
**SALINE WATER PURIFICATION TECHNOLOGY AT HOUSEHOLD
LEVEL AND LOW-COST DURABLE HOUSING TECHNOLOGY
FOR COASTAL AREAS OF BANGLADESH**

Stakeholder consultation report
Durable housing technology solutions

KICT

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1. INTRODUCTION

Due to sea-level rise, saline water intrusion is increasing in the coastal region of the country 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.

The first activity of the technical assistance (TA) is to engage the relevant stakeholder of Bangladesh. Stakeholder engagement is the most important ingredients for successful project delivery. Stakeholders could 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. BACKGROUND

The objective of the CTCN¹ Technical Assistance is to support the climate vulnerable coastal areas of Bangladesh and the Palli Karma-Sahayak Foundation (PKSF) with the identification and introduction of household level desalination technique(s) as well as low-cost salinity proofed housing option(s) in coastal areas of Bangladesh. The contract was awarded by UNIDO (United Nations Industrial Development Organization) to a Korean Consortium Team led by the Green Technology Center Korea (GTCK).

The Project Consortium team was formed between three Korean organizations: The Green Technology Center, a policy research institute on climate technology cooperation under the Ministry of Science and ICT (MSIT), Korea Institute of Civil Engineering and Building Technology (KICT), an eminent public R&D institute in building technology and environmental engineering, and Glory & Tech Co., Ltd (GAT), a cooperation specialized in solving water problems in developing countries.

3. KICK OFF MEETING 2018.02.05 – 2018.02.07

This meeting was to initiate the first dialogue between Bangladesh counterparts (the Ministry of Environment, Forest and Climate Change, Palli Karma-Sahayak Foundation) and other relevant stakeholders such as government and government technical agencies.

A. Day 1 (2018.02.05)

Kick Off Meeting on 5th Feb at PKSF office	
Attendee	Md. Abdul Karim, PhD (M). Fazle Rabbi Sadeque Ahmed (M) (PKSF) Dr. Chang U Chae (M), Jun Seok Choi (M) (KICT) Gyung Nam Shin (M), Chang Sun Jang (M), Ry Won Yang (F) (GTC) Sang Ho Lee (M) (Kookmin University)

Palli Karma-Sahayak Foundation (PKSF) conducts climate change-related programs in Bangladesh. It oversees the CTCN project, GCF project, and WB project. This kick off meeting was held on February 5, 2018 to engage relevant stakeholders from Bangladesh. In this meeting, KICT introduced the work they have done relating to this project and presented alternative technology suggestions for low-cost durable housing suitable for the socioeconomic and climatic conditions in Bangladesh. After this quick introduction of the

¹Climate Technology Center & Network is an implementing arm of Technology Mechanism under UNFCCC.

CTCN TA team, PKSf commented that they plan to commercialize this project’s results. PKSf’s expectations from the Korean professional organizations seemed to be very high with regard to housing, and PKSf has promised to support Korean organizations in conducting smooth research on this project. In addition to this, PKSf requested us to focus on “durability” rather than on “low cost” for housing.



Kick Off Meeting on 5th Feb. at DoE office	
DoE	Mirza Shawkat Ali (M), Dilruba Akter (F)
KICT	Dr. Chang U Chae (M), Jun Seok Choi (M)
GTC	Gyung Nam Shin (M), Chang Sun Jang (M), Ry Won Yang (F)
Kookmin University	Sang Ho Lee (M)

DoE in Bangladesh had requested UN CTCN team for Korea’s proposal to be given preference over other countries’ proposals. The reason is that Korea already had experience in dealing with developing countries, and DoE thought that it might benefit Korea in developing technology proposals for Bangladesh. At this time, DoE promised to invite various relevant stakeholders for future meetings such as for the Inception meeting that would be held at the end of April. Through this meeting, DoE reminded the TA team that a few more workshops would be held during this project. As these workshops should be carried out with local residents of the southern coast of Bangladesh, DoE requested the TA team to arrange a specialist to interpret between Bengali and English. In addition,

discussion was conducted to clarify who would be the subjects for the final training workshop that was to be held in November, and whether the participants would be from private businesses, local government officials, or whether a union should be included.



Kick Off Meeting on 5th Feb. at HBRI office	
HBRI	Mohammad Abu Sadeque (M), M.A.Wahed (M)
KICT	Dr. Chang U Chae (M)
GTC	Gyung Nam Shin (M), Chang Sun Jang (M), Ry Won Yang (F)

The Housing and Building Research Institute (HBRI) is an autonomous organization under the Ministry of Housing and Public Works of Bangladesh. HBRI’s role was to help KICT understand Bangladesh’s situation and provide consultation during this project. HBRI was willing to join this CTCN project with KICT. Director (CEO) of HBRI, Mr. Mohammad Abu Sadeque Peng, advised us that there would be some restriction due to laws and regulations related to construction and building materials on the southern coast of Bangladesh; he promised to help KICT in reviewing those parts. He also introduced an HBRI booklet on housing standard guidelines regarding climate disasters, and encouraged KICT to use this booklet to understand the Bangladeshi building status and current durable housing technologies. Mr. Sadeque also emphasized that this project aims to improve the quality of life of people living on the southern coast of Bangladesh and asked KICT to focus on “high quality of durable housing.”



B. Day 2 (2018.02.06)

Kick Off Meeting on 6th Feb. at DoE office	
PKSF	Md. Abdul Karim (M), PhD. Fazle Rabbi Sadeque Ahmed (M)
DoE	Mirza Shawkat Ali (M), Dilruba Akter (F)
KICT	Dr. Chang U Chae (M), Jun Seok Choi (M)
GTC	Gyung Nam Shin (M), Chang Sun Jang (M), Ry Won Yang (F)
Kookmin University	Sang Ho Lee (M)

Another meeting with DoE was held on Feb 6, 2018, where DoE emphasized that the final goal of the project is to improve the quality of life of the Bangladeshi people. Their expectations from the TA team seemed to be very high and they promised to extend their full support on this project. The main contents of this meeting included the introduction of the CTCN project and the presentation of plans for this project by the TA team. DoE reminded the TA team that this project is about adaptation to climate change and not about the reduction. For example, degradation of building material due to temperature rise and degradation of living environment due to room temperature rise should be addressed in terms of adaptation. Therefore, the proposed housing technologies should be approached from the viewpoint of adaptation.



C. Day 3 (2018.02.07)

Kick Off Meeting on 7th Feb. at KOICA office	
KOICA	Hyun Kyu Cho (M)
KICT	Dr. Chang U Chae (M)
GTC	Gyung Nam Shin (M), Chang Sun Jang (M), Ry Won Yang (F)

For smooth progress of the CTCN project in Bangladesh, the TA team requested KOICA Bangladesh to participate in this project as well. The KOICA Bangladesh office was committed to undertaking projects in neighboring countries such as Bhutan, and it was not easy for them to participate in this project in 2018. However, the office promised to carry out budget adjustments so that they could participate in 2019.



Kick Off Meeting on 7th Feb. at PKSF office

Attendee	PhD. Fazle Rabbi Sadeque Ahmed (M), Rabi Uzzaman (M) (PKSF) Dr. Chang U Chae (M) (KICT) Gyung Nam Shin (M), Chang Sun Jang (M), Ry Won Yang (F) (GTC)
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Another meeting was held with PKSF on Feb 7, 2018. As a co-financer, PKSF was willing to invest funds in this project, which would be discussed at an appropriate time in the future. Bagerhat and Satkhira were selected from five proposed regions. Additionally, PKSF would hire an external NGO that works in the selected areas for cooperation. PKSF requested the TA team to visit one or two villages in the two selected regions. PKSF suggested several ways to visit these selected sites: 45 minutes from Dhaka airport to Jessore airport by plane and another 3 to 4 hours by car, or 10-12 hours by car from Dhaka. PKSF promised to contact and coordinate with a local NGO to provide support to the TA team on their visit by arranging vehicles and accommodation. PKSF would send some lists and CVs of local experts at the selected site, and PKSF requested the TA team to prepare all presentation materials in Bengali and English for the regional launch meeting.

4. INCEPTION MEETING 2018.04.02 – 2018.04.04

A. Day 1 (2018.04.02)

Inception Meeting on 2 nd Apr. at HBRI office	
HBRI	Mohammad Abu Sadeque (M), M.A.Wahed (M)
KICT	Dr. Chang U Chae (M), Dr. Tae Hyeob Song (M), Sanghee Kim (F)
BOF KOREA	Young Wan Kim (M)

HBRI was willing to support KICT for this CTCN project. HBRI had published housing guidelines regarding climate disasters jointly with the UNDP titled “Standard guidelines for rural housing in disaster-prone areas of Bangladesh” in March. HBRI kindly gave KICT a copy of this booklet and it mostly covers the northern areas of Bangladesh; hence, Satkhira and Bagerhat sites are not included. However, this booklet includes minimum standards for adequate housing and durable housing designs, and so on, for natural disaster-prone areas and it would help KICT understand the situation in Bangladesh before the field trip for survey. HBRI’s CEO had mentioned the necessity of reviewing laws and regulations for building materials, for instance, the use of burned-brick with mud and corrugated sheets was prohibited because it flies during hurricanes. Mr. Sadeque emphasized and asked KICT to focus on "affordable and reasonable price with durable housing techniques" rather than “low cost.” There are no laws and regulations regarding rural housing in Bangladesh but this project might provide an opportunity to formulate them.



B. Day 2 (2018.04.03)

Inception Meeting on 3 rd Apr. at DoE office	
PKSF	Md. Abdul Karim (M), PhD. Fazle Rabbi Sadeque Ahmed (M)
DoE	Mirza Shawkat Ali (M), Dilruba Akter (F)
GTC	Chang Sun Jang (M), In Hye Park (F)
HBRI	Mohammad Abu Sadeque (M), M.A.Wahed (M)
KICT	Dr. Chang U Chae (M), Dr. Tae Hyeob Song (M), Sanghee Kim (F), Dr. Jun Seok Choi (M), Dr. Yun Chul Woo (M)
BOF KOREA	Young Wan Kim (M)
BUET	Dr. Khandaker Shabbir Ahmed (M)

The inception meeting was held on April 3, 2018 at Chamely conference center at the DoE office. The DoE director introduced CTCN technology-transfer initiatives in Bangladesh under UNFCCC, and PKSF made a presentation on their experiences in coastal housing and saline water purification in rural Bangladesh. The TA team explained the project overview and possible technology options for housing and desalination.

Most stakeholders agreed that decrease in durability in the coastal area is a significant problem and technology solutions must be found for this. They also mentioned that “durability” does not mean “resilience.” HBRI CEO, Mr. Sadeque, told us that HBRI had already surveyed the coastal area for publishing building guidelines but focused on the northern area. He commented that the southern coast might need wood, and bamboo technologies for now, but he emphasized on “durability.” Further, he said that buildings are not used for merely 1 or 2 years, therefore, they should be assessed after 30 years of use. Bangladesh needs to layout a plan for the next generation and adopt new technology solutions as well. The Ministry of Agriculture in Bangladesh presented the problem of earthquakes in southern coast area and informed us that a team from Netherlands had worked on a project called “Low cost housing related to climate disaster.” PKSF also requested the TA team to focus on architectural aspects (flat area, community center, resilience) as well as engineering aspects (material durability, multi-residential construction, structural safety). Housing durability means the durability of materials and construction methods. DoE emphasized that it is necessary to clarify who are the subjects of this project. It is necessary to determine whether the subjects are private businesses,

local government officials, members of a union, community member representatives, etc.

In this meeting, DoE mentioned three workshops: 1) a central government workshop, 2) a regional workshop, and 3) a training workshop. As they had promised, they sent a few lists and CVs of local NGOs and experts from the selected sites such as Bagerhat and Satkhira area after this meeting. The participants wanted to see excellent achievements that can improve the quality of life of the Bangladeshi people.



C. Day 3 (2018.04.04)

Individual meeting with the UN/ESCAP on 4th Apr.	
UN/ESCAP	Dr. Rezaul Karim (M)
KICT	Dr. Chang U Chae (M), Dr. Tae Hyeob Song (M), Sanghee Kim (F)

This meeting was requested by Dr. Rezaul Karim, who is a relevant stakeholder and a former chief of the environment unit of UN/ESCAP. He asked us to assess the overall situation in the regions of Bagerhat and Satkhira. He recommended that we find out about

various aspects of the culture of Bangladesh such as facing west to pray, constructing toilets only in the North and South directions, and so on.

He recommended a few points to us:

- 1) Bangladeshi people want future-oriented housing technologies to be introduced, rather than current residential technology. This requires consideration of a cost range that is within the reach of the local population, but there is a need to focus on durability.
- 2) The current HBRI guideline only focuses on rural areas in northern regions. The guideline needs to be used as reference to build housing in coastal region.
- 3) Contact the BUET professor, ask the professor to join you, and seek advice for this project.
- 4) Contact KUET to request them to hold a local workshop in Khulna division
- 5) Invite local governments to participate in local workshops (contact DoE Director, Mr. Mirza Shawkat Ali)
- 6) Propose technology solutions by different income groups (e.g., Low income, middle income, and so on)

5. INVITATIONAL WORKSHOP BY KICT HOUSING PART 2018.08.27 – 2018.08.31

The “Invitational workshop for public officials and experts from Bangladesh” was hosted by KICT housing team to share knowledge on durable housing technologies for coastal area of Bangladesh, to discuss on preliminary investigation for field trip of coastal area in Bangladesh and to discuss on the development of suitable housing model for coastal area of Bangladesh.

As there was a limitation of the budget and the time, KICT housing team had invited DoE officials and few experts who is relevant to this project, especially on Housing part.

Mr. Mirza Shawkat Ali recommended two of officials from DoE who are Md. Habibul Haque Khan, the director of the DoE Khulna division office and Mr. Parimal Singha, the Deputy Secretary Forest and Climate change office of Ministry of Environment, Forest and Climate Changes.

Md. Mohammad Abu Sadeque(male), the formal director of Housing and Building Research Institute (HBRI), Dr. Rezaul Karim, the Chairman of Bangladesh Unnayan Parishad (BUP), and Mr. Kazi Amdadul Hoque, the director of Friendship were invited to participate in this invitational workshop.

Title	Invitational workshop for public officials and experts from Bangladesh
Date	27 th of August 2018 (Monday) ~ 31 st of August 2018 (Friday)
Place	KICT (Korea Institute of Civil Engineering and Building Technology)
Purpose	- Sharing knowledge on durable housing technologies for coastal areas of Bangladesh - Discussing on preliminary investigation for field trip of coastal area in Bangladesh - Discussing on the development of suitable housing model for coastal area of Bangladesh
Attendees	5 public officials and experts

➤ Attendees from Bangladesh

No.	Name	Affiliation	Position	Email Address
1	Md. Habibul Haque Khan (M)	DoE	Director, Khulna Divisional Office	habib.hkhan65@gmail.com

2	Mr. Parimal Singha (M)	Ministry of Environment, Forest and Climate Changes	Deputy Secretary, Forest and Climate Change	parimal95@gmail.com
3	Dr. Rezaul Karim (M)	Bangladesh Unnayan Parishad (BUP)	Chairman	csdik@hotmail.com
4	Mohammad Abu Sadeque (M)	Housing and Building Research Institute (HBRI)	Former Director	abusadeque@gmail.com
5	Kazi Amdadul Hoque (M)	Friendship	Director	kaziamdadul@friendship.ngo

□ Workshop Program

	08.27(Mon)	08.28(Tue)	08.29(Wed)	08.30(Thu)	08.31(Fri)
09:00 ~10:00		<u>Site Visit 1</u> Byucksan Factory (Eumsung)	<u>Greeting</u> with President of KICT	<u>Site Visit 4</u> Korea Territorial Development Museum (Seoul)	<u>Site Visit 7</u> Apartment construction site (Ilsan)
10:00 ~11:00			<u>Introduction</u> KICT, GTC, GAT		
11:00 ~12:00			<u>Meeting 1</u> Current status of the project		
12:00 ~13:30		<u>Lunch</u>	<u>Lunch</u>	<u>Lunch</u>	<u>Lunch</u>
13:30 ~14:30		<u>Move</u> (Eumsung → Jamsil, Seoul)	<u>Presentation 1</u> Development of public housing in Korea	<u>Move</u> (Jongro → Gangnam)	<u>Departure</u> (Incheon)
14:30 ~15:00	<u>Arrival</u> (Incheon)		<u>Meeting 2</u> Preliminary investigation for field trip		
			<u>Presentation 2</u> Development of rural housing in Korea		
			<u>Presentation 3</u> Building Materials and	<u>Site Visit 5</u>	

15:00 ~16:00			technologies in Bangladesh	LG Hausys (Gangnam)
		Site Visit 2 Lotte World tower (Jamsil, Seoul)	Meeting 3 Development of suitable housing model in coastal area of Bangladesh	Site Visit 6 Bangladesh Embassy (Yongsan)
16:00 ~18:00	Move (Incheon→Eumsung)		Site Visit 3 Zero Carbon Green Home (Ilsan, KICT)	
18:00 ~19:00		Move (Jamsil → Myungdong)	Move (Ilsan →Myungdong)	Move (Yongsan → Myungdong)
19:00~	<u>Dinner</u>	<u>Dinner</u>	<u>Dinner</u>	<u>Dinner</u>

Invitational workshop Meeting on 29th Aug. at KICT office	
KICT	Dr. Chang U Chae (M), Dr. Tae Hyeob Song (M), Sanghee Kim (F), Dr. Jun Seok Choi (M), Dr. Yun Chul Woo (M)
DoE	Md. Habibul Haque Khan (M), Mr. Parimal Singha (M)
BUP	Dr. Rezaul Karim (M)
HBRI	Mohammad Abu Sadeque (M)
Friendship	Kazi Amdadul Hoque (M)
GTC	Rywon Yang (F)
GAT	Dongjin Yang (M)

During the preparation of a field trip in September, KICT thought that first two meetings held in Bangladesh (Kick-off meeting and Inception meeting) were not enough to communicate with the relevant stakeholders and there was some lack of communication to plan for a field trip through email. Therefore, KICT housing team invited Bangladesh public officials and experts to South Korea to discuss the options and challenges to address low cost housing and water technology issues in Southern Bangladesh. This workshop also helped to share the knowledge on durable housing technology options for the coastal area of Bangladesh.

For the smooth running of the field survey trip, KICT definitely need a local NGO's support who has done similar survey trips. KICT asked a former director of HBRI, Mr. Mohammed

Sadeque, for help regarding on recommendation of the NGO and Mr. Sadeue introduced the local NGO called *Friendship*. Friendship is a non-governmental organization that aims to help poor people in remote and unaddressed communities in Bangladesh. Mr Kazi Amdadul Hoque from Friendship had already done few projects similar to the CTCN project and had researched durable housing for Bangladesh while participated in the publishing of “Standard guideline for rural housing in disaster prone areas of Bangladesh”.

This workshop meeting was concluded with active participation of the attended stakeholders’ from Bangladesh. There are few following key considerations and decisions during this invitational workshop for this CTCN project.

- 1) Due to the rainy season in Bangladesh, the TA team was unable to visit the field survey area until August. Through this meeting, all the stakeholders and the TA team decided to have field survey in early September in 2018, and KICT, HBRI and Friendship decided to join on water team’s schedule (8th September – 15th September).
- 2) Md. Habibur Haque Khan, who is a DoE officer from Khulna division, was invited to attend this workshop as a DoE regional area representative, and had expressed and offered his full support for the workshop that would be held in Khulna division during field trip. He also added that he wished smooth implementation of the TA and from outcome of the TA, he expects the people of the coastal area could have improved access to clean and safe water and living environment





6. REGIONAL MEETING 2018.09.11

During the inception mission and the inception workshop, it was advised by the Ministry of Environment, Forest and Climate Changes and the DoE to narrow down the target site for the technical assistance project. Among the five (5) target regions initially mentioned in the request, Bagerhat and Satkhira were recommended, considering their more imminent needs of technology solutions.

Khulna division is one of the eight divisions of Bangladesh. It comprises of administrative districts, namely Bagerhat District and Satkhira District.

With the coordination of the DoE in Dhaka, the local level kick-off meeting was held on the 11th of September, 2018 at the DoE Khulna Division Office. The objective of this meeting was to introduce the TA project to the local stakeholders. The objective, activities, and implementation plan and expected outcomes were explained to the participants of the meeting. Also, the expectations of the participants were shared and discussed.

The participants were as following:

Regional meeting on 11th Sep. at DoE Khulna division office	
DOE Khulna Division	Md. Habibul Haque Khan (M), Director of DOE Khulna Division Office and the staffs
Nowabenki Gonomukhi Foundation ²	Mr. Sadar Zia Uddin (M)

² The Nowabenki Gonomukhi Foundation is a non-profit management organization accelerating finance for the rural community. It works in the areas related to women’s empowerment, income generation, food security, employment creation, biodiversity conservation, climate resilience, and small-scale SMEs at grass root level interventions. It is a partner organization of PKSF with experience in providing clean water to coastal areas of

	Mr. SM Mahabub Alam (M)
KICT	Dr. Tae hyeob SONG (M) Dr. Chansoo JEON (M)
GAT	Mr. Dong Jin YANG (M) Ms. Jiwon KIM (F) Mr. Woo-seok LEE (M)
Rodem Foundation	Mr. Du-suck HONG (M) Mr. David Halder (M)
CTCN Media team	Mr. Mohammad Hasan (M)

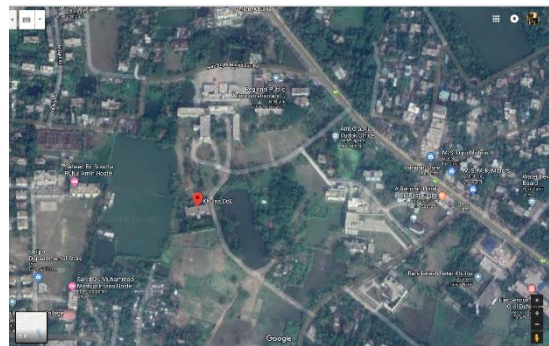
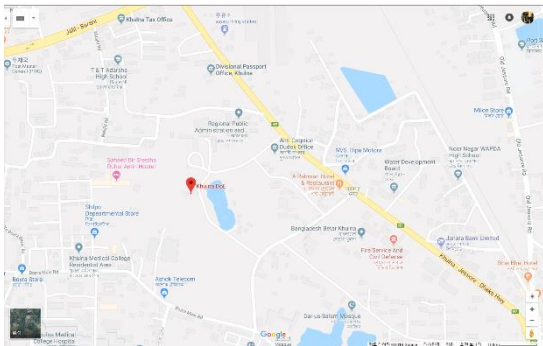
The project team gave a presentation on the CTCN Technical Assistance Project, including its background, objective, detailed activities, and timeline. Mr. Dong Jin YANG, the mission leader of the water technology part of the TA explained their mission in this technical assistance (TA) which was to review and propose desalination technology at the household level. Dr. Tae Hyeob SONG gave a presentation of the objective and detailed activities as the mission leader of the housing technology part of the TA. Both mission leaders asked the DoE of Khulna Division for support during the implementation of the TA and for facilitated access to the local sites to gather information and data. The field study for the target sites was scheduled to be conducted during this mission and the detailed plan of site visit was shared and explained during the meeting.

Md. Habibul Haque Khan, the Director of the DoE 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 viruses 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 in strengthening climate resilience of the region, many projects focus on the urban and peri-urban area. He insisted that there should be additional focus on the rural area of the Khulna Division.

Satkhira and Bagerhat District. Under the advice of the PKSF, NGF participated in the kick-off meeting and the site survey conducted after the meeting.

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.

To conclude, 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.



DoE Khulna Division



Meeting with DoE Khulna

ANNEX 1. CTCN KICK OFF MEETING

Inception mission of the CTCN Technical Assistance project for “Saline Water Purification Technology at Household Level and Low-cost Durable Housing Technology for Coastal Areas of Bangladesh”

I. PROJECT OVERVIEW

Background of the Project: The objective of the CTCN³ Technical Assistance is to support the climate vulnerable coastal areas of Bangladesh and the Palli Karma-Sahayak Foundation (PKSF) with the identification and introduction of household level desalination technique(s) as well as low-cost salinity proofed housing option(s) in coastal areas of Bangladesh. The contract was awarded by UNIDO (United Nations Industrial Development Organization) to a Korean Consortium Team led by the Green Technology Center Korea (GTCK).

Implementing Entities: The Project Consortium team was formed between three Korean organizations: The Green Technology Center, a policy research institute on climate technology cooperation under the Ministry of Science and ICT (MSIT), Korea Institute of Civil Engineering and Building Technology (KICT), an eminent public R&D institute in building technology and environmental engineering, and Glory & Tech Co., Ltd (GAT), a cooperation specialized in solving water problems in developing countries.

Project duration: Total project duration is 11 months (Dec. 2017~ Nov. 2018).

II. INCEPTION MISSION OVERVIEW

Mission Date: 4th Feb. (SUN) – 8rd Feb (Thur.)

Mission objective: This mission is to initiate the first dialogue between Bangladesh counterparts (the Ministry of Environment, Forest and Climate Changes Palli Karma-Sahayak Foundation) and other relevant stakeholders. Expectations of all the stakeholders on this project will be shared and discussed alongside with the details of the activities and the timeline of the project.

List of Mission Team Members (Total 7 people)

Name	Position	Organization
Dr. Kevin SHIN	Director (mission leader)	Green Technology Center
Mr. Changsun JANG	Deputy Director, Researcher	
Ms. Rywon YANG	Researcher	
Dr.Chang-U CHAE	Senior Research Fellow	
Dr. June-seok CHOI	Senior Researcher	

³Climate Technology Center & Network is an implementing arm of Technology Mechanism under UNFCCC.

Dr. Tae-mun HWANG	Research fellow	Korea Institute of Civil Engineering and Building Technology
Prof. Sang-ho LEE	Associated Professor	

Mission Agenda

▷ Day 1 (Mon. Feb. 5) Stakeholder Meeting

Time	Details	Attendees
10:00-12:00	Meeting with Director General, DoE and NDE	- Director Mirza Shawkat Ali, Assistant Director Dilruba Akter(DOE) - Rezaul Karim(water resources and environment specialist) - Korean mission team
12:00-13:00	Lunch	
15:00-17:00	Meeting with PKSf	- Managing Director Abdul Karim, Director Fazle Rabbi Sadeque Ahmed(PKSf) - Rezaul Karim(water resources and environment specialist) - Director Mirza Shawkat Ali(DoE) - Korean mission team

▷ Day 2 (Tue.Feb. 6) Stakeholder Meeting

Time	Details	Attendees
11:30-	Courtesy call with Additional Secretary MoEF	- Director Mirza Shawkat Ali(DoE) - Rezaul Karim(water resources and environment specialist) - Korean mission team
13:00-14:00	Lunch	DoE shall arrange lunch
14:00-16:00	Stakeholder Consultation Meeting at DoE Conference Room	- Director Mirza Shawkat Ali(DoE) - Rezaul Karim(water resources and environment specialist) - Korean mission team And other organizations(please refer to the attached participant list)
16:00-17:00	Meeting with BUET and CEGIS	- BUET - Ahmed Zulfiquar Rahaman(CEGIS) - Korean mission team

▷ Day 3 (Wed. Feb. 7) Stakeholder meeting

Time	Details	Attendees
9:00-10:00	Meeting with KOICA	- Country director Hyun Gue Cho - Korean mission team - Rezaul Karim(water resources and environment specialist)

11:00-12:00	Meeting with ADB	- Project officer Farhat Jahan Chowdhury - Korean mission team - Rezaul Karim(water resources and environment specialist)
13:30-14:30	Meeting with PKSf	- Director Fazle Rabbi Sadeque Ahmed, Deputy Manager Rabi Uzzaman(PKSf) - Rezaul Karim(water resources and environment specialist) - Korean mission team
15:00-16:00	Wrap-up meeting with DoE	- Director Mirza Shawkat Ali, assistant director Dilruba Akter(DoE) - Rezaul Karim(water resources and environment specialist) - Korean mission team
16:00-17:00	Visit and meeting HBRI	- CEO Mohammad Abu Sadeque, Principal Research Engineer M.A. Wahed(HBRI) - Assistant Director Dilruba Akter(DOE) - Korean mission team

No	Name & Designation	Organization
1.	Ahmed Zulfiquar Rahaman	CEGIS
2.	Dr. Sultan Ahmed Director General	DoE
3.	Mohammad Abu Sadeque	HBRI
4.	Dr. Rezaul Karim Chairman	Bangladesh Unnayan Parishad
5.	Mr. Mirza Shawkat Ali Director Climate Change & International Convention	DoE
6.	Mr. Ziaul Haque Director Air Quality Management	DoE
7.	Mr. Saifur Rahman Senior Engineer	Department of Public Health Engineering (DPHE)
8.	Ms. Dilruba Akter Assistant Director (Climate Change)	DoE
9.	Mr. Md. Abdul Karim	Palli Karma-Sahayak Foundation (PKSF)

10.	Fazle Rabbi Sadeque Ahmed	Palli Karma-Sahayak Foundation (PKSF)
11.	Rabi Uzzaman	Palli Karma-Sahayak Foundation (PKSF)
12.	Mohammad Abu Sadeque	HBRI
13.	Dr. Kevin SHIN	Green Technology Center
14.	Mr. Changsun JANG	Green Technology Center
15.	Ms. Rywon YANG	Green Technology Center
16.	Dr.Chang-U CHAE	Korea Institute of Civil Engineering and Building Technology
17.	Dr. June-seok CHOI	Korea Institute of Civil Engineering and Building Technology
18.	Dr. Tae-mun HWANG	Korea Institute of Civil Engineering and Building Technology
19.	Prof. Sang-ho LEE	Kookmin University

ANNEX 2. CTCN INCEPTION WORKSHOP

CTCN Inception workshop

Date: 03 April 2018, Tuesday

Venue: Chamely Conference Center, DoE, Dhaka

Time	Item/Session	Speaker
14:00	Opening - Opening Remarks	Dr. Rezaul Karim Vice Chairman, BUP
(Session 1) Introduction		
14:10	Workshop Introduction: CTCN Technology Transfer Initiatives in Bangladesh under UNFCCC	Mr. Mirza Shawkat Ali Director (CC & IC), DoE
14:30	Group Photo and Break	
14:40	PKSF Experience on coastal housing and saline water purification in rural Bangladesh: Submission of Technical Assistance request to NDE, Bangladesh	Dr. Fazle Rabbi Sadeque Ahmed Director (Env. & CC), PKSF
14:50	Presentation on CTCN TA project overview - Project Activities overview (Project objectives, background, scope, expected outcome) - Project Implementation Plan	Mr. Chang Sun Jang, Deputy Director, Green Technology Center
(Session 2) Low cost domestic climate-resilient housing technology solutions		
15:05	Available housing technology in the local context : Its problems and on-going efforts	Mr. Md. Abu Sadeque, Peng Director, HBRI
15:20	Presentation on possible housing technology options	Dr. Chang-U Chae, Senior Research Fellow, KICT
15:40	Discussion - Discussion on necessary actions, how project results and outputs can support the local context	
16:10	Tea Break	
(Session 3) Saline water purification technology at household level		
16:20	Available desalination technology in the local context: its problems and on-going efforts	Engr. Md. Saifur Rahman, Superintending Engr., DPHE
16:40	Presentation on possible desalination technology options	Dr. June Seok Choi, Senior Research, KICT
17:00	Discussion - Discussion on necessary actions, how project results and outputs can support the local context	
17:30	Closing remarks (on behalf of GTC)	Mr. Chang Sun Jang, Deputy Director, Green Technology Center
17:35	Speech of the Chief Guest	Mr. Abdullah Al Mohsin

		Chowdhury Secretary, MoEF
17:40	Closing remarks by the Chair	Dr. Sultan Ahmed Director General, DoE

**CTCN Inception Workshop
03 April 2018**

No	Name & Designation	Organization
1.	Mr. Abdullah Al Mohsin Chowdhury Secretary in Charge	Ministry of Environment and Forests, Bangladesh
2.	Dr. Sultan Ahmed Director General	DoE
3.	Mr. Changsun JANG Team Leader	CTCN Technical Assistance Team, South Korea
4.	Dr. Nurul Quadir Additional Secretary	Ministry of Environment and Forests, Bangladesh
5.	Mr. Mirza Shawkat Ali Director Climate Change & International Convention	DoE
6.	Mr. Ziaul Haque Director Air Quality Management	DoE
7.	Mr. Saifur Rahman Senior Engineer	Department of Public Health Engineering (DPHE)
8.	Ms. Omaina Rahman Director	Unicom Intellect Ltd.
9.	Md. Saiful Alam Director	Earth Sand (BD) Limited
10.	Mr. Makame Mahmud Assistant to Director	International Center for Climate Change and Development
11.	Mr. Mokhlesur Rahman Executive Director	Center for Natural Resource Studies (CNRS)
12.	Mr. Md. Yusuf Mehedi Assistant Director	Bangladesh Climate Change Trust (BCCT)
	Dr. Apurbo K. Podder	Bangladesh University of Engineering and

13.	Assistant Director	Technology (BUET)
14.	Dr. Abu Taib Mohammed Shahjahan Associate Professor	Bangladesh University of Engineering and Technology (BUET)
15.	Ms. Rabeya Khanum Student Department of Social Work	Jagannath University, Dhaka
16.	Mr. Md. Abdul Mojib Sarder A Community Leader of the Coastal Region	Koyra, Khulna
17.	Mr. Abu Sumon Climate Change Specialist	UNDP Bangladesh
18.	Dr. Fahmida Khanom Director (NRM)	DoE
19.	Dr. Fazle Rabbi Sadeque Ahmed Director	Palli Karma-Sohayak Foundation (PKSF)
20.	Mr. Q. S. I. Hashmi Additional Director General	DoE
21.	Mr. Abu Sayed Md. Faysal Research Associate	Center for Environmental and Geographic Information Services (CEGIS)
22.	Mr. Md. Anjum Islam Associate Officer Monitoring and Documentation	Action Aid Bangladesh
23.	Mr. AKM Rafiqul Islam Deputy Director (NRM)	DoE
24.	Ms. Mayeesha Azhar Research Assistant Environment, Sustainability and Energy	UNDP Bangladesh
25.	Mr. Arif M. Faisal Programme Specialist	UNDP Bangladesh
26.	Ms. Nazria Islam Senior Manager Disaster Management and Climate Change	Bangladesh Rural Advancement Committee (BRAC)
27.	Mr. Samar Krishna Das Assistant Director (Publicity)	DoE
28.	Dr. Rezaul Karim Chairman	Bangladesh Unnayan Parishad

29.	Ms. Inhye Bak Researcher	The Green Technology Center-Korea (GTC-K)
30.	Dr. Yunchal Uoo Consultant	Korea Institute of Civil Engineering & Building Technology (KICT)
31.	Mr. Dipesh Kanti Datta Assistant Vice President Saad Musa Group, Chittagong	The Green Technology Center-Korea (GTC-K)
32.	Dr. June-Seok Choi Consultant	Korea Institute of Civil Engineering & Building Technology (KICT)
33.	Dr. Chang-U Chae Head, National Green Building Center	Korea Institute of Civil Engineering & Building Technology (KICT)
34.	Ms. Sanghee Kim Professional	Korea Institute of Civil Engineering & Building Technology (KICT)
35.	Dr. Tae Hyeob Song	Korea Institute of Civil Engineering & Building Technology (KICT)
36.	Mr. Zoung Wan Kim Consultant	The Green Technology Center-Korea (GTC-K)
37.	Mr. Samar Krishna Das Assistant Director (Publicity)	DoE
38.	Mr. Md. Harun Or Rashid Assistant Director (International Convention)	DoE
39.	Ms. Dilruba Akter Assistant Director (Climate Change)	DoE
40.	Mr. Muhammad Selim Hossain Program Officer Joint Crediting Mechanism Secretariat	DoE
41.	Mr. Md. Anamul Haque Rafi PA to Director (Climate Change)	DoE
42.	Mr. Md. Jalal Uddin Office Assistant	DoE

ANNEX 3. INVITATIONAL WORKSHOP BY KICT HOUSING TEAM

Invitational Workshop by KICT Housing team 27- 31 August 2018

□ Overview

- **Title:** Invitational workshop for public officials and experts from Bangladesh
- **Date:** 27th of August 2018 (Monday) ~ 31st of August 2018 (Friday)
- **Place:** KICT (Korea Institute of Civil Engineering and Building Technology)
- **Purpose:**
 - Sharing knowledge on durable housing technology for coastal area of Bangladesh
 - Discussing on preliminary investigation for field trip of coastal area in Bangladesh
 - Discussing on the development of suitable housing model for coastal area of Bangladesh
- **Attendees:** 8 public officials and experts

□ Attendees

No.	Name	Affiliation	Position	Email Address
1	Md. Habibul Haque Khan	DoE	Director, Khulna Divisional Office	habib.hkhan65@gmail.com
2	Mr. Parimal Singha	Ministry of Environment, Forest and Climate Changes	Deputy Secretary, Forest and Climate Change	parimal95@gmail.com
3	Dr. Rezaul Karim	Bangladesh Unnayan Parishad (BUP)	Chairman	csdik@hotmail.com
4	Mohammad Abu Sadeque	Housing and Building Research Institute (HBRI)	Former Director	abusadeque@gmail.com
5	Kazi Amdadul Hoque	Friendship	Director	kaziamdadul@friendship.ngo

□ Program

	08.27(Mon)	08.28(Tue)	08.29(Wed)	08.30(Thu)	08.31(Fri)
09:00 ~10:00		Site Visit 1 Byucksan Factory (Eumsung)	Greeting with President of KICT	Site Visit 4 Korea Territorial Development Museum (Seoul)	Site Visit 7 Apartment construction site (Ilsan)
10:00 ~11:00	Introduction KICT,GTC, GAT				
11:00 ~12:00	Meeting 1 Current status of the project				
12:00 ~13:30		Lunch	Lunch	Lunch	Lunch
13:30 ~14:30		Move (Eumsung → Jamsil, Seoul)	Presentation 1 Development of public housing in Korea	Move (Jongro → Gangnam)	Departure (Incheon)
14:30 ~15:00			Presentation 2 Development of rural housing in Korea		
15:00 ~16:00	Arrival (Incheon)	Site Visit 2 Lotte World tower (Jamsil, Seoul)	Presentation 3 Building Materials and technologies in Bangladesh	Site Visit 5 LG Hausys (Gangnam)	
16:00 ~18:00	Move (Incheon→ Eumsung)		Meeting 3 Development of suitable housing model in coastal area of Bangladesh	Site Visit 6 Bangladesh Embassy (Yongsan)	
18:00 ~19:00		Site Visit 3 Zero Carbon Green Home (Ilsan, KICT)			
19:00~	Dinner	Move (Jamsil → Myungdong)	Move (Ilsan →Myungdong)	Move (Yongsan → Myungdong)	
		Dinner	Dinner	Dinner	

□ Agenda of 29th of August 2018 invitational workshop at KICT

Time	Item/Session	Speaker
9:00	Opening	KICT – Dr. Chae
(Session 1) Introduction		
09:30	Introduction: CTCN TA project	GTC – Ms. Yang
10:00	Meeting 1: Current status of the Project	KICT – Dr. Chae KICT – Dr. Woo
11:00	Meeting 2: Preliminary investigation for field trip	Friendship – Mr. Hoque
11:30	Discussion: Field trip	
(Session 2) Low cost domestic climate-resilient housing technology solutions		
13:30	Presentation 1: Development of public housing in Korea	Kyung Hee University – Prof. Lee
14:00	Presentation 2: Development of suitable housing model in coastal area of Bangladesh	KICT – Dr. Chae
14:30	Discussion : Low cost domestic climate-resilient housing technology solutions	KICT – Dr. Chae
15:00	Presentation 3 : Development of suitable housing model in coastal area of Bangladesh	Han Nam University – Prof. Han
15:30	Presentation 4 : Building Materials and technologies in Bangladesh	HBRI - Mr. Sadeque
16:00	Site Visit: KICT	KICT – Dr. Song

**Invitational Workshop by KICT Housing team
27- 31 April 2018**

KICT

1.	Dr. Chang-U Chae Head, National Green Building Center	Korea Institute of Civil Engineering & Building Technology (KICT)
2.	Ms. Sanghee Kim	Korea Institute of Civil Engineering & Building Technology (KICT)
3.	Dr. Tae Hyeob Song	Korea Institute of Civil Engineering & Building Technology (KICT)
4.	Mr. Sung Mo Seo	Korea Institute of Civil Engineering & Building Technology (KICT)
5.	Ms. Yujin Kim	Korea Institute of Civil Engineering & Building Technology (KICT)
6.	Mr. Sang Won Kim	Byucksan
7.	Mr. Sung Tae Ahn	Byucksan
8.	Ms. Han Bom Kim	Byucksan
9.	Ms. Yang Hee Lee	Byucksan
10.	Ms. Sung Eun Park	Byucksan
11.	Md. Habibul Haque Khan	DoE
12.	Mr. Parimal Singha	Ministry of Environment, Forest and Climate Changes
13.	Dr. Rezaul Karim	Bangladesh Unnayan Parishad (BUP)
14.	Mohammad Abu Sadeque	Housing and Building Research Institute (HBRI)
15.	Kazi Amdadul Hoque	Friendship

16.	Dr. Tae Hyung Kim	Korea Institute of Civil Engineering & Building Technology (KICT)
17.	Dr. June-Seok Choi	Korea Institute of Civil Engineering & Building Technology (KICT)
18.	Dr. Yunchal Uoo	Korea Institute of Civil Engineering & Building Technology (KICT)
19.	Ms. Ry Won Yang	The Green Technology Center-Korea (GTC-K)
20.	Mr. Jae Min Kim	The Green Technology Center-Korea (GTC-K)
21.	Dr. Sang Hee Shin	Korea Institute of Civil Engineering & Building Technology (KICT)
22.	Dr. Soon Ho Park	Glory and Tech
23.	Mr. Dong Jin Yang	Glory and Tech
24.	Prof. Pil Won Han	Hannam University
25.	Prof. Hyun Jung Lee	Gyunghee University
26.	Dr. Dong Woo Cho	Korea Institute of Civil Engineering & Building Technology (KICT)

ANNEX 4. CTCN FIELD STUDY

Visit Schedule of Friendship and Korea Institute of Civil Engineering and Building Technology (KICT) Team to different villages in Bagerhat and Satkhira districts with Friendship in Bangladesh

DATE: 09th to 14th September 2018

Day 1: 09th September'2018 (Sunday)

Time Schedule:

1. Arrival at Hazrat Shah Jalal International AIRPORT, Dhaka :
12:10 hrs. (ETA)
2. Arrival and reporting at Domestic Airport : 15:30 hrs.
(ETA)
3. Departure from Dhaka to Jessore Domestic Airport by Biman Flights : 16:30 hrs.
(ETD)
4. Arrival at Jessore Domestic Airport :
17:15 hrs.
5. Departure from Airport to Khulna by Microbus : 17:45 hrs.
(ETD)
(Need 2:30h traveling by road- 70km)
6. Arrival at Hotel and Check-in to hotel (khulan) : 20:15 hrs.
(ETA)
(Hotel: Castle Salam, Khulna)
7. Dinner at Hotel & Night Stay : 20:30 hrs.

Day 02: 10th September 2018 (Monday)

Time Schedule

1. Breakfast at Hotel :
08:00 hrs.
2. Departure from Hotel to Mongla, Bagerhat by Microbus : 09:00 hrs.
(ETD)
(Need 1.5h traveling by road-48km)
3. Arrival at Hotel Pashur Mongla : 10:30 hrs.
(ETA)
4. Refreshment at Hotel Pashur Mongla : 10:35 hrs.
5. Departure from Ghat to villages by Speed Boat : 11:00 hrs.
(Need 20-30min one way traveling by river)
6. Arrival and visit villages :
11:45 hrs.
(Village Kaya bunia under Chadpai union, Mongla Upazila, Bagerhat)
7. Departure to another village by Speed Boat :
12:30 hrs.

8. Arrival and visit villages :
13:00 hrs.
(Village Kamal kathi under Padmapukur union, Mongla Upazila, Bagerhat)
9. Departure to Hotel Pashur Mongla :
14:00 hrs. (ETA)
10. Arrival at Hotel Pashur Mongla : 14:30 hrs.
(ETA)
11. Lunch at Hotel Pashur Mongla : 14:30 hrs.
12. Departure to Village by Microbus :
15:30 hrs.
13. Arrival and visiting villages :
16:00 hrs.
14. Departure to Hotel at Khula by Microbus : 17:30 hrs.
15. Arrival at Hotel :
19:00 hrs.
16. Dinner at Hotel & Night Stay : 20:30 hrs.

Day 03: 11th September 2018 (Tuesday)

Time Schedule

1. Breakfast at Hotel & Hotel Check out : 08:00 hrs.
2. Departure to Khulna Division office by Microbus : 08:45 hrs.
3. Arrival and Meeting with DoE at Khulna Division office : 09:00 hrs.
4. Departure to Shyamnagar by Microbus : 11:00 hrs.
5. Arrival at Friendship Hospital Shyamnagar :
13:30 hrs.
6. Lunch at Friendship Hospital Shyamnagar :
13:35 hrs.
7. Departure to Villages by Microbus & boat :
14:10 hrs. (ETD)
(Need 25minutes by car & 20 minutes by boat)
8. Arrival and visiting Village :
15:00 hrs.
(Village Kamal kathi under pabmapukur Union of Shyamnagar Upazila)
9. Departure to Village by Motorbike :
15:30 hrs.
10. Arrival and visiting Village :
(Village Noth Jhapa under pabmapukur Union of Shyamnagar Upazila)
11. Departure Island to village by Boat :
16:20 hrs. (ETD)
12. Arrival and visiting Village :
16:45 hrs.
(Village Durgabati under Burigoalini Union of Shyamnagar Upazila of Satkhira)
13. Departure to Hotel at Symnagar by Microbus : 17:30 hrs.
14. Arrival at Hotel (**Borsha Guest House, Symnagar, Satkhira**) :
18: 45 hrs.
15. Dinner at Hotel & Night Stay : 20 :00
hrs.

Day 04: 12th September 2018 (Wednesday)

Time Schedule

1. Breakfast at Hotel :
07:30 hrs.
2. Hotel check out in Symnagar, Satkhira : 08:00 hrs.
3. Departure to Satkhira District Office by Microbus : 08:15 hrs.
4. Arrival and meeting with Meeting with local stakeholders : 10:00 hrs.
5. Departure to Jessore Domestic Airport by Offices Car : 13:00 hrs.
6. Lunch at Chuknagar during travel roadside restaurant : 13:45 hrs.
7. Arrival at Jessore Domestic Airport :
15:30 hrs.
8. Departure to Dhaka Domestic Airport : 17:40 hrs.
9. Arrival at Dhaka Domestic Airport :
18:25 hrs.
10. Departure to Hotel by Offices Car :
18:45 hrs.
11. Arrival at Hotel :
19:30 hrs.
12. Dinner at Hotel :
20:00 hrs.
13. Night Stay at Hotel :
21:30 hrs.

Day-05: 13th September 2018 (Thursday)

1. Breakfast at Hotel :
08:30 hrs.
2. Departure to Friendship Head Office by Microbus : 08:30 hrs.
3. Arrival at Friendship Head Office :
09:00 hrs.
4. Meeting at Friendship Head Office :
09:30 hrs.
5. Lunch at Friendship Head Office :
12:00 hrs.
6. Departure to BOF KOREA Dhaka office by Microbus :
13:00 hrs.
7. Meeting at BOF KOREA Dhaka office :
13:30 hrs.
8. Departure to Hotel by Microbus : 17:00 hrs.
9. Arrival at Hotel :
18:00 hrs.
10. Dinner Night Stay at Hotel :
20:30 hrs.

Day-06: 14th September 2018 (Friday)

1. Breakfast at Hotel :
08:00 hrs.
2. Departure to BOF KOREA Dhaka office by Microbus :
08:30 hrs.
3. Meeting at BOF KOREA Dhaka office :
09:00 hrs.
4. Departure to Dhaka international Airport by Office Car : 10:30 hrs.
5. Arrival and reporting at Dhaka international Airport :
11:30 hrs.

**Field study trip
09- 15 September 2018**

1.	Dr. Tae Hyeob Song	Korea Institute of Civil Engineering & Building Technology (KICT)
2.	Dr. Chan Soo Jeon	Korea Institute of Civil Engineering & Building Technology (KICT)
3.	MD.Mohammad Abu Sadeque	Housing and Building Research Institute (HBRI)
4.	Mr. Kazi Amdadul Hoque	Friendship
5.	Mr. Sadar Zia Uddin	BUP
6.	Mr. SM Mahabub Alam	BUP
7.	Dr. Dong Jin Yang	GAT
8.	Ms. Ji-Won Kim	GAT
9.	Mr. Woo-Seok Lee	GAT

ANNEX 5. CTCN CAPACITY TRAINING WORKSHOP

Tentative Program Agenda

Capacity Training Workshop, 12-13 November 2018

Venue: PKSF Auditorium, PKSF Bhaban, E-4/B, Agargaon Administrative Area, Sher-e-Bangla Nagar, Dhaka.

Day 1 - 12th November, 2018

Time	Item/Session	Speaker
09:00 – 09:30	Registration	
Opening Session		
9:30 – 10:10	Recitation from the Holy Quaran	Mr. Babul Hossain Imam, DoE
	Welcome Address	Mr. Mirza Shawkat Ali Director, Climate Change and Int'l Conv., DoE
	Address by the Korean Representative	Dr. Chang U CHAE KICT
	Address by Chairman BUP	Dr. Rezaul Karim BUP
	Address by the Special Guest	Dr. Nurul Quadir Additional Secretary Ministry of Env., Forest and Climate Change
	Address by the Chief Guest	Mr. Abdullah Al Mohsin Chowdhury Secretary Ministry of Env., Forest and Climate Change
	Address by the Chair	Dr. Sultan Ahmed Director General DoE

10:10 – 10:30	Group Photo and Coffee Break	
(Session 1) Low cost domestic climate-resilient housing technology solutions		
Session Chair: Dr. Rezaul Karim, Moderated by Engr. Shamim, Director HBRI		
10:30 – 11:00	Field survey results of southern coastal areas in Bangladesh	Dr. Chang U CHAE KICT Mr. Kazi Amdadul Hoque Friendship
11:00 – 11:30	Review of building materials and component alternatives for southern coastal housing	Dr. Tae Hyeob SONG KICT
11:30 – 12:30	Design guideline for housing construction in southern coastal areas of Bangladesh	Mr. Mohammad Abu Sadeque HBRI
12:30 – 13:00	Proposals of housing model for southern coastal areas of Bangladesh	Dr. Chang U CHAE KICT Young Wan Kim BOF Korea
13:00 – 13:30	Open discussion	Moderated by Engr. Shamim, Director, HBRI
13:35 – 14:30	Lunch	
(Session 2) Saline water purification technology solutions		
Session Chair: Dr. Fazle Rabbi Sadeque Ahmed, Moderated by Representative of DPHE		
14:30 – 15:00	General water purification techniques using membrane technologies	Prof. Sangho LEE Kookmin University
15:00 – 15:30	Investigation of local water use in the village of Satkhira, Bagerhat region	Dr. Dongjin YANG GATC
15:30 – 15:50	Coffee Break	
15:50 – 16:20	Implementation and technical part of managing desalination water treatment plant in south	S.M Mahabub Alam & Sarder Ziauddin NGF

	east coastal region of Bangladesh	
16:20 – 17:00	Low-cost desalination applications to solve water problems in coastal areas of Bangladesh	Dr.Yunchul WOO KICT
17:00 – 17:20	Open discussion	Moderated by Representative of DPHE
17:20 – 17:30	Closing	

Day 2 - 13th November, 2018

Time	Item/Session	Speaker
(Session 3) Identifying finance opportunities for the technology deployment		
Session Chair: Dr. Sultan Ahmed, Director General, DoE		
10:00 – 10:30	Climate Technology Cooperation through CTCN and Korea's Technology Cooperation activities	Mr. Chang Sun JANG GTC
10:30 – 11:00	Access to Climate Finance	Ms. Rywon YANG GTC
11:00 – 11:20	Coffee break	
11:20 – 11:50	Technology cooperation and its potential linkage with carbon market	Dr. Sue Kyung LEE GTC
11:50 – 12:20	Open discussion	
12:20 – 12:50	Closing remarks	Mr. Chang Sun JANG GTC
		Dr. Sultan Ahmed, Director General, DoE
12:50 – 14:00	Lunch	

**CTCN Capacity Training Workshop
12-13 November 2018**

MoEFCC		
1.	<p>Abdullah Al Mohsin Chowdhury Secretary in Charge Ministry of Environment, Forest and Climate Change (MoEFCC) Bangladesh Secretariat Dhaka</p>	<p>Phone: 9540481 E-mail: secretary@moef.gov.bd</p>
2.	<p>Dr. NurulQuadir Additional Secretary Ministry of Environment, Forest and Climate Change (MoEFCC) Bangladesh Secretariat Dhaka</p>	<p>Phone: 01552-328617 E-mail: nquadir@gmail.com</p>
3.	<p>Dr. Abu Nasar Mohammad Abdullah Deputy Secretary Ministry of Environment, Forest and Climate Change (MoEFCC) Bangladesh Secretariat Dhaka</p>	<p>Mobile : 01712232802 Email : abdullah6677@gmail.com</p>
DoE		
4.	<p>Dr. Sultan Ahmed Director General DoE Headquarters, Agargaon Dhaka-1207</p>	<p>Phone: 8181800 E-mail: dg@doe.gov.bd</p>
5.	<p>Quazi Sarwar Imtiaz Hashmi Additional Director General</p>	<p>Phone: 8181767 E-mail: hashmi@doe.gov.bd</p>

	DoE Headquarters, Agargaon Dhaka-1207	
6.	Dr. Mallick Anwar Hossain Director (Admin) DoE Headquarters, Agargaon Dhaka-1207	Phone : 8181790 mallickah@yahoo.com
7.	Syed Nazmul Ahsan Director (Env. Clearance) DoE Headquarters, Agargaon Dhaka-1207	Phone: 8181673 E-mail: nazmul@doe.gov.bd
8.	Mirza Shawkat Ali Director (Climate Change & Int'l Con) DoE Headquarters, Agargaon Dhaka-1207	Phone: 8181797,01720222363 E-mail: mirzasal@yahoo.com
9.	Md. Ziaul Hoque Director (AQM) DoE Headquarters, Agargaon Dhaka-1207	Phone: 8181770, 01817008703 E-mail: zia@doe.gov.bd
10.	Dr. Fahmida Khanom Director (NRM) DoE Headquarters, Agargaon Dhaka-1207	Phone: 8181784 E-mail: fkhanom71@gmail.com
11.	Mohammed Solaiman Haider Director (Planning) DoE Headquarters, Agargaon Dhaka-1207	Phone: 01817116050 Email: haider@doe.gov.bd
12.	Md. Hasan Hasibur Rahman	Phone : 8181093

	Deputy Director (Planning) DoE Headquarters, Agargaon Dhaka-1207	hasanhasibur@doe.gov.bd
13.	Mrs. Dilruba Akter Assistant Director (Climate Change) DoE Headquarters, Agargaon Dhaka-1207	Phone:01918425010 E-mail: ruaab1786@gmail.com
14.	Mrs. Shahanaaj Assistant Director(Climate Change) DoE Headquarters, Agargaon Dhaka-1207	
OTHERS ORGANIZATION AND MINISTRY		
15.	Md. Mahmudul Hasan Director General Water resources planning organization, WARPO Bhaban, 72,Green Road, Dhaka 1215, Bangladesh.	Phone: +88 02 44819006 , +88 02 44819015 Mobile: +8801712297429 E-mail: dg@warpo.gov.bd
16.	Executive Director Institute of water modeling(IWM) House,-496, Road-32, DOHS, Mohakali, Dhaka	Phone: +8801716415528, +8801755574250 E-mail: mnh@iwmbd.org
17.	Mr. Md. Abdul Karim Managing Director Palli Karma-Sahayak Foundation (PKSF)	
18.	Dr. Md. Jashim Uddin Deputy Managing Director (Administration) Palli Karma-Sahayak Foundation (PKSF)	

19.	Fazle Rabbi Sadeque Ahmed Director Palli Karma-Sahayak Foundation (PKSF)	
20.	K. M. Marufuzzaman, Manager, Palli Karma-Sahayak Foundation (PKSF)	
21.	Md Rabiuzzaman, Deputy Manager Palli Karma-Sahayak Foundation (PKSF)	
22.	Md. Mahmuduzzanm Deputy manager, Palli Karma-Sahayak Foundation (PKSF)	
23.	Eng. Tariqul Islam, Program Officer Palli Karma-Sahayak Foundation (PKSF)	
24.	Dr. Sharif Ahmed Chowdhury Deputy Manager, PKSF, Agargaon, Dhaka.	dr.sharif.chowdhury@gmail.com
25.	Mr. Saifur Rahman ChiefEngineer Department of Public Health Engineering (DPHE)	Mobile: 01711241546 E-mail: addlce.works@dphe.gov.bd,
26.	Director General	

	Department of Disaster Management, 92-93, Mohakhali C/A, Dhaka-1212	
27.	Chief Conservator of Forests Forest Department, Agargaon Sher-e-Bangla Nagar, Dhaka-1207	Telephone: 88-02-8181737 Fax: 88-02-8181741 E-mail : ccf-fd@bforest.gov.bd
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