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Training on
Specialized Expert System for Agro-Meteorological Early Warning (SESAME)
22-23 August 2019
Phnom Penh, Cambodia

1. Background

Weather and climate information of different lead times need to be translated into easy-to-understand and usable sectoral advisories, for facilitating better information uptake among institutional and community end-users. The Specialized Expert System for Agro-Meteorological Early Warning (SESAME) has been developed by the Regional Integrated Multi-Hazard Early Warning System (RIMES) for assisting agriculture officers and extension workers in automating the process of translating weather/climate information into agricultural advisories that could be provided to farmers, for informed and better management of resources and risks.

In 2018 SESAME was customized and piloted in select districts in Cambodia. With support from the United Nations Development Programme (UNDP) and in collaboration with the Department of Meteorology (DOM), RIMES is working with the General Directorate of Agriculture (GDA) to build on initial work and further expand the customization and use of SESAME among farmers in pilot districts. This provides support to the already operational process of generation, dissemination, and application of forecast-based agricultural advisories by the Department of Agriculture and Land Resources Management (DALRM).

SESAME is composed of the following key components:

- a) Crop database, which stores location-specific crop data, with web interface for data handling and database management
- b) Forecast data management system, which stores model outputs, with modules for generating weather patterns, real-time comparison with observed meteorological data, and archiving of datasets
- c) Agro-advisory expert database, which stores crop- and location-specific predefined advisories that correspond to weather patterns and environmental conditions, with web interface for expert inputs
- d) Dissemination system for issuance of SESAME products, which include long-term historical meteorological observation data, normal values for daily and monthly climate based on 30-year historical meteorological data, observation data from the immediate past, forecast information (3 days, 10 days divided into 2 pentads, monthly and seasonal), and crop management advisories
- e) Feedback system, which allows users to give online feedback and recommendations for improving the system

SESAME requires “training” from agriculture officers to enable the system to evaluate crop sensitivity to the predicted weather, analyze its influence on crop growth, and input appropriate crop management advisories to the system. SESAME learns from these associations through machine-learning algorithm. Once the system has adequate historical advisories, it automatically identifies and generates advisories for anticipated specific weather patterns.

This training on SESAME is organized for key agriculture officers from pilot locations to provide necessary inputs into SESAME to enable automated generation of advisories after ingestion of sufficient agriculture data, including operational advisories.

2. Objectives

The training, broadly aimed to capacitate agricultural officers (i.e. expert users) in using SESAME, is specifically targeted to enable them to:

- identify climate-related issues in agricultural production, and evaluate how weather and climate information could be integrated in decisions to address these issues
- familiarize weather and climate information products and terminologies
- analyze the potential impacts of extreme weather/climate events on crop growth using historical climate information, weather forecasts and climate outlooks
- develop location- and crop-specific cost-effective strategies/measures to manage potential impacts from extreme weather/climate events
- communicate climate risks more effectively and assess the economic value of weather and climate information application
- introduce SESAME design, features, and functionalities and appreciate the value of SESAME agro-advisories in optimizing climate opportunities and in reducing climate-related risks
- practice the use of SESAME including the preparation of forecast-based agro-advisories
- provide and receive user feedback to guide system refinement
- train extension workers and farmers to be able to understand, access, and disseminate and integrate advisories into farm-level decision-making

3. Target Participants

Table 1 defines the proposed participants from GDA and DOM Headquarters, provinces and districts.

Table 1. SESAME training participants

Department	No. of Participants	Remarks
DOM and GDA HQ Representatives	4	Two representatives from each department
Kampong Speu Provincial Office	1	Operational Staff familiar with crop data for Samroang Torng District
Samroang Torng District Office	2	Operation staff based in the district office for at least 2 years
Battambang Provincial Office	1	Operational Staff who is familiar with crop data for Thmor Koul District
Thmor Koul District Office	2	Operation staff based in the district office for at least 2 years

4. Agenda

Table 2 outlines the agenda for the 2-day training.

Time	Session	Facilitator/Presenter
Day 1. 1 August 2019		
09:00-09:30	Welcome Remarks Remarks Remarks Participant Introduction	GDA DOM UNDP All
09:30-10:00	Group Photo and Tea Break	
10:00-10:30	Introduction to the Training - Overview - Expectations and Ground Rules	GDA
10:30-11:15	Climate, Crops and Pests and Disease Dynamics - Crop and climate interaction - Cropping calendar and climate-related risks - Weather/climate and pest and diseases outbreak - Seasonal climate variations and crop management practices - Opportunities for climate risk management using weather and climate information	GDA and RIMES
11:15-12:00	Weather and Climate in Pilot Areas - DOM: mandate and services - Relevant terminologies - Weather, climate, extremes and climatological normals in pilot areas - Weather and climate information products - Exercise on interpreting forecasts	DOM
12:00-13:00	Lunch Break	
13:00-13:45	Weather and Climate Information Application - Understanding uncertainty and seamless integration of multi-timescale forecast information in a risk management framework - Evaluating potential impacts to specific crops at particular growth stages - Developing strategies/measures for managing potential impacts	DOM and RIMES
13:45-14:30	Communicating Climate-Related Risks - Risk communication - Case studies	DOM and RIMES
14:30-15:00	Exercise on Weather and Climate Application, Risk Communication, and Estimating Economic Value of Forecast-Informed Decisions	RIMES
15:00-15:15	Tea Break	
15:15-15:45	Introduction to and Updates on SESAME in Cambodia - Functionalities - System design - Features	RIMES
15:45-16:00	Participant Feedback/Discussion	GDA, DOM and RIMES
16:00-16:45	SESAME Demonstration - Data entry - Crop calendar generation	RIMES
16:45-17:00	Synthesis of Day 1 and Announcements for Day 2	RIMES

Time	Session	Facilitator/Presenter
Day 2. 2 August 2019		
09:00-09:15	Recap of Day 1	Participants
09:15-10:45	SESAME Demonstration - Preparation of forecast bulletin and advisories - Generation of agro-advisories	
10:45-11:00	Tea Break	
11:00-11:45	SESAME Demonstration - Disseminating forecast and advisory bulletin - System evaluation	
11:45-12:00	Discussion	
12:00-13:00	Lunch Break	
13:00-15:00	SESAME Exercises	
15:00-15:15	Tea Break	
15:15-15:45	Training Evaluation and Participants Feedback	
15:45-16:30	Way Forward and Closing	