PROJECT INFORMATION DOCUMENT (PID)
IDENTIFICATION/CONCEPT STAGE

Report No.: PIDC32458

Project Name	Strengthening FMIS Capacity in Bihar
Region	SOUTH ASIA
Country	India
Sector(s)	General water, sanitation and flood protection sector (100%)
Theme(s)	Natural disaster management (50%), Water resource management (50%)
Lending Instrument	Lending Instrument
Project ID	P157111
Borrower Name	Department of Economic Affairs
Implementing Agency	Flood Management Information System, Water Resources Department, Bihar
Environment Category	C - Not Required
Date PID Prepared	30-Sep-2015
Estimated Date of Approval	12-Nov-2015
Initiation Note Review Decision	The review did authorize the preparation to continue

I. Introduction and Context

Country Context

Floods have the greatest potential for damage of all natural disasters worldwide, whereas, the risk of deaths due to flooding is highly concentrated in Asia. In Indian plains flood takes places every year more as recurring event. Extreme rainfall and flooding is causing illnesses, deaths and mass displacement. In 2008, the embankments of the Kosi River, a tributary of the Ganges, broke, displacing over 3.5 million people in India, and disrupting transport and power across large areas. Severe floods in Mumbai in 2005 have been attributed to both climatic and non-climatic factors, suggesting an interaction between climate change and other stressors. Flood risk is increasing over time as a result of population pressure in flood prone areas, and the values of assets and infrastructure in the areas are increasing as well. The Fifth Assessment Report (2014) of the Intergovernmental Panel on Climate Change (IPCC) identifies flood as one of the key climate related risks for South Asia, primarily India given its coverage and exposure to life and assets.

Flood forecasting services have many local benefits, but on the wider scale ultimately operate in support of the civil protection and emergency response services. Forecasting and warning services are, in most cases, state services and their main goal is to deliver reliable and timely information to the civil protection services as well as to the general public. This should be accomplished with enough lead time to allow line departments such as disaster management department and people to take measures to protect themselves from flooding or take appropriate actions. Therefore, the goal of flood forecasting service is to provide inputs for a full level of operations throughout the flood plains and flood deltas.

Sectoral and Institutional Context

Bihar is India's most flood-prone State, with 76% of the population in the north living under the recurring threat of flood devastation. Recurrent floods are detrimental to Bihar's economy and undermine poverty alleviation efforts. There is a need to develop and strengthen flood forecast capacity for Bihar. Traditional efforts at flood management have focused on structural systems, such as the building of a system of embankments, many of which are not properly maintained and outlived their project lives. Despite the largely structural solutions that have been the focus of flood mitigation in the past decades, the threat of floods remains as high as ever to the economy and livelihoods in Bihar. There has been excellent Government of Bihar documents (e.g. the 1994 Second Bihar Irrigation Commission, 2008 Sanyal Committee Report) that highlights the need for a non-structural measures mainly operational flood forecasting capacity in Bihar. They also emphasize that flood management needs to "form part of the overall comprehensive plan for optimum development of water resources of a basin."

The Government of Bihar (GoB) undertook implementation of Flood Management Implementation Support Project Phase II, which aimed to improve flood management in the State. However, there exists both technical and institutional capacity gaps in the Flood Management Information System (FMIS) Cell of Water Resources Department, Bihar to generate and disseminate timely and customized information to move the sector agencies from flood disaster response to improved flood preparedness and to effectively support lives and flood management in the flood prone areas of the State. The present project is a step in the development of a modelling system and capacity for flood forecast and inundation mapping in the Bagmati-Adhwara river basin.

Relationship to CAS/CPS/CPF

The project aligns with the Bank's Country Partnership Strategy 2013-2017 along its second pillar – Transformation. The project will contribute operationally through flood forecasting to improve flood management to reduce flood risk. The impacts of floods are traditionally felt most by the poorest and most vulnerable people in India, including through damage to crop lands and other property and transmission of water-borne diseases. The project will also contribute to improved understanding of flood through water and natural resources planning and management at national and state levels.

II. Project Development Objective(s)

Proposed Development Objective(s)

The development objective of this grant fund is to strengthen Government of Bihar's institutional capacity and tools/models in operational flood forecast and inundation modeling, and community outreach for flood risk management in Bagmati-Ahwara basin, within the Ganges basin.

Key Results

Grant activities will contribute to strengthening operational Flood Management Information System capacity of Water Resources Department, Bihar. The expected key results and outcomes are:

Expected Results:
1. To institutionalize the Meteorological Framework for ensemble Short and Medium Range Precipitation Forecast and high frequency rainfall estimates for Operational (day-to-day) Model Runs
2. To extend the existing flood forecast model to cover the whole basin from Hayaghat to Dumri, confluence with Kosi river
3. To set up Open Source Distributed Flood Forecasting Models to compare and improve modeling capacities of FMIS.
4. To develop effective community alerts and communications for improved flood risk management

Expected Outcomes:
1. Improved flood modeling capacity - The grant initiative equips the Water Resources Department (WRD) of Government of Bihar (GoB) with improved flood forecast modeling capacity to provide operational forecasts in Bagmati-Adhwara basin, and capacity to scale up to other basins in the State
2. Improved community participation-The community outreach is strengthened with targeted alerts and more effective communication models
3. Regional knowledge base- Knowledge base and skills created to develop similar models in other states covered under the Bank assisted National Hydrology Project

III. Preliminary Description

Concept Description

The project design primarily would focus on improving the flood forecasting capacity of WRD/GoB through development of appropriate models including strengthening existing model in Baghmati-Adhwara basin, operational use of ensemble rainfall forecasts and assimilation of satellite based near-real time rainfall estimates, improving community outreach, and institutionalizing modeling capacity within the WRD.

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Activity 1: operationalization and use of ensemble rainfall forecasts and satellite based near--real time rainfall estimates
Activity 2: The flood forecast model developed in FMIS2 will be extended from Hayaghat to Dumri, confluence with Kosi river
Activity 3: Setting up Open Source Distributed Flood Forecasting Models to compare and improve modeling capacities of FMIS.
Activity 4: Community based flood risk management
Activity 5: Capacity Building, Training and Outreach

The key issues to meet Development Objectives include flood forecast modeling in a data-poor environment in a shared basin, use of free-to-use modeling software to enable scaling up in the Ganga basin, enabling community based flood management through targeted and timely flood alerts, and institutionalizing modeling capacity through trained modeling team.

IV. Safeguard Policies that Might Apply

Safeguard Policies Triggered by the Project	Yes	No	TBD

Environmental Assessment OP/BP 4.01		×	
Natural Habitats OP/BP 4.04		×	
Forests OP/BP 4.36		×	
Pest Management OP 4.09		×	
Physical Cultural Resources OP/BP 4.11		×	
Indigenous Peoples OP/BP 4.10		×	
Involuntary Resettlement OP/BP 4.12		×	
Safety of Dams OP/BP 4.37		×	
Projects on International Waterways OP/BP 7.50		×	
Projects in Disputed Areas OP/BP 7.60		×	

V. Financing *(in USD Million)*

Total Project Cost:	0.475	Total Bank Financing:	0
Financing Gap:	0		

Financing Source	**Amount**
South Asia Water Initiative (SAWI)	0.475

VI. Contact point

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