Communicating Multi-Hazard Opportunities And Risks Through Institutional Mechanisms

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RIMES

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Regional Training on Multi-Hazard Early Warning
Hyderabad, India

PRESENTATION OUTLINE

OPPORTUNITIES AND RISKS COMMUNICATION IN VARIOUS LEVELS: ***Platforms and Mechanisms***

FORECAST/INFORMATION APPLICATION: ***Good Practices in Various Sectors***

SUSTAINED ENGAGEMENT WITH COUNTRIES: ***Responding to Evolving Needs***

Gaps Revealed by NMHS-RIMES Engagements in End-to-End EWS

No participatory mechanism for identifying user requirements; information not tailored

Weak communication channel and feedback mechanism at various levels

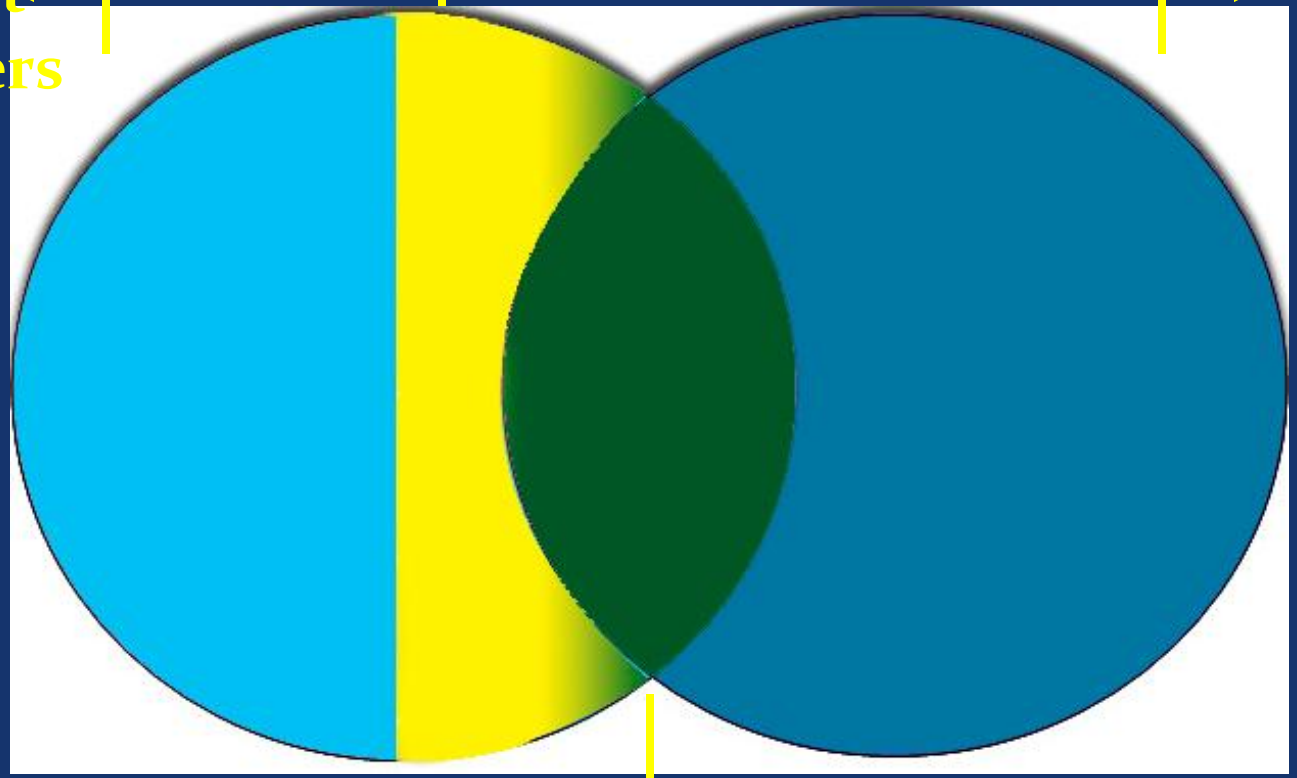
Users have no mechanism for translating information after receipt

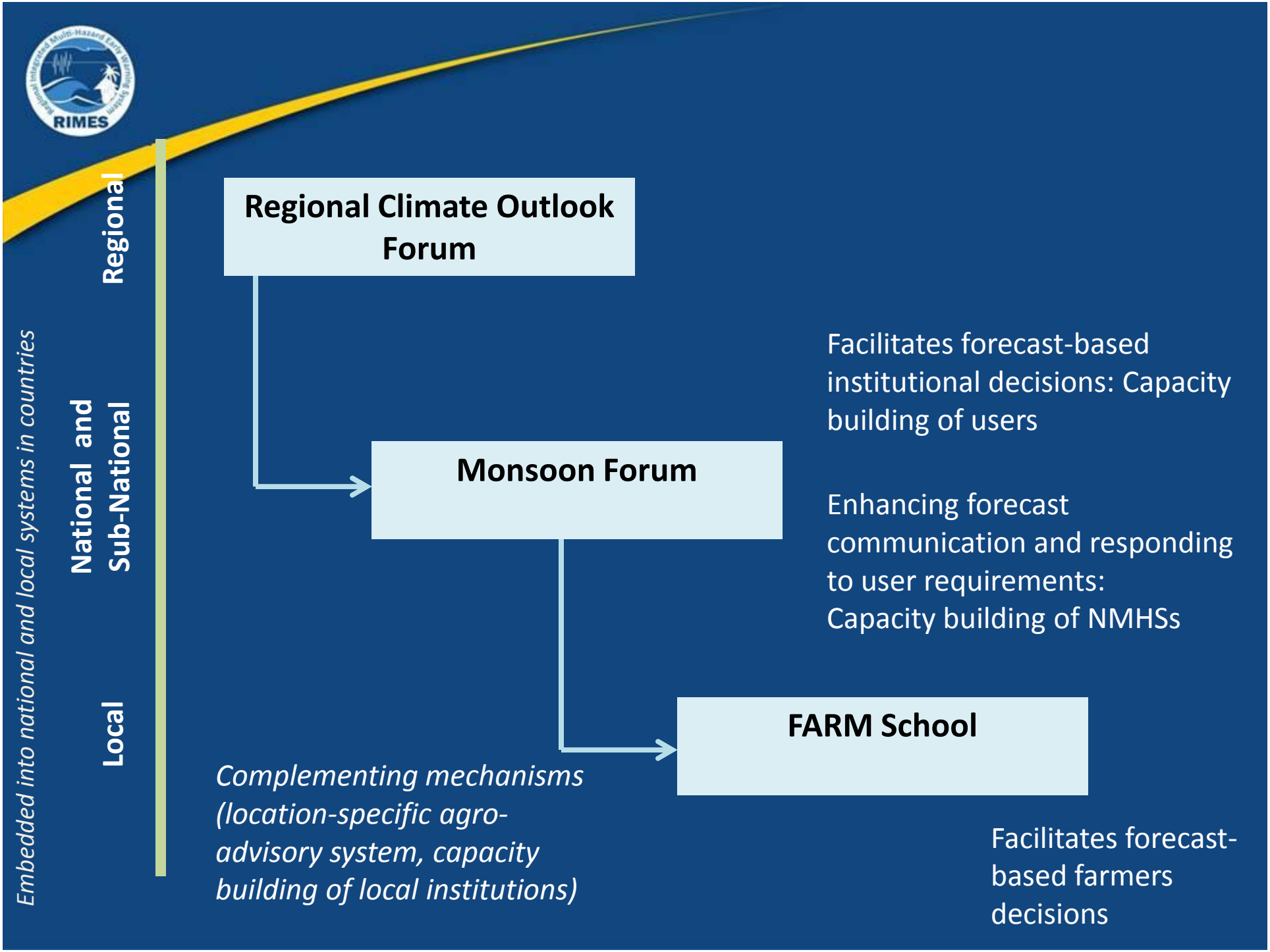
Institutional and community mechanisms are inadequate for responding to information

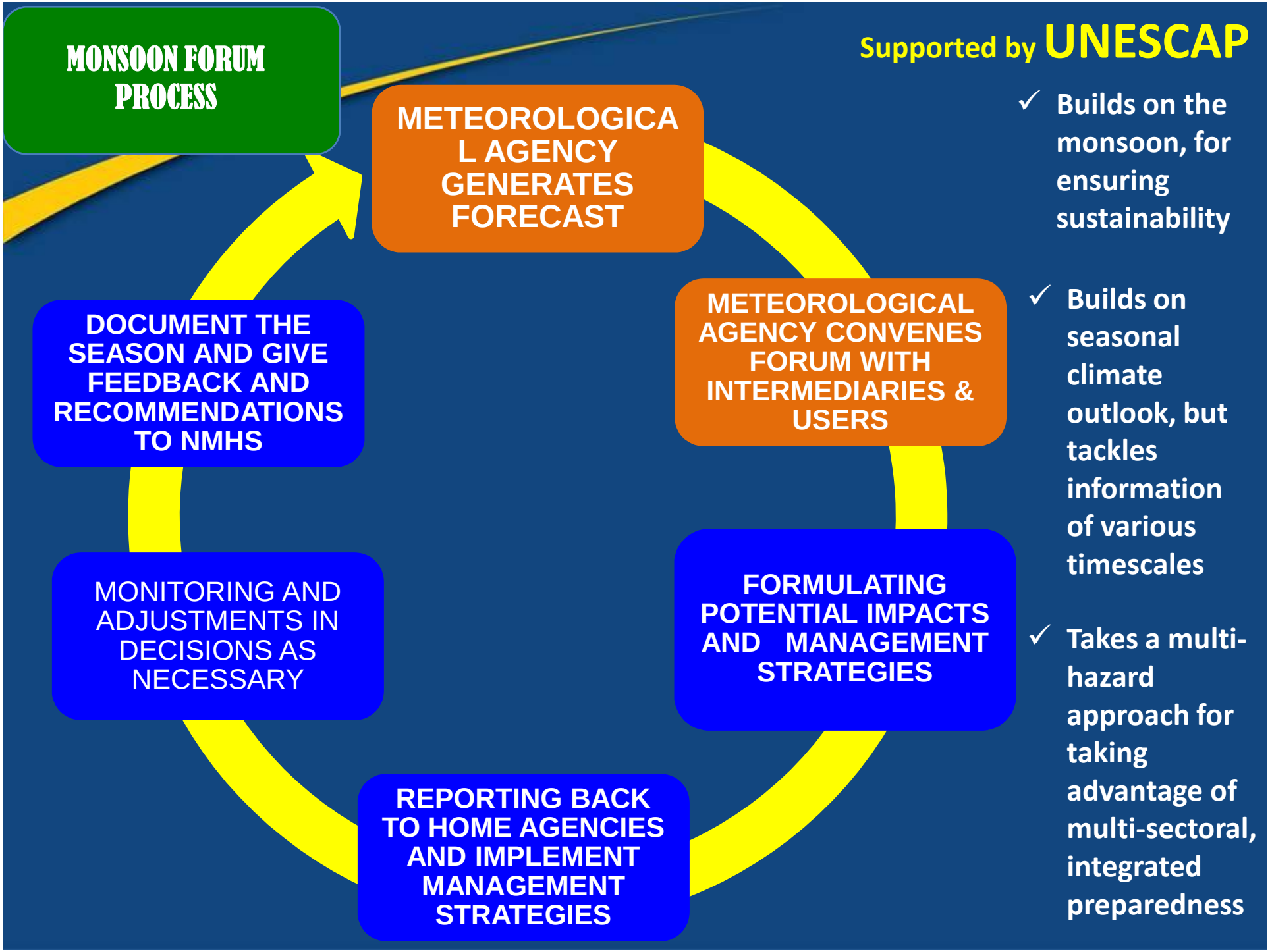
Available interventions are not needs/demands-based

Addressing gaps in climate generation and application: RIMES philosophy and principle

Integration of NMHSs into User Institutions and Communities: A Work in Progress




Regional
National and Sub-National
Local
Embedded into national and local systems in countries
Regional Climate Outlook Forum
Monsoon Forum
FARM School
Facilitates forecast-based institutional decisions: Capacity building of users
Enhancing forecast communication and responding to user requirements: Capacity building of NMHSs
Complementing mechanisms (location-specific agro-advisory system, capacity building of local institutions)
Facilitates forecast-based farmers decisions

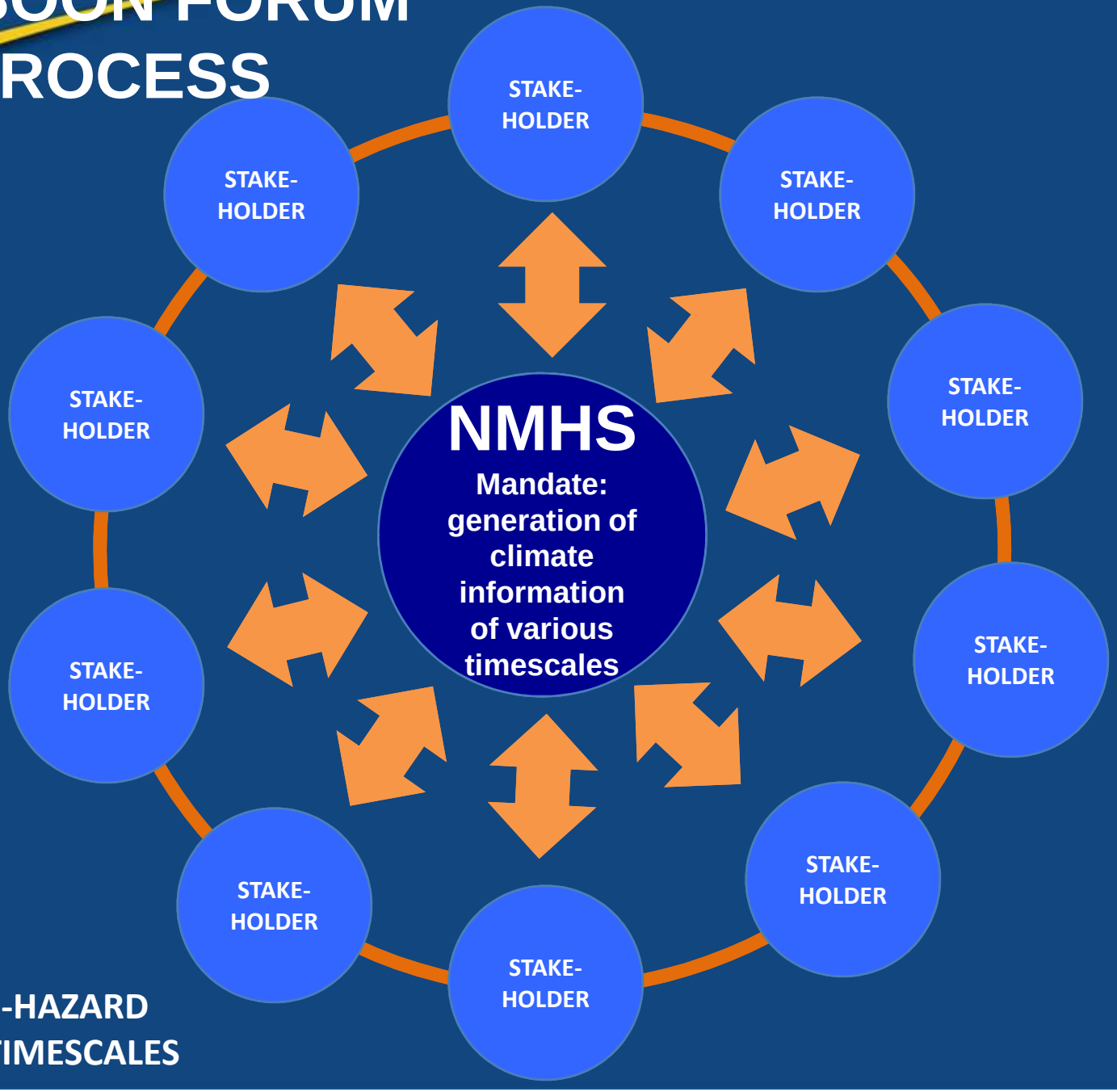

MONSOON FORUM PROCESS
Supported by UNESCAP
METEOROLOGICAL AGENCY GENERATES FORECAST
METEOROLOGICAL AGENCY CONVENES FORUM WITH INTERMEDIARIES & USERS
FORMULATING POTENTIAL IMPACTS AND MANAGEMENT STRATEGIES
REPORTING BACK TO HOME AGENCIES AND IMPLEMENT MANAGEMENT STRATEGIES
MONITORING AND ADJUSTMENTS IN DECISIONS AS NECESSARY
DOCUMENT THE SEASON AND GIVE FEEDBACK AND RECOMMENDATIONS TO NMHS
✓ Builds on the monsoon, for ensuring sustainability
✓ Builds on seasonal climate outlook, but tackles information of various timescales
✓ Takes a multi-hazard approach for taking advantage of multi-sectoral, integrated preparedness

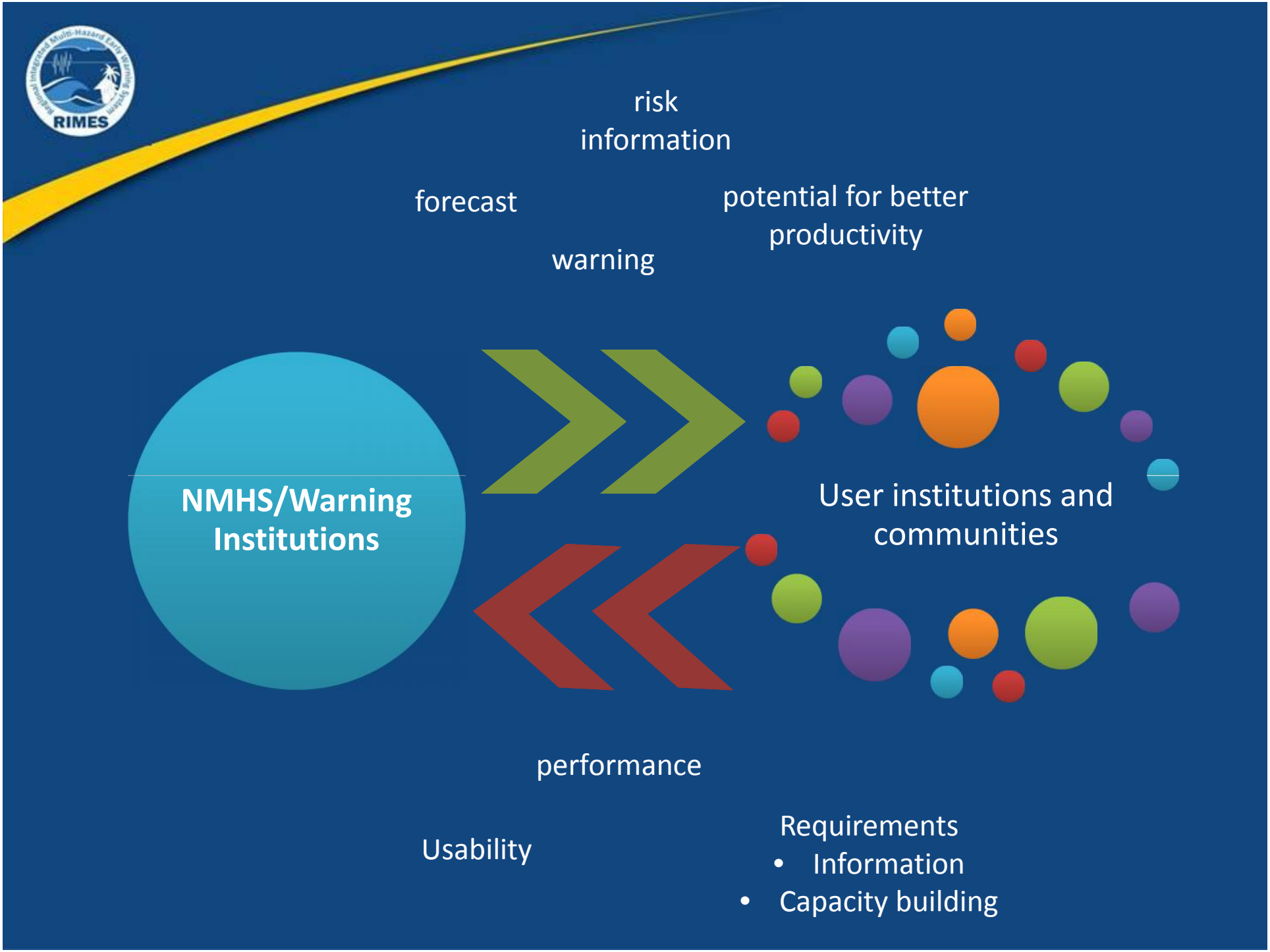
MONSOON FORUM PROCESS

NMHSs as the Focal Institution, being the mandated national institution for weather, climate (and earthquake and tsunami) services in the countries

STAKEHOLDERS are key institutions in the country mandated for productivity and risks management

- **MULTI-HAZARD**
- **MULTI-TIMESCALES**




risk
information
forecast
potential for better
productivity
warning
NMHS/Warning
Institutions
User institutions and
communities
performance
Usability
Requirements
• Information
• Capacity building

- ARMENIA: 1st SEASONAL FORUM
- BHUTAN: 2nd NATIONAL CLIMATE OUTLOOK FORUM
- BANGLADESH: 8th MONSOON FORUM
- CAMBODIA: 6TH MONSOON FORUM
- LAO PDR: 5TH MONSOON FORUM
- MALDIVES: 5TH MONSOON FORUM

- MYANMAR: 16TH MONSOON FORUM
- NEPAL: 5TH MONSOON FORUM
- PAKISTAN: 4TH MONSOON FORUM
- SEYCHELLES: 1ST SEASONAL FORUM
- SRI LANKA: 13TH MONSOON FORUM
- TIMOR LESTE: 3rd FORECAST BRIEFING

INDONESIA: CLIMATE FORUM

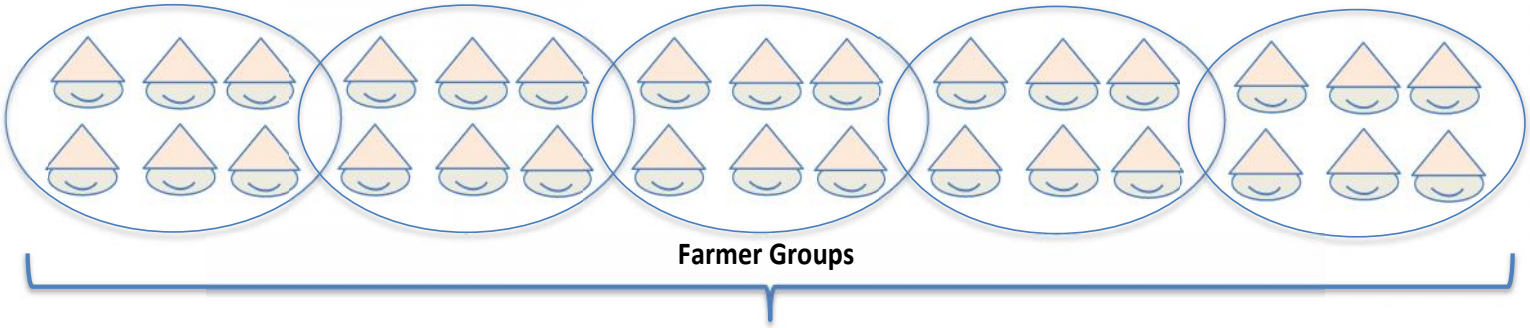
MONGOLIA: WINTER OUTLOOK FORUM

PHILIPPINES: CLIMATE OUTLOOK FORUM

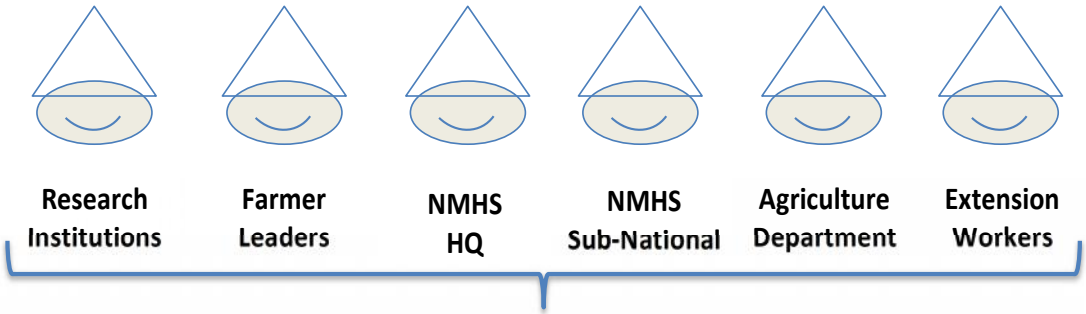
VIETNAM: CLIMATE FORUM

FORECAST APPLICATION FOR RISK MANAGEMENT IN AGRICULTURE (FARM) School

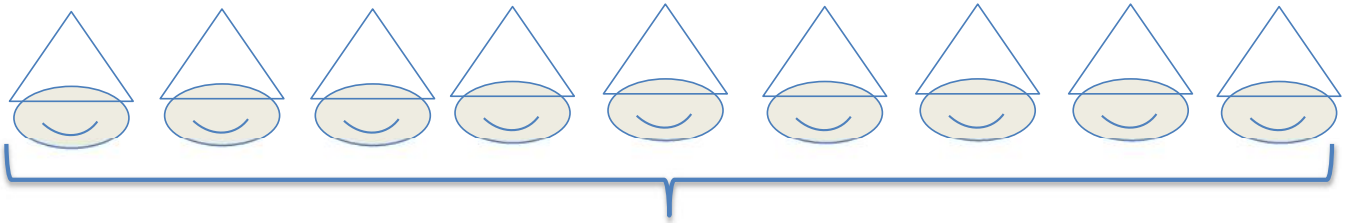
Step 1: Farmers' Needs Assessment



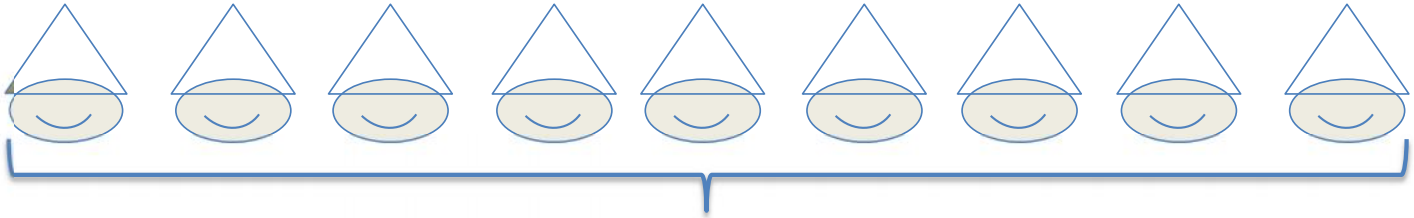
Step 2: Curriculum Development/ Customization



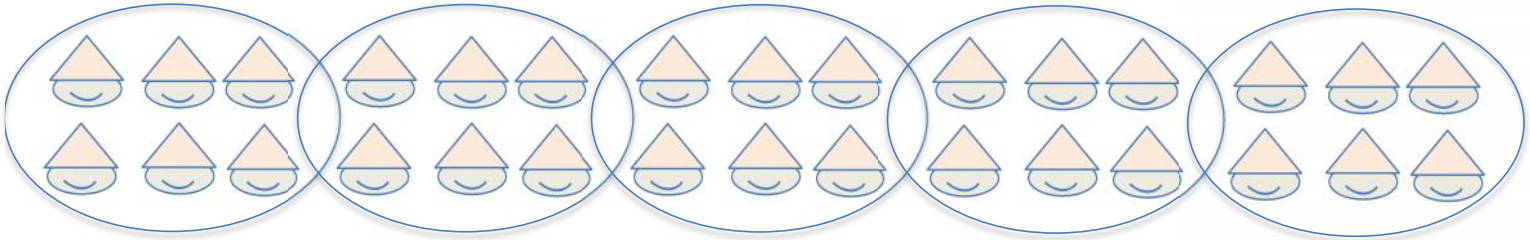
Step 3: Curriculum Testing/ Training of Trainers and Refinement



Step 4: Training of Sub-National Trainers and Farmer Leaders and Further Refinement of Curriculum



Step 5: Dialogue with Farmers



FARM SCHOOL

CURRICULUM

- Part I: Human Dimension of the Learning Process
  - Module 1: Learning Contract

- Part II: Weather and Climate and Forecast Products
  - Module 2: Knowing Weather and Climate Elements
  - Module 3: Understanding Weather and Seasonal Climate Forecasts
  - Module 4: Process of Rain Formation
  - Module 5: Introduction to Weather and Climate Measuring Instruments and Simple Instrument Fabrication and Calibration
  - Module 6: Field Visit to a weather observation station

- Part III. Application of Climate Information to Farming Operations
  - Module 7: Field Observation on Weather, Plant Pests and Diseases and Growth Conditions of Plants
  - Module 8: How to Use Climate Information for Setting Up Planting Strategies
  - Module 9: Leaning the Field Water Balance Concept and its Use to Assess Irrigation Requirements and Flood Risks

- Part IV. Assessing Economic Value of Climate Information
  - Module 10: Assessing Economic Value of Climate Information
  - Module 11: Flood and Drought Control Program Using Low Cost and Location-Specific Technologies to Address Extreme Climate Events
  - Module 12: Preparation for CFS Field Day

FARM SCHOOL

CAPACITY BUILDING OF END-USERS IN FORECAST APPLICATION

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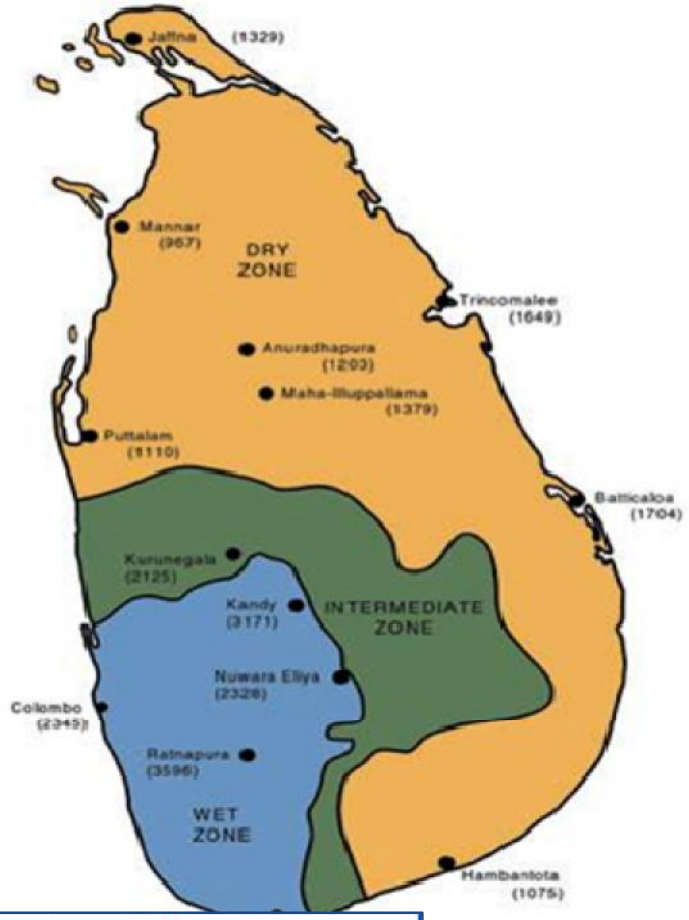
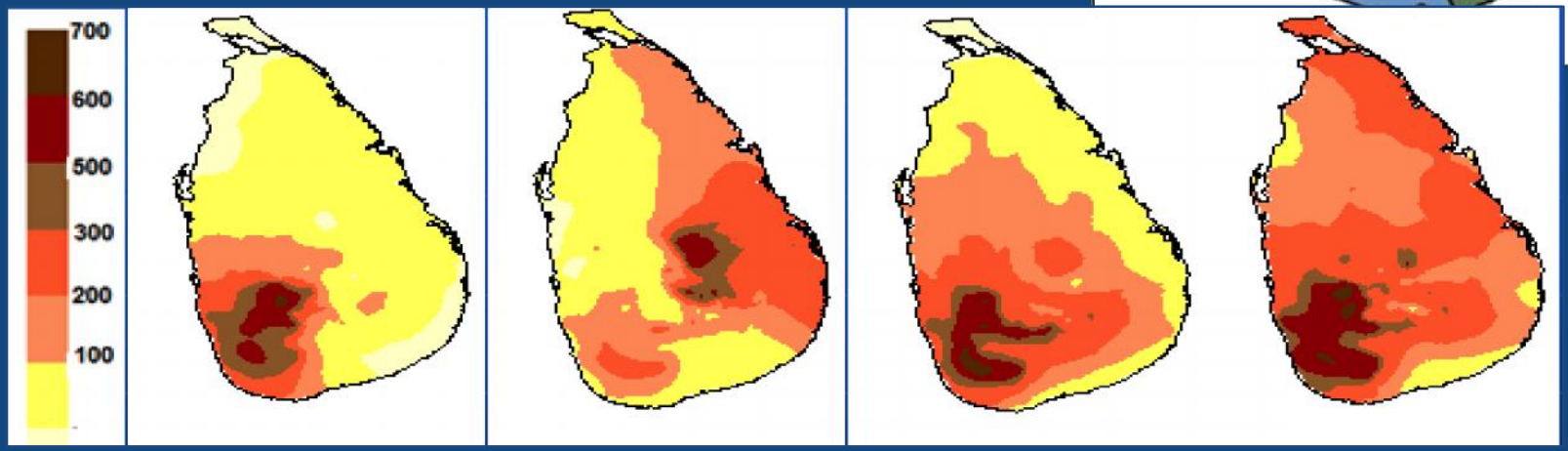
CAPACITY BUILDING OF END-USERS IN FORECAST APPLICATION

FORECAST APPLICATION: Good Practices in Sri Lanka

Climate Seasons in Sri Lanka and their contribution to national annual average rainfall

Season	Period of Occurrence	Average rainfall received	Contribution to national annual average rainfall
1st Intermonsoon	Mar - Apr	268 mm	14%
Southwest Monsoon	May - Sept	556 mm	30%
2nd Intermonsoon	Oct - Nov	558 mm	30%
Northeast Monsoon	Dec - Jan	479 mm	26%
Total annual average rainfall		1,861 mm	





SW Monsoon NE Monsoon 1st Intermonsoon 2nd Intermonsoon

RESPONDING TO USER REQUIREMENTS: FORECAST OF VARIOUS TIMESCALES

DEVELOPMENT OF FORECAST OF DIFFERENT TIMESCALES IN SRI LANKA BASED ON MONSOON FORUM STAKEHODER DEMANDS

ENHANCEMENTS IN SPATIAL RESOLUTION WERE ALSO INTRODUCED BY DOM; FORECAST FOR SPECIFIC SECTORS EVOLVED

SRI LANKA: Water Management for Agriculture

Department of Irrigation and Department of Agriculture

Yala Season **2014**

Observed Rainfall and Seasonal/ Monthly Outlook from DOM

Minimal rainfall received during the 2013-14 NE Monsoon

Potential for below normal rainfall for 1st intermonsoon of 2014

DOI convened joint meeting with DOA

Decision: Advance Yala season for optimizing available stored water and potential rainfall in April and May

Informed the District Secretary to advance the District Agriculture Committee Meeting

Farmers awareness through Project Management Committee meetings held in March 2014

Decisions reviewed at weekly Water Management Committee Meetings using DOM monthly forecast

Provided advisory to farmers

- In Batticaloa, farmers were advised not to wait for rainfall; start planting immediately to take advantage of available water from
- Advised farmers to reduce cultivation extent
- Advised farmers to plant early maturing varieties
- Provided irrigation support, following strict guidelines

Farmers apply information

- Farmers planted immediately in March and harvested in July
- Recorded highest yield

Maha Season started in September 2014, prior to onset of 2nd Intermonsoon rainfall

- ***Yala – April to August***
- ***Maha – October to February***

SRI LANKA: Water Management for Agriculture

Department of Irrigation and Department of Agriculture

Yala Season **2014**

Observed Rainfall and Seasonal/ Monthly Outlook from DOM

Below normal rainfall received during the 2013-14 NE Monsoon

Potential for below normal rainfall for 1st intermonsoon of 2014

- ***Yala – April to August; supported by the 1st Inter-Monsoon and Southwest Monsoon***
- ***Maha – Supported by the NE Monsoon Season and 2nd Inter-Monsoon***

DOI convened joint meeting with DOA

Decision: Advance Yala season for optimizing available stored water and potential rainfall in April and May

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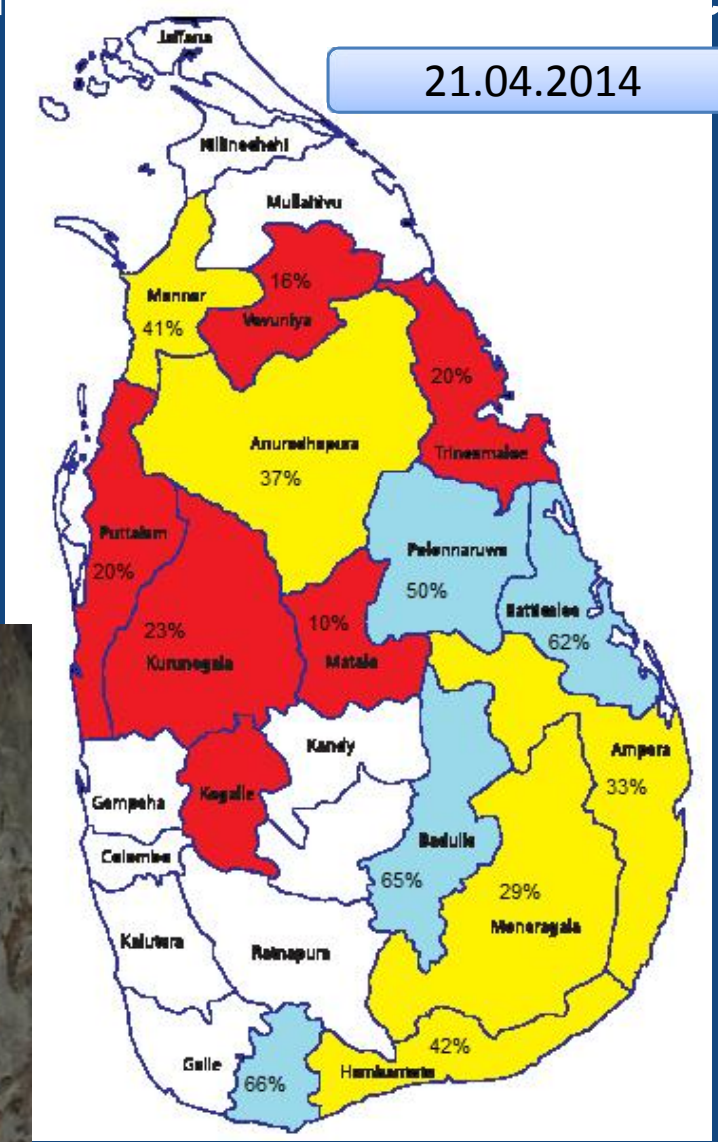
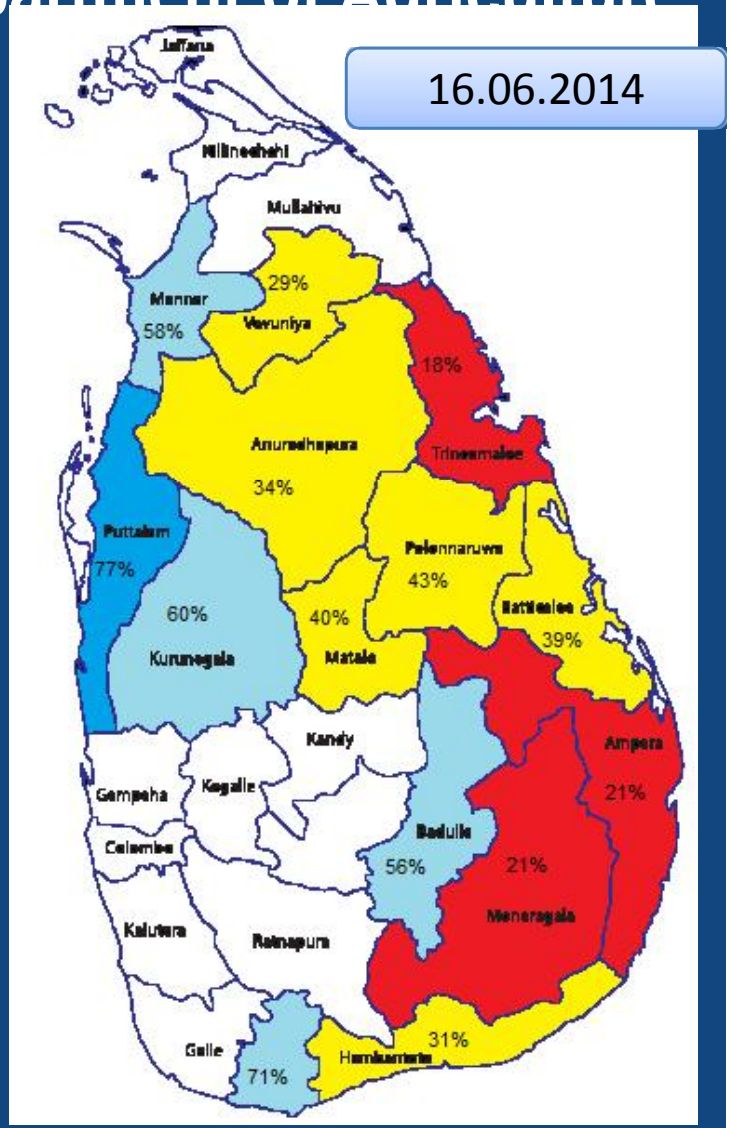




Source: DOI, Sri Lanka

SRI LANKA: Water Management for Agriculture for Yala 2015

Department of Irrigation and Department of Agriculture

- DOM's monthly outlook, for March and April 2015, indicated higher potential for drier than normal conditions

DOA and DOI, integrating assessment of available resources:

- Provided advisories to farmers to start Yala cultivation early with available water, from the NE Monsoon
- Cultivation of short-maturing varieties
- DOI maximized water storage and issued a Department Circular for regulation of water releases

SRI LANKA: Water Management for Agriculture

Yala 2015

Department of Irrigation and Department of Agriculture

- March and April 2015 exhibited uneven rainfall distribution
- The challenge in the 2015 Southwest Monsoon Season *(May to September)* was to protect the Yala cultivation
- DOM forecast indicated higher probability for below normal rainfall condition, for the season

DOA and DOI:

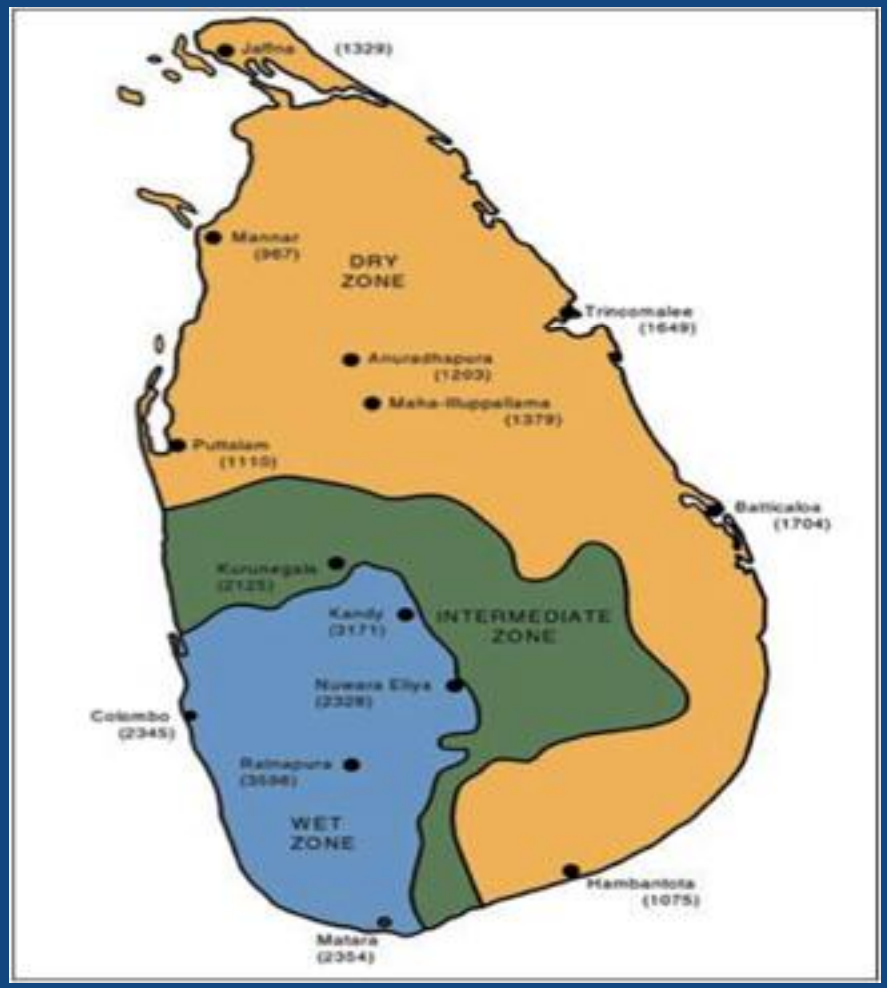
- Provided advisories to farmers to integrate water saving irrigation practices for the remainder of the season
- Utilized all possible mechanisms for ensuring that information would reach farmers
- Release of water stored in tanks was regulated, for sustaining crops

SRI LANKA: Water Management for Agriculture

Yala 2015

Department of Irrigation and Department of Agriculture

- Despite extended dry spells within the 2015 SW Season, there are no major setbacks in the dry and intermediate zones
- The 2015 Yala Season cultivation was recorded at 96% cultivation rate
  - 23% increase against 5-year Yala season average
  - Increase in cultivation of other field crops was also recorded, compared to 2014 Yala Season

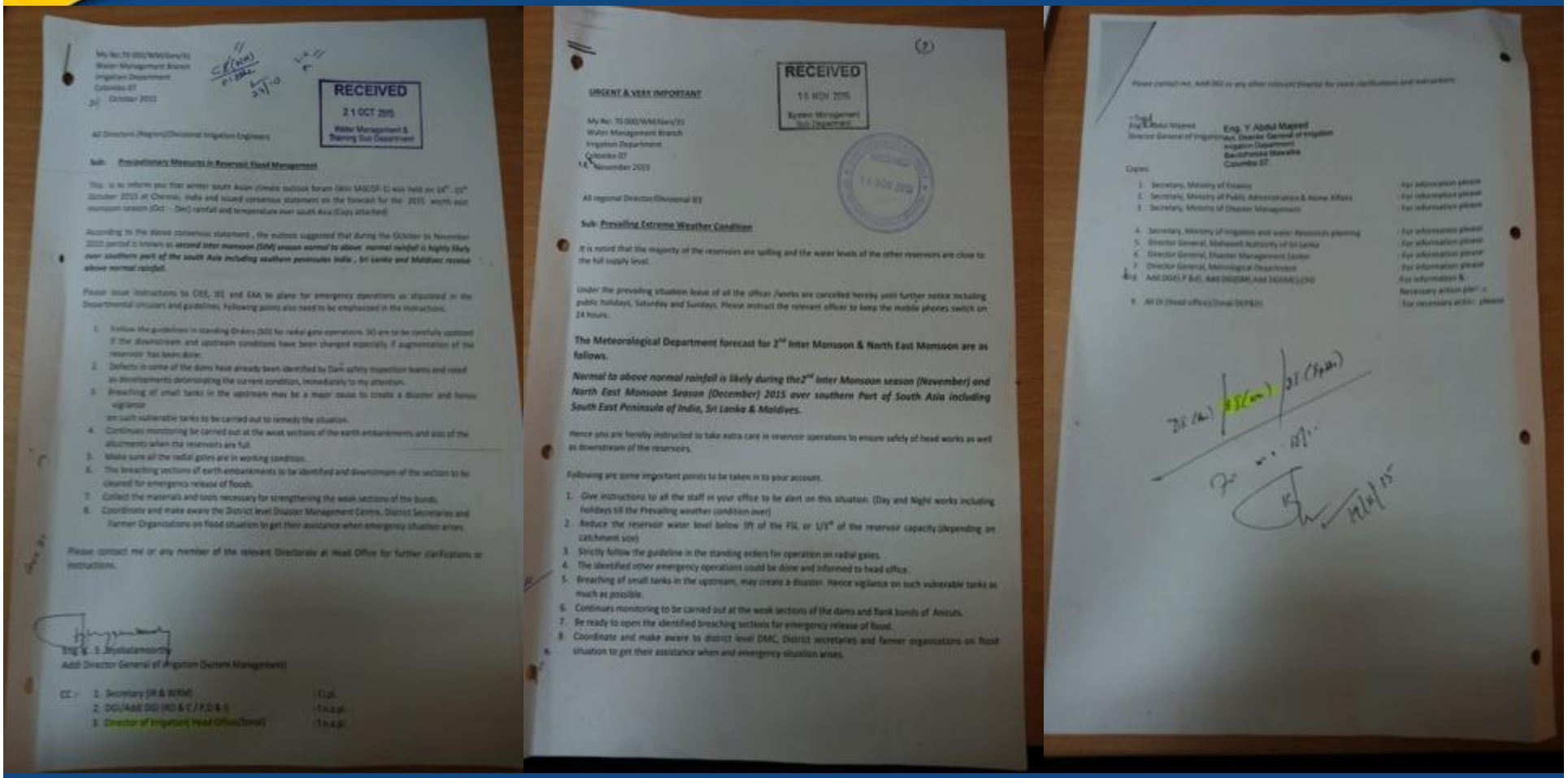


SRI LANKA: Water Management for Agriculture

October 2015-February 2016

Department of Irrigation and Department of Agriculture

- Forecast for 2nd Intermonsoon and NE Monsoon: normal to above normal rainfall
- Issuance of special instructions to Irrigation officials, including maintaining of reservoir levels 1M below full capacity, for managing both flood risks as well as water resources for agriculture sector
- Continued monitoring observed conditions and forecast



RECEIVED
21 OCT 2015
Water Management & Training Sub Department

Sub: Precautionary Measures in Reservoir Flood Management

RECEIVED
15 NOV 2015

URGENT & VERY IMPORTANT

Sub: Prevailing Extreme Weather Condition

Eng. Y Abdul Majeed

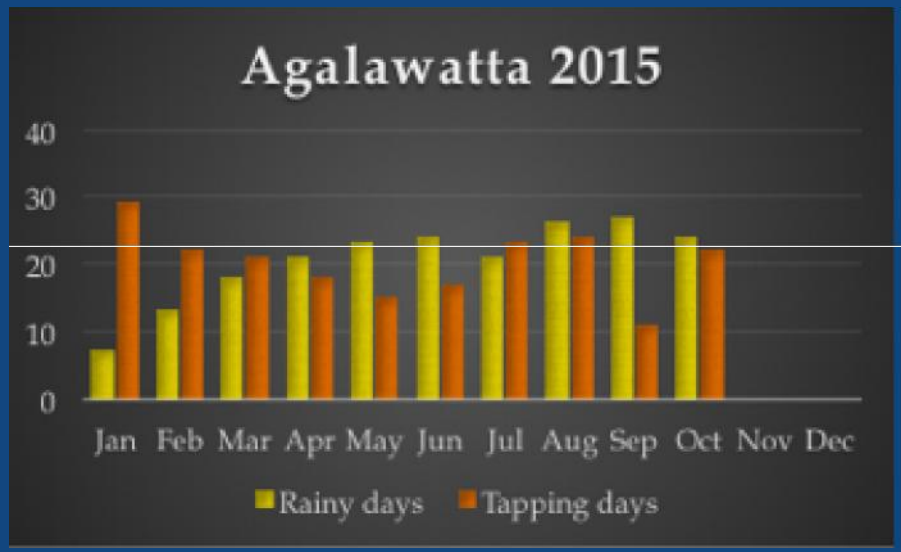
Source: DOI, Sri Lanka

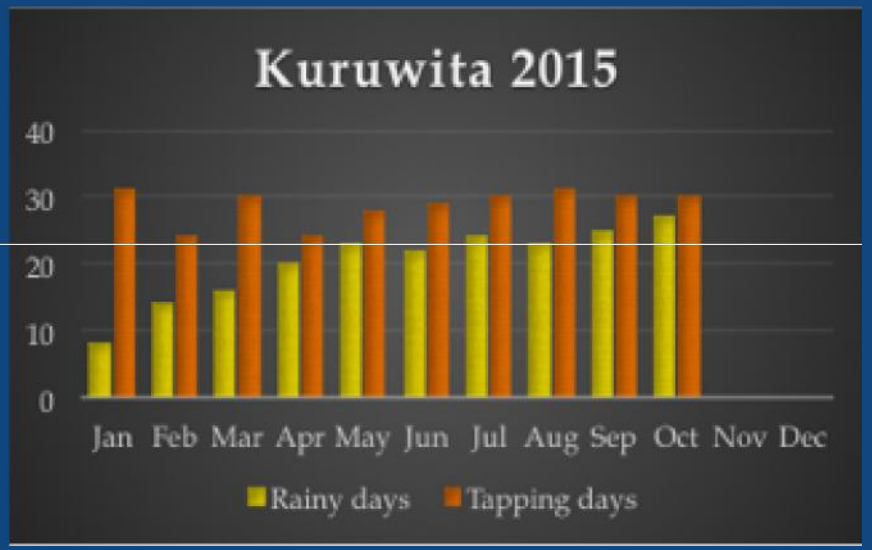
SRI LANKA: Water Management for Agriculture

Department of Irrigation and Department of Agriculture

- Averted flooding during the season
- By end of 1st Inter-monsoon of 2016, reservoir water levels are more than 90%
- Planned for 100% Yala cultivation for reservoir operations

SRI LANKA: Maximizing Rubber Production
Rubber Research Institute



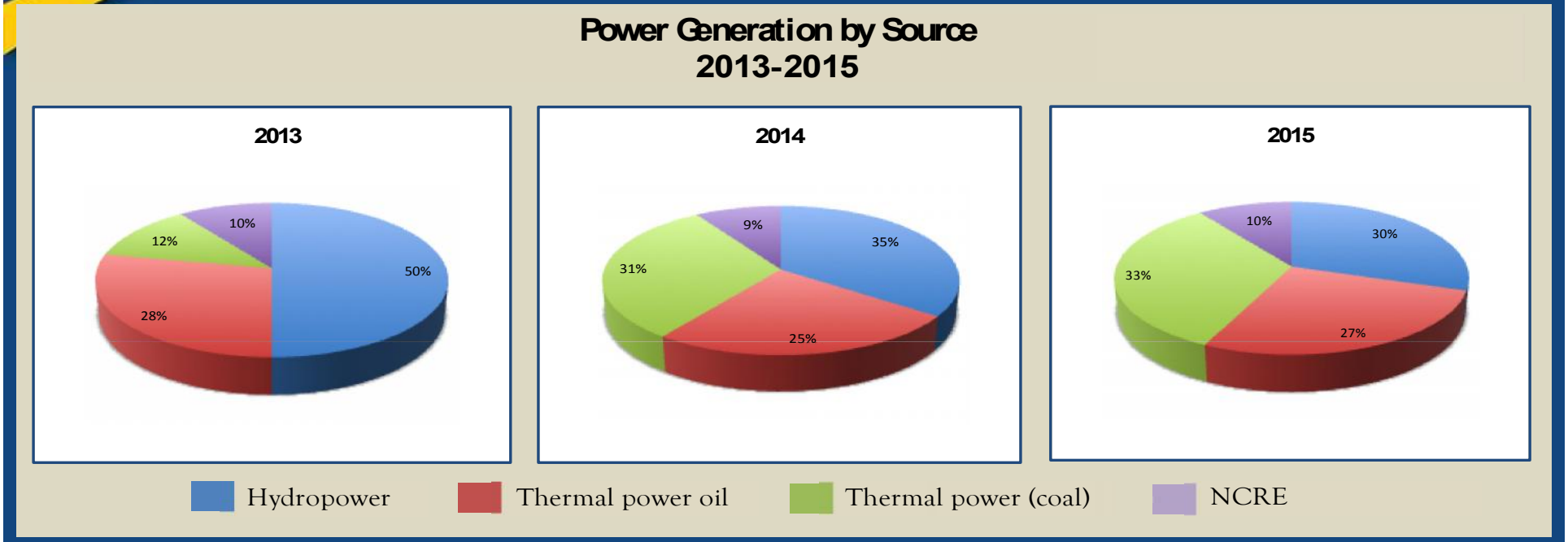


FORECAST-BBASED DECISIONS FOR THE 2015 SOUTHWEST MONSOON SEASON: RRI

Establishment of rain guards in rubber producing areas in Sri Lanka, for ensuring rubber production despite rainfall received during the 2015 Southwest Monsoon Season

SRI LANKA: Ensuring Energy Production and Supply

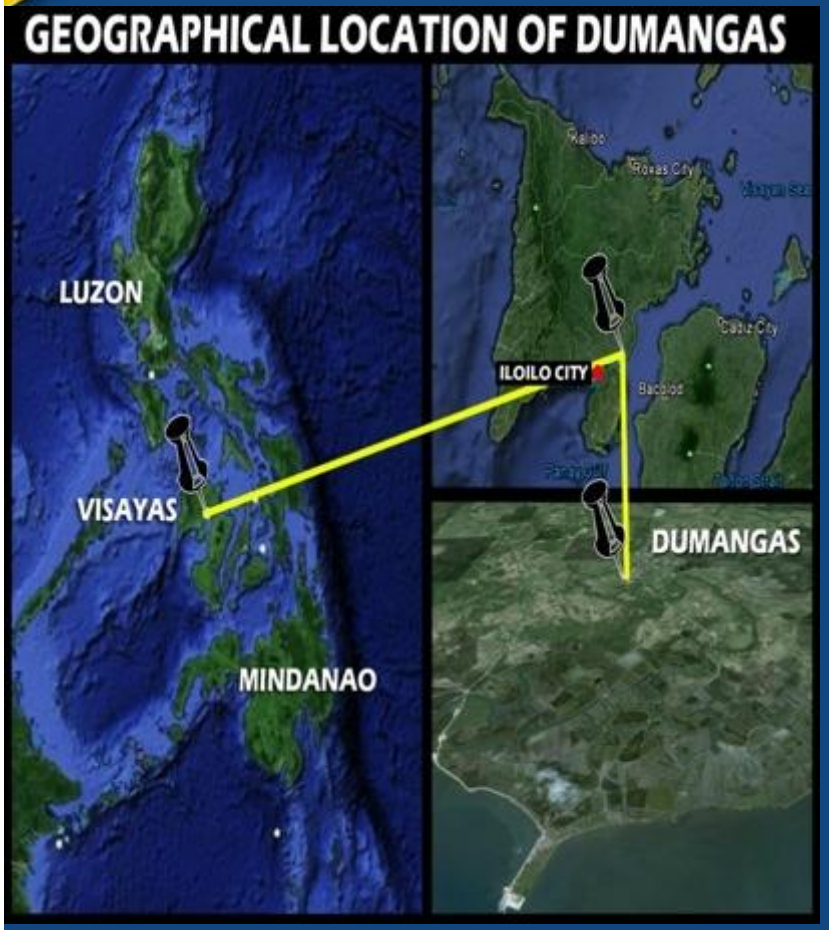
Ceylon Electricity Board



FORECAST-BBASED DECISIONS FOR THE 2015 SOUTHWEST MONSOON SEASON: CEB

- Minimized hydropower generation
- Took advantage of the anticipated below normal conditions for maintenance work in hydropower stations and associated power transmission lines

PHILIPPINES: Enhancing Agricultural Productivity in Dumangas, Iloilo



- In 2015, despite El Nino conditions, significant increases in agricultural production in Dumangas has been recorded due to the following decisions:
  - Switching to recommended crops (drought resistant paddy/other crops)
  - Water resources regulation

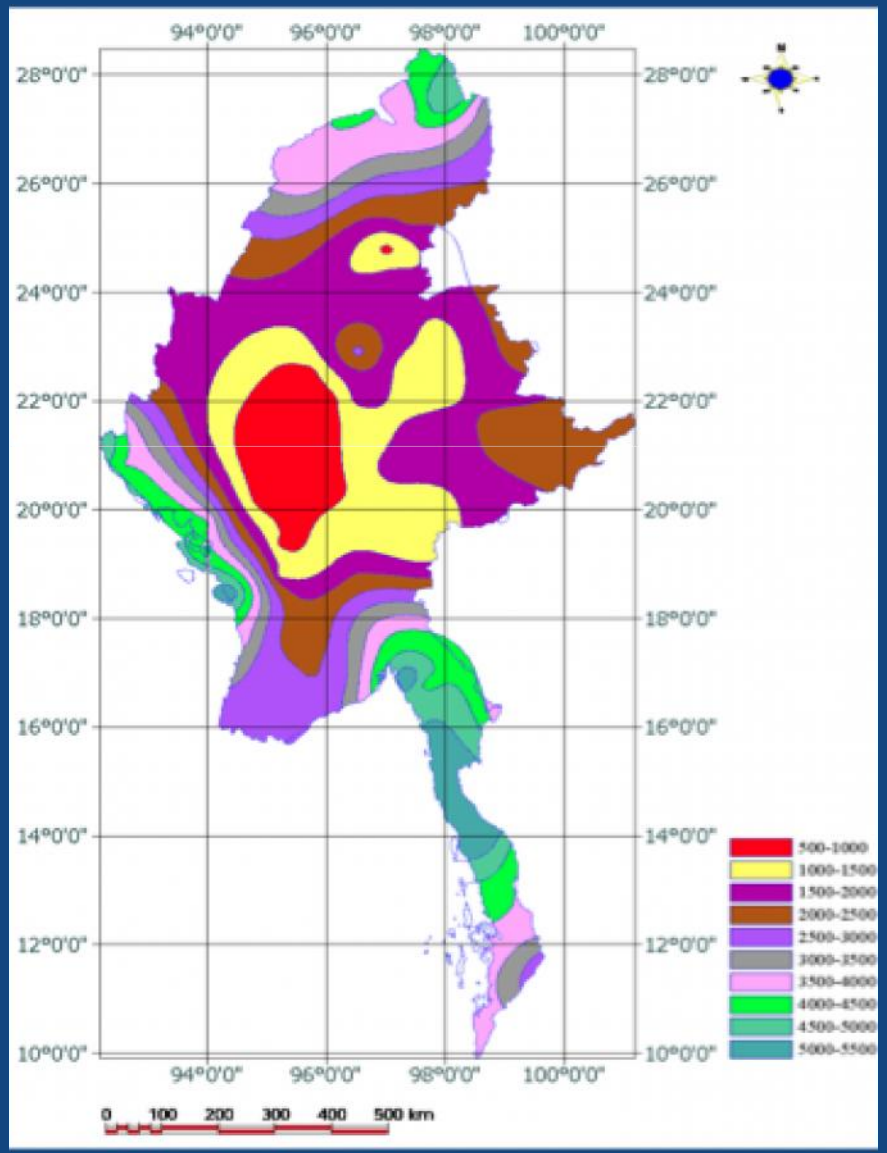
- Dry season crops also recorded better production, particularly due to switching to advisable crops (vegetables, corn, mung bean), due to anticipated below normal rainfall for the season

MYANMAR: Taking Advantage of Severe Weather Conditions

- Severe weather conditions in the Bay of Bengal, Andaman Sea, and West Philippine Sea could bring rainfall to Myanmar

- Farmers take advantage of forecast information for harnessing potential rainfall for various undertakings

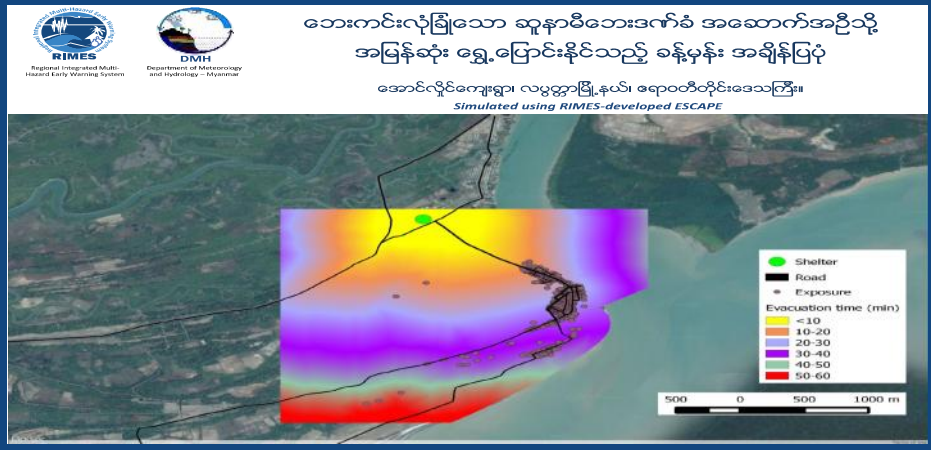
FARM School is complemented by the Specialized Expert System for Agro-Meteorological Early Warning (SESAME)



IN VARIOUS COUNTRIES: Better appreciation of earthquake and/or tsunami risks from sustained discussions

Better involvement of national and local level officials in undertaking measures for enhancing stakeholders awareness

Integration of tools to institutional systems for better earthquake preparedness



ENHANCED GENERATION OF FORECAST/WARNING INFORMATION

- Upgrading and expansion of weather stations
- Capacity building in application of tools (i.e. GIS) for enhanced sp… analysis of data…
- Improving spatial and temporal forecast resolution
- Enhancing DMH capacity in analyzing earthquake events and tsunami early warning
- Downscaling of climate change projections

ENHANCED FORECAST/INFORMATION TRANSLATION AND UTILIZATION

- Updating of agro-ecological maps
- Capacity building and development of tools for …translation (agro-… system, sectoral advisory system)
- Capacity building of farmers in enhanced uptake of information of different timescales
- Enhancing stakeholders capacity in utilizing earthquake and tsunami information

9th Monsoon Forum, Myanmar, October 2012

မိုးလေဝသနှင့်ဧလဗေဒညွှန်ကြားမှုဦးစီးဌာန
မြေလျင်ဌာနခွဲ၊ နေပြည်တော်

ShakeCast Report
National Earthquake Data Center (NEDC)

Magnitude 6.8 - MYANMAR

Version 1

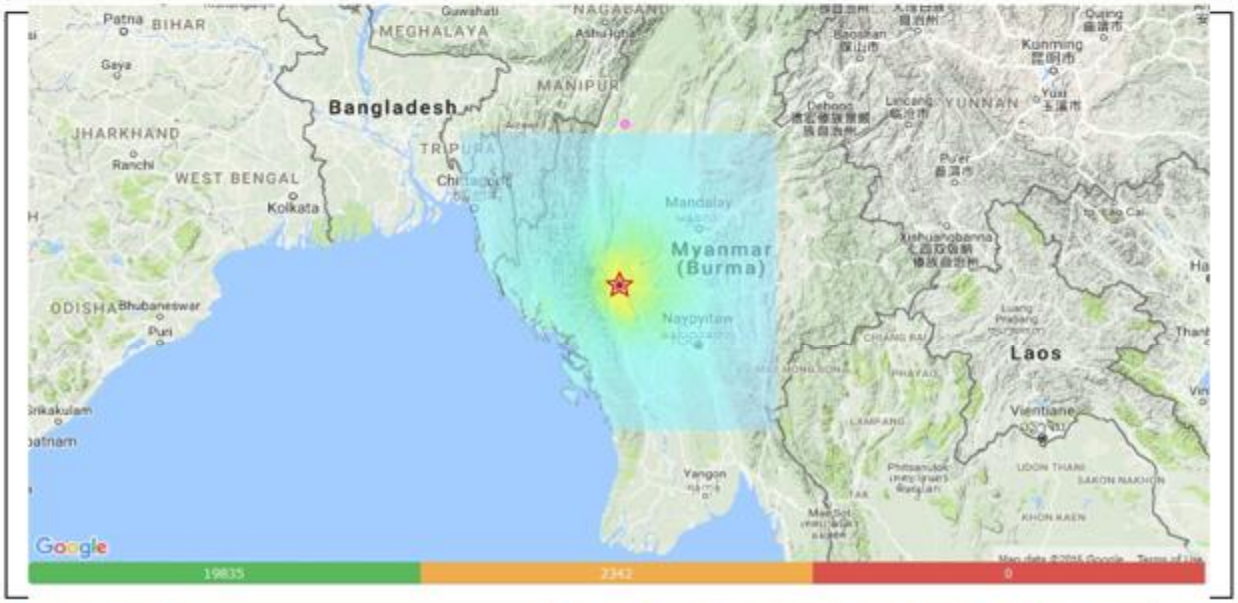
Origin Time: 2016-08-24 10:34:55 GMT

Created: 2016-08-24 14:15:16 GMT

Latitude: 20.91920 Longitude: 94.57890

Depth: 84.07 km

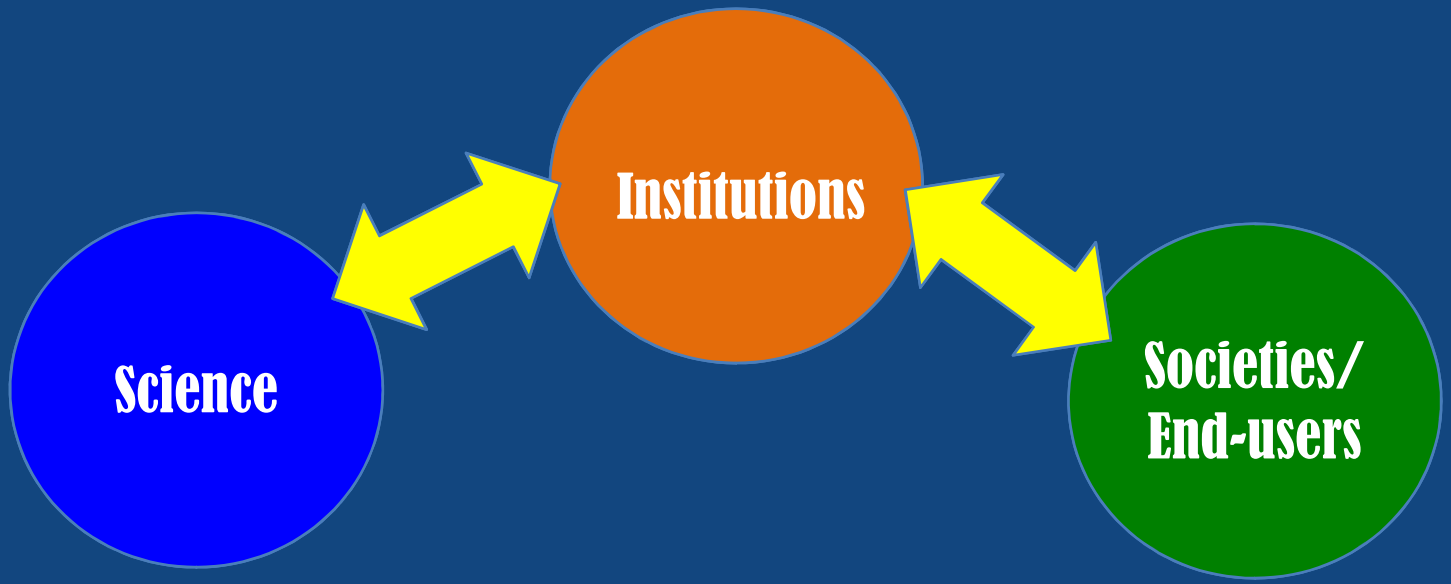
These results are from an automated system and users should consider the preliminary nature of this information when making decisions relating to public safety. ShakeCast results are often updated as additional or more accurate earthquake information is reported or derived.



Description	Name	Ep. Distance (km)	Latitude	Longitude	Inspection Priority	MMI
VILLAGE	Yae Ma	0.56	20.9197	94.5843	Moderate	VI
VILLAGE	Zee Pin San	1.27	20.9259	94.5690	Moderate	VI
VILLAGE	Htone Khaung	3.16	20.9396	94.6003	Moderate	VI
VILLAGE	Shwe Zan Thee	3.19	20.9134	94.6089	Moderate	VI
VILLAGE	Htan Ta Pin	3.97	20.9072	94.6149	Moderate	VI
VILLAGE	Ma Lu	4.1	20.8972	94.6106	Moderate	VI
VILLAGE	Chaung Yae Tet(South)	5.16	20.9063	94.6266	Moderate	VI
VILLAGE	Chaung Yae Tet(North)	5.26	20.9083	94.6281	Moderate	VI
VILLAGE	Kan Gyi	7.42	20.9094	94.6494	Moderate	VI
VILLAGE	Tha Pyay	10.09	21.0103	94.5751	Moderate	VI
VILLAGE	Taung Hpi Lar	10.81	20.8924	94.6789	Moderate	VI
VILLAGE	Myo Oh	10.88	20.8967	94.4771	Moderate	VI
VILLAGE	Myay Nu	11.36	20.9017	94.6865	Moderate	VI
VILLAGE	Dee Doke Pin	11.42	20.8180	94.5578	Moderate	VI
VILLAGE	Kyun Taw	11.42	21.0224	94.5775	Moderate	VI
VILLAGE	Ywar Thar Aye	11.64	21.0213	94.6055	Moderate	VI

* MMI level may extend beyond map boundary; some facilities may not appear on the map due to space restriction

Addressing Capacity Gaps in End-to-End Information Generation and Application



An evolving and continuing process: SUSTAINED DEMAND-DRIVEN, INSTITUTIONAL INTERVENTIONS REQUIRED

Thank you for your attention

Regional Integrated Multi-Hazard Early Warning System
2nd Fl Outreach Bldg, Asian Institute of Technology Campus
58 Moo 9 Paholyothin Rd., Klong Nung, Klong Luang
Pathumthani 12120 Thailand
URL: www.rimes.int