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Assessment of  
**Community  
Responses to  
Advisory Services  
and Early Warning**



**September, 2020**

**Under Strengthening Household Ability to Respond to Development Opportunities  
(SHOUHARDO) III Program of CARE Bangladesh**

**Supported by USAID and Government of Bangladesh**







This report is produced through the generous support of the United States Agency for International Development (USAID) and complementary support from Government of Bangladesh through CARE's SHOUHARDO-III Program. Contents of this report are the responsibility of RIMES and do not necessarily reflect the views of USAID or the United States Government. The pictures, data and information used in this report are intellectual property of Regional Integrated Multi-Hazard Early Warning System (RIMES) unless otherwise mentioned. Hence, these cannot be published or reproduced in any form without prior permission or appropriate reference.



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**Cover Photo**

A woman is returning from field at Bamondanga union of Nageshwari upazila of Kurigram district

**Inner Photo**

A female participant working in her vegetable garden in Haldia union of Shaghata upazila of Gaibandha district

## **Acknowledgement**

RIMES would like to gratefully acknowledge the support provided by the staff of SHOUHARDO III Program including all CARE Regional Offices and implementing partners of CARE Bangladesh. Special thanks go to the Project Managers, Upazila Coordinators, Technical Officers and Field Trainers of the implementing partners of the study area for this assessment- NDP in Sirajganj, ESDO in Jamalpur, SKS in Gaibandha, MJSKS in Kurigram and DAM in Sunamganj. They helped local level mobilization of the beneficiaries to enable the team in implementing an intensive schedule over a very short period while maintaining the social distancing protocol. We appreciate their cooperation throughout the assessment process. Our sincere gratitude goes to the participants for their time and active participation for this post flood assessment. Without their feedback of the performance of the voice messaging system and insight to their condition, this assessment would not have been possible. We convey our heartfelt gratitude to them.

## **Executive Summary**

Regional Integrated Multi-Hazard Early Warning System (RIMES) is currently implementing the project “Improved Weather and Flood Information System for Community Based Risk and Resource Management” under Strengthening Household Ability to Respond to Development Opportunities (SHOUHARDO) III program of CARE Bangladesh supported by USAID and with complementary support from Government of Bangladesh. The project focuses on making localized weather and flood forecasts available to the communities at risk with sufficient lead time in an understandable format.

To improve the existing weather and flood forecast, RIMES has successfully operationalized the 15-days streamflow forecasting system at Flood Forecasting & Warning Centre (FFWC) of the Bangladesh Water Development Board (BWDB) and customized location specific weather forecasts for the 23 upazilas of 8 SHOUHARDO III districts as well as Dhaka in collaboration with Bangladesh Meteorological Department (BMD). Using these improved weather and flood information, RIMES in collaboration with FFWC-BWDB, BMD, Department of Disaster Management (DDM), Department of Agricultural Extension (DAE) and Department of Livestock Services (DLS) has been disseminating weather and flood forecast along with agromet advisory, livestock advisory, advisory for before, during and after floods, etc via voice message broadcasting system directly to the selected beneficiaries of the RIMES intervention. These community oriented weather information and advisory services aims to enhance resilience and move the conversation from “What the weather will be” to “What the farmer should do”. Regular monitoring was carried out by RIMES to improve the performance of the voice messaging system on a regular basis. However, a detailed assessment is required to realize the response of the community to these advisory services and early warnings. In this connection, RIMES professionals along with a team of enumerators carried out an assessment to assess the community response and the impact of the weather information and advisory services during 19-27<sup>th</sup> September, 2020.

The objective of this assessment was to evaluate the impact of the weather and flood information system as well as the advisory services at the community level and the response of the community to these information and advisories. The assessment mainly focused on the 2020 flood affected districts of the pilot areas- Sirajganj, Gaibandha, Jamalpur, Kurigram and Sunamganj. The study was conducted in Participatory Rural Appraisal (PRA) approach which focuses on incorporating the knowledge and opinions of rural people in the planning and management of development projects and programs. A sample size of 685 participants was chosen for the assessment. However, due to the Covid-19 pandemic, Government declared

nationwide lockdown in 22<sup>nd</sup> March, 2020 for which all field activities were halted. But RIMES followed a contingency plan to provide support to FFWC to ensure the smooth operation of flood forecasting system as well as dissemination of flood forecasts, warnings and advisories to the communities at risk. In August, lockdown restrictions were relaxed and RIMES resumed their field activities following all health protocols. The assessment was planned accordingly after careful deliberation with CARE Bangladesh. RIMES customized the assessment plan following health protocols and maintaining social distancing at all instances. The assessments were carried out in two parts- onsite survey and phone survey. Total 206 participants took part in individual surveys and FGDs, 59 participants from different upazilas only took part in FGDs. To achieve the targeted sample size, 472 participants took part in the assessment process over the phone. However, completion of the phone surveys took longer than anticipated as most of the participants answered their phone only during the afternoon and evening. Around 5-10 participants who are not selected beneficiaries under the RIMES intervention but are from SHOUHARDO III HH (other livelihood groups), took part in the onsite assessments. These participants did not receive any voice message under the project. They were included in the assessment to assess the reach of the secondary dissemination of information. For reporting purpose, these participants are mentioned as “Non-listed Participants”. Selected beneficiaries of the project i.e. direct recipients of voice messages, are mentioned as “*Listed Participants*”.

The participants belonged to all age groups with the majority belonging to the 26-30 years' group. 69% female participants were interviewed during the assessment. Among these participants, 73% participants were listed participants and 27% are non-listed participants.

The participants described the monsoon 2020 flood as of higher magnitude than the previous years in terms of duration. Although, maximum level of flood water did not cross the highest recorded waterlevel at any point but the length of flooding exceeded the previous year's flood duration for which the participants described this year's flood as one of the worst floods in recent times. RIMES had broadcast regular flood warnings, forecasts and flood preparedness advisory as well as advisory during and after floods. Majority of the participants said they did not follow the first flood warning due to the unexpected early arrival. After seeing the forecast become reality, they started to follow the advisory and warnings. Upon receiving the flood warning information after the first spell of flood started, majority of the participants took the information seriously and started taking early action according to the advisories before the second spell of flood. Repeated and prolonged flooding caused damages at both individual level and at community level. Despite receiving flood warnings and preparedness advisories, participants suffered the devastation of flooding. Houses were damaged and floors were

eroded, homestead vegetables were destroyed, ducks and chickens were washed off. T. Aman and Jute crop production were severely damaged during the floods resulting in complete loss of production. Households, crop production, roads and embankments were damaged most due to the floods. On an average, most of the participants faced damage worth 10000-30000 BDT per household during the flood. It was observed during the onsite surveys and FGDs that participants of Sirajganj and Kurigram suffered the maximum damage. From the assessment it was revealed that almost 97% (including participants of both on-site and phone survey) among the listed participants said they received forecast-based advisory, flood forecast and warning through voice messages.

A user's baseline assessment and information need was conducted in December'2019 which revealed that despite being vulnerable and in need of advisories to cope with agricultural and livestock management practices in the face of climatic shocks, 84% of the respondents from the Char region and 87% respondents in Haor region neither received agrometeorological advisories nor got timely early warning before an extreme event. The percentage of participants in different districts receiving agrometeorological advisory and early warnings has increased drastically from December'2019 when the baseline survey was conducted to September'2020 when the community response assessment was conducted. From the assessment it was revealed that almost 97% (including participants of both on-site and phone survey) among the listed participants received forecast-based advisory, flood forecast and warning through voice messages. 80% among the non-listed participants received the forecast-based advisory and early warnings. This is a clear indication that the listed participants share the information they get with their neighbors, relatives and friends indicating that the listed participants have played an important role in dissemination of the information. All listed participants said that they received flood forecast, early warning, weather forecast, agromet advisory, livestock advisory, flood preparedness message and Covid-19 awareness messages mainly through voice message broadcasting. Majority of the non-listed participants received different types of information from their neighbors, local bazars, volunteers or from IVR 1090. Most of the participants expressed that the level of accuracy of the information provided by the voice message is usually 100% accurate. Majority of the participants said that they fully understand the contents of the voice messages. 94% of the participants said that they did not receive such information in the past. Around 80% participants usually receive voice messages 2-3 times a week. Mobile service being crucial for the smooth operation of the voice messaging system, the participants shared their insight into the mobile services during the floods. 48% participants said there was no change in mobile services during this time while 36% participants said the mobile network got interrupted frequently and 16% said the mobile service was bad in their area specially in Chowhali and Shahjadpur upazila. They

expressed that technical difficulties of the mobile operator caused the interruption in mobile services.

Most of the participants took different early actions after receiving flood forecast and warnings according to the advisories. Some participants were advised by the community to take early action while others took action when they saw heavy rainfall and flood water in their locality. Some participants could not take early action due to lack of awareness and resources. Most of the listed participants took early action with more than 5 days' lead time. The non-listed participants said they heard from their neighbors, local bazar or volunteers about the weather and flood information for which majority of non-listed participants only had 1-3 days lead time for taking early action before the flood. This year on an average, the participants saved 70345 BDT per household by taking early action and forecast based advisories. Participants saved the most amount in livestock sector by following the advisories. Participants saved as much as 39460 BDT per household in the livestock sector and 26850 BDT per household in the agriculture sector.

The impact of the voice message system was visible in all of the study areas. However, in many cases the participants were unable to act according to the advisories even though they received the information. Lack of resources and capacity to act upon the advisory are some of the difficulties the participants faced. The most important recommendation that was unanimous in all upazilas, is the need to express their problems, issues and thoughts. Capacity building of the participants is very much important at this stage to enable them to act upon the information that are being available to them. Community awareness and adequate sensitization about underlying risks are also required for building resilience among the community.

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# **Chapter 1**

## **Introduction**

### **1.1 Background**

Regional Integrated Multi-Hazard Early Warning System (RIMES) is currently implementing the project “Improved Weather and Flood Information System for Community Based Risk and Resource Management” under Strengthening Household Ability to Respond to Development Opportunities (SHOUHARDO) III program of CARE Bangladesh supported by USAID and with complementary support from Government of Bangladesh. The project focuses on making localized weather and flood forecasts available to the communities at risk with sufficient lead time in an understandable format. Through different innovative decision support systems, community oriented capacity building programs to transform and tailor the forecast products to more sector oriented actionable format; RIMES has been working relentlessly to connect the science, institutions and society to reach the last mile of the end-users through this project.

The SHOUHARDO III program works with poor rural beneficiaries from 8 districts of the char and haor regions of Bangladesh. These beneficiaries are highly dependent on agriculture and livestock for their livelihood. By repeatedly being exposed to natural hazards, these communities do not have the capacity to buffer against the impacts of climate risk through their own assets which makes them the most vulnerable to disasters. To overcome the underlying risks of climate variability and furnish better agricultural/livestock production and disaster risk reduction, RIMES has piloted the application of weather and flood forecast information and forecast based advisory (agricultural and livestock) for these vulnerable communities.

For the past few decades, Bangladesh has shown significant progress in forecasting of flood, weather and other weather induced hazards. However, these forecasts rarely reach at risk communities with enough lead time to take any early action. Even if the forecasts reach the end-users, sometimes these are difficult to interpret at the community level due to lack of capacity. So it is crucial to improve lead time of the forecasts as well as interpret these forecasts into understandable and actionable advisories.

In order to improve the forecast products and understand the existing capacity of the community in forecast application and their response to warnings, assessment of the user capacity and information need of the end users are prerequisites. In this connection, an

assessment was carried out to understand users' baseline capacity and information need during December, 2019 in the selected pilot areas of the project. Using the learnings and recommendations from the users' baseline capacity assessment, RIMES has collaborated with different national stakeholders to improve the weather and flood information system and advisory services.

To improve the existing weather and flood forecast, RIMES has performed the following activities through this project:

- **15-Day Streamflow Forecast:** RIMES has successfully operationalized the 15-days streamflow forecasting system at Flood Forecasting & Warning Centre (FFWC) of the Bangladesh Water Development Board (BWDB). Using this longer lead time forecast, FFWC was able to predict the flood of June, 2020 with 14-days lead time.
- **Location specific Weather Forecast:** RIMES in collaboration with Bangladesh Meteorological Department (BMD) has customised location specific weather forecasts for the 23 upazilas of 8 SHOUHARDO III districts and also Dhaka. These forecasts are available in the "Upazila Weather Portal" that has been linked to the BMD website and are available in both Bangla and English for better understanding.

Using the long lead flood forecast and the upazila specific weather forecasts, RIMES has been generating location-specific weather and flood forecasts and warnings in collaboration with FFWC, and BMD directly to the selected beneficiaries of this project through a voice message broadcasting system. These weather and flood information are simultaneously disseminated at district, upazila, union and community level. RIMES has also collaborated with Disaster Management (DDM), Department of Agricultural Extension (DAE) and Department of Livestock Services (DLS) to generate and broadcast agromet advisory, livestock advisory, advisory for before, during and after floods, etc. These community oriented weather information and advisory services aims to enhance resilience and move the conversation from "What the weather will be" to "What the farmer should do". RIMES carried out regular monitoring by randomly calling the recipients and collected feedback to maximize the reach and benefit of the value added information. Adjustments were made based on the recommendations of the recipients. However, a detailed assessment is required to realize the response of the community to these advisory services and early warnings. In this connection an assessment was carried out during September, 2020 to assess the community response and the impact of the weather information and advisory services. RIMES professionals along with a team of enumerators carried out the assessment process from 19-27th September, 2020. A team of photographers and cinematographers also accompanied to support documentation.

## 1.2 Objective of the Assessment

The objective of this assessment was to evaluate the impact of the weather and flood information system as well as the advisory services at the community level and the response of the community to these information and advisories. The main objectives of the assessment are:

- Assess reach and usability of the forecast and advisories
- Assess the community response to and benefits of advisory service and early warning system
- Identify gaps, further information need and areas of improvement
- Identify potential case studies and good practices

## 1.3 Voice Message Dissemination

In collaboration with FFWC-BWDB, BMD, DDM, DAE and DLS, RIMES has been broadcasting forecasts, advisory messages and early warnings in the project areas for the past year. In collaboration with DAE, RIMES prepared two advisory bulletins and disseminated with experimental voice broadcasting system during 25-26 December 2019 to about 2000 beneficiaries. Since then as of September'2020, RIMES has broadcast 70 voice messages which included agromet advisories, livestock advisories, flood forecast and warnings, advisories for before, during and after flood situation. The infographic in Figure 1 provides an overview of the voice message broadcast.



Figure 1 Voice message broadcast statistics

Special thunderstorm safety awareness message and a weather alert for the Cyclone AMPHAN was also broadcast during this time. The forecast/advisory messages have been broadcasted to 15635 recipients which includes but not limited to SHOUHARDO III program beneficiaries and other relevant stakeholders (e.g. Upazila Disaster Management Committee Members, Union Disaster Committee Members, Union Disaster Volunteers, DRR leaders, Local Service Providers, etc.). As per the system generated report, voice message was able to reach 14801 recipients as of September 2020. The SHOUHARDO III field offices and the Implementing Partners were made aware of the voice messages. Phone numbers of some of the staff members of SHOUHARDO III field offices and the Implementing Partners were incorporated in the dissemination list so that they can contribute in wider dissemination and utilization of the advisories.

Some sample voice messages have been given in the following boxes (Box 1-2):

#### **Box-1**

##### **Flood Preparedness Advisory**

“Today is Saturday, 11<sup>th</sup> of July, 2020. You are already aware that waterlevel of Jamuna river is likely to cross danger level by tomorrow or the day after tomorrow. This may cause flooding in the low lying areas of Shaghata and Fulchhari upazila.

As part of flood preparedness:

- Store dry food, firewood, fuel and alum (fitkiri) or water purification tablets for use during emergency.
- Residents of flood prone low lying areas or char areas should take shelter in relatively higher ground or in a safe place. If you are already in a shelter, embankment or comparatively higher ground, then stay there. Considering the Coronavirus pandemic situation, maintain social distancing as much as possible.
- Shift livestock and poultry birds to higher ground as soon as possible and arrange fodder.
- Worm infestation in animals increase during floods. Contact the local vet or Upazila Livestock Office for deworming medication.
- Net the ponds in low lying areas and if possible repair the edge of the ponds to prevent fish from washing away.
- Keep an eye on your children to avoid accidents like drowning.
- You may store carbolic acid to prevent your household from snake infestation during flood.
- Share the flood forecast with your neighbors and relatives.”

**Box-2**  
**Livestock Advisory**

“Today is 21<sup>st</sup> August. You already know during the monsoon season, different type of diseases in cattle and poultry increase and crisis of animal food usually occurs in the Haor region. Advisories in this situation are:

- Vaccinate your animals against infectious diseases such as Foot and Mouth disease, Black Quarter, Pneumonia, Anthrax etc. For vaccination, contact the local vets or Upazila Livestock Office.
- Feed your animal deworming medicine as advised by the Vet.
- Cattle must be fed dry hay. Wet or rotten straw should be avoided.
- Feed your animal banana, mango, jackfruit, fig leaves or mix straw with water hyacinth to make up for the lack of green grass.
- Give 300 to 400 gm broken rice or rice bran to lactating animals and growing heifers.
- If possible, give 20 to 25 g of any branded mineral mixture for boosting immunity and growth of animals.
- Vaccinate your poultry against Newcastle disease.”

As Bangladesh reported its first confirmed Covid-19 case on 8<sup>th</sup> March, 2020, advisory bulletins mentioning the symptoms and safety measures were disseminated in the SHOUHARDO III program areas for public awareness.

#### **1.4 Overview of the Monsoon 2020 Flood**

The flood of monsoon 2020 is unique because of its duration and intensity. In fact, it was the recorded highest flood of the month June. This year almost 40 % of the country was inundated (FFWC). Duration of flood in many areas of the country exceeded that of 1988, 2018, 2019 etc. The monsoon 2020 flood is mainly characterized by flooding in the Brahmaputra basin. The most devastating effects were faced by the char region. Being located in the basin of mighty river Brahmaputra, the char region dwellers had to face severe consequences during the monsoon flood of 2020. Although the height of inundation did not exceed the recorded high, the length of flooding exceeded the record breaking flood of 2019. In many areas, the flood lasted for almost a month.

In Jamalpur and Kurigram the flood exceeded the duration of the 1988 flood. In Jamalpur and Kurigram the flood lasted for 37 and 28 days respectively which is higher than the duration of 1988 flood (16 days and 22 days for Jamalpur and Kurigram respectively).

This year the monsoon flood hit mainly in two spells (Figure 2-3). Due to excessive rainfall in the upstream region of Assam-Meghalaya and Arunanchal Pradesh, the monsoon flood started comparatively earlier this year. The first spell of flood hit in late June and ended in the last week of July. However, by 11th July the second spell of flood began and it lasted till first week of August. During this time some areas were inundated for almost around 40 days. The

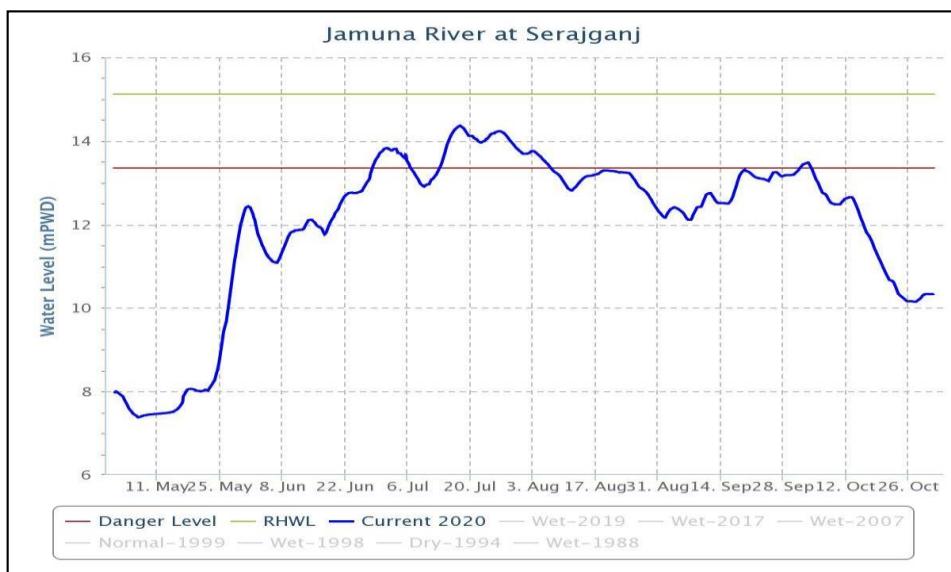


Figure 2 Observed waterlevel of Jamuna River at Sirajganj station

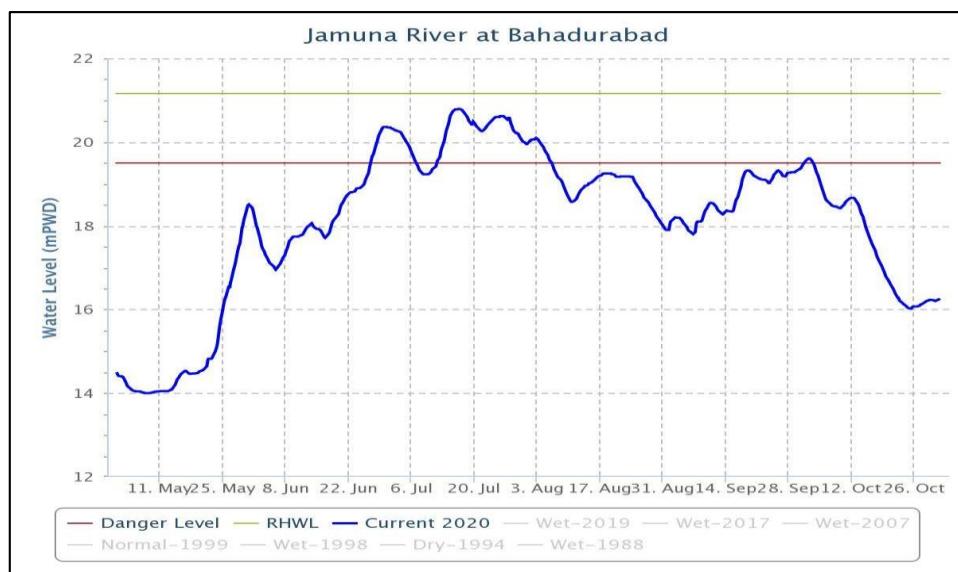


Figure 3 Observed waterlevel of Jamuna River at Bahadurabad point

pilot areas being low-lying char region, were repeatedly flooded from the overflowing Brahmaputra and Jamuna River as water level remained close to the danger level at all

stations. Due to excessive rainfall in the upstream of Bangladesh, water level crossed the danger level again in the last week of September (24<sup>th</sup> September till 3<sup>rd</sup> October) and these areas were inundated again.

It is worth mentioning that the water level in none of the stations of the project areas crossed their highest recorded water level this monsoon.

As an upstream location, Kurigram got affected earlier than the three other districts and consequently waterlevel in Kurigram started receding before the downstream locations of Gaibandha, Jamalpur and Sirajganj.

Table 1 and 2 shows an overview of the monsoon 2020 flood and its comparison with historical floods respectively.

*Table 1 Overview of monsoon 2020 flood*

<b>Stage</b>	<b>Duration</b>	<b>Affected area</b>	<b>Cause</b>	<b>Average Rainfall</b>
First spell	27th June- 6th July	Northern districts that are adjacent to Teesta, Brahmaputra, Jamuna River and central areas adjacent to Padma River	excessive rainfall in Assam-meghalaya, Arunanchal, West Bengal as well as in the Himalayan regions	(June June – 29 24) Assam-meghalaya :355 mm Arunanchal 475 mm. Himalayan regions and West Bengal: 177 mm.
Second spell	11 <sup>th</sup> July- 20 <sup>th</sup> July	Northern districts that are adjacent to Teesta, Brahmaputra, Jamuna River , and central areas adjacent to Padma River	excessive rainfall in Assam-meghalaya, Arunanchal, West Bengal as well as in the Himalayan regions	(9th July – 14th July) Assam-meghalaya :360 mm Arunanchal 640 mm. Himalayan regions and West Bengal: 222 mm.
Third spell	20th July – 8th August	40% of the country inundated including northern, north eastern, central as well as areas adjacent to Dhaka.	excessive rainfall in Assam-meghalaya, Arunanchal, West Bengal as well as in the Himalayan regions	(19th July -22nd July) Assam-meghalaya :230 mm Arunanchal 210 mm. Himalayan regions and West Bengal: 95 mm
Fourth spell	16 <sup>th</sup> August – 25 <sup>th</sup> August	Coastal and central region of the country	Due to excessive rainfall in the coastal belt and abnormal tidal	20 <sup>th</sup> August -24 <sup>th</sup> August Countries Coastal Region: 200 mm

<b>Stage</b>	<b>Duration</b>	<b>Affected area</b>	<b>Cause</b>	<b>Average Rainfall</b>
			force due to new moon effects	
Fifth spell	16th September 21st – September	northern districts that are adjacent to Dharla and Jamuna River	Excessive rainfall in Assam-meghalaya, Arunanchal, West Bengal as well as in the Himalayan regions	<u>22<sup>nd</sup> September – 27<sup>th</sup> September</u> Assam-meghalaya :200 mm Arunanchal 480 mm. Himalayan regions and West Bengal: 240 mm
Sixth spell	24th September-3rd October	northern districts that are adjacent to Dharla, Teesta, Atrai, Gur and Jamuna River	excessive rainfall in Assam-meghalaya, Arunanchal, West Bengal as well as in the Himalayan regions	<u>11<sup>th</sup> September – 16<sup>th</sup> September</u> Assam-meghalaya :330 mm Arunanchal 360 mm. Himalayan regions and West Bengal: 408 mm

Table 2 Comparison of monsoon 2020 flood with historical floods

Station	River	Recorded Highest Water Level (mPWD)	Danger Level mPWD (	Year		
				1988	1998	2020
Kurigram	Dharla	27.84	26.5	27.41	27.22	27.53
Noonkhawa	Brahma-putra	28.10	26.5	27.92	27.35	27.46
Fulchhari	Jamuna	21.35	19.82	-	-	21.06
Bahadurabad	Jamuna	21.16	19.50	20.62	20.37	20.79
Sariakandi	Jamuna	19.07	16.7	19.07	-	17.98
Sirajganj	Jamuna	15.12	13.35	15.12	14.76	14.36
Kazipur	Jamuna	17.47	15.25	-	-	16.47

In the haor region, the flood was not as severe as it was in the char areas. This year Habiganj and Kishoreganj district were not flooded. Some parts of Netrokona (Kalmakanda union) and Sunamganj were inundated but it was a result of flashy nature of north eastern rivers such as Jadukata, Someswari and Jhalukhali.

## 1.5 Study Area

SHOUHARDO III program area includes 8 districts of the char and haor region- Sirajganj, Gaibandha, Jamalpur, Kurigram, Habiganj, Kishoreganj, Netrokona and Sunamganj. The pilot areas of the RIMES-CARE partnership were finalized during the beginning of the year Oct'19-Sep'20 and includes in total 23 unions from 13 upazilas under these 8 districts. The weather and flood information and advisories were disseminated to all the selected beneficiaries of these pilot areas.

The char region experienced severe flooding during the monsoon season of 2020, starting from the last week of June lasting till the second week of August in some areas. Tahirpur upazila of Sunamganj district also experienced flooding during this monsoon season. During this period, flood early warning, flood preparedness advisory, advisory for agriculture and livestock during and after floods, flood forecasts etc. were broadcast at regular intervals. The

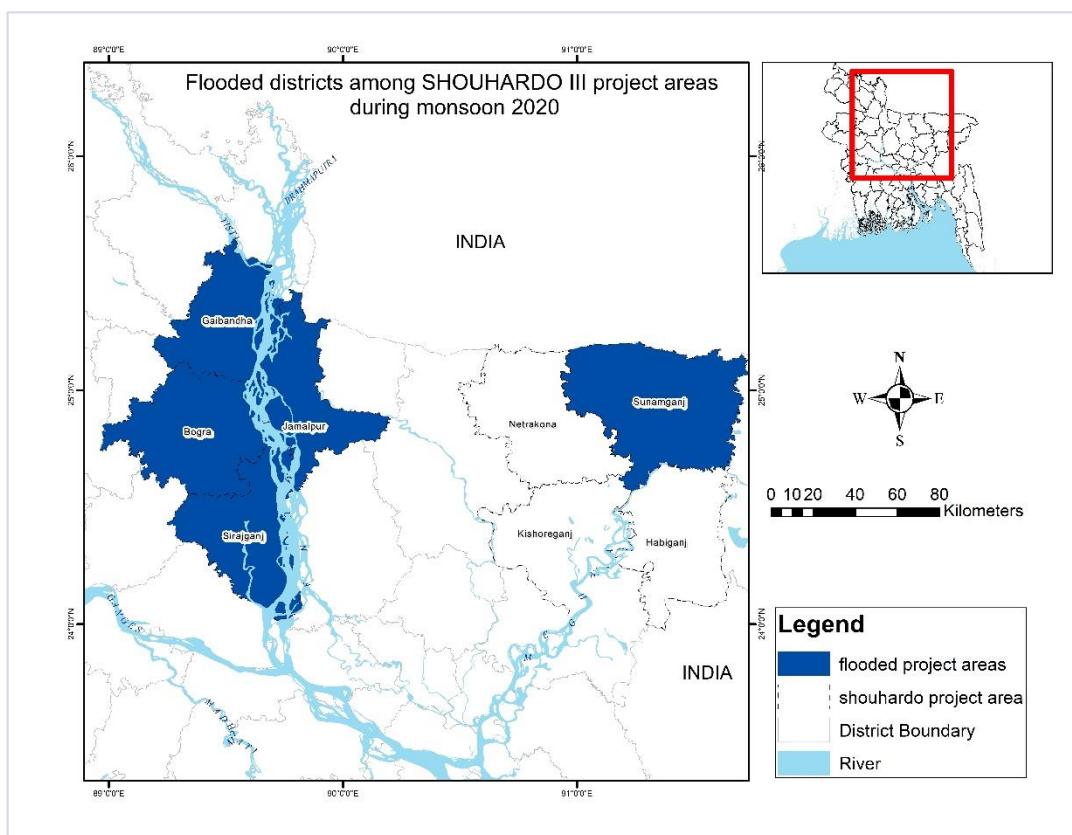


Figure 4 Study area for the assessment

assessment mainly focused on the 2020 flood affected districts of the pilot areas- Sirajganj, Gaibandha, Jamalpur, Kurigram and Sunamganj. This post flood assessment provided an insight into the actual use and application of these advisory services, forecasts and early warnings and what more needs to be done to make the system more comprehensive, usable and user-friendly as well as improve the forecast itself.

## **1.6 Limitations of the study**

The major limitation of this assessment was the Covid-19 pandemic situation. On 22<sup>nd</sup> March, 2020 nationwide lockdown was declared and all field activities were halted. RIMES implemented a contingency plan so that the soft activities can be carried out by the professionals from home and the early warning system can continue. During this time, RIMES professionals provided technical support to FFWC to ensure the smooth operation of flood forecasting system as well as dissemination of flood forecasts, warnings and advisories to the communities at risk. During August, the government started to relax the lockdown restrictions and RIMES resumed their field activities following all health protocols. As the implementing partners of SHOUHARDO III program were following restricted movement in the field, RIMES planned the assessment accordingly and took the following precautions:

- Onsite surveys were carried out with around 40% participants of the total sample size. The rest of the participants took part in phone survey.
- Focus group discussions (FGDs) were carried out with maximum 5-6 participants.
- At each union, three different locations were selected for conducting the assessments and only 7-8 participants were present at a time.
- The number of enumerators for conducting individual surveys were also reduced to three to avoid mass gathering.
- Masks were provided for the participant, instant body temperature check was carried out and there were proper arrangements for handwashing at all locations.



*Figure 5 Instant body temperature check of the participants being carried out by RIMES*

Another limitation was faced while conducting the phone surveys. Most of the people were not always available on the phone for being engaged in different works. It was observed that most of the participants answered their phones during afternoon and evening. So, the beneficiaries who were reached for the phone surveys at morning or noon rarely responded. Then again there were phone numbers that were unreachable or switched off. In total, 822 participants were attempted for the phone surveys and only 472 participants responded. It was clear through the assessments (both onsite and over the phone) that the participants were eager to learn more about forecast-based agricultural and livestock management. The surveyors had to spend a significant amount of time behind each participant for answering all of their queries. For these reasons, the completion of the phone surveys took longer than anticipated

# Chapter 2

## Study Methods

### 2.1 Methodology

The study was conducted in Participatory Rural Appraisal (PRA) approach. This approach focuses on incorporating the knowledge and opinions of rural people in the planning and management of development projects and programs.

For sampling method, the guidelines of United Nations Department of Statistics from 'Designing Household Survey Samples: Practical Guidelines' (UNDS, 2005) was used. The proposed method uses the following equation to determine the sample size:

$$N_h = (84.5) (1-r)/ (r) (p)$$

Here,

- N<sub>h</sub> Parameter to be calculated, Sample size
- r an estimate of a key indicator to be measured by the survey, (r=0.7, with a confidence level of 95%, considering 70% of participants receiving early warning based on the system generated statistics)
- p the proportion of the total population accounted for by the target population and upon which the parameter, r, is based, (P=0.06, considering the beneficiaries account for approximately 6% of total SHOUHARDO III households)

This gives a sample size of 603.57~604. A sample size of 685 participants was chosen for the assessment. The sample size has been distributed among the 14 unions under the 5 flood affected districts of char and haor region in ration with the number of beneficiaries per area. Although the onsite surveys were conducted with 285 participants, only 206 participants took part in the individual surveys. Some participants of Tahirpur, Nageshwari, Shaghata and Fulchhari only took part in the FGDs and left the survey site as soon as the FGDs were over due to having other work engagement. So, to get a representative sample size, the number of phone surveys per upazila was adjusted accordingly. So, the total sample size including onsite surveys and over the phone surveys became 678. The plan and schedule of assessment is given in details in Annex-1.

The data for individual surveys were collected using Google Forms. The data were validated and complemented by the findings from FGDs, then were compiled, sorted and analyzed to provide statistical analysis.



*Figure 6 Focus group discussion in Haldia union of Shaghata upazila*

## **2.2 Participant Selection**

Participants were chosen following the randomization method. A random number was assigned to each participant of the selected upazilas. Then the numbers were sorted in ascending order generating a completely random list of participants for that particular upazila. Priority was given to female participants. Considering the Covid-19 pandemic situation, the assessments were carried out in two parts- onsite survey and over the phone survey. Due to social distancing protocol, the onsite surveys were carried out with maximum 36 participants from each Union. Around 5-10 participants who are not selected beneficiaries under the RIMES intervention but are from SHOUHARDO III HH (other livelihood groups), took part in the onsite assessments. These participants did not receive any voice message under the project. They were included in the assessment to assess the reach of the secondary dissemination of information. For reporting purpose, these participants are mentioned as “Non-listed Participants”. Union Disaster Management Committee members also took part in the onsite surveys to provide a better understanding of the community response. The phone

surveys were conducted with only selected beneficiaries of the project i.e. direct recipients of voice messages. For reporting purpose, these participants are mentioned as “*Listed Participants*”.

## **2.3 Survey Questionnaire**

The individual survey questionnaire was designed focusing on quantitative assessment while the FGD questionnaire was designed to focus on the qualitative analysis. The general discussions from the sites validated and complemented the findings from the individual surveys to represent a valid statistical comparison. UDMC members were also invited to take part in the FGDs. A separate smaller set of questionnaire was prepared for phone survey. The onsite individual survey, FGD and phone survey questionnaire are given in Annex-2.

# Chapter 3

## Assessment

### 3.1 Characteristics of the participants

During the onsite survey, total 206 participants took part in individual surveys and FGDs. 59 participants from different upazilas only took part in FGDs. 472 participants took part in the assessment process over the phone. It was advised from CARE Bangladesh to keep at least 65% female participants. Following the requirement, 69% female participants were interviewed during the assessment. The participants belonged to all age groups with the majority belonging to the 26-30 years' group (Figure 7).

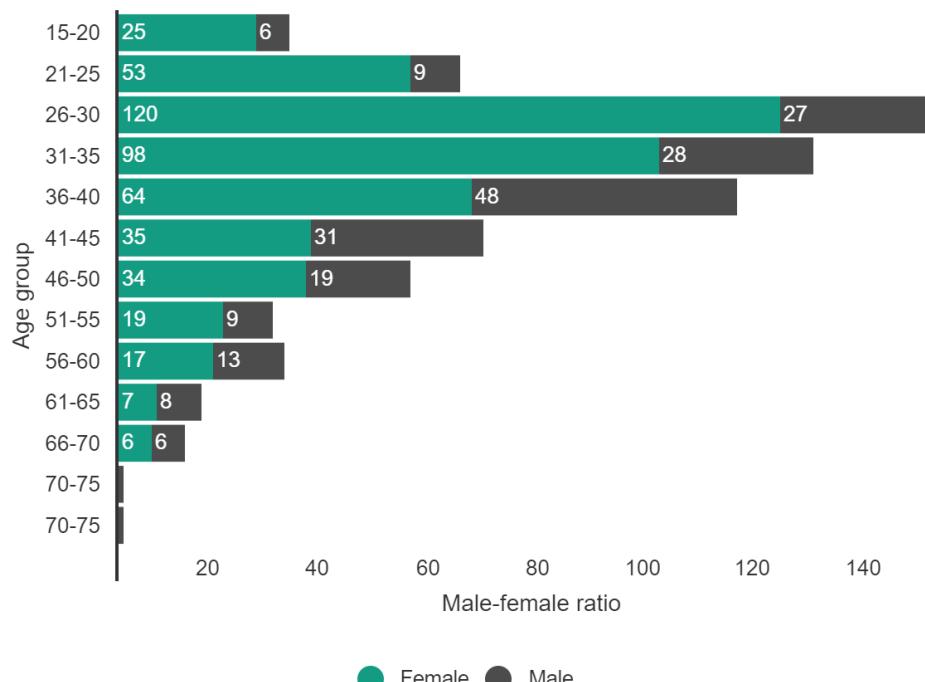


Figure 7 Age distribution of participants

Among these participants, 73% participants were listed participants and 27% are non-listed participants. Most of the participants under the RIMES intervention are mainly dependent on agriculture and livestock for their livelihood. Majority of the female participants (93%) are



Figure 8 Distribution of listed and non-listed participants

housewives and engage in backyard vegetable gardening and livestock rearing. The male members are mostly involved in farming (67%). Besides farming and livestock rearing, the participants also take up fishing, day labor, small business, tailoring etc. as means of livelihood.

### 3.2 Participant's Perception of the 2020 Monsoon Flood

The participants described the monsoon 2020 flood as of higher magnitude than the previous years in terms of duration. Maximum level of flood water did not cross the highest recorded waterlevel at any point but the length of flooding exceeded the previous year's flood duration for which the participants described this year's flood as one of the worst floods in recent times.



Figure 9 A participant from Haldia union showing the maximum level of flood water of 2019 and 2020 monsoon flood respectively by the discolouration of the tin of her house

As flood arrived early this year, some participants did not pay much importance initially to the flood warnings that were broadcast via voice message during the last week of June. When water started to overflow the river banks, they realized the importance of the flood warnings but this realization came after the flood had already started. So, the participants could not take any early action this time. During the first week of July when the flood water started to recede, they received another flood warning. This time they took the information seriously and tried to follow the advisories accordingly. However, the repeated and prolonged flooding caused damages at both individual level and at community level. Houses were damaged and floors were eroded, homestead vegetables were destroyed, ducks and chickens were washed off.

Households, crop production, roads and embankments were damaged most due to the floods (Figure 10).

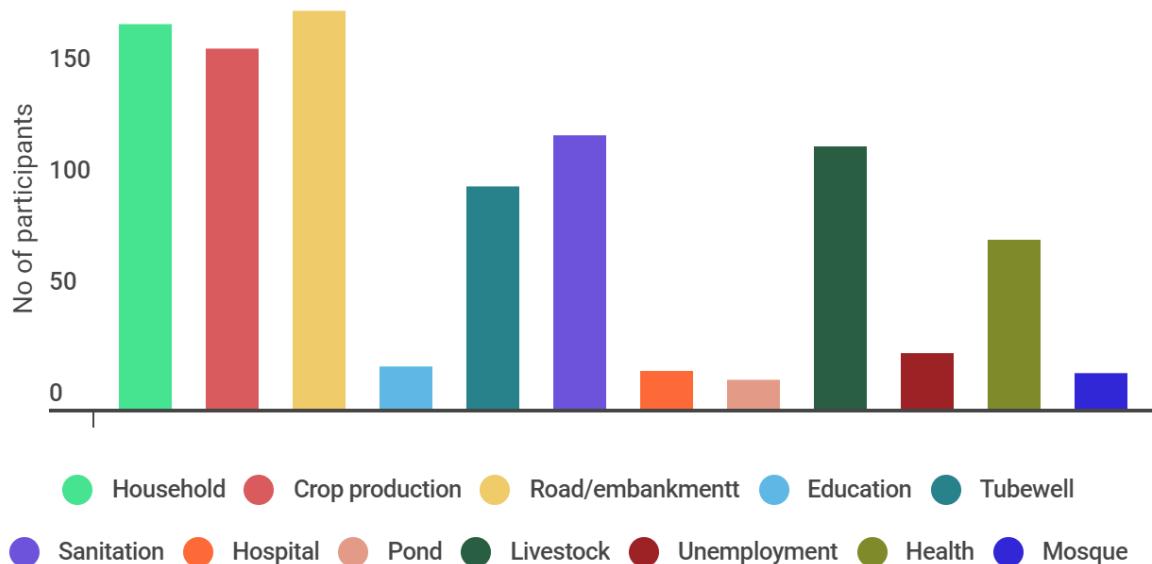
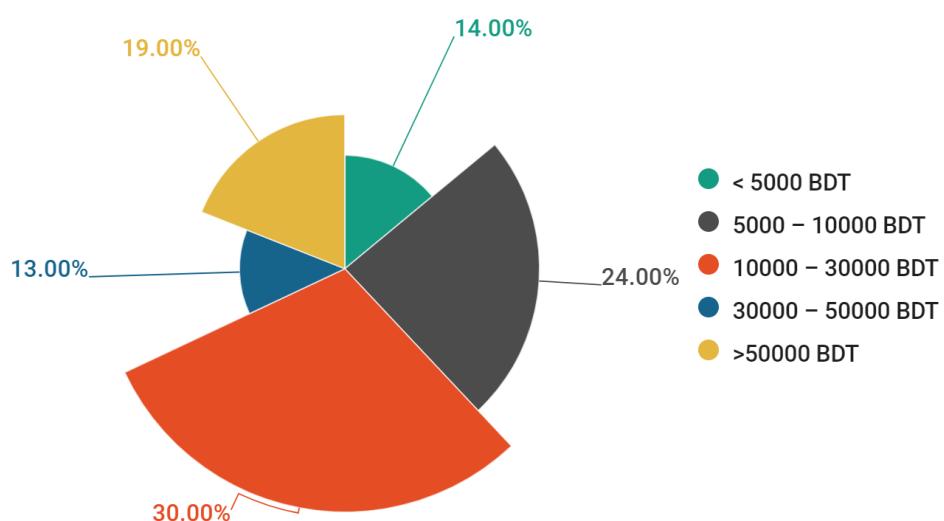
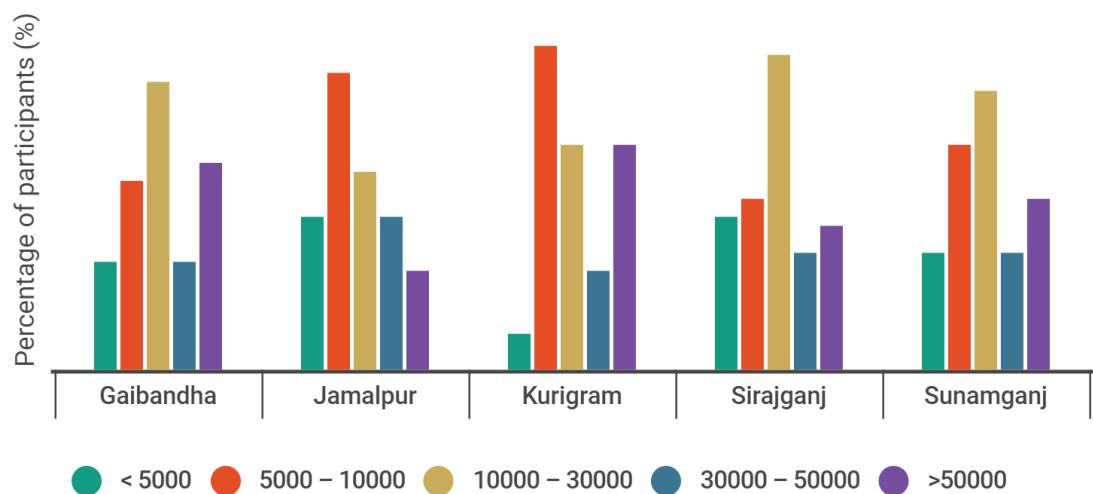


Figure 10 Damage experienced during the monsoon 2020 flood

The participants were asked about the amount of damage they encountered during this flood. They mentioned that maximum damage occurred during the first and last spell of the flood. As flood arrived early, they were not prepared and their crop production specially jute production suffered the most damage. The prolonged flooding caused damage to their households, roads and embankments. On an average, most of the participants faced damage worth 10000-30000 BDT per household during the flood (Figure 11).

It was observed during the onsite surveys and FGDs that participants of Sirajganj and Kurigram suffered the maximum damage (Figure 12).



*Figure 11 Amount of damage experienced during the monsoon 2020 flood*

Majority of participants from Sirajganj, Gaibandha and Sunamganj suffered damage between 30000-50000 BDT per household. In Kurigram and Jamalpur, participants said that on an average, they faced damage worth 10000-30000 BDT during the flood.

Lack of proper sanitation caused unaccountable misery to the female participants specially those who were pregnant. Tubewells were submerged causing scarcity of pure drinking water. Participants would have to walk several miles in the flood waters to get drinking water from the one or two tubewells in their community that were on comparatively higher ground. Some participants were afraid to go to flood shelters in fear of Covid-19. Some participants in Omarpur union of Chowhali and Belgacha union of Islampur had the plinth of their houses raised under the SHOUHARDO III program. Their households did not incur much damage from the floods.

*Figure 12 District-wise comparison of damage suffered by the participants*

Majority of the participants who are involved in farming suffered losses in crop production. The participants received agromet advisory before the floods that advised them to cut their jute if they had reached 80% maturity. Due to early flooding the participants could not save their jute as at the time of flooding the jute were not ready for harvesting. Following the advisories, Md. Abdur Rahim from Erendabari union of Fulchhari upazila was able to cut jute as he sowed early and it was at the state of 80% maturity before the flood. So he saved about one “Bigha” of jute. He was the only one in his village who had harvested jute this season. Participants from Bamandanga union of Nageshwari upazila expressed their regret of not cutting the jute at the time of receiving the advisory as they could have used the immature jute as fuel instead of completely letting it rot in flood water.

When floodwater started to recede during the first week of July, participants were eager to prepare seedbeds for T. Aman rice. However, after receiving a flood warning for the second spell in mid-July, majority of the participants refrained from preparing seedbeds and other agricultural activities and avoided potential loss.

After flood water started to recede for the second time, participants prepared seedbeds for T.Aman and proceeded with the plantation. However, heavy rainfall in the upstream areas and in Bangladesh resulted in the rise of waterlevel again during the end of September. Flood warning and advisory were disseminated accordingly. Unfortunately, it was a time were the crop was in the middle of their growth stage and was submerged in water for 10-12 days due to the unexpected inundation. Most of the participants could not save their T. Aman crop even though they received the flood warning and advisory. At the end of September, they were preparing to plant a local variety called “Ganjia” paddy as they had lost all their Aman paddy

in the flood. The participants were not aware of any flood resistant type of paddy. Participants from Erendabari and Haldia union said that they delayed the sowing of groundnut, chili, eggplant and other vegetables when they received flood forecast in September, warning them that the waterlevel may rise again. Participants from Omarpur union said that they followed the advisories and did not plant ground nuts and other vegetables before the flood. They were preparing to sow chili, onion, ground nuts and other vegetables at the end of September as they had no T.Aman production this year.

Participants were regularly advised on livestock management before, during and after the floods. Upon receiving the flood forecast and advisory before the second spell, they took their livestock to flood shelter with them and made proper arrangements. Those who stayed at home during the floods, made temporary animal shed on higher ground. To make up for the shortage of animal feed during flood, participants were advised to give their cattle hyacinth leaves by mixing them with hay, leaves of mango, banana and other trees. The participants of Belgacha union of Islampur upazila exclaimed that this advisory was very helpful for them. Participants said that they had saved significant amount of money by following the advisories such as taking their animals to higher ground before the flood, washing grass before giving to the animals or not letting them graze on field immediately after flood water recedes. In Bamandanga union of Nageshwari upazila, the participants could not arrange for dry hay for their livestock and had to buy hay from the market at a higher price.



*Figure 13 A participants in Erendabari union raised the ground for his animals as part of flood preparedness measures*

Outbreak of Lumpy Skin Disease (LSD) during floods was a new challenge for the participants as they did not know much about this disease before. The participants received advisory for LSD although some of them did not realize the meaning of the word “LSD” or “Lumpy Skin Disease”. Most of the people couldn't identify it in preliminarily stage and it spread among the entire area as all the cows were kept together at the flood shelter during the flood. But some people realized that the message was about an infectious disease of cow and like Covid-19, the infected cows needed to be kept separate from other cows. Md. Abdul Mokul from Haldia union said that he had 6 cows and one of them got infected with LSD. He isolated the infected cow from others and took necessary steps for recovery through consultation with the local veterinary following the livestock advisories. The disease was mentioned by different local names in different upazilas such as “Furfuri” or “Gorur Foshka” etc. As LSD is a comparatively new disease, the local vet or Upazila Livestock Office could not supply vaccines. Participants from Bamandanga union received special livestock advisory on LSD and understood that the message was about an infectious disease of cows. When their cows were infected with LSD, they consulted with the local vet. They took proper care of the infected cows and some of the cows recovered while a few died.

Few participants in Haldia and Bamandanga union received training on goat management from the government and helped others to prepare raised shed for goats. Participants who stayed at their homes also mentioned that they prepared makeshift sheds for their poultry before the second spell of flood. However, many chickens and ducks fell from these sheds

and were washed away during the floods. They also mentioned that they could not always manage clean drinking water for their animals and poultry. Moreover, due to the early arrival of flood, participants could not vaccinate their animals on time. As a result, many animals suffered from sickness due to drinking the dirty flood water.

# Chapter 4

## Forecast-based Advisory and Early Warning

### 4.1 Findings from users' baseline assessment

It was revealed during the user's baseline assessment and information need which was conducted in December'2019 that despite being vulnerable and in need of advisories to cope with agricultural and livestock management practices in the face of climatic shocks, 84% of the respondents from the Char region and 87% respondents in Haor region neither received agrometeorological advisories nor got timely early warning before an extreme event. This information was usually received from TV or by dialing the IVR number 1090. It was also revealed that the current lead time of forecast for different extreme events in Char and Haor Region is 1- 3 days. It was reported during the FGDs that during the flood of 2019, the participants received the flood warning only hours before flood water started to enter their house. For this they could not take any early action. It was also revealed from the survey that no livestock advisory system was available during that time and they received little to minimum agricultural and livestock advisory from the local seed, fertilizer sellers, vaccinators etc.

### 4.2 Feedback on the forecast-based advisory and early warning

Since the user's baseline assessment and information need, RIMES has broadcast 70 forecast-based advisory and early warning messages as of September'2020. These messages have been broadcast more than once depending on the importance and urgency of the content. The listed participants received the messages directly. From the assessment it was revealed that almost 97% (including participants of both on-site and phone survey) among

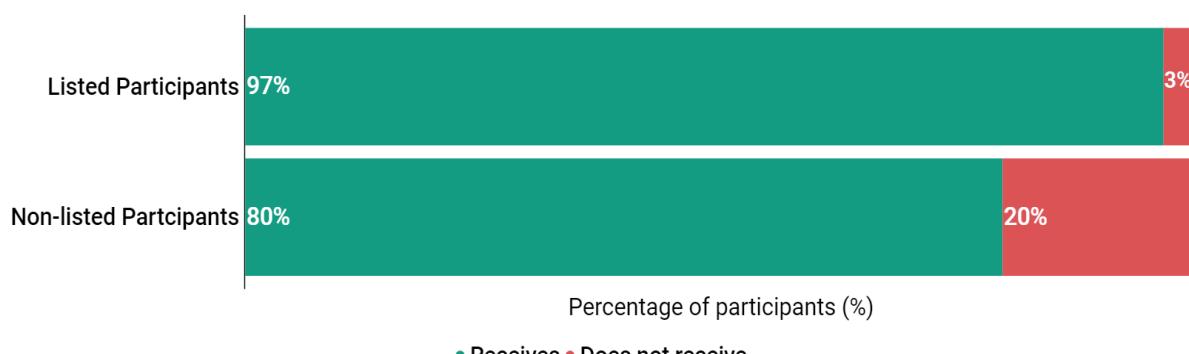
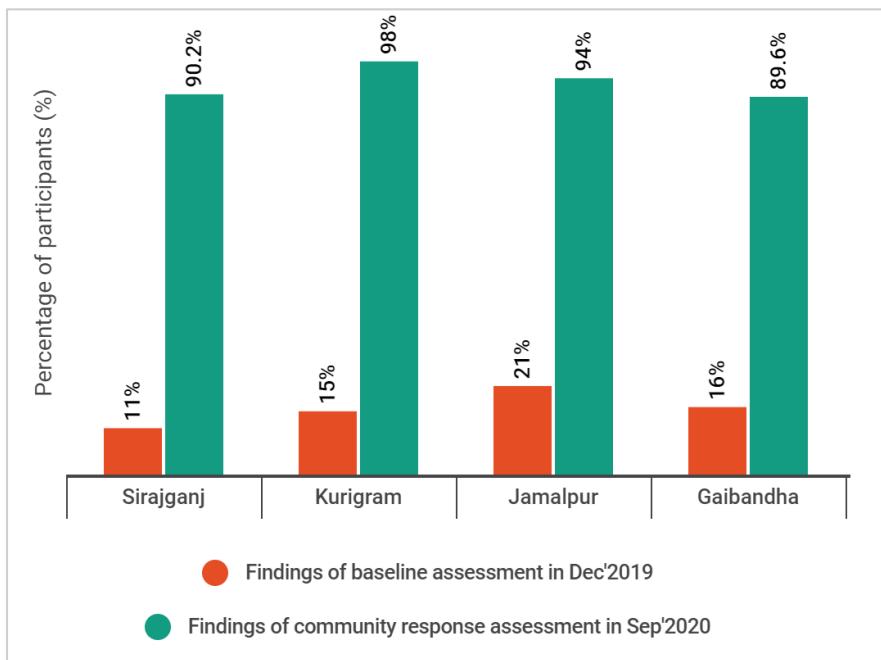


Figure 14 Percentage of listed participants receiving forecast-based advisory and early warnings

the listed participants said they received forecast-based advisory, flood forecast and warning through voice messages (Figure 14).



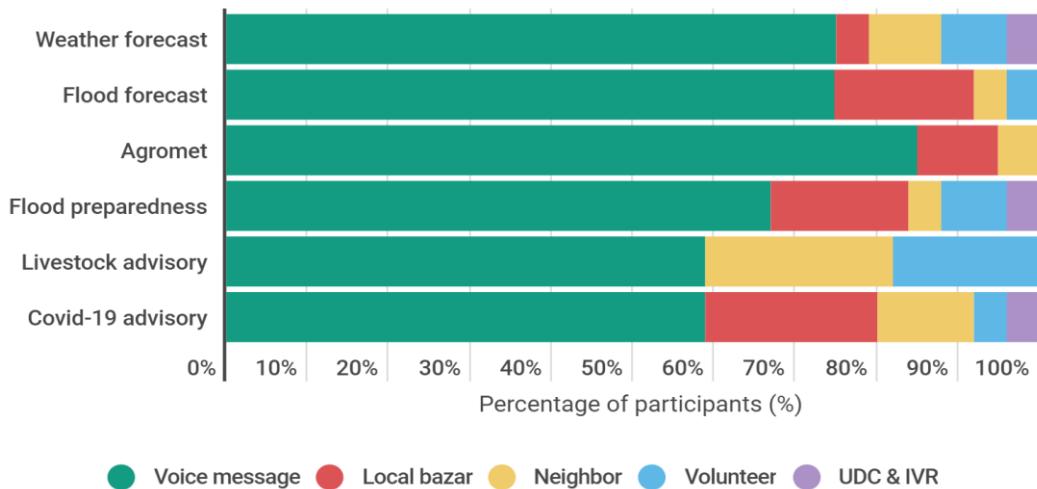
*Figure 15 Comparison of participants of different districts receiving forecast-based advisory and early warnings from December'2019 to September,2020*

80% among the non-listed participants received the forecast-based advisory and early warnings. This is a clear indication that the listed participants share the information they get with their neighbors, relatives and friends. The percentage of participants in different districts receiving agrometeorological advisory and early warnings has increased drastically from December'2019 when the baseline survey was conducted to September'2020 when the community response assessment was conducted (Figure 15).

### 4.3 Medium

All listed participants said that they received flood forecast, early warning, weather forecast, agromet advisory, livestock advisory, flood preparedness message and Covid-19 awareness messages mainly through voice message broadcasting. Along with voice message, they also received the information from neighbors, volunteers of the implementing partners, local bazars and media. Some participants said that they called the IVR 1090 number to confirm the received weather and flood information.

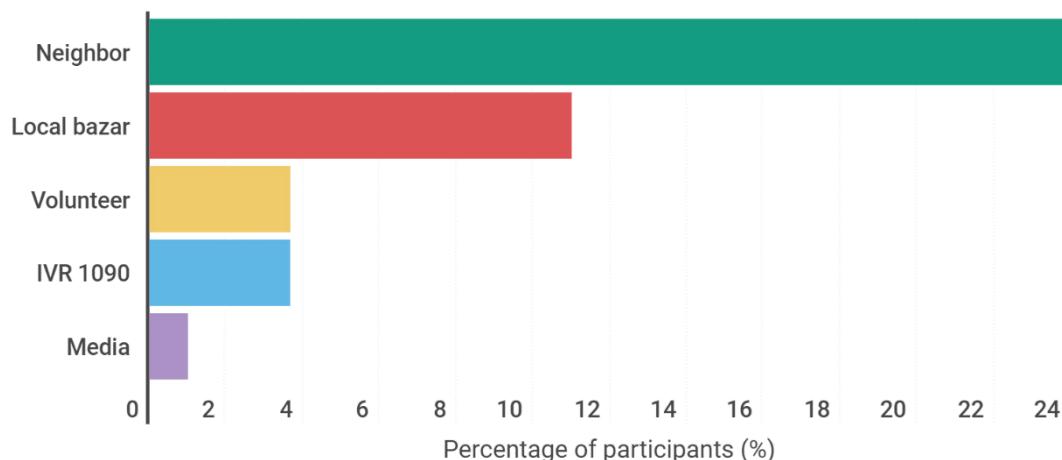
Figure 16 gives a representation of the various medium by which the listed participants received different information services.



*Figure 16 Different mediums through which listed participants received information*

It is to be noted that the voice messages were also sent to the field staff of the implementing partners (mentioned here as volunteers) and also the listed Union Disaster Committee members, Upazila Disaster Volunteers, Upazila Disaster Committee members, local service providers, religious leaders, school teachers and disaster volunteers of the pilot areas.

Majority of the non-listed participants received different types of information from their neighbors, local bazars, volunteers or from IVR 1090 (Figure 17).



*Figure 17 Different mediums through which non-listed participants received advisory and early warning*

The statistics in Figure 17 indicates that the listed participants have played an important role in dissemination of the information. At earlier stages, the beneficiaries did not give much importance to the information they received from the voice messages as this was a completely new experience for them. Many participants exclaimed that they did not even know it was possible to anticipate the weather or flood in advance. Some participants also expressed that at the earlier stages they were afraid to answer the voice message because they thought it

would cost them money if they answered the call. But when they realized that the weather or flood information that was being provided through the voice messages were correct and they can get benefitted by following the advisories from the voice messages, they started to follow the advisories. In fact, their neighbors also started to enquire about the information shared via voice messages after seeing the participants getting benefited from it. It was also made clear to the participants that the voice messages are free of cost and they would not be charged for receiving any calls. This was also an influencing factor which made the participants more interested in the voice messages. One participant from Bamandanga union of Nageshwari upazila said he does not worry about the weather anymore as he would get a voice message if any bad weather or extreme weather event is in the forecast.

#### **4.4 Voice messages service**

Listed participants shared their perception of the voice messaging system. 84% participants said that they are familiar with the voice message number “9666777200”. 93% participants expressed that were satisfied with the length of the voice message which is usually kept within 1-1.5 minutes. Most of the participants expressed that the level of accuracy of the information provided by the voice message is usually 100% accurate (Figure 18).

Majority of the participants said that they fully understand the contents of the voice messages (Figure 19).

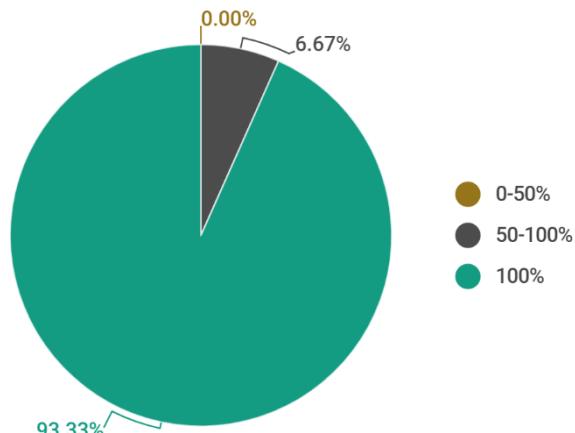


Figure 18 Participants' perceived level of accuracy of the voice message

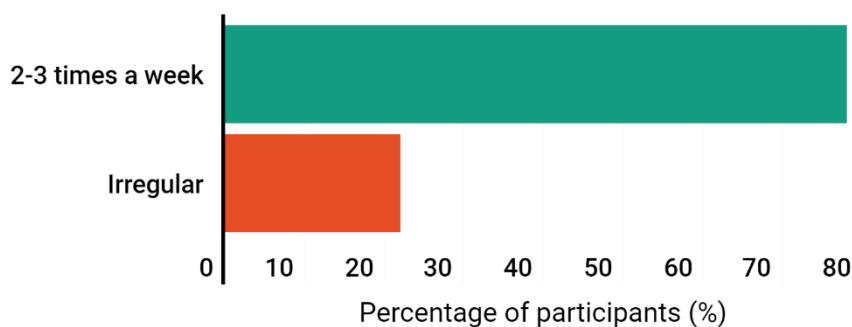
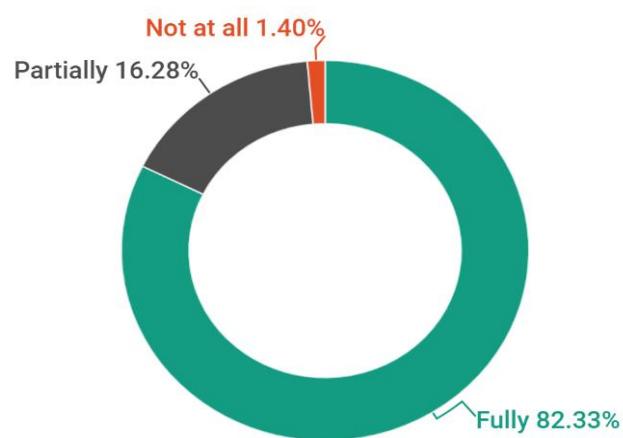


Figure 19 Frequency of receiving voice message

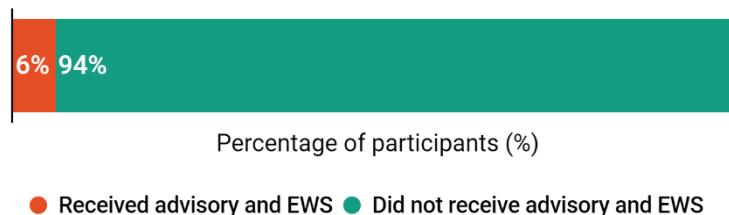
However, some participants expressed that they sometimes have difficulties in understanding some of the terms used such as name of a particular insecticides, fertilizer or other technical terms. They sometimes have local name for certain technical terms. Such as the participants of Belgacha union said they are familiar with the word “feed” or the Bangla name “Khonij Lobon” rather than the term “mineral mixture”.

Around 80% participants usually receive voice messages 2-3 times a week (Figure 20). Some participants said they receive voice messages irregularly. Participants also said that if they ever miss a voice message, they usually ask their neighbors about the contents of the message. The participants share the information with their family members as well as community members.

They also said that they usually receive information such as duration, intensity, timing of a weather event and also the actions they need to follow based on forecast. 94% participants said that they did not receive such information in the past (Figure 21).



*Figure 20 Participants' level of understanding of the contents of the voice message*



*Figure 21 Participants receiving advisory and early warning information in the past*

## 4.5 Mobile service

Mobile service is a key element of the voice message broadcasting system. Un-interrupted mobile network is required so that the participants can get the forecast and warnings at the right time through the voice messages. The participants evaluated the overall mobile services during the time of flood. 48% participants said there was no change in mobile services during the floods. 36% participants said the mobile network got interrupted frequently while 16% said the mobile service was bad in their area specially in Chowhali and Shahjadpur upazila. They expressed that technical difficulties of the mobile operator caused the interruption in mobile services (Figure 23).

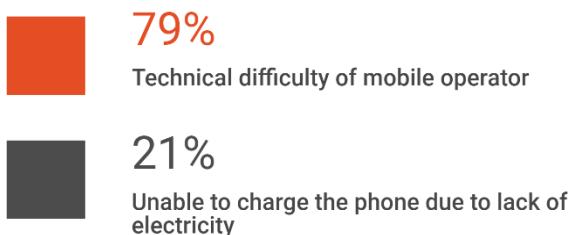


Figure 23 Participants experiencing loss of mobile communication during flood season

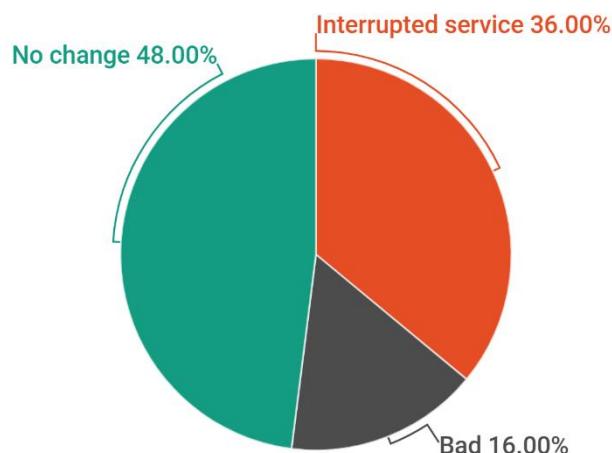


Figure 22 Performance of mobile services during the monsoon 2020 floods

Very few participants were unable to receive the voice messages for being unable to charge their phones due to lack of electricity during floods. Participants of Islampur and Shaghata upazila received uninterrupted service and said they did not find any difficulty in receiving the voice messages due to network issues.

## 4.6 Response to and benefits of advisories and early warning

As mentioned earlier, the participants did not take the weather forecasts or advisories seriously at the initial stage. Soon they started to realize that the information provided in the voice messages were useful and following the advisories would bring them benefits. Majority of the participants said they did not follow the first flood warning due to early arrival. After seeing the forecast become reality, they started to follow the advisory and warnings. Upon receiving the information after the first spell of flood started, majority of the participants took the information seriously and started taking early action according to the advisories before the second spell of flood (Figure 24).

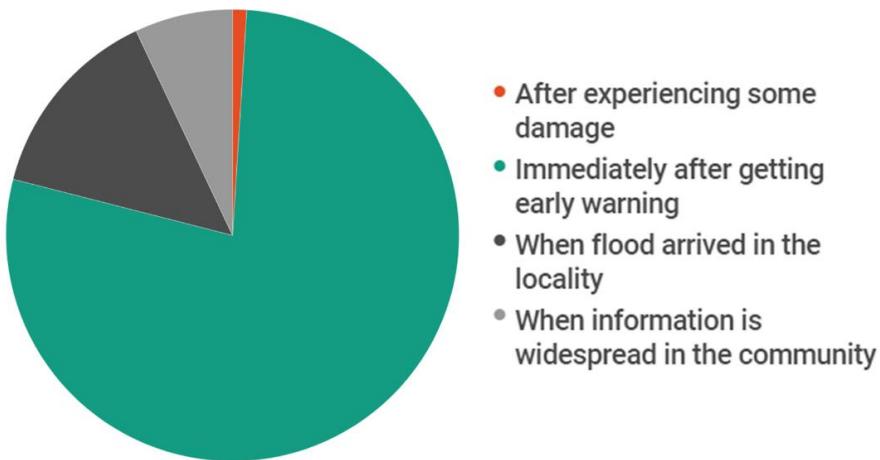


Figure 24 Factors that influenced the decision of taking early action

Some participants were advised by the community to take early action while others took action when they saw heavy rainfall and flood water in their locality (Figure 25).

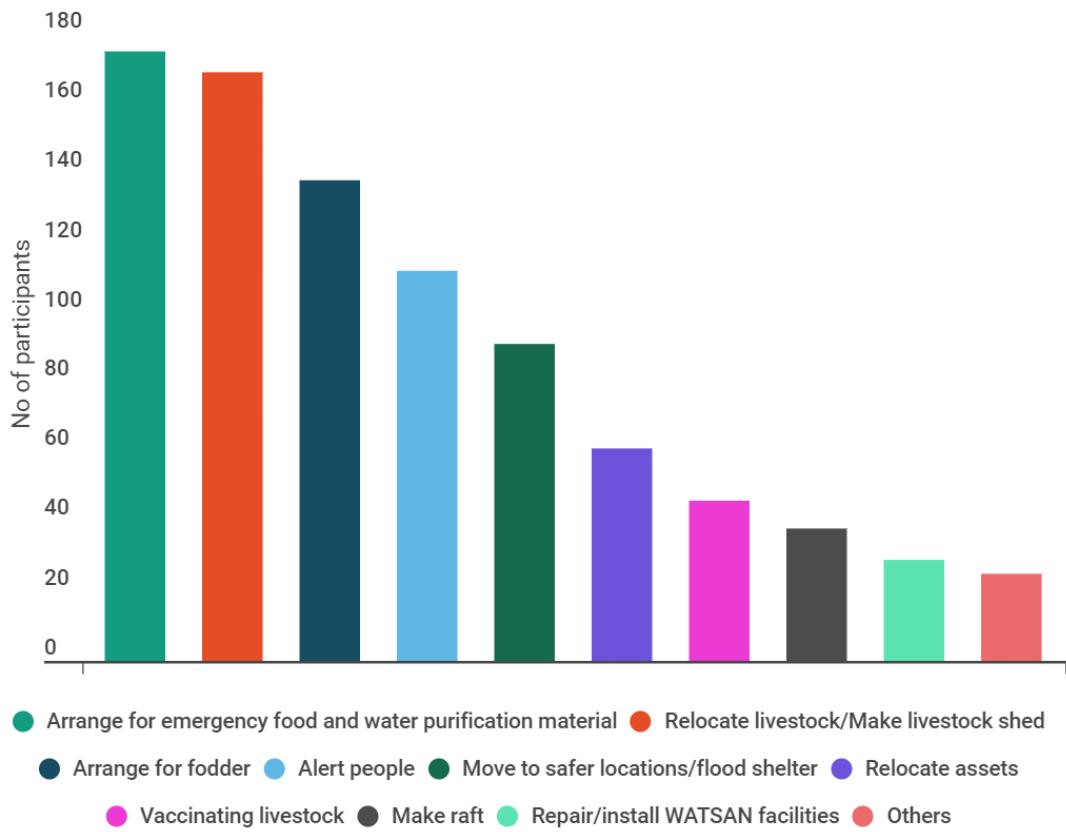
Most of the participants took different early actions after receiving flood forecast and warnings according to the advisories (Figure 26).



Figure 25 Participants taking early action before the flood

Majority of the participants arranged for emergency food, water and relocated their livestock to higher ground or safer locations. They mentioned that most of their tubewells were inundated except the ones located in higher ground. They stored pure drinking water before the arrival of flood but soon their supply was over and they had to walk in the flood waters to collect drinking water from these tubewells during the floods. Participants of Islampur union had to go to the only tubewell that was on a comparatively higher ground to collect water.

Around 50% of participants said they went to local flood shelters, higher grounds or took shelter on embankments along with their livestock and poultry. Participants of Haldia and Tahirpur upazila took shelter in their local schools which are also used as flood shelters. The other half stayed in their homes in fear of Covid-19. Participants also arranged for fodder for their livestock and poultry. Some participants specially in Shaghata upazila spent as much as

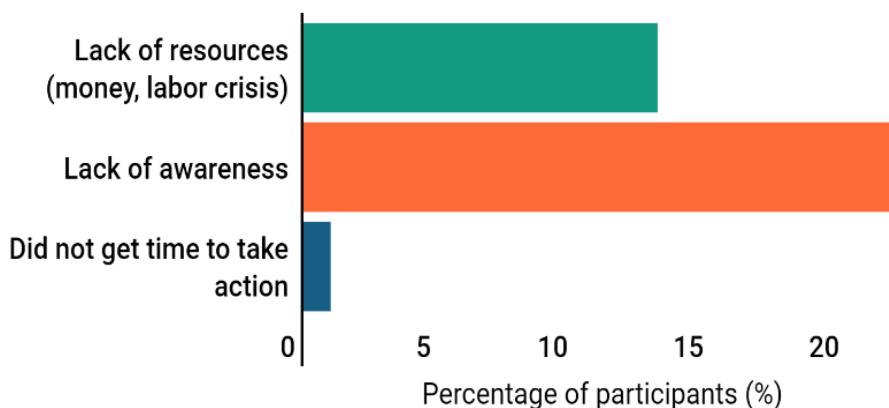


*Figure 26 Different early actions taken by the participants before the flood*

2000 BDT per week for purchasing fodder for their livestock. Due to Covid-19 pandemic, many family members of the participants who were working in garments or other places in the city lost their jobs and went back to their villages. With increased members in the family and none to minimum income, the participants had to take high amount of loans for surviving during the floods. Some of the participants also mentioned that they had to sell their assets and livestock

at lower price for arranging the basic necessities. Participants of Tahirpur and Shahjadpur upazila were able to vaccinate their livestock according to the advisories as they had a vaccinator in their community who is also a listed participant under the project. Vaccination of animals was a challenge this year due to the pandemic situation. Usually, majority of the participants vaccinate their animals through vaccination camps. But this year, such camps could not be arranged due to social distancing restrictions. The participants mentioned that they do not know from where to vaccinate their animals or whom they can contact regarding this. The participants of Bamandanga union could not vaccinate their animals in time as they usually have to travel a long way to buy vaccines for their livestock. But most of the time the vaccines get damaged by the time they bring it back to their animals as they do not have the proper vaccine storage/transportation solutions. Very few participants took other early actions such as repairing WATSAN facilities, making rafts, repairing roads/embankments with sand bags and bricks etc.

However, some participants could not take early action due to lack of awareness and resources (Figure 27).



*Figure 27 Reason for not taking early action*

Many participants were not sensitized adequately or trained about weather forecasts and the availability of such information. 63% participants said they were not able to bear the cost of taking early actions. They had to take loan from others to arrange for basics such as food, medicines, fuel, fodder etc. Participants took early action both individually and collectively as a community.

Most of the listed participants took early action with more than 5 days' lead time (Figure 28). During the users' baseline assessment, participants said they rarely got more than 1-day lead time to take any action. In many cases, they were only informed about the flood when flood water had already entered their households.

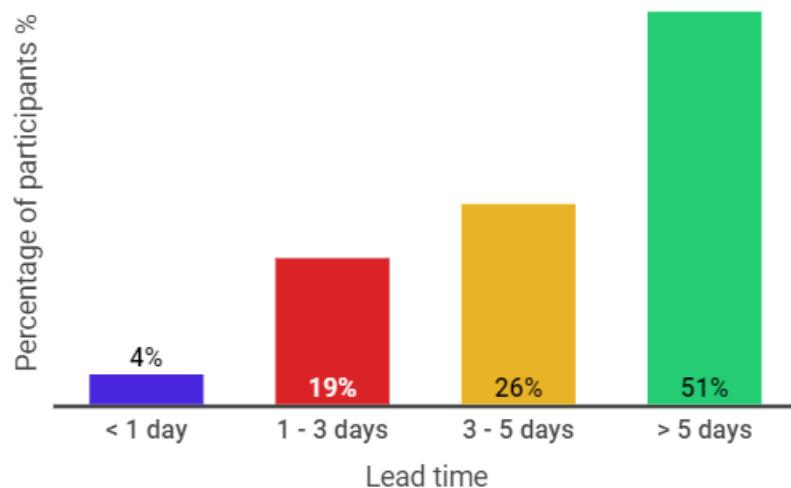


Figure 28 Listed participant's perceived available lead time to take action during the monsoon 2020 flood

The non-listed participants said they heard from their neighbors, local bazar or volunteers about the weather and flood information for which majority of non-listed participants only had 1-3 days lead time for taking early action before the flood (Figure 29).

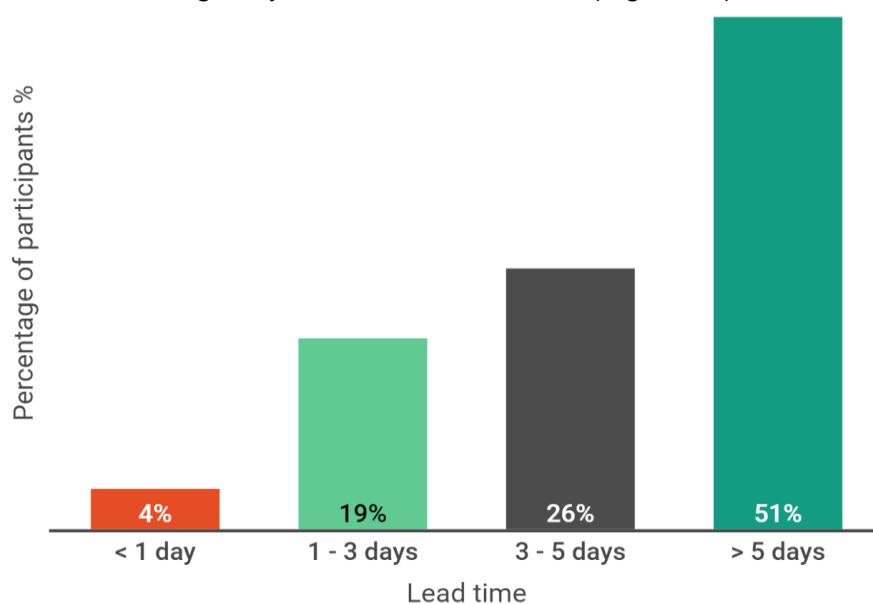
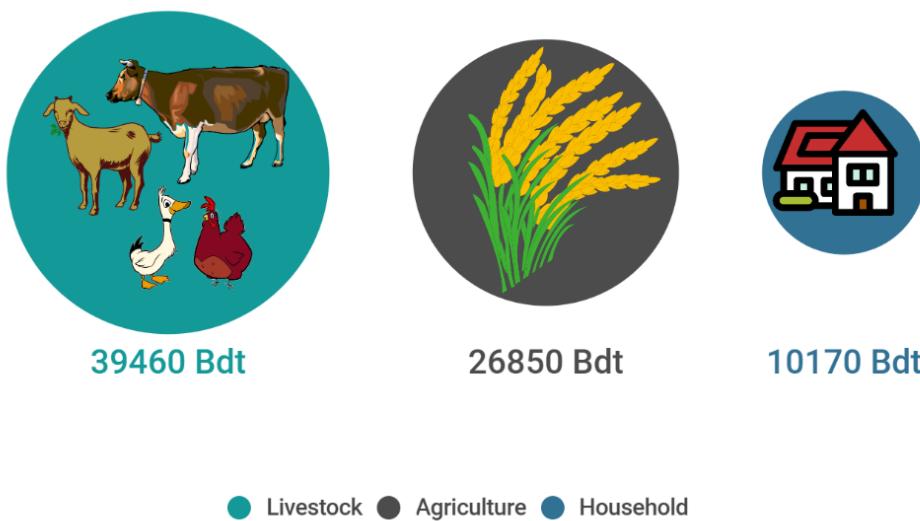


Figure 29 Available lead time for non-listed beneficiaries

The participants also expressed that previously they did not know it was possible to mitigate the losses or that they suffer every year due to floods. Although, the prolonged flooding added to their sufferings this year, they were better prepared and well informed about the flood situation than the previous years. This year on an average, the participants saved 70345 BDT per household by taking early action and forecast based advisories. Participants saved the most amount in livestock sector by following the advisories (Figure 30). Participants saved as much as 39460 BDT per household in the livestock sector and 26850 BDT per household in the agriculture sector.



*Figure 30 Amount of money saved in different sectors by following advisories*

It is to be noted that the amount of money saved in different sectors has been calculated by finding the estimated cost of livestock, crop, assets etc. that would have been damaged or lost if no early action was taken according to the advisories. For example, a participant relocated his 6 cows to higher ground and arranged for fodder in advance after receiving flood warning and advisory from the voice messages. The estimated cost of his livestock is 360000 BDT. If he had not taken any early action, his livestock would have suffered from hunger, different disease or worst case scenario could have died. So, by following the advisories, the participant saved 360000 BDT in livestock sector. Similarly, a participant was planning to plant groundnut in his field from which his anticipated income was 20000 BDT. As soon as he received a flood warning, he did not proceed with the plantation of groundnut seeds. If he had proceeded with his initial plan, all his crop would have been ruined by the flood water and thus he saved 20000 BDT.

## **4.7 Gaps and challenges faced by women in receiving early warning**

The female participants were asked whether they faced any challenges in receiving early warning or if their opinions were included in the decision-making process of taking early-actions. Some of the participants mentioned that they did not own any mobile phones of their own. So, they had enlisted their husband or son or other family member's phone number with the program. As a result, these participants would not directly receive the voice messages. Sometimes, they fail to receive the call due to being busy. Some participants said in the initial stages when they first started receiving the voice messages, their family members would not believe them. But once they started to realize the importance of the content of the voice messages, they were supportive of them. The female participants also said that their family members would ask them if they received any new information or advisory as the information received form the voice message is for their own benefit and is intended to help them.

# Chapter 5

## Observations and Learnings

### 5.1 Recommendations

From the assessment it was observed that the overall performance of the voice message was satisfactory and the participants were enthusiastic about the advisory services and early warning system. The impact of the voice message system was visible in all of the study areas for those who responded to early warning.

-  The opportunity to call for advice or discuss problems the same way they receive the voice messages
-  The opportunity to hear the voice message again
-  8-10 days lead time would be much beneficial
-  Recipients should be increased
-  After flood, agricultural advice is very beneficial.
-  More livestock related advisory should be included
-  Capacity building trainings should be provided
-  Need for community consultation for mass awareness

*Figure 31 Recommendations and suggestions from participants*

However, in many cases the participants were unable to act according to the advisories even though they received the information. Lack of resources and capacity to act upon the advisory are some of the difficulties the participants faced. In some instances, the participants were

unable to understand a few technical terms such as danger level, Lumpy Skin Disease, carbofuran, mineral mixture etc. They understood that danger level means something related to danger but did not fully understand its meaning. It was observed that they have their local terms for many technical terms. So, more interaction with community is required to improve the voice message service and make it more appropriate for the community.

The most important recommendation that was unanimous in all upazilas, is the need to express their problems, issues and thoughts. The participants were eager to discuss their problems via mobile phone in the same way they receive the voice messages. Some of the knowledgeable participants want the voice messages in written format in case they miss the call.

Capacity building of the participants is very much important at this stage to enable them to act upon the information that are being available to them.

Participants were eager to take capacity building training specially for agricultural and livestock sectors. Those who have previously received training under SHOUHARDO III program has shown promising results which has made the others even more interested in the trainings. Capacity building focusing on forecast application and decision making can enable the community to make informed, decisions in calculating and reducing risks as well as maximizing the benefits of weather conditions. There was also general need for resources in all upazilas for implementing the early actions. Community awareness and adequate sensitization about underlying risks are also required for building resilience among the community.



Figure 32 Capacity building needs of participants

# **Case Studies and Good Practices**

“

I am Majeda Begum from Paglar Char Village, Erendabari Union, Fulchhari Upazila, Gaibandha. I am a housewife; my husband is a day laborer. During this flood, I received flood forecast through voice message and shared with my husband. Then he discussed this with neighbors and started taking early action. I got five days' lead time before the flood and I was able to secure my livestock and store feed and fodder as well. I also stored dry food, saline, water purification tablet and moved to flood shelter safely. During previous floods, we did not get any time to take any preparedness measures before floods as we never received warning with enough lead time. Every year we had to face different water-borne diseases and couldn't store fodder for our livestock. But this year I am very happy as all the members of my family are healthy and I was better prepared this time.

”





“

*My name is Momena and I am from Beragram Village, Belgacha union, Islampur Upazila, Jamalpur. I regularly follow the advisories from the voice message. I have raised my homestead, so that we do not have to move during the flood. The advisories have been very useful to stock necessary things like dry foods, fuel, pure water etc. After the flood, I've planted different vegetables in my backyard. I always follow the agricultural advisories and schedule pesticides and insecticides application accordingly. These advisories has helped me to minimize the cost of vegetable production as well as get better production.*

”



“

*I am Afroza Begum from Paschim Char Luchni Village, Bamandanga union, Nageshwari Upazila, Kurigram. Even though I've received the early warning and flood forecasts, I could not take early action due to monetary crisis. There was no higher ground nearby and I could not afford boat to shift my two goats which were later washed away with the flood waters. Yet, I am optimistic. I hope I will be able to apply advisories during normal period. Nevertheless, the information gives us foreseeability and mental strength. Someone giving us information to help us, working for our benefit means a lot to me. I am grateful to SHOUHARDO program for this as rarely anyone thinks about people like us living in such remote area.*

”



“

I am Mukul Mia from Bera Gram, Haldia Union, Saghata, Gaibandha. This year, most of us lost our jute due to the early flood. We also received the early warning to harvest our crops if they are 80% matured. But some of us did not believe in that message and some did not have the capacity. Taking a lesson, I always followed the advisories afterwards and took actions accordingly. I did not plant Aman rice when the flood water receded as I was already warned that water will rise again. I also took preparedness measure for my cattle and goat during flood by taking them to shelter 3 days before the flood.

”

“

I am Abdul Alim from Bulbulir Char Village, Erendabari Union, Fulchhari Upazila, Gaibandha. I am the local Imam of Bulbulir Char village mosque. From the very beginning, I listened to the advisories and shared among the villagers when they gathered at the mosque. During the flood, this became a more popular practice as the forecasts were correct and more people came to me for the information such as when the flood water will recede. After the 1st week of August when flood water started to recede, I began to plant groundnut in my land. But after receiving a voice message saying that water may rise in next 3-5 days, I promptly stopped planting and saved, my input cost in groundnut. As per my calculation, I think I have saved around 20000 BDT by this single decision.

”



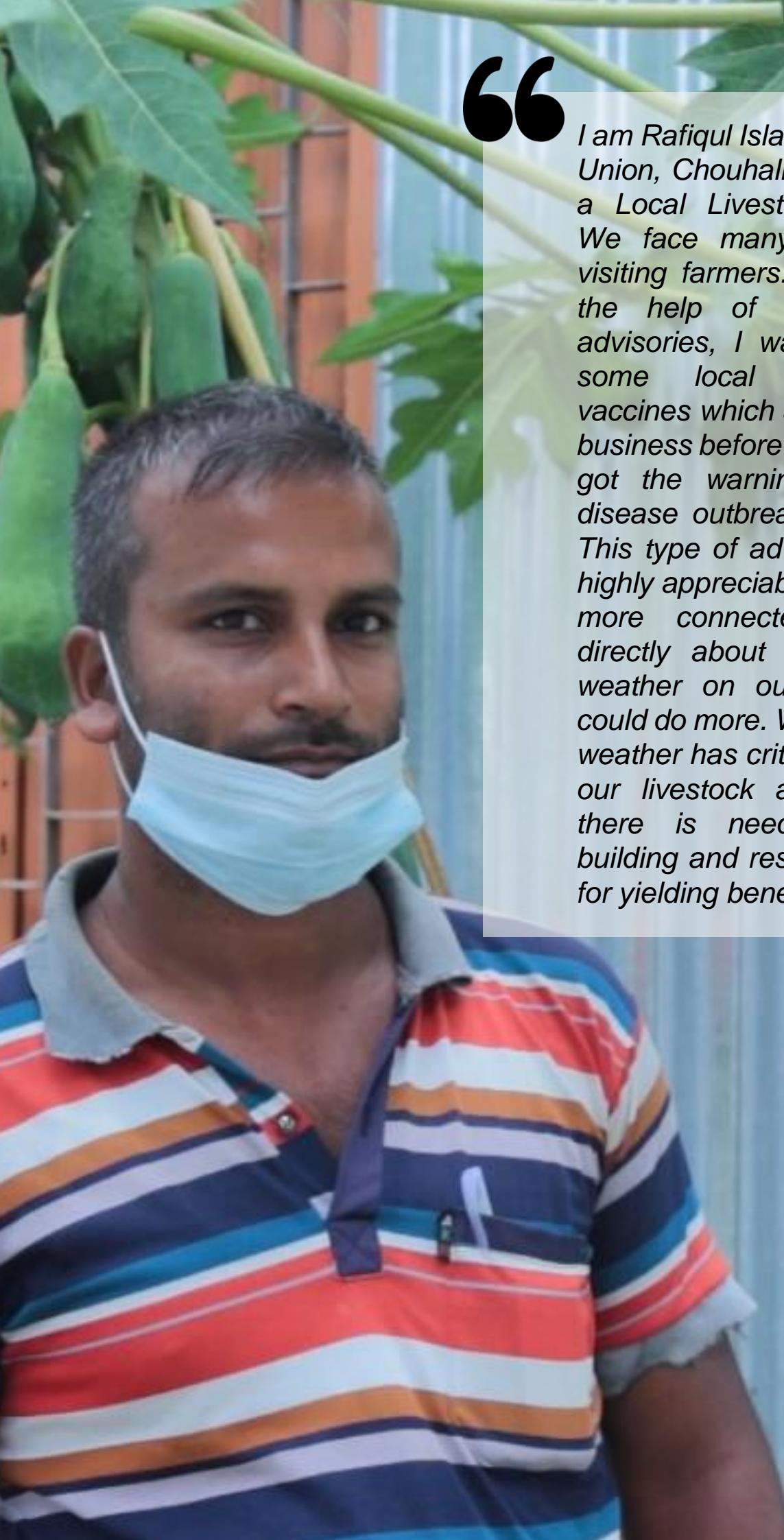
I am Nazia Khatun from Choto Chantara village, Sonatoni union, Shahjadpur, Sirajganj. When I first received the flood warning message, I shared with my neighbors. At first they didn't believe on the message, they said, how you can tell the future. When they observed that the forecast were correct, they came back to me to know when the water will recede, whether if I got another call etc. Then I told them water will rise again after 12th July. By these early warning message, we saved our livestock, got ourselves prepared 5 days before floods. This was very helpful and effective and I personally appreciate the initiative.

”





I am Mosammot Haowa Khatun, from Sonatoni union, Shahjadpur upazila of Sirajganj district. After getting the information of the flood from the voice message, I discussed it with my husband and my family. We moved our valuables to the higher ground beside the road, stocked puffed rice and other dry foods and also made arrangements for fodder. We moved our livestock, chicken and ducks to the higher ground as well. We also shared the flood forecast with our neighbors. By getting the information I was able to take early action and made arrangements before flood water arrived. I was able to save my only cattle which was my main asset for me during flood.



“

*I am Rafiqul Islam from Omarpur Union, Chouhali, Sirajganj. I am a Local Livestock Vaccinator. We face many queries while visiting farmers. This year with the help of forecast based advisories, I was able to help some local farmers with vaccines which also boosted my business before the floods. I also got the warning of the new disease outbreak, named LSD. This type of advisory service is highly appreciable. If we can get more connected to experts directly about the impacts of weather on our livestock, we could do more. We know that the weather has critical influence on our livestock and poultry but there is need for capacity building and resource allocation for yielding benefits at scale.*

”

## Annex-1

*Table 3 Plan and Schedule of the assessment of community response to advisory and early warnings*

District	Upazila Name	Union Name	Sample Size	Over Phone	Onsite Individual Survey	FGD	Location	Date
Sunamganj	Tahirpur	Dakkhin Sreepur	60	44	16	3	3 locations under Dakkhin Sreepur union	17-Sep-20
		Uttar Sreepur						
Kurigram	Nageshwari	Bamandanga	87	59	28	3	3 locations under Bamandanga union	21-Sep-20
		Narayanpur						
	Char Rajibpur	Mohanganj	45	45				
Gaibandha	Shaghata	Haldia	96	65	31	3	3 locations under Haldia union	22-Sep-20
	Fulchhari	Erendabari	86	60	26	3	3 locations under Fazlupur union	23-Sep-20
		Fazlupur						
Jamalpur	Islampur	Belgacha	85	49	36	3	3 locations under Belgacha union	27-Sep-20
Sirajganj	Shahjadpur	Sonatoni	86	52	34	3	3 locations under Sonatoni union	28-Sep-20
	Chowhali	Bagutia	83	48	35	3	3 locations under Omarpur union	29-Sep-20
		Omarpur						
<b>Total</b>			<b>678</b>	<b>472</b>	<b>206</b>	<b>21</b>		

## Annex-2

### Individual survey questionnaire (onsite survey)

Set B

#### Community Response to Forecast-based Advisories and Early Warnings

Name of the respondent: \_\_\_\_\_ M ( )/ F ( ) Age: \_\_\_\_\_

Village: \_\_\_\_\_ Union: \_\_\_\_\_ Upazila: \_\_\_\_\_

Mobile Number: \_\_\_\_\_ Date: \_\_\_\_\_

#### Part A: General Information

1 Occupation:

- Farmer
- Fishermen
- Day laborer
- Student
- Businessmen
- House Wife
- Unemployed
- Others \_\_\_\_\_

2 How will you characterize this years' flood compared to 2019 monsoon floods?

- Similar
- Of higher magnitude
- Of lower magnitude
- Not comparable due to the nature of flooding

3 What kind of damage you/your community experience during this flood?

*For example: Household, Crop/Catch/Production, Road/Embankment, Education, Tube well, Sanitation, Hospital, Pond, Livestock, Unemployment, Health, Mosque, Others)*

Items	Type		Partial	Fully
	Individual	Community		

4 How much damage/loss you suffered during this flood? (In Taka)

- < 5000
- 5000 – 10000
- 10000 – 30000
- 30000 – 50000
- >50000

#### **Part B: Forecast-based Advisory/Early Warning**

1. Did you receive –

<input type="checkbox"/> Flood forecasts/early Warning	<ul style="list-style-type: none"> <li>○ Voice message</li> <li>○ 1090</li> <li>○ Local bazar</li> <li>○ Neighbor</li> <li>○ Volunteer</li> <li>○ Local Government</li> <li>○ Media (TV/Radio/Newspaper)</li> <li>○ UDC Entrepreneur</li> <li>○ Other _____</li> </ul>
--	--

<input type="checkbox"/> Weather forecast	<ul style="list-style-type: none"> <li><input type="radio"/> Voice message</li> <li><input type="radio"/> 1090</li> <li><input type="radio"/> Local bazar</li> <li><input type="radio"/> Neighbor</li> <li><input type="radio"/> Volunteer</li> <li><input type="radio"/> Local Government</li> <li><input type="radio"/> Media</li> <li><input type="radio"/> UDC Entrepreneur</li> <li><input type="radio"/> Other _____</li> </ul>
<input type="checkbox"/> Agromet Advisory	<ul style="list-style-type: none"> <li><input type="radio"/> Voice message</li> <li><input type="radio"/> 1090</li> <li><input type="radio"/> Local bazar</li> <li><input type="radio"/> Neighbor</li> <li><input type="radio"/> Volunteer</li> <li><input type="radio"/> Local Government</li> <li><input type="radio"/> Media</li> <li><input type="radio"/> UDC Entrepreneur</li> <li><input type="radio"/> Other _____</li> </ul>
<input type="checkbox"/> Livestock advisory	<ul style="list-style-type: none"> <li><input type="radio"/> Voice message</li> <li><input type="radio"/> 1090</li> <li><input type="radio"/> Local bazar</li> <li><input type="radio"/> Neighbor</li> <li><input type="radio"/> Volunteer</li> <li><input type="radio"/> Local Government</li> <li><input type="radio"/> Media</li> <li><input type="radio"/> UDC Entrepreneur</li> <li><input type="radio"/> Other _____</li> </ul>
<input type="checkbox"/> Flood preparedness message	<ul style="list-style-type: none"> <li><input type="radio"/> Voice message</li> <li><input type="radio"/> 1090</li> <li><input type="radio"/> Local bazar</li> <li><input type="radio"/> Neighbor</li> <li><input type="radio"/> Volunteer</li> <li><input type="radio"/> Local Government</li> <li><input type="radio"/> Media</li> <li><input type="radio"/> UDC Entrepreneur</li> <li><input type="radio"/> Other _____</li> </ul>
<input type="checkbox"/> COVID Awareness	<ul style="list-style-type: none"> <li><input type="radio"/> Voice message</li> <li><input type="radio"/> 1090</li> <li><input type="radio"/> Local bazar</li> <li><input type="radio"/> Neighbor</li> <li><input type="radio"/> Volunteer</li> <li><input type="radio"/> Local Government</li> <li><input type="radio"/> Media</li> <li><input type="radio"/> UDC Entrepreneur</li> <li><input type="radio"/> Other _____</li> </ul>

If direct recipient of voice message, answer the followings

Are you familiar with the voice message phone number? Yes/No  
Was the message length ok? Yes /No

What is your perceived level of accuracy of the early warning/forecast information you received?

- 100%
- 50-100%
- 0-50%

2. How much did you understand the information in the message from the source?

- Fully
- Partly
- Not at all

3. How frequently did you receive the warnings from source?

- Everyday
- 2-3 times a week
- Irregular

4. What information did you get from the source?

- Timing
- Intensity
- Duration
- What actions should take and how

5. Did you receive such information in the past? Yes/No

6. Did you share the messages with others? Yes/No

If yes with whom did you share with –

- Neighbors
- Family Members
- UDMC Members
- Farmer/Women Groups
- Others (specify) \_\_\_\_\_

7. Any suggestions to improve the forecast/advisory messages?

---

---

#### **Part C: Mobile Service Characteristics**

1. How did the mobile phone infrastructure perform during the floods?  
a. No Change

- b. Bad
  - c. Interrupted service
2. If you had experienced loss of mobile communication during flood season, what was/were the reason/s behind it?
- a. Unable to charge phone due to lack of electricity
  - b. Technical difficulty of mobile operator
  - c. Others

#### **Part D: Response and Benefits of Advisories and Early Warning**

1. How did you perceive the seriousness of the recent floods upon receipt of the information?
- Not serious
  - Somewhat serious
  - Serious
  - Very serious

2. Did you take any early actions preparing for the recent flood? Yes/No

If no, what was the limiting factor? *Can select more than one option*

- Uncertainty and consistency of information
- Trust and experience on using the information
- Understandability
- Lead time
- Capacity to take actions

If yes mention the type of action

- Individual
- Collective
- Both

3. What actions did you take in response to the advisories/early warning information?  
*Can select more than one option*

- Validate information
- Move to safer locations/Flood Shelter
- Arrange for emergency food and water purification material
- Net pond
- Repair Embankments/evacuation routes
- Relocate livestock/Make livestock shade
- Arrange for fodder
- Vaccinating Livestock

- Relocate Assets
  - Harvesting
  - Applying necessary pesticides before disease outbreak
  - Delayed planting
  - Stall fertilizing
  - Raise machineries
  - Alert people
  - Fish harvest
  - Make raft
  - Repair/install WATSAN facilities
  - Others \_\_\_\_\_
- 
- 
- 

4. What made you decide to take these actions?

- Saw the flood water/rainfall
- Received the warning
- Advised by the community
- Advised by the UDMC

5. How much did you save because of taking early actions? (In Taka), *add remarks if any*

Items	Damage/loss Avoided or Saved (Taka)
Household Asset	
Livestock	
Fisheries	
Agriculture	
Others	

6. When did you take early actions?

- When hazard arrived in the locality
- Immediately after getting early warning
- After experiencing some damage
- When information is widespread in the community

7. How much lead time did you get for taking early actions/preparedness?

- a. < 1 day
- b. 1 - 3 days
- c. 5 days
- d. > 5 days

8. Were you able to bear the cost for taking early actions?  
a. Yes                  b. No                  c. Partially

9. Did you experience difficulties in responding due to COVID-19 situation?
- 
- 

**Part E: Further improvements**

1. Gaps and Suggestions

Information Need or other Gaps	Suggestions for Improvement

2. Capacity building training needed? Yes/No

If yes mention the areas –

- Interpretation of forecast
- Agromet advisory implementation
- Livestock advisory implementation
- Flood Preparedness
- Others \_\_\_\_\_

Enumerator Code:

Signature:

# FGD questionnaire

---

## Community Response to Advisory Services and Early Warnings

### Consent to Participate in Focus Group Discussion:

RIMES is currently implementing the project “Improved Weather and Flood Information System for Community Based Risk and Resource Management” under SHOUHARDO III program of CARE Bangladesh supported by USAID. RIMES in collaboration with FFWC-BWDB, BMD, DDM, DAE and DLS has been broadcasting forecasts, advisory messages and early warnings in your Union for the past few months. These community oriented weather information and advisory services aim to enhance resilience and move the conversation from “What the weather will be” to “What the farmer should do”. You have been asked to participate in a focus group discussion, the purpose of which is to assess the advisory services and response of the community to this information. The information obtained from the focus groups will be used to identify the gaps and further improve the advisory services.

You can choose whether or not to participate in the focus group and stop at any time. Your response will remain anonymous and no names will be mentioned in the report. There are no right or wrong answers to the focus group questions. We want to hear many different viewpoints and would like to hear from everyone. We hope you can be honest even when your responses may not be in agreement with the rest of the group. In respect for each other, we ask that only one individual speak at a time in the group and that responses made by all participants be kept confidential.

Do you have any questions regarding the survey?

- We understand this information and agree to participate fully under the conditions stated above

\*Start the focus group by briefing the participants on Covid-19 awareness

Covid-19 has spread worldwide due to coronavirus. As there are no vaccinations yet, no one knows when the pandemic may be over. However, we can minimize the severity of the pandemic through awareness:

- Frequently wash hands with soap.
- Practice the etiquette of sneezing and coughing.
- Wear mask while outside.
- Maintain at least 3 feet distance from others.

- If you experience any of flu like illness like, fever, cough, sore throat, please stay at home and contact the following numbers- 10655, 16263 and 33

## Community Response to Forecast-based Advisories and Early Warnings

Village: \_\_\_\_\_ Union: \_\_\_\_\_ Upazila: \_\_\_\_\_

Date: \_\_\_\_\_

- 1 How will you compare this year's flood with the one of 2019? What kind of damage you/your community experienced during this flood? (For example: Household, Crop/Catch/Production, Road/Embankment, Education, Tube well, Sanitation, Hospital, Pond, Livestock, Unemployment, Health, Mosque, Others)
- 

- 2 Did you receive any advisory/warning messages? How did you receive these messages? What type of early warning and advisory message did you receive? (Flood early warning, Flood forecast, Flood preparedness advisory, Post flood advisory, Agromet and livestock advisory etc.) Did you understand the contents of the messages? If not, what do you think are the reasons? Did you ever receive such information in the past?
- 

- 3 Did you take any action in response to advisories/warnings? If no, why? If yes, what actions did you take in your community/village/locality in response to the advisories/early warning information? Were you able to bear the cost of actions? What were the constraints for taking actions?(or what else was needed for taking early actions)
- 

- 4 Ask the female participants if they face additional challenges in receiving and responding to this information. If yes, request them to explain why.
-

- 5 Do you think the early warning and advisory messages have helped you in being better prepared for floods? If yes, how it helped compared to previous floods?
- 

- 6 What do you think are the problems with the existing early warning and advisory messages? Are there any information gaps? What are your suggestions to overcome the problems and gaps?
- 

- 7 Did you receive any relevant trainings before? Do you think such trainings will help better utilize the information? What are the areas would you like to receive trainings on?
-

# Mobile survey questionnaire

Set M

## Community Response to Forecast-based Advisories and Early Warnings

Name of the respondent: \_\_\_\_\_ M ( )/ F ( ) Age: \_\_\_\_\_

Village: \_\_\_\_\_ Union: \_\_\_\_\_ Upazila: \_\_\_\_\_

Mobile Number: \_\_\_\_\_ Date: \_\_\_\_\_

1. Did you receive -

- Flood early Warning
- Weather forecast
- Agromet Advisory
- Livestock advisory
- Flood preparedness message
- COVID Awareness

2. Answer the following question (*remarks if any*)

Was the message length ok? Yes /No

What is your perceived level of accuracy of the early warning/forecast information you received?

- 100%
- 50-100%
- 0-50%

How much did you understand the information in the message from the source?

- Fully
- Partly
- Not at all

What information did you get from the source?

- Timing
- Intensity
- Duration
- What actions should take and how

Did you receive such information in the past? Yes/No

How frequently did you receive the warnings from source?

- Everyday
- 2-3 times a week
- Irregular

3. Did you take early action based on the advisories/warnings? Yes/No

If Yes, when did you take early actions?

- When hazard arrived in the locality
- Immediately after getting early warning
- After experiencing some damage
- When information is widespread in the community

4. How much lead time did you get for taking early actions/preparedness?

< 1 day      b. 1 - 3 days    c. 5 days      d. > 5 days

5. Were you able to bear the cost for taking early actions?

Yes      b. No      c. Partially

6. How much did you save because of taking early actions? (In Taka), *add remarks if any*

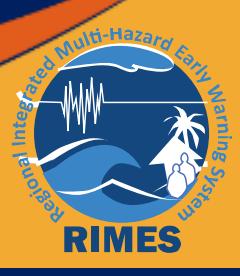
---

7. Any suggestions to improve the forecast/advisory messages?

---

Enumerator Code:

Signature:



Regional Integrated Multi-Hazard Early Warning System (RIMES)

Second Floor, Outreach Building, Asian Institute of Technology campus, 58 Moo 9 Paholyothin Rd., Klong Nueng, Klong Luang, Pathumthani 12120, Thailand