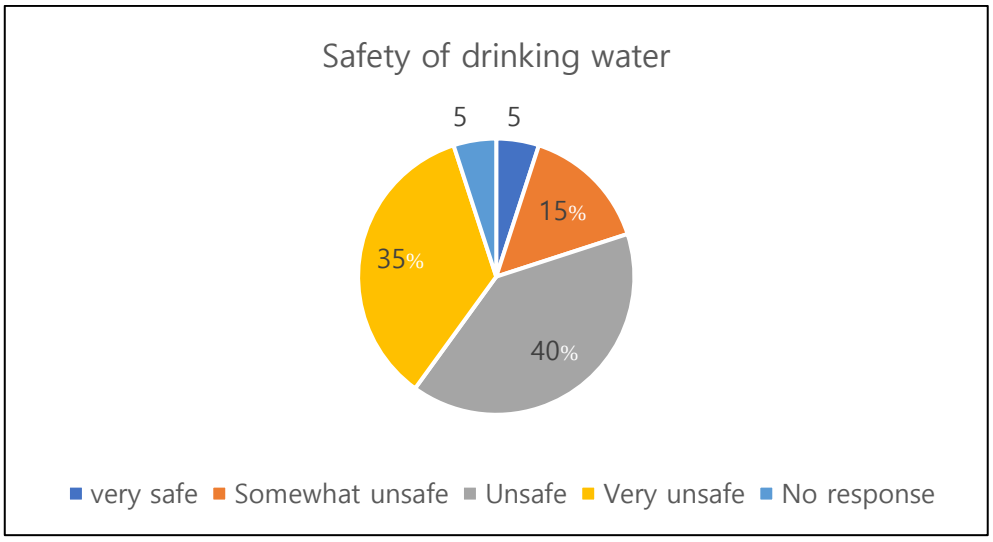
However, due to poor economic conditions of the people of Satkhira, only 35 per cent of respondents were willing to pay for safe drinking water, and the rest were unwilling to pay for drinking water. This suggests that a system should be introduced for the local people to supply drinking water at minimum cost or free of charge.



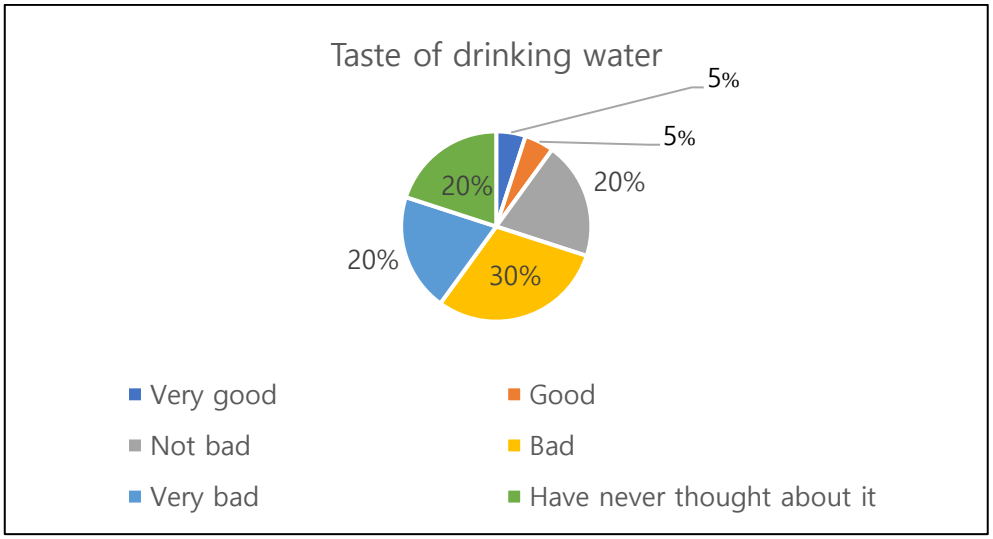
Next, residents were asked about possible health problems when using local water. In the results of multiple responses, stomachache was the most common heath issue caused by unsafe local water, followed by skin diseases and tooth decay.



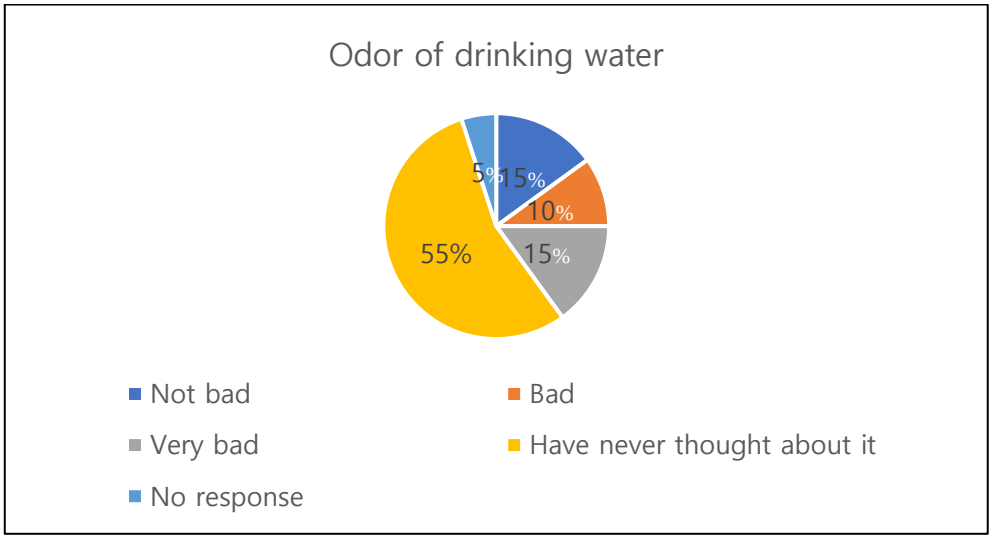
Residents also showed high distrust of the stability of drinking water. Nearly 90 per cent said drinking water would not be safe. However, there was no recognition of which of the water ingredients was a risk factor, and despite such distrust, local people were using groundwater or pond water as drinking water.



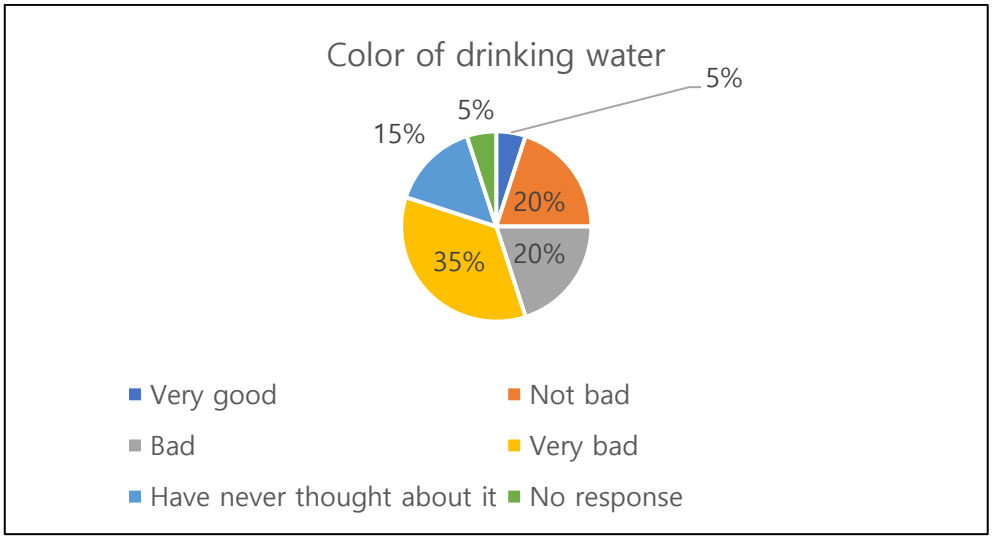
Local residents were questioned about the taste and smell of water. As a result, half of the respondents said that the taste was bad, only 10 percent said the water tasted good, and the rest said that it was not bad for the taste of water or they had never thought about the taste of water at all.



Only 15 per cent of the respondents said that the smell of water was not bad, while 25 percent acknowledged the bad smell, but more than half said they had never thought about it. People who responded to the smell said that the water usually smells like fish and iron.

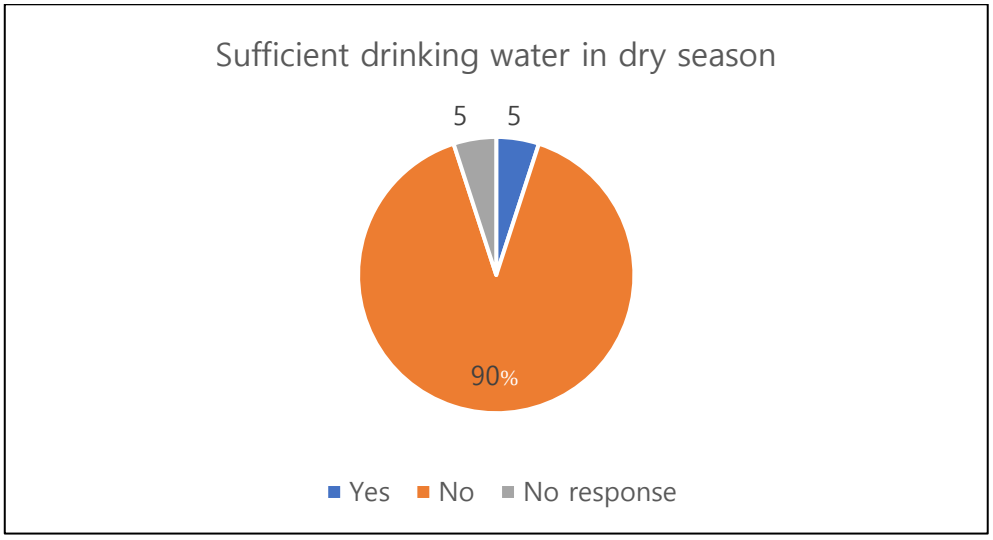


About the color of the water, more than half of the respondents thought the color was bad. In fact, underground water turns red in the air and forms sediment with an iron ingredient.



Also noteworthy is that Bangladesh has distinct dry and rainy seasons, with the majority of its drinking water lacking. When drinking water is missing, they could go far and bring in drinking water from faraway villages, use rainwater from pots, purchase drinking water, or boil underground water from Tube Well.

Waterworks providing drinking water facilities that had been distributed to villages by government agencies or outside organizations for local people were examined during the survey because they are currently underutilized. 15 per cent of the respondents said that the reasons for not using public drinking water facilities were: the cost, bad taste, and long distance. Local residents responded that the most necessary thing to secure drinking water was to use the water purification filtering system, but it was difficult to use the system due to the cost of the facility and water purchase.



3.2 Sathkira, Bagerhat Regional Representatives Meeting

The project team listened attentively to the opinions of the representatives from the villages in Satkhira and Bagerhat. The representatives for each village are as follows.

Table 9. List of Satkhira and Bagerhat Regional Village Representatives

Representative name	District	Village of jurisdiction
MD. RAJIB HOSSAIN	Satkhira	Khesora, Salua, Kanaidiya
ABU SHAMIM ASHNU	Bagerhat	Korori

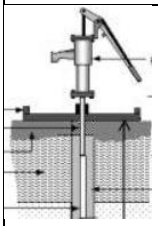
Md. Rajib Hossain, the representative of the Satkhira district and the three villages of Khesora, Salua, and Kanaidiya (total population: 32,225), stated that in Satkhira drinking water is secured through shallow tube wells, ponds, filters, and rainwater harvesters. However, the majority of water does not go through a purification process. He suggested that the shallow tube wells and rainwater harvesting methods should be improved to secure drinking water.

On the other hand, Abu Shamim Ashnu, a representative of Bagerhat and the village of Korori (population: 18,500), suggested that deep tube wells should be used to ensure safe water quality and that it is necessary to increase the number of deep tube wells for the poor in the region.

Annex1. Local Survey Form for Regional Representatives

Village Representative Information and Major Ideas for Bangladesh

Survey Date:

<table>
<tr><th>Items</th><th colspan="5">Details</th></tr>
<tr><td rowspan="2">Village Information</td><td colspan="5">1) Select your Area: Bagerhat ( ) or Satkhira ( )
2)Name of Village: Khesora, Salua, Kanaidiya</td></tr>
<tr><td colspan="5">1) Village Population: Person
2) The numbers of Households:</td></tr>
<tr><td>Name of Village Representative</td><td colspan="5"></td></tr>
<tr><td>Contact information</td><td colspan="2">Phone:</td><td colspan="3">E-mail:</td></tr>
<tr><td rowspan="4">Key Opinions of Village Representative</td><td colspan="5">Question1. What are the main types of drinking water supplies in your area? (Multiple responses available)</td></tr>
<tr><td>  </td><td>  </td><td>  </td><td>  </td><td>  </td></tr>
<tr><td>Shallow Tube Well
( )</td><td>Pond Sand Filter
( )</td><td>Rainwater Harvester
( )</td><td>Piped Water Supply
( )</td><td>Reverse Osmosis Plant
( )</td></tr>
<tr><td colspan="5">Question 2. Are existing drinking water facilities well utilized?</td></tr>
</table>