FLOOD HAZARD ASSESSMENT, FORECASTING AND EARLY WARNING IN GHANA.

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Outline of Presentation

- Project background & objectives
- Images of floods in Accra and Northern Ghana
- Project Area
- Project Structure and Activities
- Products of assessment
- Disaster Reduction Management-Country Plan
- Structural Intervention (Flood risk reduction)
- Contribution of HSD to MIFMASS program
Background & Objectives

- Ghana ranks high amongst African countries most exposed to risks from multiple climate-related disasters such as floods (UNDP/NADMO, 2009).
  - **June 3, 2015, Accra floods** - most devastating in terms of geographic extent, severity of impact/damage & level of losses. Estimated 52,622 people were affected; over 150 lives lost with 86 injured in the metropolis
  - Estimated **US$300 Million** in damages
  - **2007 & 2010 floods in Northern Ghana**;
    - The floods from late 2010 affected more than 200,000 people, mainly in the north;
    - Most affected areas: White Volta, Oti river and Black Volta river settlements within the fringe of Lake Volta
    - Government of Ghana in 2011 requested support from the **World Bank** for better managing floods in the north – Flood Hazard Assessment and Flood Early Warning System (FEWS) in the Volta river Basin

**Objectives of the Project:** The broad objective is to strengthen the institutional capacity of the agencies responsible for flood and disaster risk management in support of Ghana’s efforts to achieve the Hyogo Framework for Action for disaster reduction.

**Key Objective:** Strengthening flood management in the Volta river basin
Images of devastating June 3, 2015 Floods in Accra, Ghana

Accra - Ghana, June 3, 2015
Images of June 3, 2015 Floods in Accra

Accra - Ghana, June 3, 2015
Rescuing victims of Floods by NADMO in Northern Ghana

Northern Ghana, 2010
Project Structure & Activities

- WIS
- Timeseries
- Data validation
- GIS
- Static geographic database survey data
- Hydro-meteo

DEM (White Volta river basin)
Project Structure & Activities....contn’.....

- Hydro-meteo
  - Timeseries
  - Data validation
  - Models
    - rainfall runoff
    - hydraulic 1D
    - hydraulic 2D
  - GIS
    - Static geographic database
    - survey data
    - Flood mapping
    - Flood mitigation
    - Flood genesis

- Flood Early Warning System
- meteo satellite
- meteo forecast field
- water levels

- GIS
Products of flood Hazard Assessment

- Water Information system-Volta (WIS-Volta)
- GIS-database (GIS-Volta)
- Flood assessment models
  - Flood Genesis
  - Flood mitigation
  - Hazard maps
  - Flood Early Warning System for White Volta and Oti river basins (FEWS-Volta)
White Volta river flood genesis

Easy analysing with WIS and models:
Gradual building up during the rainy season
Flood mitigation measures

Multi-purpose Pwalugu Reservoir

Size and dam management determine flood mitigation effect
Flood hazard maps

Emergency planning

Spatial planning
Flood early warning system
White Volta (FEWS-Volta)

Rainfall forecast
Satellite measurements
Field information
Flood early warning system
White Volta (FEWS-Volta)

Forecast river floods
Analyse precipitation patterns
1. Strengthening Flood Management

Strengthen flood management in the Volta river Basin

More accurate flood forecasting information through improved FEWS Volta;
Enhanced data sharing mechanism established among relevant institutions;
Sustained and increased technical capacity of WRC, HSD, and GMet for flood management;
Flood risk information is available to the district assemblies for district planning;
Timely and effective communication of information to communities in the White Volta Basin.

Gmet, HSD, WRC, WRI, District Assemblies, Communities

2. Advocacy and Capacity Building

Foster advocacy and to strengthen capacity at national, regional and local government levels for disaster risk reduction and preparedness.

Strengthened national and regional platforms for disaster risk reduction; and
Sustained and increased technical capacity of national, regional and local governments for disaster preparedness; through simulation exercises and tailored capacity building programs.

NADMO, UNDP, EDUCATIONAL INSTITUTIONS (Universities), DRR Platforms
NADMO

- Responsible for Management of Disasters and Related Emergencies
- Coordinating activities of GoG and NGOs in Disaster Management
- Depends on GMet and HSD to obtain information on EWS (Floods and Draught)
- Mode Information Transmission
  - EOC (Emergency Operation Centre)
    - CREW (Community Resilience Early Warning) System
    - Media
- Community Engagement
  - Improve resilience and reduce vulnerability
Community Engagement: Simulation Exercises (NADMO)
Flood Risk Reduction – Structural Measures (Dredging)

In May, 2019, Ghana Government initiated the dredging of the major tributaries of Volta river basin in Ghana in addition to the non-structural measures already operational in the basin.

Four key state institutions involved in the Dredging of the Volta river and its tributaries
- Hydrological Services Dept.,
- Water Research Institute,
- Field Engineers Regiment (Ghana Army)
- Water Resources Commission.

Objective of the Dredging

- Increase the carrying capacities of the tributaries in the Volta river basin
- River training and channel improvement
Flood Risk Reduction – Structural Measures (Dredging)
Flood Risk Reduction – Structural Measures (Dredging)
Contribution of the Ghana Hydrological Services Department (HSD) to the MIFMASS programme

- Provision of flood risk information for disaster prevention and management within the Volta river basin
- Provision of Hydrological/river basin data (discharge and stage) for flood monitoring and assessment within the Volta river basin
- Provision of water level forecasts (flood alerts) from FEWS-Volta and FEWS-Oti for early warning within the Volta basin
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