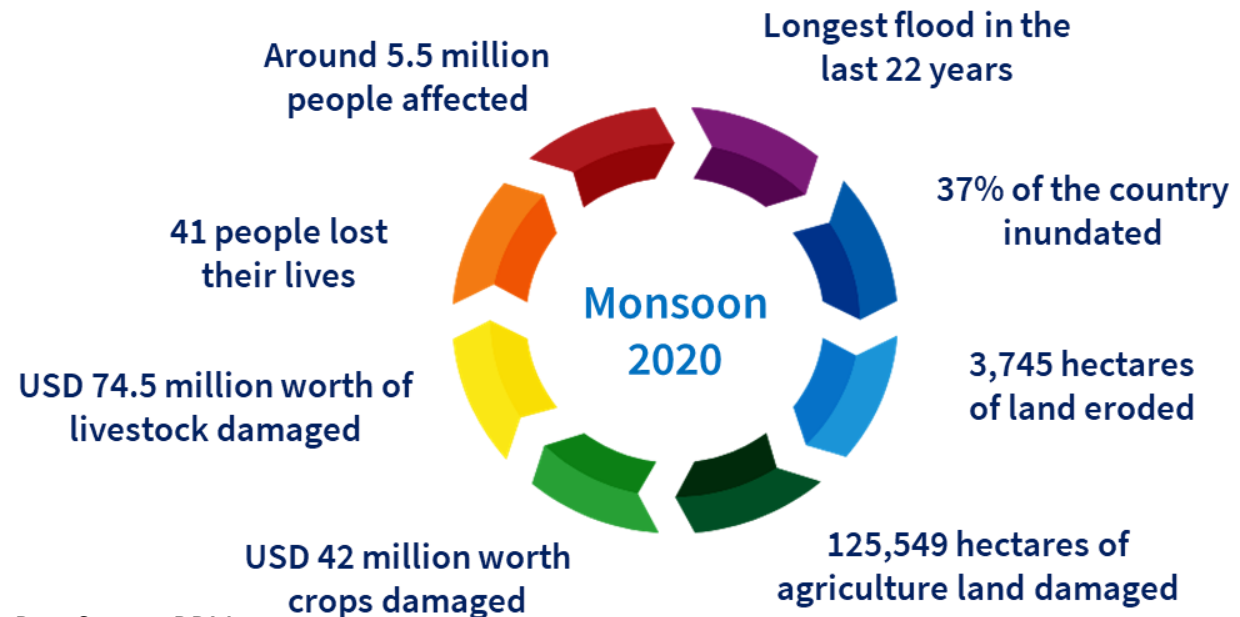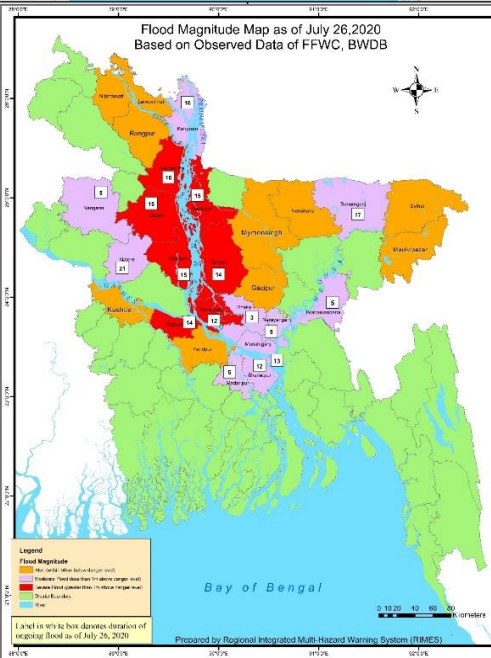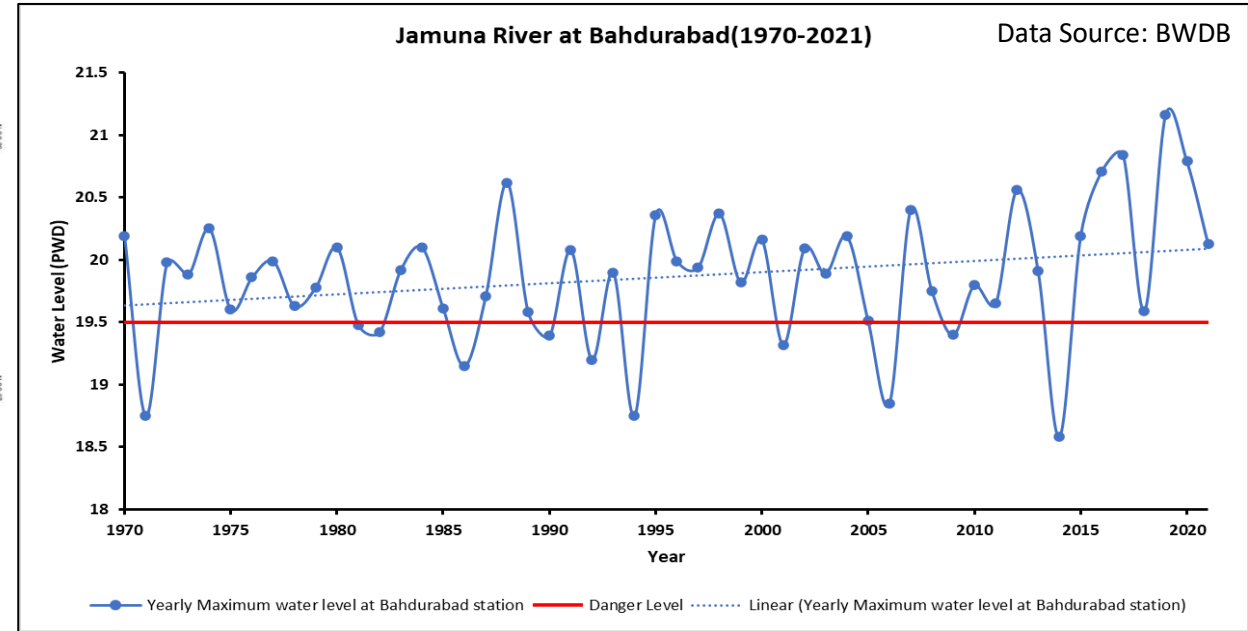# SOUTH ASIA HYDROMET FORUM III
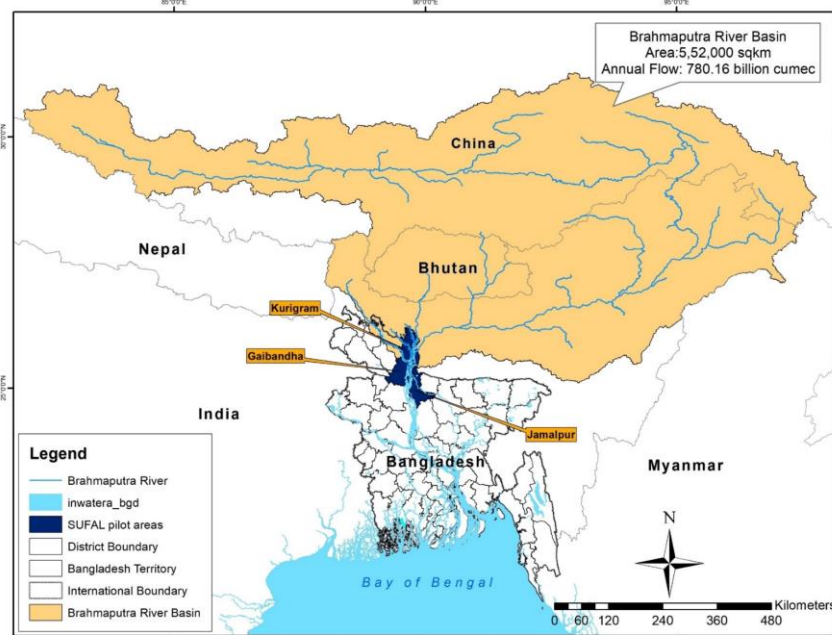
USER-FOCUSED TAILOR-MADE WEATHER AND CLIMATE SERVICES DRIVING THE CLIMATE/ EARLY WARNING INFORMATION VALUE CHAIN

Design and delivery of tailor-made services to facilitate Forecast based Actions (FbAs) at the Community Level in Bangladesh – Lessons from Northwest Bangladesh

Raihanul Haque Khan
RIMES

November 15-18, 2021
Annual Event- Virtual

Brahmaputra River Basin
Area: 5,52,000 sqkm
Annual Flow: 780.16 billion cumec

Jamuna River at Bahdurabad (1970-2021)

Data Source: BWDB

Legend
- Brahmaputra River
- inwatera_bgd
- SUFAL pilot areas
- District Boundary
- Bangladesh Territory
- International Boundary
- Brahmaputra River Basin

Flood Magnitude Map as of July 26, 2020
Based on Observed Data of FFWC, BWDB

Monsoon 2020

Around 5.5 million people affected

Longest flood in the last 22 years

37% of the country inundated

41 people lost their lives

3,745 hectares of land eroded

USD 74.5 million worth of livestock damaged

USD 42 million worth crops damaged

125,549 hectares of agriculture land damaged

Data Source: DDM

1. ASSESSING USER NEEDS for weather and climate information
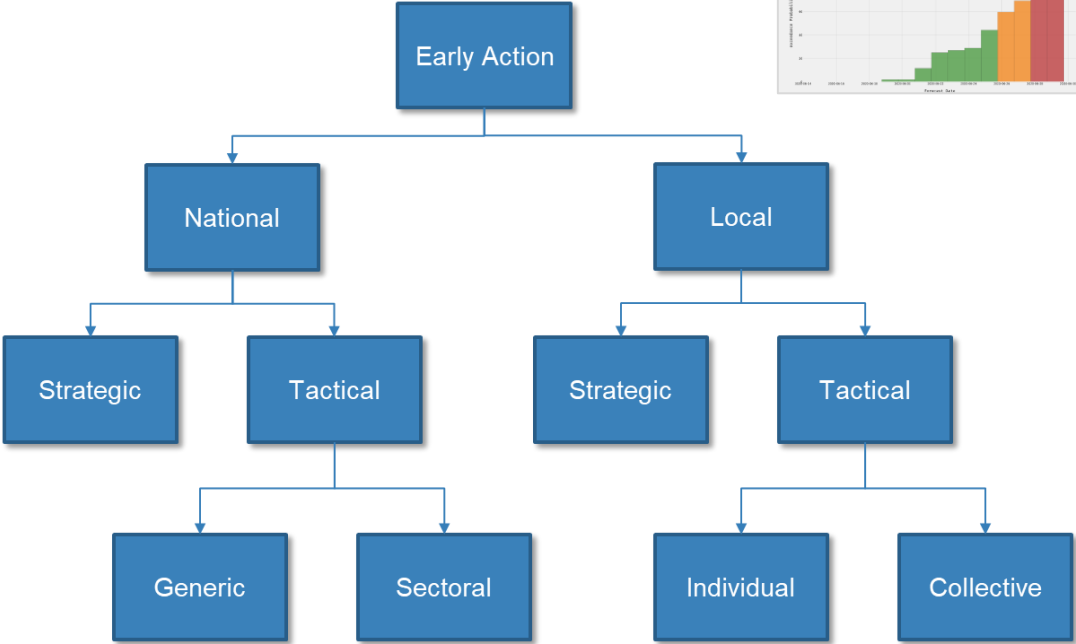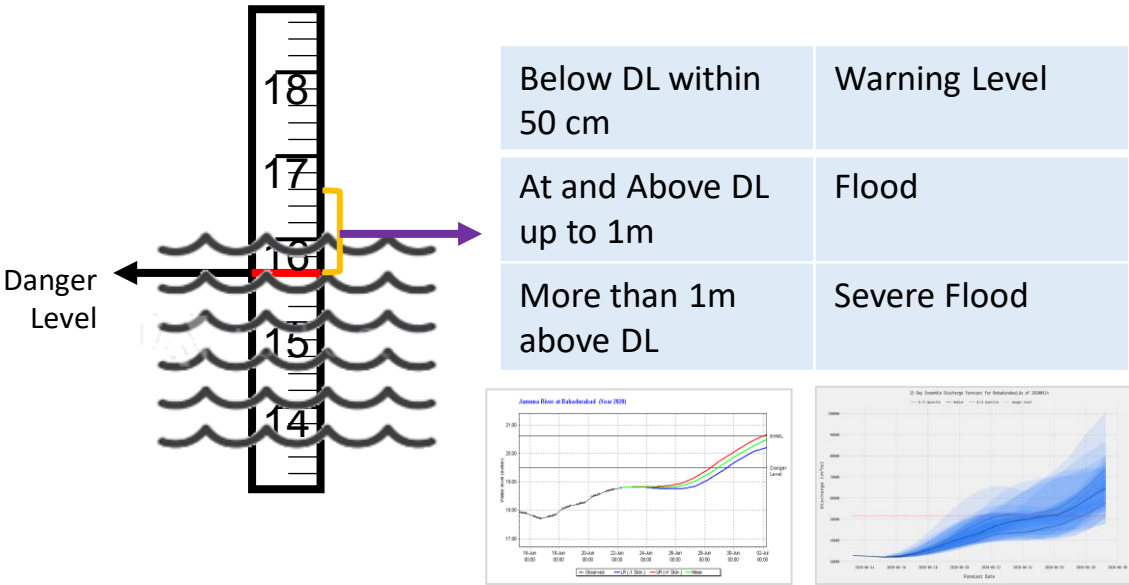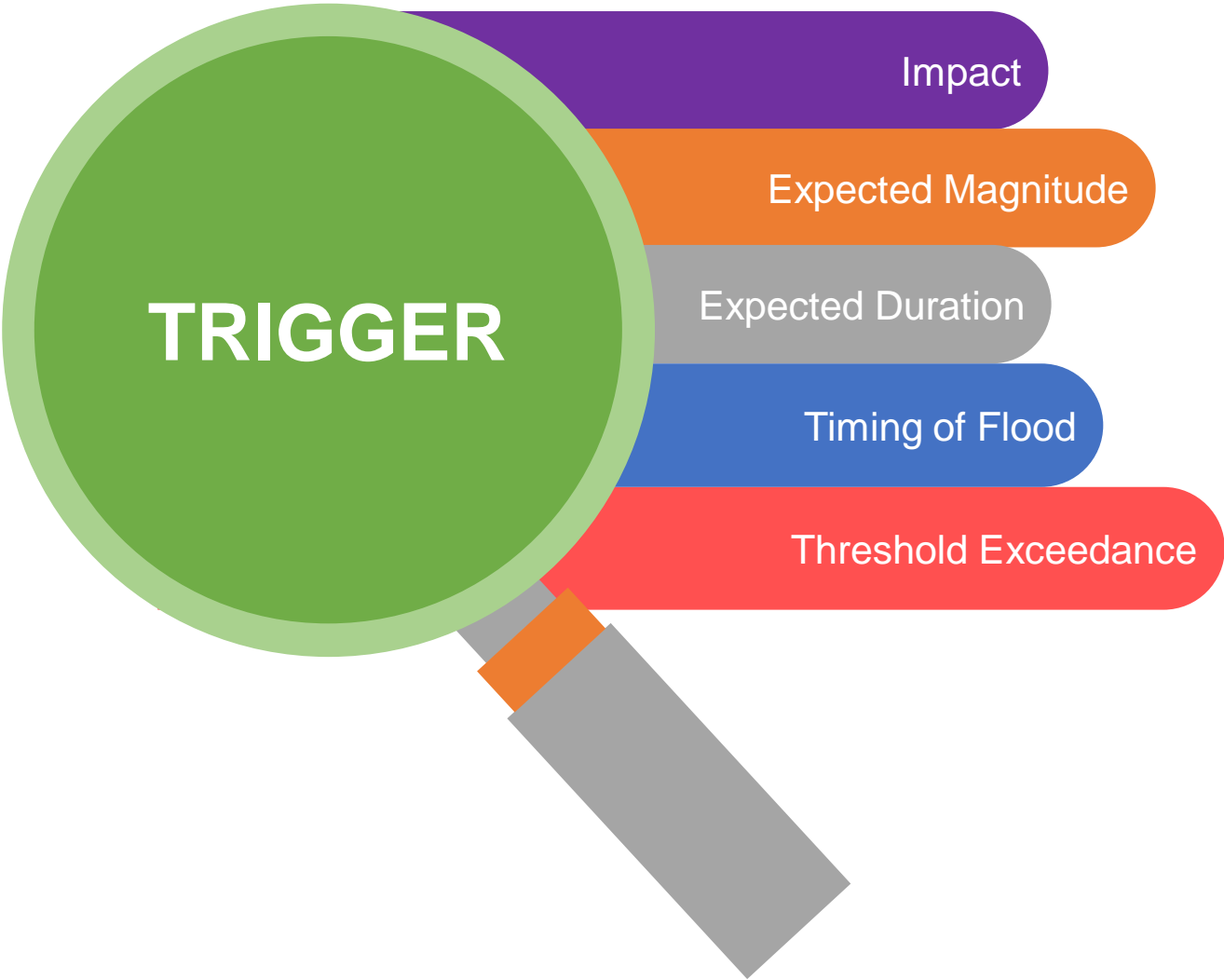
If **FbA** is the **Answer**, what was the **Question**?

- No standard operating procedure
- Traditional FBF focuses on cash grants only
- Weak dissemination mechanism
- No localized information
- Integration with GoB system

TRIGGER

- Impact
- Expected Magnitude
- Expected Duration
- Timing of Flood
- Threshold Exceedance

Danger Level

Below DL within 50 cm	Warning Level
At and Above DL up to 1m	Flood
More than 1m above DL	Severe Flood

Early Action
- National
  - Strategic
  - Tactical
    - Generic
    - Sectoral
- Local
  - Strategic
  - Tactical
    - Individual
    - Collective

2. DEFINING THE TRIGGERS: The Early Action Matrix

Institutional Level

Forecast Trend ↓ → Danger Level	Decreasing	Increasing
More than 1m above Danger Level		
At danger level and Up to 1m above Danger Level		
Within 1m below Danger Level		>75% Probability of Danger Level Exceedance <75% Probability of Danger Level Exceedance

Expected duration, impact, forecast consistency, rate of increase, time to peak

Community Level

Lead time / Early Actions	1-3 Days	3-5 Days	5-7 Days	7-10 Days	10 – 15 days

How to respond to EW, how better utilize financing

EWM → Forecaster → Disaster management & Humanitarian

Danger Levels!

Example: Institutional Level Matrix ⟶ SOP

Forecast Trend / Danger Level	Decreasing	Increasing
More than 1m above Danger Level	Monitor Flood Forecast, Emergency Medicine Distribution, Special Advisory from Agriculture, Livestock, Fisheries and Public Health department, Water purification tablet distribution;	Multi-purpose cash grant, Disaster Management Committee Meeting, Prepare new flood shelters, Early Warning Dissemination, Ensure safety and security of women and children at shelters;
Within 1m below Danger Level	Monitor Flood Forecast, Special Advisory from Agriculture, Livestock, Fisheries; Repair embankments/roads, vaccinate livestock, instruction to leave flood shelter;	**>75% Probability of Danger Level Exceedance** Disaster Management Committee Meeting, Repairing evacuation routes, Early Warning Dissemination, Multi-purpose cash grant, Shelter preparation, evacuate families at risk; **<75% Probability of Danger Level Exceedance** Shelter preparation, Water purification tablet storage, store disinfectant and anti-venom, vaccinate livestock, Volunteer and Medical Team, prepare evacuation boats;

Modified Matrix Considering COVID Context

Type of Action	Early Action
Level 1 Early Actions **Can be taken at 50-60% probability of flood occurring**	❑ Provision of protective gear for DMCs and volunteers (COVID19 considerations) ❑ Preparation of general advisory on forecast and flood risk for households ❑ Dissemination of forecast and early warning information to community ❑ Checking and repair of hand-held / mobile loudspeakers, volunteer support, renting van ❑ Listing most vulnerable households for MPCG (Cross-check list of VGD/VGF); selection criteria: poverty level, household location, gender/inclusion, Agri/WASH/health ❑ Listing most vulnerable households for evacuation and other support ❑ Preparation of flood shelters and evacuation points (repair rooms, WASH facilities, electric supply, with provisions for gender and special needs, COVID19 considerations) ❑ Repair damage to access roads, evacuation routes and embankments (Coordination with BWDB and using indegeneous knowledge), CfW for fixing roads, evacuation points ❑ Protection and repair of tube wells and toilets in common and large catchment areas (schools, flood shelters, evacuation points)
Level 2 Early Actions **Can be taken at 75% probability of flood occurring and when at least 5 days flooding is expected**	❑ Multi-purpose cash grants (MPCG) to ultra-poor and poor households in flood forecasted zones (BDT 4,500) ❑ Distribution of water container / tanks to households (20L/500L), water purification tablet, soap, ORS etc. ❑ Evacuation support to most vulnerable households with women, children, elderly, persons with disability (e.g. provision of boats and trawlers) Arrangement of transportation in case of evacuation (boats, trawlers), Rent, fuel costs ❑ Provision of face masks and/or first aid kits at shelters (Coordination with DoH and DPHE) depending on numbers of persons taking shelter at each point

3. IMPLEMENTATION: Operationalizing Early Action

Jun 14, Flood event in Brahmaputra basin detected

Jun 16, Local level flood forecast bulletin issued, Trigger 1 Activated

June 21, Local level flood warning issued, Trigger 2 Activated
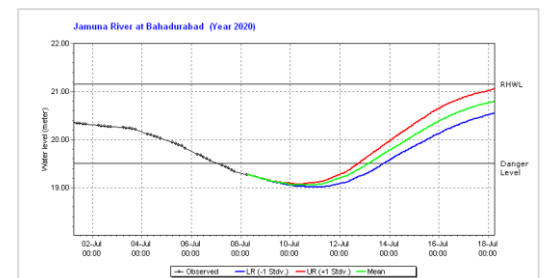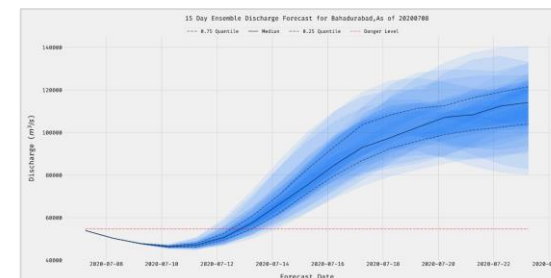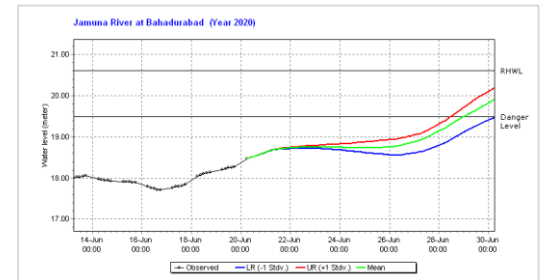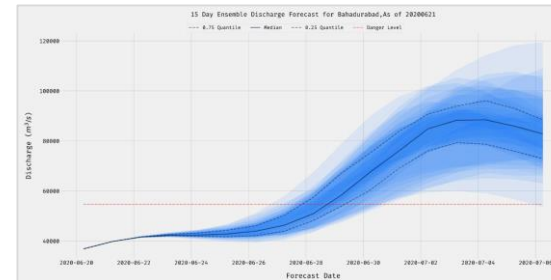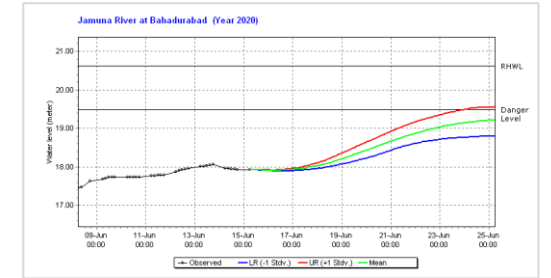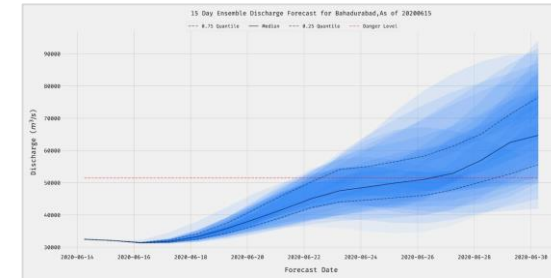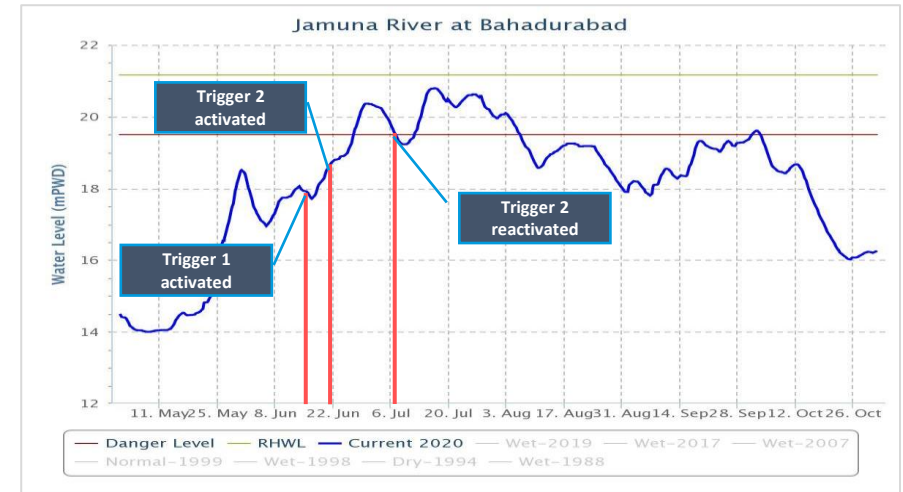
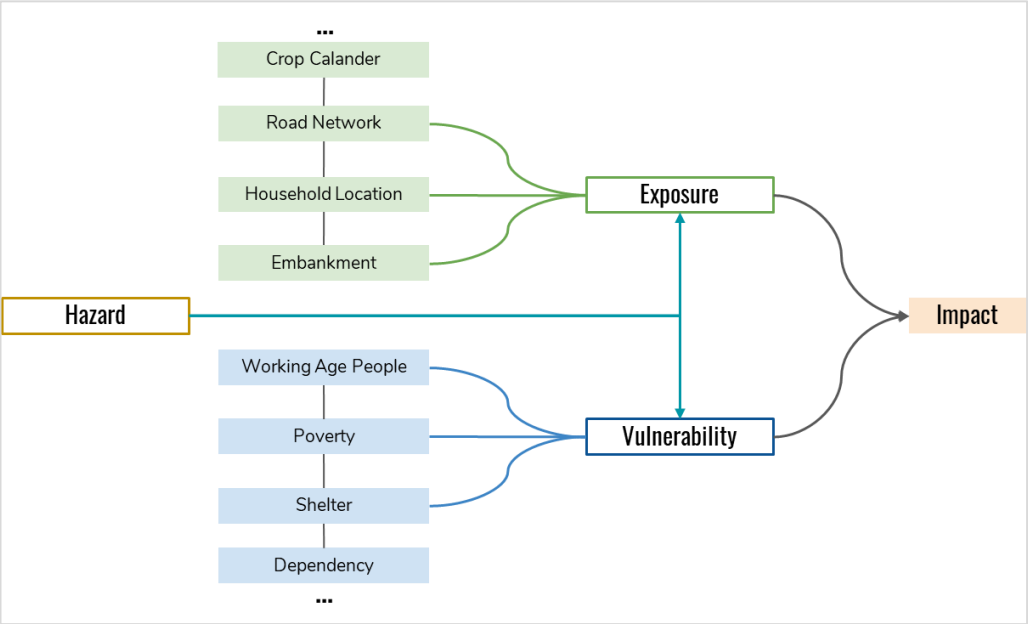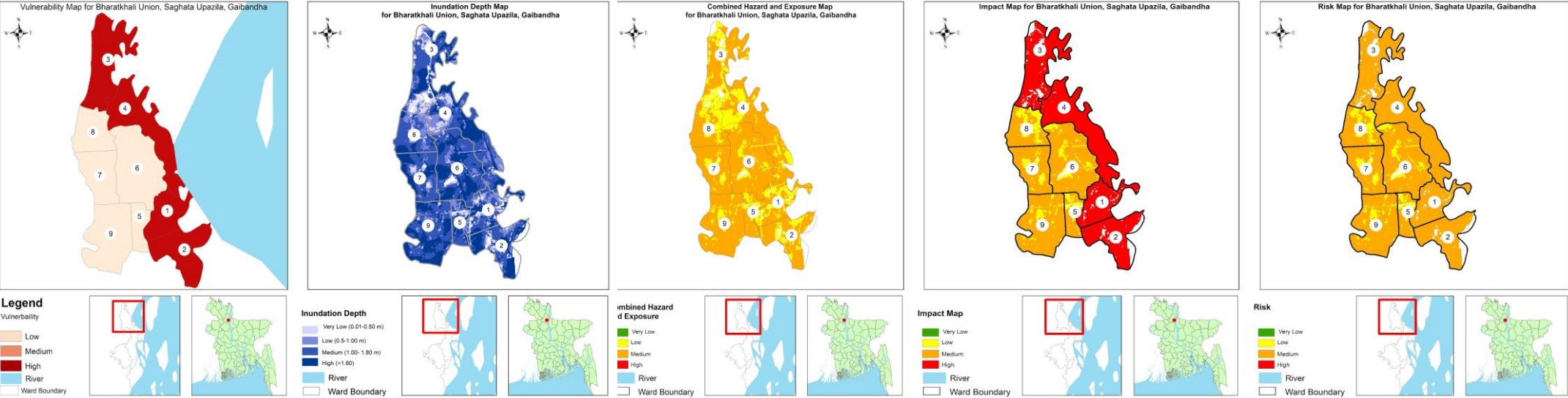June 28 – July 6, flood continued max WL remained within 1m above DL

July 9, Trigger 2 reactivated, max WL exceeded 1m above DL around end of July

Communicated through FFWC's email and SUFAL voice broadcasting system

Vulnerability Map for Bharatkhali Union, Saghata Upazila, Gaibandha

Inundation Depth Map for Bharatkhali Union, Saghata Upazila, Gaibandha

Combined Hazard and Exposure Map for Bharatkhali Union, Saghata Upazila, Gaibandha

Impact Map for Bharatkhali Union, Saghata Upazila, Gaibandha

Risk Map for Bharatkhali Union, Saghata Upazila, Gaibandha

4. DELIVERING TAILOR-MADE INFORMATION to the Communities

- Voice Message Broadcasting was used for simultaneous dissemination from district level downward to community level
- Local level flood forecast bulletins were disseminated via emails
- At community level hand mics, boat patrols, mosque announcements etc. were used for warning dissemination.

Photo Credit: SUFAL Project

5. BENEFITS of FbA to Communities: Post Monsoon Assessment 2020

WATER PURIFICATION TABLET	
WASH FACILITIES	
ANTI-VENOM	
LIVESTOCK SHADE/KILLA	
TENT	
VACCINES	
CASH	
DRY FOOD	
FUEL	
FODDER	

NUMBER OF RESPONDENTS
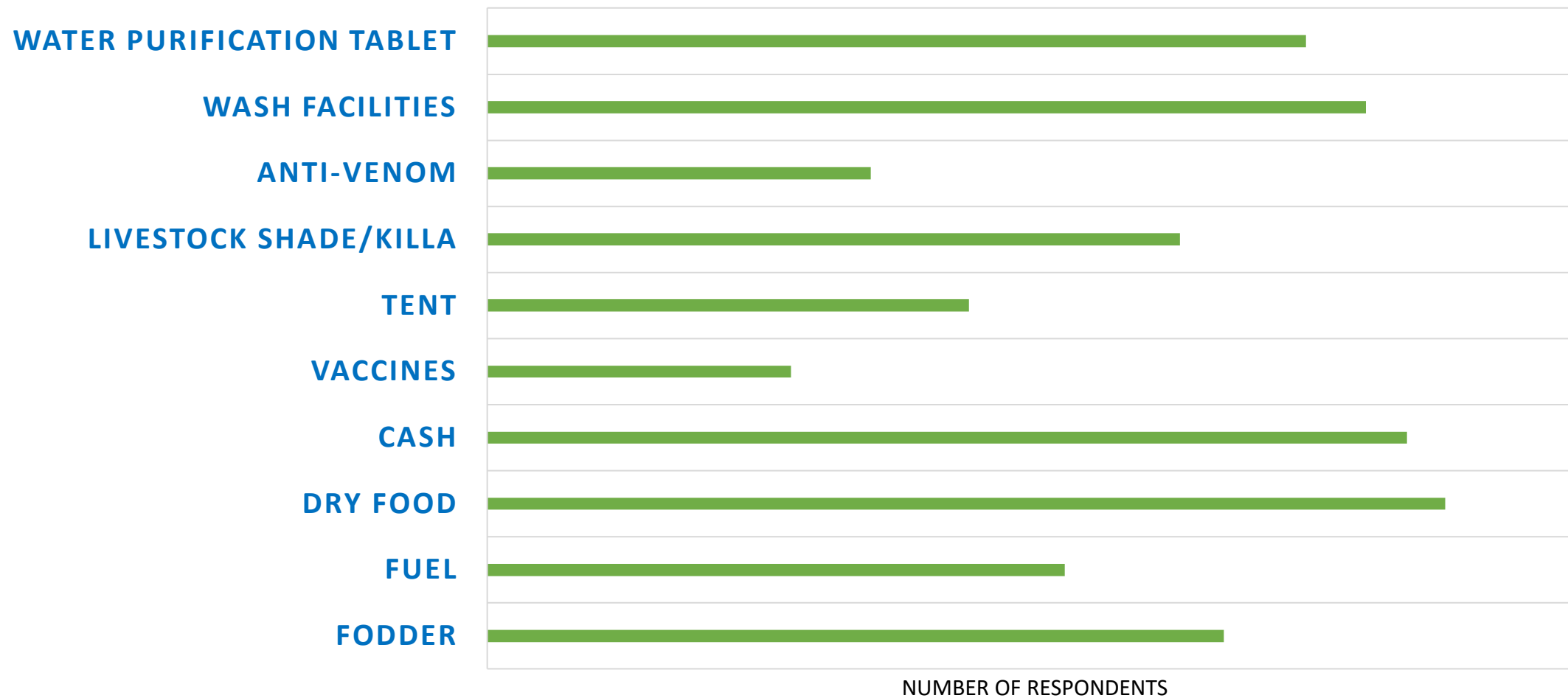
Additional support required at the community level for early action

6. INSTITUTIONAL MECHANISM

Private Sector

Research & Development Partners

Climate Information Value Chain

feedback | information

01 External Data Provider
02 In-Country Data Provider
03 Sectoral Experts
04 Boundary Org.
05 National Level Users
06 Community Level Users

Community Level Users

External Data Provider

06

01

National Level Users

05

02

In-Country Data Provider

04

03

Boundary Org.

Sectoral Experts

1   External Data Providers

External Data Providers Global Producing Centers, Regional Climate Centers etc. For Example, European Center for Medium Range Weather Forecast (ECMWF), NOAA etc. Strenghthen NHMS with value added data.

Community Level Users

06

External Data Provider

01

National Level Users

05

02

In-Country Data Provider

Boundary Org.

04

03

Sectoral Experts

2 In-Country Data Provider

National Hydromet Service Providers
Production of tailored hydro-meteorological information based on the demand from the sectoral institutions/experts. In this case the information is produced by Flood Forecasting and Warning Center of Bangladesh Water Development Board.

Community Level Users — 06

External Data Provider — 01

In-Country Data Provider — 02

Sectoral Experts — 03

Boundary Org. — 04

National Level Users — 05

Sectoral Experts co-produces tailored sector specific advisory services based on tailored hydrometeorological information considering the demand of the end users from National down to local level. In this case Department of Disaster Management, Department of Agricultural Extension, Department of Livestock Services etc.

3 — Sectoral Experts

Boundary Organizations Two-way Communication of climate information and advisory services. For example, Media, Disaster Management Committees, Extension Workers, NGOs, CBOs etc.

Boundary Organisations 4

- 06 Community Level Users
- 01 External Data Provider
- 02 In-Country Data Provider
- 03 Sectoral Experts
- 04 Boundary Org.
- 05 National Level Users

National/Sub-National Users Contributes in co-production, assess user demand, uses information at decision making and provides feedback. For example, Humanitarian Workers, Development Planners, Disaster Managers, Public Health, private sector etc.

National/Sub-National Users — 5

01
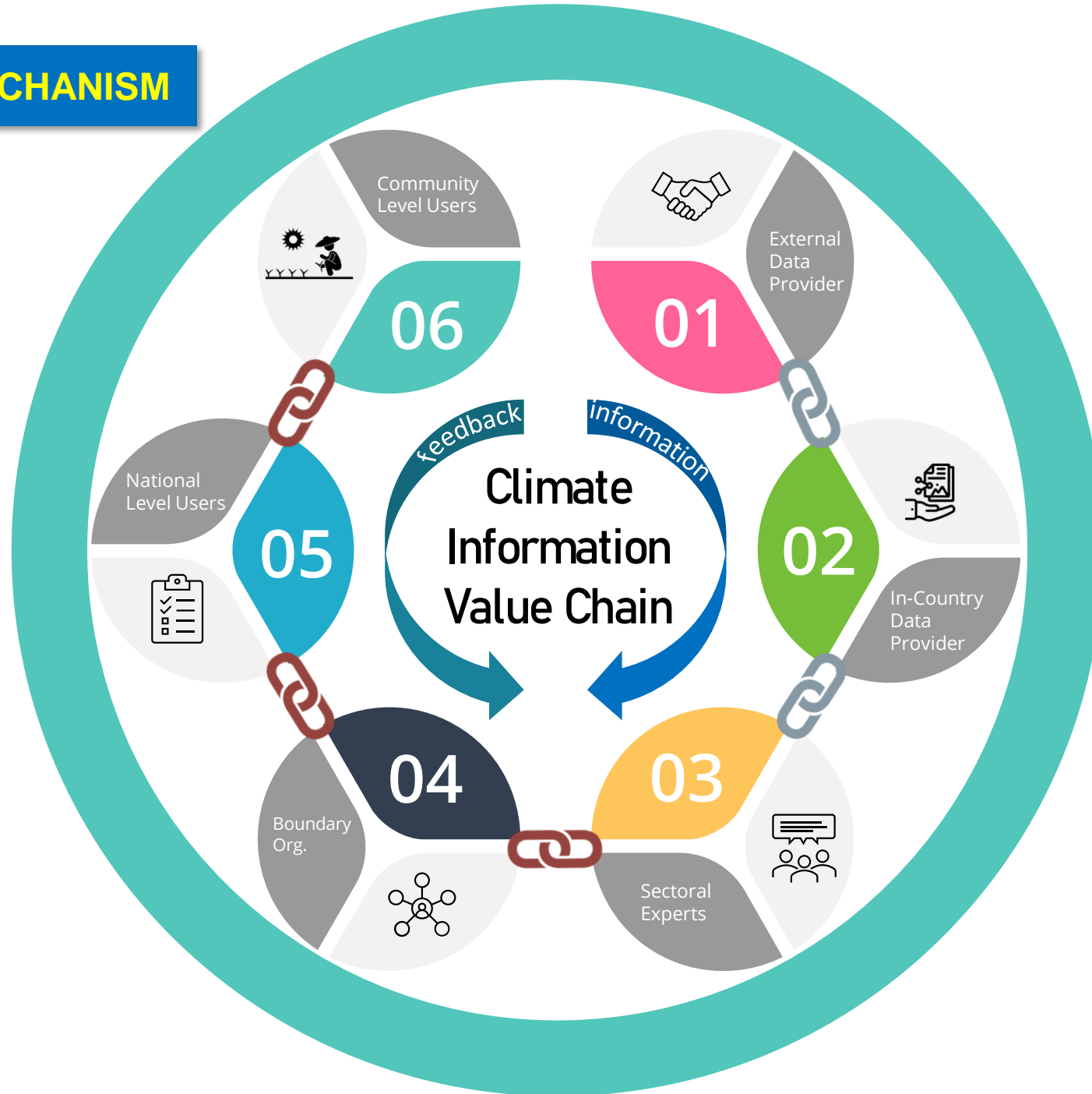
Community Level Users 6

Community Level users blend in indigenous knowledge with tailormade information to reduce risk and optimize resource management. Farmers, Vulnerable Communities etc.

Climate Information Value Chain

feedback — information

01 External Data Provider
02 In-Country Data Provider
03 Sectoral Experts
04 Boundary Org.
05 National Level Users
06 Community Level Users

7. KEY LESSONS LEARNED

Scenario-based Triggers Works Well

Traditional forecast based financing single triggers cannot capture the overall spectrum of Forecast Based Action (FBA). Scenario based triggers works well in case of multiple peaks/frequent floods in single season. However, capacity is needed to interpret and communicated the triggers. The triggers are not automated, a human layer is needed.

FBA for Community Resilience

FBA not only helps to avoid losses and minimize risks but also let communities save their productive assets, input costs that in turn contributes to long-term community resilience.

Strengthening Stakeholder Engagement and Coordination

Coordination with NHMS, DMA and sectoral institutions is ever so important. There is need for interfacing platforms and or decision support systems and standard operating procedures. There is need for regular dialogues, trainings and outreach programs. Capacity of the stakeholders and communities need to be enhanced for translating forecast into proactive ex-ante actions.

Need for longer lead time and Impact Based Forecasts

For better preparedness and anticipatory actions a combination of short, medium range and longer lead time forecast is required. Longer lead time is required to take strategic moves for anticipatory actions e.g. resource mobilization. Impact based forecasts need to be scaled up and operationalized for better anticipation of risks and pinpoint where actions are needed most.

7. KEY LESSONS LEARNED

Additional support required for the community

Although the forecast based advisories can significantly reduce losses, minimize risks; in order to maximize the benefits from these services, additional support, resource availability/mobilization should be ensured in the broader spectrum of Forecast Based Action (FBA). For example, only cash grants may not be useful for the farmers during the anticipatory window if there is fodder crisis in the locality.

Demand for two-way communication

The project developed a voice message broadcasting platform which has been used as the key channel for dissemination. This is one way broadcasting system. However, it was revealed from local level assessment that communities do not only want to listen to the advisories but also ask further case specific questions. An umbrella call center for climate services, through an interfacing agency can be developed in future to cater this need.

Further action required for women

While mobile services can improve the information delivery significantly, there are still challenges with advisory service delivery to the women. Although the project provided information to women groups, further action required to ensure women are equally informed. Women have been found to be more proactive in listening to and adhering to advisories in some cases.

Thank you!

PROGRAM TO SUPPORT SOUTH ASIA REGIONAL DEVELOPMENT IN OPERATIONAL FORECASTING AND SERVICE DELIVERY

SAHF Website: https://sahf3event.rimes.int/