

CLIMATE INNOVATION CHALLENGE

Monthly Progress Update

Reporting Period (Month)	<u>21 Mar to 20 Apr</u>
Grantee Name	<u>Seoul National University</u>
Project Title	<u>CIC 405: INTEGRATED PEST MANAGEMENT USING SEAMLESS CLIMATE INFORMATION</u>
<p>1. List the key activities undertaken during this month</p> <ul style="list-style-type: none"> (1) CHECK THE PROGRESS AND ISSUES IN ONGOING ACTIVITIES (2) SHARE DATA INCLUDING LATITUDE AND LONGITUDE COORDINATES FOR THE DISEASE AND INSECT SURVEY IN THE FIELDS OF BANGLADESH. (3) PRODUCE OUTLINE ABOUT UPCOMING TRAINING DATES AND DETAILS. (4) EXAMINE ABOUT GRIDDED CLIMATE OBSERVATION DATA OVER BANGLADESH. 	
<p>2. List the key beneficiaries /stakeholders consulted during this month</p> <ul style="list-style-type: none"> • Plant Pathology Division, Entomology Division, Climate Change Adaptation Division, BRRRI • Cumilla Agricultural Office, BRRRI Regional Station in Cumilla 	
<p>3. Summarize key achievements and milestones of this month</p> <ul style="list-style-type: none"> • SNU and IWMI had the third consultation meeting with BRRRI (Annex1.Meeting minute attached). The participants discussed the four consultation topics that SNU shared via e-mail before the meeting. The discussion was mostly based on the previous email exchanges with the BRRRI scientists regarding project progress and issues. • Dataset from BRRRI about the Boro season in 2021-2022 was shared. BRRRI is monitoring a total of 40 plots in the Cumilla area. Each district had surveyed at the same time. Using the coordinates of 40 plots, IWMI presented a GIS map to locate the field locations on the gridded observation data that IWMI produced. In order to link climate information with pest prediction, it is necessary to use the downscaling data from IWMI. Also, IWMI suggested utilizing one single grid observation data to test the pest survey data from 10 plots for modeling. • SNU briefly presented about the analysis results of technical assessment survey (Annex 2. a presentation file attached) to discuss the potential agenda and details of upcoming training for the BRRRI scientists. The training will consist of two phases: the first training will be a virtual meeting using Zoom, held sometime between the end of May to mid-Jun. The training will be held in July. Trainees will be divided into 2 groups, the provider side and the user side, depending on the demands and interests of the participants. Because of time limit, IWMI suggested to ask participants to run models 	

by themselves after the first training. BRRRI partners will support the remaining group of participants in Bangladesh to run all the packages.

- BRRRI partners are making a progress about the review comments of the IPM management options with an Entomologist of BRRRI. BRRRI is checking the management options for BPH, Stem borer, and GLH management. SNU will start working on the disease management options in the meantime.
- BRRRI shared the reproducibility of all climate variables in newly developed high resolution gridded data in Cumilla station. BRRRI found significantly replicated the observed data except for solar radiation in terms of annual and monthly scale. Before IWMI starts working on downscaling data by scale, which takes a long time, it is necessary to discuss and confirm the ObsGrid data with local experts. IWMI and SNU discussed confirming that the observation data is well reproducing the climate characteristic in the Cumilla area before taking the advice of the Bangladesh partners.

4. List key issues to be resolved

- Various opinions were discussed with the country partners regarding the training agenda. SNU will draft the first training agenda and timeline. It will be shared via email to get comments from BRRRI partners and IWMI to finalize the agenda for training. The agenda will need to be finalized before the end of April, so that the preparation of the first training can start right away. After fixing the training date, about permission authority, BRRRI partners will make an official letter to inform the participants including requests within 1 week. As the training approaches, the preparation must be thorough.
- Some coordinates of survey field plots in Bangladesh are close to each other in one district and it could almost be grouped into 4. Because of the issue about linking with the weather station in the project, it has to be considered that only one plot in each group can use. As the research progresses, related matters should be considered more.

5. Any additional issues (observations/learning in terms of the applicability, scalability and sustainability)

- The overall plan should be modified to match the speed at which the historical survey data is digitized. Historical disease survey data is key data for modeling. SNU will conduct statistical analysis with weather variables with this data

Additional training might be required based on the technical capacity assessment results, indicating additional cost may also need to be allocated for the additional ones. SNU and the team will need to consult with ADPC for the most realistic options.

Note: The progress update helps managing and monitoring the implementation of the pilot project. It helps identifying any emerging risks and resolve it quickly. The progress update is helpful to disseminate the lesson to a wider range of audience.

The monthly update should be of maximum of two pages. Please share field photos , brochure, leaflets, presentation in its original format as attachment to the month update

Meeting minutes of the 3rd consultation meeting with the country partners of BRR

- Date: 12st of April 2022
- Participants from BRR: Mohammad Ashik Iqbal Khan, Mohammad Kamruzzaman Milon, Md Mamunur Rashid
- Participants from IWMI: Jaepil Cho, Dahong Kim
- Participants from SNU: Kwang-Hyung Kim, Minju Baek, Jin-Yong Jung

● Introduction

The agenda of the 3rd consultation meeting for “*the integrated pest management using seamless climate information*” project in Bangladesh was shared via E-mail a few days before the meeting. There were four main agenda for intensive discussion in the meeting as shown below. The meeting was proceeded according to the order of the agenda.

● Meeting agenda

1. Discussion about gridded climate observation data over Bangladesh.
2. Check out the progress and issues with the disease/insect survey in the fields.
3. Discuss about the progress of the review comments of the IPM management options and historical disease survey data digitization.
4. Discuss about upcoming training dates and details about training.

● Action plans

- Dr. Mohammad Ashik Iqbal Khan
 - 1) **Dr. Khan will share the disease part of IPM management options by 17 Apr.**
 - 2) Digitization of historical disease survey data will be completed and shared with the team by the end of the month.
- Dr. Mohammad Kamruzzaman Milon
 - 1) Dr. Cho and Dr. Kim will communicate about this issue and compare with Dr. Millon’s opinion.
- Dr. Md. Mamunur Rashid
 - 1) Excel file for the coordinate information about survey plots will be shared with Dr. Mamun, so that he can double check the coordinates of each plot.
- Mr. Dahong Kim
 - 1) Mr. Kim will share with Dr. Millon the link of gridded climate observation dataset produced by Dr. Cho.
- Dr. Kim, Mr. Jin-Yong Jung
 - 1) Statistical analysis of the historical insect occurrence data from BRR will be conducted and the team will share the results with the national partners

● Narratives for meeting minutes

1. Discussion about gridded climate observation data over Bangladesh.

Dr. Cho announced that, before going to the next procedure, it is needed to confirm that produced observation data is well reproducing the climate characteristic in the Cumilla area. It should be decided based on the opinion of the Bangladesh partners. Regarding Dr. Milon's paper related to climate change scenarios, Dr. Cho requested reference data for a comparison of some climatology in the Bangladesh area. Dr. Milon has various data like station data, gridded data, and ERA5 data to easily compare. Dr. Cho and Dr. Kim will communicate about this issue and compare it with Dr. Milon's opinion. Also, Dr. Cho asked about the major climate index for each pest and disease which is useful in the vulnerability assessment Bangladesh whole area. Dr. Kim explained that there is no simplified index for each disease and he suggested it will be finalized after running the model.

2. Check out the progress and issues with the disease/insect survey in the fields.

Dr. Khan shared a dataset about the Boro season in 2021-2022. It is a survey result by Dr. Mamun about 34 plots with 6 additional plots in the Cumilla area. It consists of 10 plots in 1 Upazila. Main Upazila is Nangalkot, Debidwar and Laksam. And number 35 to 40 plots are about Barura and Adarsha Sadar for extra. Dr. Mamun mentioned that 40 plots are necessary to get more local-specific information of pest and disease occurrence in Cumilla. Data collection took place on the same day in 10 plots of each Upazila.

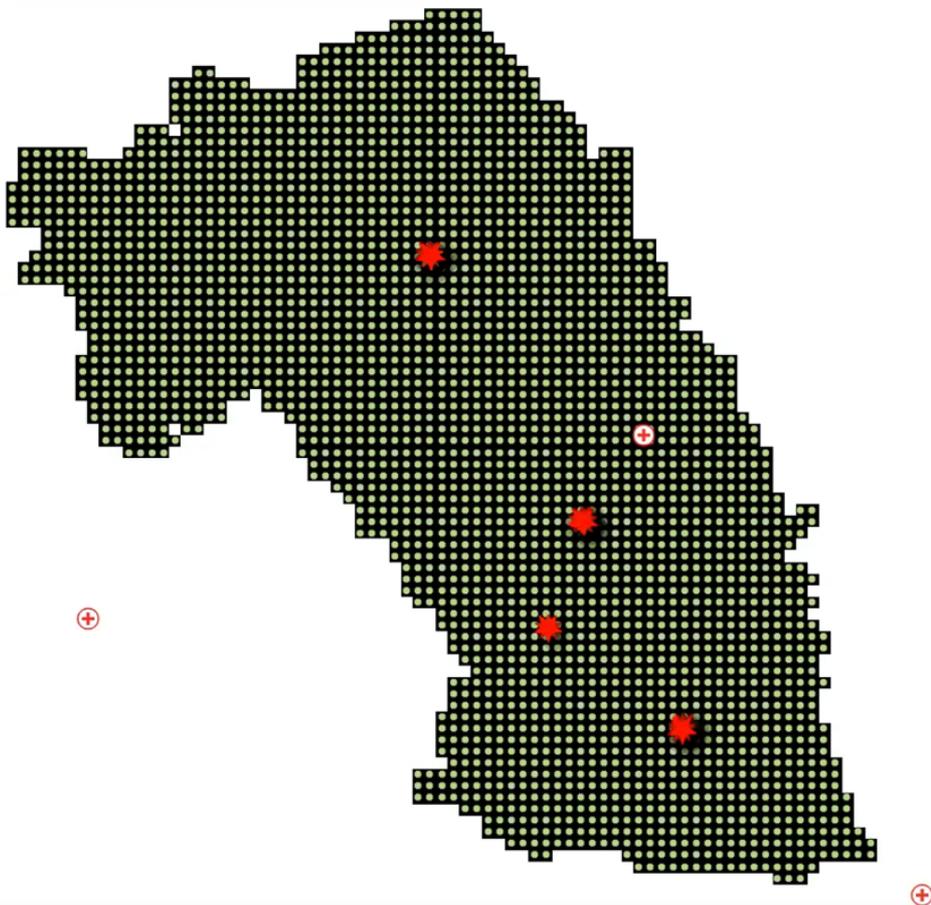


Figure 1. Map of coordinate about survey plots by Dr. Cho.

Mr. Jung collected all the coordinates of plots that were in the image files from Dr. Mamun into an Excel sheet. This file will be shared with Dr. Mamun to double-check the coordinates. Using the coordinates information, Dr. Cho created a map to check locations over Cumilla area. A circle with a cross means a weather station, a green dot means 1km resolution data and the red point means 40 plots where disease and pest data collection takes place. This map shows 10 plots in each Upazila are very near to each other and total four sites representing four Upazila are distributed in Cumilar district. Dr. Cho mentioned that even though there are about 40 plots in total, only one grid climate data can be used for each site with 10 plots. Dr. Kim suggested that a grid climate data can address the climate conditions for 10 plots of each site and thus be used for model validation.

3. Discuss about the progress of the review comments of the IPM management options and historical disease survey data digitization.

Dr. Khan sent the email about this third agenda before the meeting. Dr. Khan will share the disease part of IPM management options this week. SNU team will start working on the IPM decision trees using the disease part first.

Using digitized historical survey disease data, SNU team will conduct statistical analysis using corresponding weather data from the Cumila station. SNU team informed that the historical disease survey data is a key data for modeling. And data from Dr. Mamun in the field will be used to validate the models and also to understand the performance of the models together with the seasonal and sub-seasonal forecasts from the UniDform software.

4. Discuss about upcoming training dates and details about training.

Based on the technical assessment survey to the potential trainees in BRRI, we discussed to identify the training agenda. Ms. Baek briefly presented about the analysis result of the technical assessment survey. Based on the calendar of project, the first training will be conducted between the end of May to mid-Jun. And the last training will be in July. The first training will take place with the Zoom in a virtual meeting format and the last training can be done as a face-to-face training if possible depending on the circumstances.

Although we identified some key areas for technical capacity building, the team agreed that not all the participants have to run all the training packages. Since the participants belong to various departments, they may need to focus more on what they may have to be responsible during the operational use of the project output (SPMP). Therefore, we will have a general introduction training session at first, where explaining the whole picture of the project, and then depending on the demands and interests of the participants, training will be divided into 2 groups, i.e., the climate information provider side and the climate information user side. The provider side will be interested in creating climate information and the user side will be interested in how to use that climate information for agricultural decision making (pest and disease modeling and integrated pest management decision trees).

Dr. Kim suggested that in the first training, we just focused on each model and basic technical capability building, such as installing and handling the R-based models with simple data analysis and digitization of data. Because utilizing the gridded climate information products requires much resources with a long time simulation, Dr. Cho suggested to have enough break time between the first and second trainings, so that the participants can run that models by themselves. At the end of the training, we will have some time to share issues and problems from the participants and solve some specific tasks together. Dr. Milon will support the remaining group of participants in Bangladesh to run all the packages.

SNU will draft the first training agenda timeline and programs. It will be shared via email and get comments from BIRRI partners and IWMI to finalize the agenda for training. The agenda will confirm before the end of April, and after that, preparation of the first training will need to start. After confirming the training date and getting a permission from authority (taking about a week), BIRRI partners will make an official letter to inform the participants.

Disease Incidence (severity) or Insect Infestation				
Date(dd/mm/yy)	Disease or insect pest	Crop growth stage	Incidence (severity) or infestation (%)	Insect population (20 hand sweeping)
26.02.2022	Rice leaf bhart	Tillering	10% (DS 3)	
	Tungro	Tillering	<0.1%	
	GLH	Tillering		1
7.03.2022	Rice leaf bhart	Tillering	10% (DS 3)	
	Tungro	Tillering	<0.1%	
	YSB	Tillering		6
13.03.2022	GLH	Tillering		3
	Rice leaf bhart	Tillering	10% (DS 3)	
	Rice leaf bhart	Maximum tillering	20% (DS 3)	
20.03.2022	GLH	Maximum tillering		2
	Rice leaf bhart	Split Booting	20% (DS 3)	
	Sheath blight	Split Booting	1% (DS 1)	
27.03.2022	Rice leaf bhart	Flowering	20% (DS 3)	
	Rice leaf bhart	Flowering	20% (DS 3)	
	Sheath blight	Flowering	10% (DS 3)	

2. Technical understanding of computer programming language

- ii. Please select the degree of your skill (ability of utilization) for R programming language.
- iii. Please select the degree of your skill for Microsoft Excel program.

