



## Using ICT for effective early warning and disaster management to save lives and livelihoods

PEOPLE CENTRED RISK INFORMATION GATEWAY (TAMTAM) ENABLES EFFECTIVE FLOOD EARLY WARNING AND DISASTER RESPONSE AT THE COMMUNITY LEVEL. IT ACTS AS A COMMUNICATION AND FEEDBACK SYSTEM FOR GOVERNMENT AGENCIES, NGOS AND COMMUNITIES.



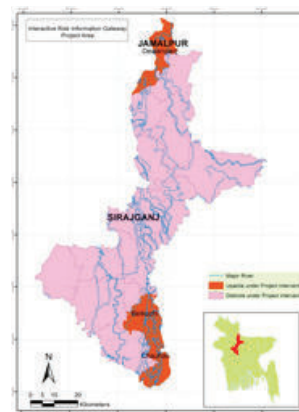
### FLOOD EARLY WARNING IN BANGLADESH

The Sendai Framework for Disaster Risk Reduction 2015-2030 highlights the need to “Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to people by 2030”. The Flood Forecasting and Warning Center (FFWC) under the Bangladesh Water Development Board (BWDB) generates 5-day flood forecast at 54 points and the Department of Disaster Management under the Ministry of Disaster Management and Relief are responsible to coordinate and disseminate this to a the local level together with other government agencies. Many gaps still remain to enable an effective “people centered early warning system”.

- ▶ Communities require localized flood forecasts and impact based warnings that helping them to take early action.
- ▶ Multiple communication mechanisms are needed to reach the most vulnerable populations (voice and text based).
- ▶ The use of mobile services and ICT should be maximized and existing institutional dissemination mechanisms need strengthening.
- ▶ A feedback system is needed to collect local information (e.g. water level readings, flood inundation, warning use and damages) to make information available for forecasting and to make response at national level.

### PROJECT AREA

The riverine islands in North West Bangladesh (char-islands) are part of the densely populated floodplains where many poor and vulnerable people live. The project targets: 5 unions at Belkuchi, Chowhali and Dewanganj Upazila in Sirajganj and Jamalpur district.



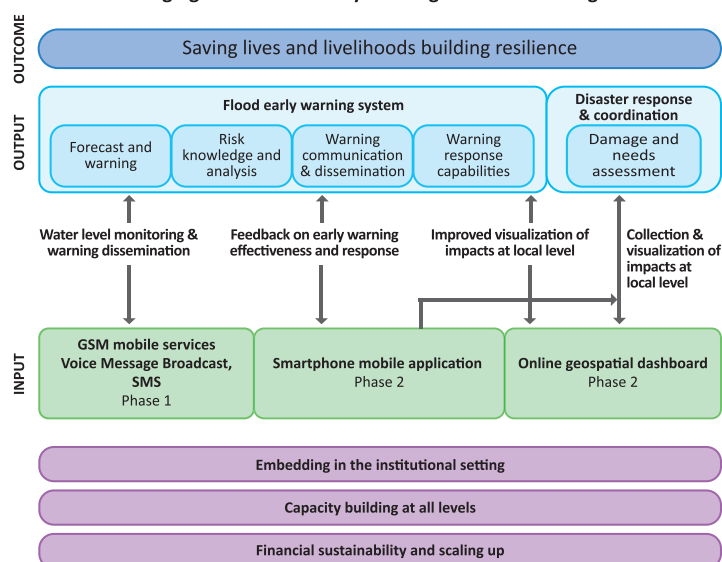
- Gorjan (10,725)
- Bagutia (19,915)
- Umarpur (13,545)
- Belkuchi Upazilla
- Rajapur Union (19,813)
- 1 union in Jamalpur District.
- Dewanganj Upazilla
- Bahadurabad (17,738)

# PEOPLE CENTRED RISK INFORMATION GATEWAY (TAMTAM) PROJECT

## PROJECT OBJECTIVES

- ▶ To reduce communication gaps by identifying, testing and evaluating potential improvements for flood warning communication using mobile services in order to strengthen existing communication channels
- ▶ To improve the content and understandability of the warning messages for local people living in remote, flood prone areas
- ▶ To establish a network of trained community volunteers and gauge readers who share relevant disaster information on a real-time basis through a newly developed App. The App feeds into a dashboard, that makes the information available to the responders, and that provides them with a better picture of the situation on the ground

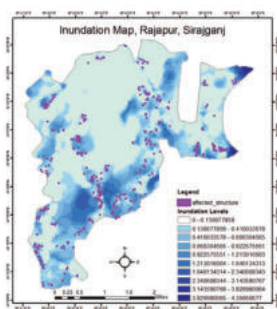
### Leveraging ICT for flood early warning & disaster management



## PROJECT OUTCOMES

### IMPROVED FORECASTING AND WARNING

- ▶ Installed 6 local water level monitoring gauges with BWDB support and trained community gauge readers (increasing awareness in communities)
- ▶ Collected and correlated local water level data at FFWC and generated 5 days localized forecast with technical support from RIMES during 2014-2015 monsoon.
- ▶ 7 days flood outlook was also generated and disseminated to the local communities based on medium range (1-10 days) probabilistic flood forecast



### RISK KNOWLEDGE AND ANALYSIS (IMPACT BASED FORECAST)

- ▶ Geospatial baseline topographic and exposure data collected in 5 unions (elevation roads, houses, water bodies etc.).
- ▶ Flood inundation and impact map generated using GIS. Satellite data used to generate flood extent map.
- ▶ 32 concrete water level gauges in floodplain installed and will be used in 2016 to validate inundation map. Further steps towards impact based forecasting and warning will be done in 2016 in line with WMO guidelines (WMO, 2015b).

### WARNING DISSEMINATION & COMMUNICATION

- ▶ Directly disseminated 1300+ voice message broadcast (VMB) to national, district and local government officials, NGOs, volunteers and community people (farmers, businessmen, teachers etc.). This increased from 300 people during the 2014 monsoon and with a higher frequency.
- ▶ Bangla SMS and email sent to disaster management officials.
- ▶ Awareness raising of the national 10941 Interactive Voice Response service (IVR).

### RESPONSE CAPACITY

- ▶ 70 volunteers, 6 gauge readers and 4 Union Digital Center entrepreneurs on EWS, DRR, community based response to floods. They play an important role in dissemination and motivate communities to take early action.
- ▶ 24 volunteers were equipped with smartphones and trained its basic use and internet.
- ▶ Risk reduction action plans (RAAP) implemented e.g. raised school ground, repaired school building and constructed road at community level.

বন্যা সতর্কবার্তা  
আজ সকাল ৬টার  
যমুনা নদী বাহাদুরাব  
৪৩ সোন্টমিটার উপ  
হচ্ছে। আগামী ২৪  
জামালপুর জেলার ব  
অবনতি হতে পারে।

Voice Message Broadcast (VMB)

**Members Login**

Username:

Password:

[Forgot Password ?](#) [Log in](#)





## 2015 PROJECT OUTCOMES

### CAPACITY BUILDING - EMBEDDING IN INSTITUTIONAL SETTING - FINANCIAL SUSTAINABILITY

The project identified the following mechanisms as important for warning dissemination and response and financial & institutional sustainability.

- ▶ The project worked closely with the Department of Disaster Management (DDM) and the FFWC in the local training and field work implementation.
- ▶ 4 entrepreneurs in the existing Union Digital Centres (UDC) were trained and 2 Union Sub Digital Centers (USC) were established to connect the isolated communities with information.
- ▶ A Flood Information Center (FIC) was developed at BWDB Siragjanj.
- ▶ Local service providers (LSPs) and other private sector representatives



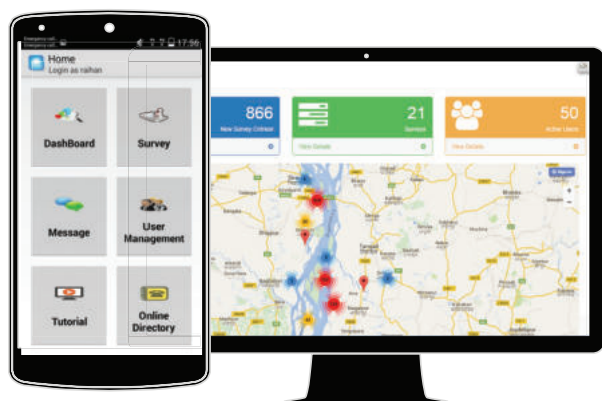
### MOBILE APPLICATION AND DASHBOARD DEVELOPMENT

Sustainable – Community orientated – user friendly

This App can be used for disseminating early warning and collecting feedback on warning effectiveness and for validating flood impact data by the FFWC while it can be used for local damage and need assessment during floods by DDM among others. It can be used for pulling and pushing data to a dashboard in both Bangla and English.

For survey use, the App has been designed in such a flexible way that new set of questions can easily be added; the data points are plotted over Google/Open Street Map and some field scenario can be understood as soon as the data are uploaded by the user.

The Dashboard will be an interactive platform for multiple users at the local level and other disaster managers. All the risk data and maps are under processing to be visualized the dashboard. Plug ins will be prepared to make the inundation mapping and damage calculation automated.



### 2015 MONSOON FLOOD -POST EVENT SURVEY USING MOBILE APPLICATION



A post flood assessment survey in 100 households in Rajapur union has been conducted by 10 of the volunteers which demonstrated their capability to use the application and collect local data.

Overall the results showed that a high percentage of the respondents

- ▶ Received warnings (approx. 70%)
- ▶ Trusted the information source (93% said it was accurate)
- ▶ Shared warnings and discussed actions with community (approx. 88%)
- ▶ Took response actions (approx. 75%) including delaying planting, making a raft, evacuating, building embankment, relocating assets/cattle, and netting fish ponds.

In 2016 the dashboard and app will be used by the local government, gauge readers and specially assigned volunteers to collect data on flood inundation, early warning effectiveness, local flood impacts and damages during the floods.



## PARTNERSHIP

People centred interactive risk information gateway (Tam Tam) project is implemented by Concern Universal with technical support from Regional Integrated Multi-Hazard Early Warning System (RIMES), Deltares (Netherlands) and Manob Mukti Songstha (MMS) with financial support of Cordaid, the Netherlands. The project is a continuation of the 'Mobile services for flood early warning'.

### Cordaid Netherland

Cordaid is a global development organization whose mission is to create flourishing, self-reliant communities in the world's most fragile and conflict-affected areas.

### Concern Universal

Concern Universal is a UK based International NGO that has been initiated in Bangladesh in 1993 especially focused in the area of Health, Education, Human rights, DRR and Livelihoods.

### Deltares

Deltares is a leading independent research and internationally operating specialist consultancy institute (non-for-profit) for water and subsurface issues with its base in the Netherlands. Deltares supports public authorities, private parties and society in their operations and ambitions, related to sustainable development of delta areas.

### RIMES:

The Regional Integrated Multi-Hazard Early Warning System (RIMES) is an international, inter-governmental, non-profit organization established on 30 April 2009.

### Manab Mukti Sangstha (MMS):

Manab Mukti Sangstha (MMS) is a local level Development Organization in Sirajgonj which is most disaster prone and poverty stricken area with a view to "see a society free from poverty, discrimination and risk of natural disasters".

## BENEFITS OF FLOOD WARNING

**INFORMATION:** Volunteers received direct voice message broadcast messages (11-17 June 2015) that the water level of Jamuna River will increase 70 CM (28 inches) at Ghourjan union. They shared this information with community people at the tea stall, Mosque announcements, community market (haat) and one to one communication.

**ACTION:** Community people that cultivate in the lowland joined together to discuss possible response actions to save their crops. They decided to jointly make temporary dam at the water entry point of the lowlands. Within two days 25 people worked together and made 70 feet long temporary dam and cost them only 19500 BDT (225euro).

**BENEFITS:** As a result of the joint efforts, cultivated land was not inundated and within next seven days and they were able to harvest sesame and Napier grass of about 120 acres of land which has a harvested crop market value of about 5,00,000 BDT (6,000 euro).

The community people shared that they were very grateful to the volunteers and other organisations including FFWC who are directly or indirectly involved with this flood early warning process.

## FACTS & FIGURES

**150,000**

Indirect Flood Early Warning Recipients

**1300+**

Direct Flood Early Warning Recipients

**70**

Volunteers Trained on DRR, EWS and Community Based Response

**24**

Volunteers Trained on Smartphone, Internet and Application based Survey

**6**

Community Gauge Readers Trained

**4**

UDC and USC Strengthened and Trained for EW Dissemination



### References:

Deltares (2015) Mobile Services for Early Warning in Bangladesh Final report.  
UNISDR (2006) Developing Early Warning Systems: A Checklist, Third International Conference on Early Warning EWC III, Bonn (Germany).  
WMO (2015a). Synthesis of the Status and Trends with the Development of Early Warning Systems.  
WMO (2015b) WMO Guidelines on Multi-hazard Impact-based Forecast and Warning Services. WMO-No. 1150

## JOINING IN

### FUNDING

Scaling Phase 2016:  
Euro 500,000 funding needed  
(details at request)

## CONTACT

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