



JOINT WMO/IOC TECHNICAL COMMISSION FOR
OCEANOGRAPHY AND MARINE METEOROLOGY

MEETING OF THE NATIONAL COORDINATION TEAM FOR THE COASTAL INUNDATION FORECASTING DEMONSTRATION PROJECT FOR BANGLADESH (CIFDP-B-NCT)

Dhaka, Bangladesh, 16-18 February 2014

FINAL REPORT

**MEETING OF THE NATIONAL COORDINATION TEAM
FOR THE COASTAL INUNDATION FORECASTING
DEMONSTRATION PROJECT
FOR BANGLADESH
(CIFDP-B-NCT)**

Dhaka, Bangladesh, 28-30 May 2013

FINAL REPORT

JCOMM Meeting Report No. 113

NOTES

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GENERAL SUMMARY OF THE MEETING

The CIFDP-B National Coordination Team (NCT) meeting was held at the Headquarters of the Bangladesh Meteorological Department (BMD), Dhaka, Bangladesh on 16-18 February 2014 was attended by NCT. The main objectives of the meeting were; to review the system design and user requirement plan; to note and discuss the progress of CIFDP-B implementation based on the system design; to review data availability of the date and establish a sharing mechanism; and to discuss on user perspectives and requirements to provide feedback on current forecasts capacities through the CIFDP-B User Requirements Plan (URP).

A training session was organized for 15-17 February 2014 at the BMD Headquarters, for the meteorologists of BMD. This training was conducted by Mr Nadao Kohno, Japan Meteorological Agency, on the ongoing development of the Bangladeshi Coastal Inundation Model that is built on the operational JMA-MRI storm surge forecasting model, incorporated with the components for tidal effects and waves.

This meeting was held in conjunction with the Work Package 1 meeting of the EU FP7 Resilience-Increasing Strategies for Coasts - toolKIT (RISC-KIT), which includes a case study on a Bangladesh coastal site (Sandwip island) that will complement the decision-making support through the CIF operation by using an advanced framework developed by European institutions (Coastal Risk Assessment Framework: CRAF). The project concept and workplan were introduced to the national stakeholders, followed by the user consultation and interview to better understand specific end-user requirements for Bangladeshi coast. The user component of CIFDP-B NCT and EU RISK-KIT WP1 are to be shared through these joint activities.

1. Data Sharing (for both CIFDP-B and RISC-KIT implementation)

NCT members have presented different data availability to enhance the CIF system in Bangladesh. Summary of the data availability for Coastal Inundation Forecasting (CIF) system, as well as agreed actions, are as follows:

Tidal Data

- Bangladesh Inland Water Transport Authority (BIWTA) operates 10 automatic stations, of which 6 are working (Char Mamtaz, Kutubdia, Tiger point, Kalapara, Hatia) at present. Data from those stations are available from 2002 onwards, but not in real time due to the lack of data communication facilities. Currently, data are collected on monthly basis to monitor navigation. Discussion was conducted with the BIWTA about the possibility to provide communication equipment to access the data in real time to BMD.

Action/Recommendation: Through implementation of CIFDP-B, a way to enable real-time data access from those active auto tide gauges will be sought.

- BIWTA has 45 manual gauges. Tide predicted data (produced using on empirical equations) are available for yearly basis – if needed, data should be purchased according to the organization policy.

Action/Recommendation: It was suggested that the BMD, on behalf of CIFDP-B NCT, make a formal request to the Ministry of Shipping to acquire data without cost, to be used for future CIF system (Action by BMD).

- Bangladesh Navy operates one automatic station in Chittagong at the Bangladeshi Naval headquarters from 1992 onwards.

Action/Recommendation: Data could be accessed free of cost with formal communication from BMD to Bangladesh Navy (Action by BMD).

- Chittagong Port Authority has five automatic tide stations, with the record of 50 years' data. It was noted with pleasure that they use a UK model for tidal prediction, which was verified to be reliable.
- Mongla Port Authority has 1 automatic tide station.
- Survey of Bangladesh (SoB) owns 1 tide station at Rangadia. Data available from 1993 onward. (6-second interval).

Bathymetry Data

- Bangladesh Navy covers up to the continental shelf / 35 nm, regularly updated. Different scale maps are available up to the scale of 1:250,000, however, no digital data can be provided to client.

Action/Recommendation: It was suggested that a request from BMD may be made to the Navy to acquire the bathymetry data for the RISC-KIT pilot area (Sandwip) only.

- Bangladesh Water Development Board (BWDB) currently implement some projects (i.e. Meghna Estuary Study, Phase II (MES II, 1998-99), IPSWAM (2008)) where some bathymetry data collected. Data access would be difficult, as they are owned by a private company.

Topography Data

- Improvement of Digital Mapping System (IDMS) of SoB will develop high resolution topography maps as well as 1:5000 scale maps for 5 divisions (Chittagong, Rajshahi, Shylhet, Khulna and Barisal).

Action/Recommendation: It was agreed that the BMD on behalf of the CIFDP-B-NCT make a request to SoB to conduct the survey to coastal area first so that data could be utilized for pre-operation testing.

- There are 19 projects under the Flood Action Plan (FAP), which has updated land elevations on a 300 m grid DEM. This data already collected from the Water Resources Planning Organization (WARPO).
- DEM with 50 m x 50 m resolution based on the FINNMAP land survey, FAP 19-National DEM (1952-64), and projects of the Bangladesh Water Development Board (i.e. Khulna Jessore Drainage Rehabilitation Project, 1997; Beel Kapalia project, 2008; and Beel Khuksia project, 2004).

Action/Recommendation: It was agreed that the BMD on behalf of the CIFDP-B-NCT make a request to BWDB to access these data.

- The Integrated Coastal Resources Database (ICRD) of WARPO contains socio economic data for the coastal area. Data could be purchased from WARPO.

2. System Design and Implementation

Based on the System Design for a Coastal Inundation Forecasting System for Fiji (JCOMM Technical Report No.74, 2013), the phase 2 system development has been under way by the system developer (S.H.M.Fakhruddin). The progress was presented to the NCT during the meeting; [the updated coastal inundation forecasting model that is based on the JMA-MRI storm surge model has been set up at the BMD, and nine Operational Forecasters were trained](#). This model incorporates storm surge height, wave in total water, astronomical tides and inundation schemes.

The river dynamics is not yet included in the current model, and it will be added in the next version to call as coastal inundation model. [Dr S.H.M. Fakhruddin agreed to handover the river component training in October 2014 \(Action\)](#). The FEWS adapter will be utilized through the collaboration with the RISK-KIT. The CIFDP-B-NCT appreciated the progress on the system development.

The importance and potential benefit of ensemble technique was again emphasized by the WMO Secretariat (B.Lee). She explained that ensemble technique helps to quantify uncertainties that all forecasting models bear, while the final decision support products (to be produced through the forecast process using the model results) will be simple and straightforward advice for decision makers. Ensemble technique will improve confidence of the forecasting/warnings. As it was agreed at the system design meeting (May 2013), [ensemble technique will be considered at the pre-operational stage, for continuous measurement of feasibility for operation. Implementing improved modelling tools such as FEWS would facilitate the operation of ensembles technique](#).

3. User Requirement Plan & Feedback

All CIFDP-B-NCT members/institutions were invited to review the first version of the CIFDP-B User Requirement Plan (URP-B; published online at: http://www.jcomm.info/index.php?option=com_oa&task=viewDocumentRecord&docID=12566), and provide comment via email or letters. All comments will be consolidated in the second version of CIFDP-B URP, to be compiled by the end of Phase 2. The following comments and suggestions were received for the next revision of URP-B, and for the activities in the Phases 2 to 4 of the CIFDP-B:

- The Department of Disaster Management (DDM) recommended that the Disaster Management Committee (DMC) structure at District, Upazilla, Pourashva, Union and City Corporation levels are key institutions for ensuring a comprehensive disaster risk reduction and management at local level. These structure bridges the gap between government and community by supporting resilience building of communities and institutions throughout Bangladesh. Thus capacity building of DMC is essential. These initiatives could be more effective if the DMCs are formed at village and ward level for effective Community integration directly to the Disaster Management (Bangladesh Standing Orders n Disaster; SoD- Appendix: 17). DDM also took initiatives on several projects to enhance community resilience on coastal hazards, such as:
 - Community Risk Assessment (CRA)
 - Risk Reduction Action Plan (RRAP)
 - hazards specific early warning knowledge, real time response & well defined dissemination systems to the communities including agro-met e/ws;
 - mass awareness about hazards;

- combined indigenous, scientific & technological knowledge management, transfer & applications;
 - active community participation mechanism including social inclusion
 - trainings, mock drills & simulations on hazards specific disaster;
 - Livelihood – Centric Adaptation Approaches (Mainly in Agriculture, Livestock's & Fisheries Sectors);
 - GOs-NGOs- CBOs Collaboration and coordination on disaster management, preparedness and early warning dissemination system
- Strong needs were noted for the education of end users to understand the meaning and impact of warning/forecasting information. It was agreed that the [Cyclone Preparedness Program \(CPP\) would support all capacity building activities for the CIFDP-B and RISC-KIT \(Action\)](#).
 - Many NCT members pointed out the need to extend and improve dissemination of warning information in different user sectors. One of the suggestions was to establish more direct links between the BMD and the local user-representing authorities, which would need to be considered with the national arrangement of the emergency responses.
 - NCT will look for the Involvement of NGO and community workers to understand the forecasting and disseminate within their programs.

Action/Recommendation: All the NCT members were requested to provide comments on the current version of the URP-B in a written form, to be compiled by the leading agency of the NCT (BMD) and by the System Developer, before the completion of the Phase 2 (end of 2014).

4. Testing of Pre-operational System

The NCT acknowledged that the Cyclone Preparedness Program (CPP) has strong capabilities and experience in conducting full-scale simulation exercises in the in coastal areas. It was noted with great appreciation that the [CPP agreed to take the leading role for the multi-agency simulation exercises at the later stage of the CIFDP-B implementation \(Action\)](#). At the present stage (Phase 2), this project will start with a table-top simulation which is also known as room demonstration to get a picture how the organizations interact and response, roles and responsibilities.

As a conclusion and next step of the Phase 2 implementation for the CIFDP-B, [the meeting agreed to conduct the first simulation exercise of the pre-operational CIF system before/at the next NCT meeting \(Action\)](#), to test the pre-operation system and identify its strength and weakness. Such an exercise will promote preparedness by testing policies, plans, and systems for CIF. The critical aspect of a simulation exercise is the proper planning, evaluation process and in particular feedback mechanisms.

The System developer (S.H.M. Fakhruddin) will share a concept note on: Scoping & Statement, Goals and Objectives, Players, Areas, Plans, Risk mapping, Hazard mapping, Limitations and Constrains of Simulations [\(Action\)](#).

5. Collaboration and mutual benefit of CIFDP-B and RISC-KIT

The NCT noted benefits from parallel activities of common goal was highlighted: for example, CIFDP-B and RISC-KIT would complement each other in delivering final outcome and benefit

to the users in Bangladesh, that the CIFDP-B will clearly demonstrate the benefit of improved forecasting through the local application for coastal risk assessment by RISC-KIT, and the RISC-KIT will benefit from the technical development and data sharing achieved by the national framework of the CIFDP-B.

For Bangladesh's national stakeholders, a clear direction for current and future improvement will be demonstrated through streamlines and collaborative implementation of the CIFDP-B, RISC-KIT and other development project, from user requirement identification, technical development for forecasting, analysis on the impact and community response and preparedness.

6. Plan for the next NCT meeting, training and further requirements

It was agreed that [the next CIFDP-B-NCT meeting will be held in September 2014, tentatively, from 21st \(Action\).](#)

Like the present case, a training will be conducted in conjunction with the meeting. A further upgraded model combined with the river simulation component will be introduced at this session. Based on the responses from the trained forecasters and meteorologists, it was found that, [in addition to the training on model operation, training on the forecasting \(purpose, procedure, targets, etc.\) would be required to ensure successful delivery of the CIFDP outcome \(Action\).](#)

7. Closing

The meeting was closed at 1700 hours on Tuesday 18 February 2014.

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AGENDA

1 OPENING

2 PROGRESS ON CIFDP-B TO DATE

- 2.1 Review of System Design and Implementation Plan
- 2.2 Discussions on the URP
- 2.3 Cyclone and Storm Surge Inundation
- 2.4 Coastal Flood Modelling Status
- 2.5 Community Level Capacity Development
- 2.6 Cyclone Preparedness Programme

3 Discussions on Data Sharing

- 3.1 Improvement of Digital Mapping System
- 3.2 Tides and other ocean observations
- 3.3 NWRD Database and its applications
- 3.4 Other data requirement to enhance forecast products

4 Discussions on End User Perspectives/Requirements and Pre-operational Forecast System

- 4.1 Update on End User Perspectives/Requirements
- 4.2 Discussions on End User Perspectives/Requirements and feedback on current forecast capacities
- 4.3 Discussions on pre-operational forecast system plan

5 Presentation on RISK-KIT

- 5.1 Objectives of RISC-KIT in Bangladesh
- 5.2 Planned activities of RISC-KIT in Bangladesh
- 5.3 Open discussion on individual opinion and experiences of participants about previous extreme events
- 5.4 Provisional field interview data collection outcome at Sandwip
- 5.5 Hunting for data from the participants and comprehensive discussion with them about their possible involvement in the project
- 5.6 Open discussion on the previous point

6 One-to-One Session

- 6.1 Detailed consultation on item 3 with identified stake-holders
- 6.2 Data mining and discussion for agreement for data exchange or involvement in field measurement program me

7 ANY OTHER BUSINESS

8 CLOSING

ACRONYMS AND OTHER ABBREVIATIONS

BITWA	Bangladesh Inland Water Transport Authority
BMD	Bangladesh Meteorological Department
BWDB	Bangladesh Water Development Board
CIF	(CIFDP) Coastal Inundation Forecasting
CIFDP	WMO Coastal Inundation Forecasting Demonstration Project
CPP	(Bangladesh) Cyclone Preparedness Programme
CRA	Community Risk Assessment
CRAF	(RISC-KIT) Coastal Risk Assessment Framework
DDM	(Bangladesh) Department for Disaster Management
DMC	(Bangladesh) Disaster Management Committee
FAP	(Bangladesh) Flood Action Plan
NCT	(CIFDP) National Coordination Team
ICRD	(Bangladesh) Integrated Coastal Resources Database
JCOMM	Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology
JMA	Japan Meteorological Agency
MRI	(Japan) Meteorological Research Institute
IDMS	(Bangladesh) Improvement of Digital Mapping System of SoB
RIMES	Regional Integrated Multi-Hazard Early Warning System for Africa and Asia
RISC-KIT	(EU FP7) Resilience-Increasing Strategies for Coasts - toolKIT
SoB	Survey of Bangladesh
SOD	(Bangladesh) Standing Orders on Disaster
RRAP	Risk Reduction Action Plan
URP	(CIFDP) User Requirements Plan
WAPRO	(Bangladesh) Water Resources Planning Organization
WMO	World Meteorological Organization

