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Supporting MOWRAM in Capacity Building on End-to-End Multi Hazard Early Warning System in Cambodia through Seasonal Forecasting, SESAME Program and Activation of Monsoon Forum in Cambodia

Basic Training on Hydrology for the Department of Hydrology and River Works

6-8 August 2019, DHRW Training room

Training Note

1. Introduction

RIMES is implementing the project on *Supporting MOWRAM in Capacity Building on End-to-End Multi-Hazard Early Warning System in Cambodia through Seasonal Forecasting, SESAME Program, and Activation of Monsoon Forum in Cambodia* as part of the United Nations Development Programme's project on "Strengthening climate information and early warning systems in Cambodia to support climate resilient development and adaptation to climate change". The latter aims for: increased institutional capacity to assimilate and forecast weather, hydrological, climate and environmental information; climate and weather information that are made available and utilized for national, sectoral, and sub-national planning, as well as for transboundary communication in the region; and strengthened institutional capacity to operate and maintain early warning systems and climate information infrastructure. Within this framework, the project being implemented by RIMES shall:

- 1) Build capacity within the Department of Meteorology (DOM) for generation of forecast at different timescales
- 2) Build capacity within the Department of Hydrology and River Works (DHRW) on basic and advanced hydrology
- 3) Customize the Seasonal Climate Forecast System (FOCUS) for Cambodia
- 4) Develop capacity of the Department of Agriculture (DOA) to produce agrometeorological advisories through a robust dissemination platform, and better manage drought situations in the country
- 5) Train end users through the Forecast Application for Risk Management (FARM) School

2. Objectives

Capacity development within DHRW shall involve:

- a) Basic training on hydrology, with focus on end-to-end flood forecasting
- b) Advance training on development of an end-to-end flood forecasting system

The basic training on hydrology shall:

- a) Develop skills on hydrological modeling
- b) Orient on end-to-end flood forecasting and warning
- c) Update on DHRW capacity for end-to-end flood forecasting and warning

3. Participants and Training Requirements

Participants to the training are DHRW staffs that have operational responsibilities in flood forecasting and warning.

All participants are expected to bring laptops with Windows. Software required are: Arc-GIS, R, HEC-GeoHMS, HEC-HMS.

4. Agenda

Day 1 (6 th August)	Training Component	Facilitator
10:00 – 11:00	Opening session <ul style="list-style-type: none">○ Welcome remarks○ Participant introduction○ Expectations from the training○ Group photo and tea break	DHRW, RIMES
11:00 – 12:30	Flood forecasting in Cambodia <ul style="list-style-type: none">○ Understand the current capacity of DHRW○ Existing mechanism of hydrological monitoring and forecasting in Cambodia○ Coordination mechanism and responsibilities of various departments for water resource management and flood forecasting○ Existing operational systems	DHRW
12:30 – 13:30 Lunch Break		
13:30 – 15:30	<ul style="list-style-type: none">○ End-to-end flood forecasting system○ Demonstration of RIMES' Flood Cautioning and Alert System (FloCAST)○ Steps involved in developing FloCAST	RIMES
15:30 – 16:00 Coffee break		
16:00 – 17:00	<ul style="list-style-type: none">○ Discussion on developing FloCAST for Cambodia○ DHRW requirements for enhancing flood forecasting and warning services	RIMES/DHRW

Day 2 (7 th August): Hands-on exercises		
Morning	<ul style="list-style-type: none"> ○ Integrate hydro-met data in a database and perform data quality assessment ○ Analyze hydrological trends and extremes 	RIMES
Afternoon	<ul style="list-style-type: none"> ○ Understanding hydrology - Introduction of hydrological processes in a river basin ○ Hydrological signatures – Mean annual flow, high flows and low flows, flow duration curves, baseflow ○ Return period analysis 	RIMES
Day 3 (8 th August): Hands-on exercises continued and discussions		
Morning	<ul style="list-style-type: none"> ○ Introduction to GIS ○ Basic exercises for familiarization in GIS ○ Basin delineation by HEC-GeoHMS ○ Demonstration of hydrological model in HEC-HMS 	RIMES
Afternoon	<ul style="list-style-type: none"> ○ Discussion and way forward 	RIMES/DHRW