



JOINT WMO/IOC TECHNICAL COMMISSION FOR
OCEANOGRAPHY AND MARINE METEOROLOGY

MEETING ON SYSTEM DESIGN FOR COASTAL INUNDATION FORECASTING DEMONSTRATION PROJECT FOR BANGLADESH (CIFDP-B)

Dhaka, Bangladesh, 28-30 May 2013

FINAL REPORT

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COASTAL INUNDATION FORECASTING
DEMONSTRATION PROJECT
FOR BANGLADESH (CIFDP-B)**

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JCOMM Meeting Report No. 105

NOTES

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GENERAL SUMMARY OF THE MEETING

The meeting on System Design for Coastal Inundation Forecasting Demonstration Project for Bangladesh (CIFDP-B) opened at 1000 hours on Tuesday 28 May 2013, at the conference room of the Pan Pacific Sonargaon Hotel, Dhaka, Fiji.

Mr Shah Alam, Director of Bangladesh Meteorological Department (BMD) and the Permanent Representative of Bangladesh with WMO, welcomed all participants in Bangladesh. He emphasized the critical importance of CIFDP-B to improve forecasting and service capabilities of BMD for coastal community, and reaffirmed the BMD's commitment for the implementation of this project. Mr Shah Alam wished a fruitful discussion and successful meeting to all participants.

Dr Bruce Stewart, Director of WMO Climate and Water Department, expressed the appreciation on behalf of WMO to the BMD and the National Coordination Team (NCT) for CIFDP-B for the successful implementation during the Phase 1 of the Project as well as for organizing this meeting. He recalled that the focus of CIFDP was to build improved operational forecasts and warnings capability for coastal inundation that can be sustained by the responsible national agencies, therefore the success of the Project relied on the leading role and active participation of national agencies. In this context, Dr Stewart congratulated on the successful implementation of CIFDP-B Phase 1, including the completion of the Definitive National Agreement (DNA) for CIFDP-B which made a critical milestone for the CIFDP-B implementation. He concluded his remark by encouraging active discussion on the CIFDP-B system design during the meeting.

The list of participants is provided in [Annex I](#).

Participants adopted its agenda for the meeting based on the provisional agenda that had been prepared by the WMO Secretariat and the CIFDP Steering Group. This agenda is provided in [Annex II](#).

All documents and information were provided through the meeting web site: <http://www.jcomm.info/CIFDP-B-P2>.

Participants were reminded that the main purpose of the meeting is to confirm the system implementation approach and the forecasting system setup, as defined in the updated CIFDP Implementation Plan ([JCOMM Technical Report No.64](#)) and to be carried out through the Phases 2 to 4 of the CIFDP-B implementation. The Participants were request to focus on review of the dataset, models, and operational schemes (including products and validation) that are available for operational applications, in order to agree on the Bangladesh Coastal Inundation Forecasting System specification during the meeting.

Summary of Discussion and Outcomes

The Bangladesh sub-project, CIFDP-B, is the first national sub-project that is being successfully implemented, and is launching the Phase 2 (system implementation) with this kick-off / system design meeting. The main purpose was to select and finalize the modelling system needed for required coastal inundation simulation, and to agree on the mode of implementation for Phase 2.

Main outcome from the meeting are as follows:

- Agreed on the system design. The system design report, as soon as the details are agreed and documented, would be published as JCOMM Technical Report series.

- Agreed on the designation of “system developer” who will lead and carry out the technical development/implementation together with the National Coordination Team (NCT) for Bangladesh. Dr S.H.M Fakruddin (Bangladesh) was proposed by the CIFDP Steering Group (PSG) as system developer, which was agreed by BMD and NCT;
- Based on the system design, the Meeting agreed on the detailed workplan as reproduced in [Annex III](#)

Participants recalled that the Definitive National Agreement (DNA) for the implementation of CIFDP-B was formally signed by BMD, Bangladesh Department of Disaster Management (DDM), Cyclone Preparedness Programme (CPP) and Regional Integrated Multi-Hazard Early Warning System For Africa and Asia (RIMES) in February 2013, with the establishment of the National Coordination Team (NCT). The participating agencies/national stakeholders reaffirmed their commitment for successful implementation of CIFDP-B.

Participants reviewed the user requirements for Bangladeshi Coastal Inundation Forecasting (CIF), which were collected at the National Stakeholders Workshop in December 2011, and discussed on the points for update.

The following points should be noted, in the CIFDP context:

- Significant improvement was noted in the Bangladeshi national coordination. All national stakeholders including Department for Disaster Management (DDM), Cyclone Preparedness Programme (CPP), Navy and Coastguard are in agreement, and setting priority on the CIFDP-B implementation and associated collaboration. The NCT, particularly BMD, has grown its understanding and capabilities to carry out required work for CIFDP-B implementation.
- JMA agreed to continue its support for CIFDP-B implementation, by technology transfer for storm surge/wave modelling and necessary data stream, through experts' engagement. RSMC-TC (India Meteorological Department) and INCOIS also reaffirmed their support;
- Further collaboration was sought between the BMD / NCT and Bangladesh Flood Forecasting and Warning Center (FF&WC). It was agreed that the collaboration at the technical level could be made immediately for Phase 2 implementation.

The meeting was closed at 1400 hours on Thursday 30 May 2013.

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AGENDA

1 OPENING

2 ORGANIZATION OF THE MEETING

- 2.1 Adoption of the agenda
- 2.2 Working arrangements

3 PROGRESS REVIEW OF BANGLADESH SUB-PROJECT (CIFDP-B)

- 3.1 Phase 1 Progress Review
- 3.2 Funding Arrangements for CIFDP Implementation
- 3.3 Ongoing and planned activities in the Bay of Bengal
- 3.4 PSG Decisions regarding CIFDP-B

4 UPDATE OF END USER PERSPECTIVES/REQUIREMENTS

- 4.1 Review of end users engagement
- 4.2 Next Steps to completion of User Requirements Document (URD)

5 DIRECTION AND OUTLINE FOR CIFDP-B PHASE 2

- 5.1 Concept and Scope of the Project – Phase 2

6 SYSTEM DESIGN FOR BANGLADESH COASTAL INUNDATION FORECAST (CIF) SYSTEM

- 6.1 Overview of proposed System Design
- 6.2 BMD
- 6.3 BWDB / FF&WC
- 6.4 RSMC-TC (India Meteorological Department)
- 6.5 RIMES
- 6.6 JMA

7 DISCUSSION OF MODEL SELECTION AND FORECAST SYSTEM DEVELOPMENT BY NATIONAL STAKEHOLDERS

- 7.1 Storm Surge Model Selection
- 7.2 Hydrological Model Selection
- 7.3 Model interconnectivity and interoperability, and linked operation with global and regional models
- 7.4 Discussion of inundation modelling requirements and options

8 DEVELOPMENT AND TESTING OF OPERATIONAL COASTAL INUNDATION FORECAST (CIF) SYSTEM FOR BANGLADESH

- 8.1 Model and System Development
- 8.2 User Products
- 8.3 Capacity Development and Training
- 8.4 Sub-Project Implementation Progress and Plan Update

9 UPDATE SUB-PROJECT PLAN FOR CIFDP-B

9.1 CIFDP-B sub-project plan updated

9.2 Revised timeline for CIFDP-B Phases 2 and beyond

10 ANY OTHER BUSINESS

11 CLOSING

Activity plan for CIFDP-B Phase 2 implementation

As agreed at the System Design meeting for
Coastal Inundation Forecasting Demonstration Project for Bangladesh (CIFDP-B)
28 – 30 May 2013, Dhaka, Bangladesh

Items	Activities	Due Date
1. Cyclone Model/ Atmospheric Forcing for TS Model	<ul style="list-style-type: none"> Develop techniques, as required, to estimate parametric values from existing model and other guidance available at BMD. Ensure appropriate parametric input is provided to storm surge model; Future Plan: run WRF using ECMWF initial condition (i.e. BMD will identify specific parameters requirement to customize WRF model using ECMWF data. Based on the request from BMD, WMO will facilitate to access the data from ECMWF; 	Sep 2013
2. Storm Surge, Wave model and inundations	<ul style="list-style-type: none"> Implement JMA-MRI storm surge model at BMD in pre-operational mode; Include waves in total water level estimates by adding a suitable fixed value, to be determined; Include tides in total water level estimates through an appropriate technique to be determined in consultation with the PSG; Update pre-operational model with new version of MRI model incorporating inundation once available from JMA; Test feasibility of running ensemble storm surge runs and determine optimum number of ensemble members considering utility and run time; 	Sep 2013 July 2013 Sep 2013 May 2014 May 2014
3. Hydrological/Hydro- dynamic Model	<ul style="list-style-type: none"> Investigate availability of suitable data on stream flow for hydrological input to the inundation model; Investigate with PSG and Deltares further details about using FEWS in CIFDP-B; 	Sep 2014 May 2014
4. Data collections	<ul style="list-style-type: none"> Ensure appropriate data flow to forecast system, including availability of bathymetry, DEM, river flow data, water level data, appropriate meteorological input; Compile adequate relevant historical data for testing the system in hind-cast mode, to include data sources noted above and additionally post-event survey data ; Propose resolution to issues of different datum reference for land and bathymetry data sets. Central data storage system development; 	Aug 2013 Sept 2013 Sep 2013 April 2014

5. System Exercise	<ul style="list-style-type: none"> • (before testing period) Simulation and hindcast of several characteristic historical events (e.g. tropical cyclones, storm surges, floods); • (before testing period) documented plan/procedure for testing, with necessary guidelines/manual for system operation ; • System testing, and summary report of the testing results; • (after testing period) an acceptance testing plan for testing in Phase 3, for further validation and improvement of the forecasting system (during the tropical cyclone season); • Prepare a procedure for operational testing of prototype versions of the CIF system, and work with the NCT to perform the testing, including the preparation of a summary report on the testing results and a testing plan for Phase 3; 	<p>April 2014</p> <p>May 2014</p> <p>Aug 2014 Dec 2014</p> <p>Dec 2014</p>
6. Capacity Building	<ul style="list-style-type: none"> • Prepare user guidelines and training material for capacity development, technology transfer and on-the-job training, for each step/component of the Bangladesh CIF system, and provide training for the system operators. Necessary travel to Bangladesh, for this purpose, will be organized separately through the WMO Secretariat; 	<p>Aug 2014</p>
7. System Reporting Framework	<ul style="list-style-type: none"> • Develop an operator feedback/issue resolution log tool to collect and document the feedback and responses from all stakeholders for future application in the Bangladesh CIF system operation, through regular interaction with the National Coordination Team (NCT) for CIFDP-B, particularly with the Bangladesh Meteorological Department (BMD); • Draft a process for validation, assessment and review for the Bangladesh CIF system being developed; • Prepare monthly progress reports for WMO (basis for monthly payments) and also reports to the regular meetings of the CIFDP Steering Group (PSG) and the meetings of the NCT for CIFDP-B; • Prepare the CIFDP-Phase 2 final report and submit through the NCT for review and approval by the PSG. 	<p>April 2014</p> <p>Dec 2014</p> <p>June 2013 -Dec 2014 Dec 2014</p>

ACRONYMS AND OTHER ABBREVIATIONS

BMD	Bangladesh Meteorological Department
CHy	WMO Commission for Hydrology
CIF	Coastal Inundation Forecasting
CIFDP	WMO Coastal Inundation Forecasting Demonstration Project
CPP	(Bangladesh) Cyclone Preparedness Programme
DDM	(Bangladesh) Department for Disaster Management
DNA	(CIFDP) Definitive National Agreement
NCT	(CIFDP) National Coordination Team
JCOMM	Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology
JMA	Japan Meteorological Agency
INCOIS	Indian National Centre for Ocean Information Services
PSG	(CIFDP) Project Steering Group
RIMES	Regional Integrated Multi-Hazard Early Warning System for Africa and Asia
RSMC	(WMO) Regional Specialized Meteorological Centre
WMO	World Meteorological Organization

