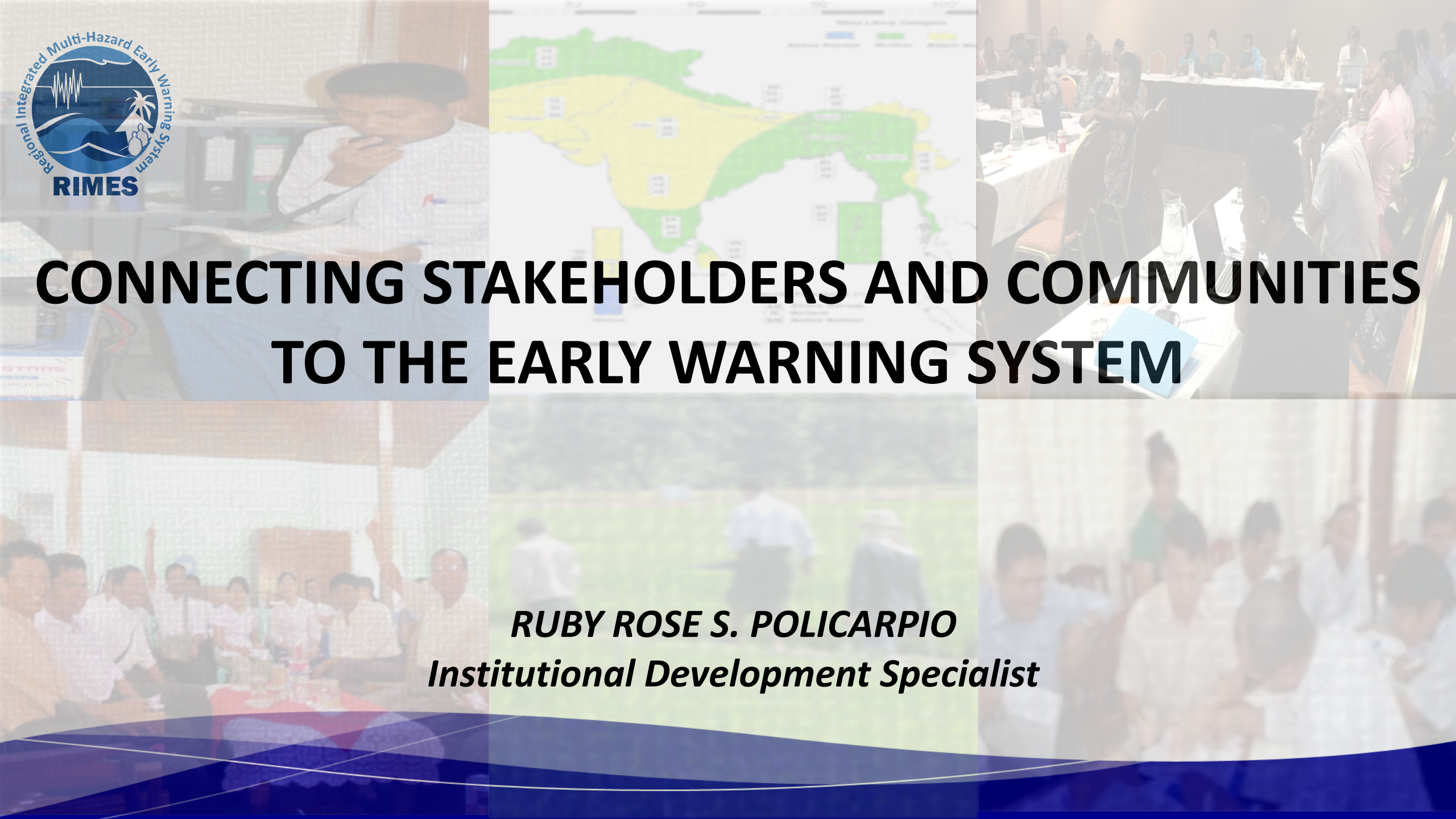
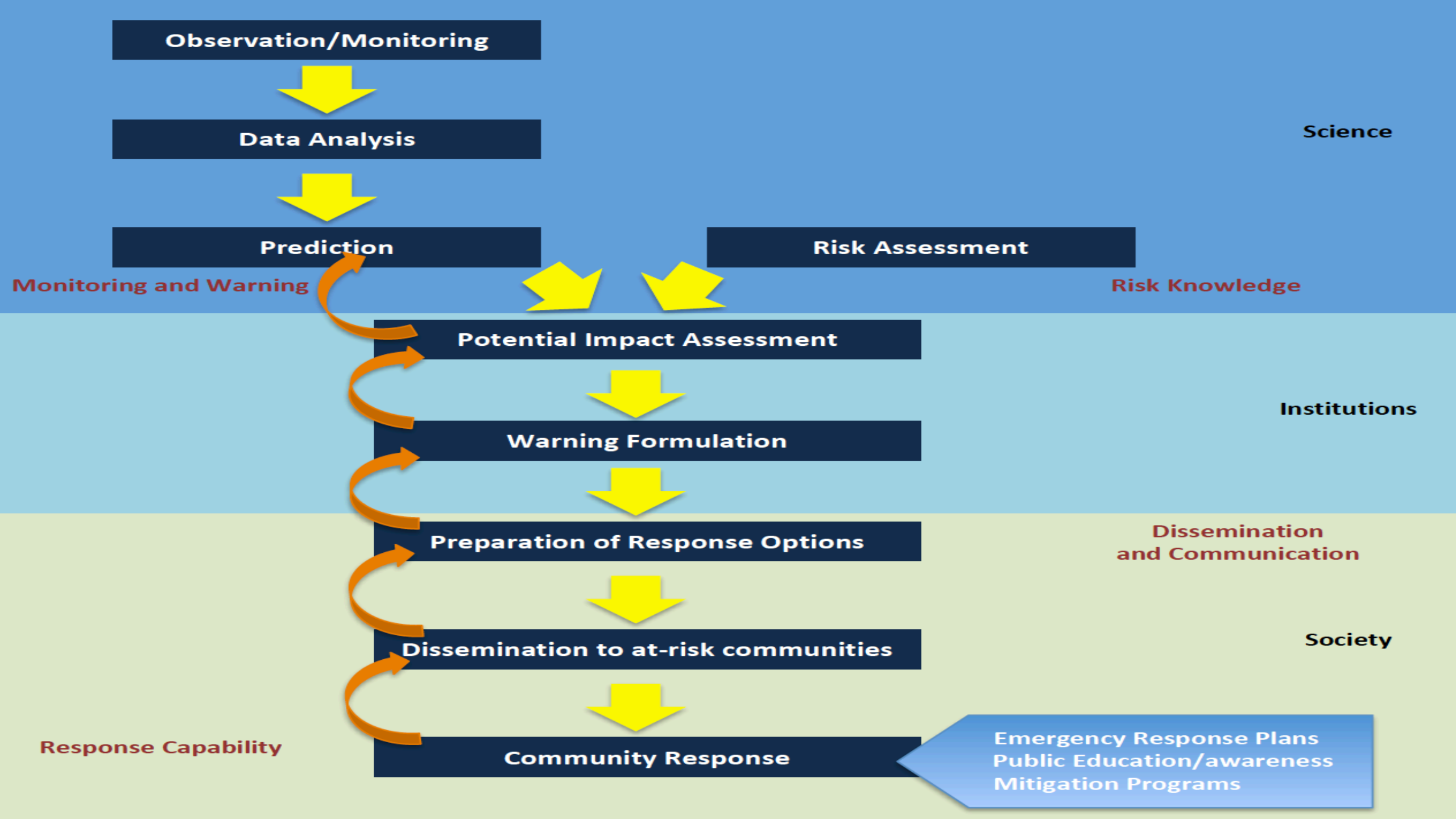


CONNECTING STAKEHOLDERS AND COMMUNITIES TO THE EARLY WARNING SYSTEM

RUBY ROSE S. POLICARPIO

Institutional Development Specialist


Observation/Monitoring
Data Analysis
Prediction
Risk Assessment
Science
Monitoring and Warning
Risk Knowledge
Potential Impact Assessment
Warning Formulation
Institutions
Preparation of Response Options
Dissemination
and Communication
Dissemination to at-risk communities
Society
Response Capability
Community Response
Emergency Response Plans
Public Education/awareness
Mitigation Programs

RISK KNOWLEDGE

Systematic data collection and undertaking risk assessments

- How known are hazards and vulnerabilities?
- What are the patterns and trends exhibited by these parameters?
- Are risk information widely available and understood?

MONITORING AND WARNING SERVICE

Development of hazard monitoring and early warning services

- Are the right parameters monitored?
- Is there a sound scientific basis for making forecasts?
- Can reliable and timely warnings be generated?

DISSEMINATION AND COMMUNICATION

Communication of risk information and early warnings

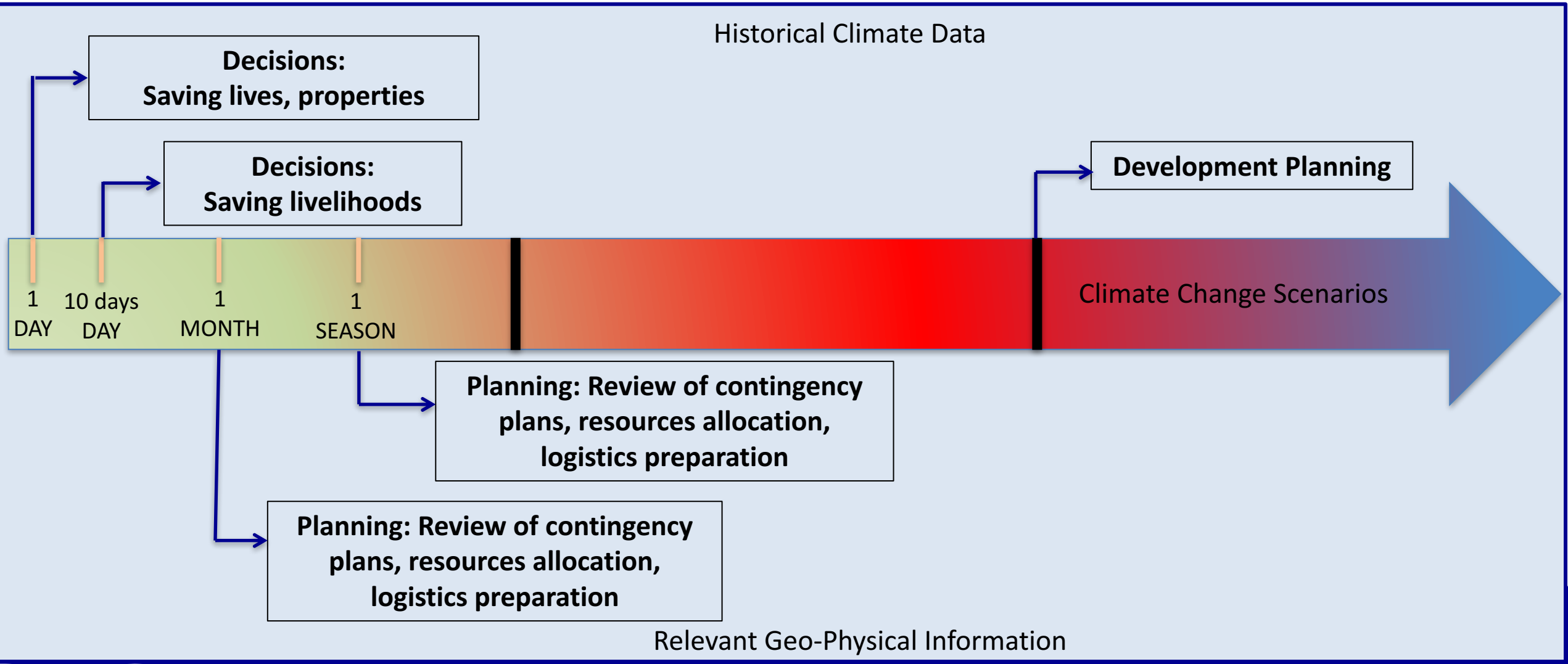
- Are warnings reaching those at-risk?
- Are the risks and warnings understood?
- Are warning information clear and usable?

RESPONSE CAPABILITY

Building national and community response capacities

- Are preparedness and response plans up-to-date and tested?
- Are local capacities and knowledge made use of?
- Are people prepared and ready to react/respond to warnings

MULTI-HAZARD, MULTI-TIMESCALES APPROACH AT CAPACITY DEVELOPMENT OF USERS



Embedded into national and local systems

NATIONAL

- Institutional Landscaping and User Needs Assessment
- National Seasonal Forum
- Training on Forecast Translation and Application
- Other technical assistances required

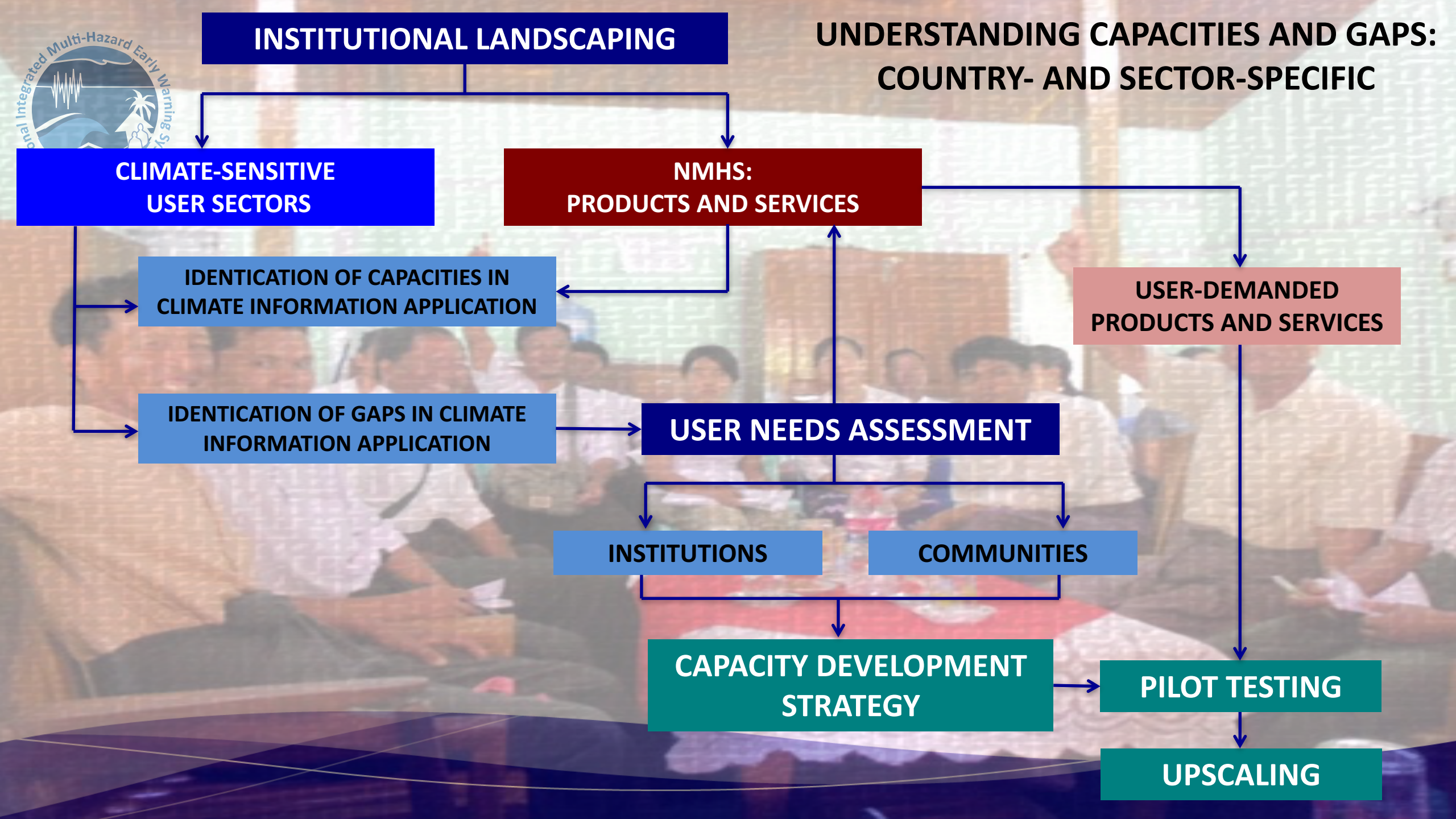
SUB-NATIONAL

- User Needs Assessment
- Sub-National Seasonal Forum
- Training on Forecast Translation and Application
- Provision of communication equipment
- Simulation exercises
- Other assistances required

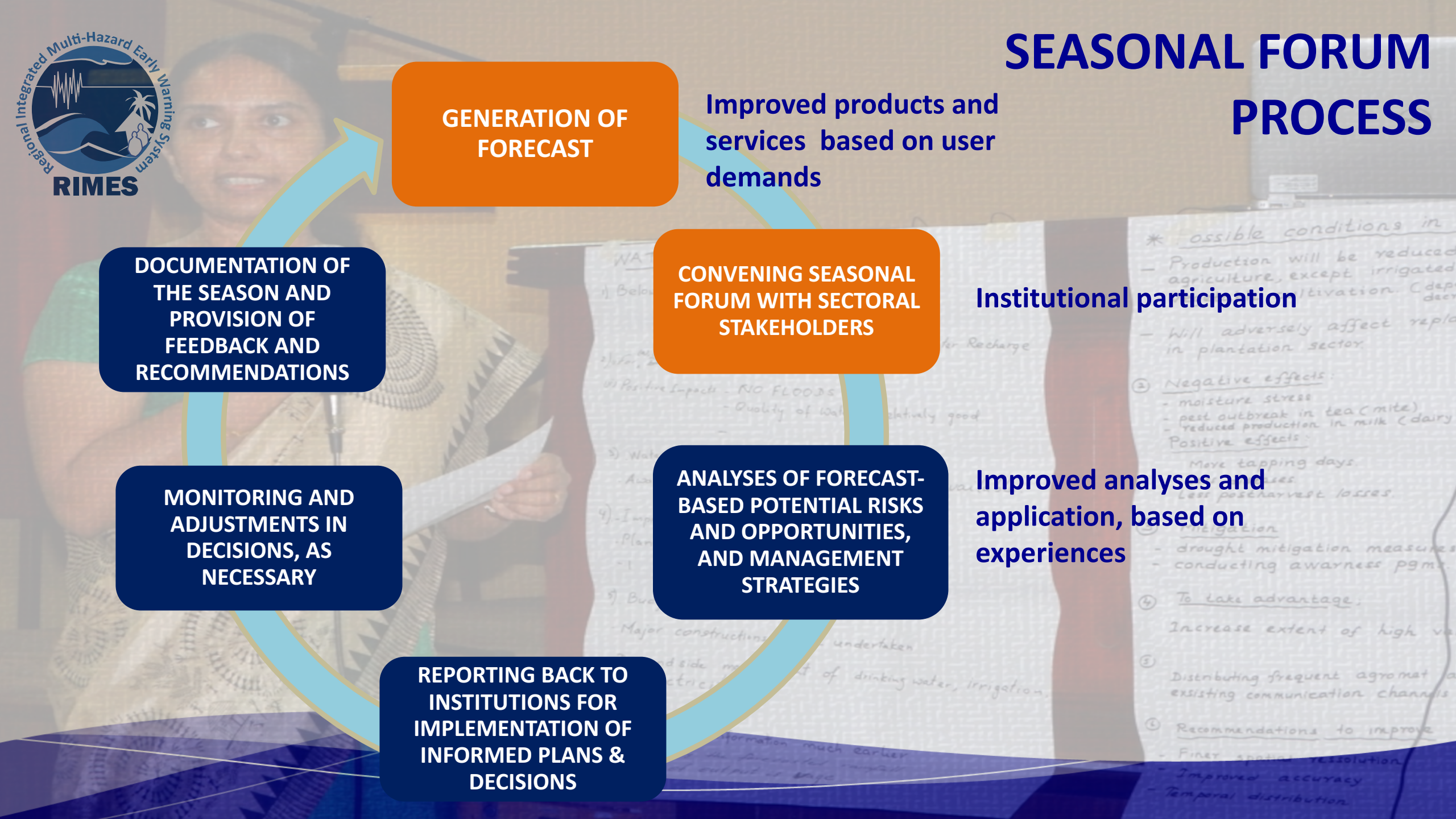
COMMUNITY

- EWS Audit and User Needs Assessment
- Training on Forecast Translation and Application, including FARM School
- Provision of communication Equipment
- Strengthening of feedback mechanism
- Simulation exercises
- Other assistances required

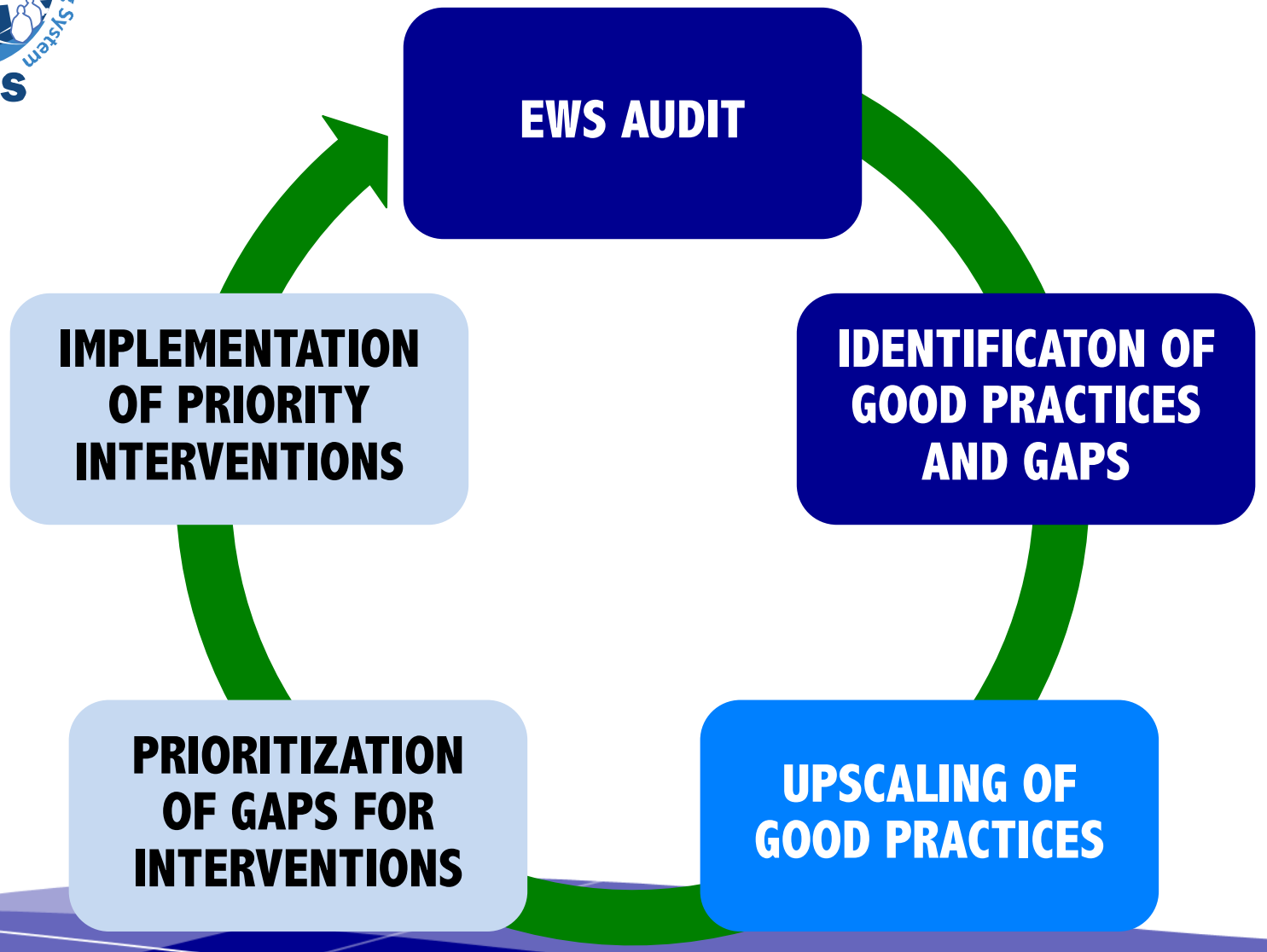
UNDERSTANDING CAPACITIES AND GAPS: COUNTRY- AND SECTOR-SPECIFIC



SEASONAL FORUM PROCESS



UNDERSTANDING CAPACITIES AND GAPS IN COMMUNITIES



EWS Audit:

- ✧ regular and sustained, to keep track of the evolving capacities and gaps in communities
- ✧ Enhances understanding and appreciation of communities of their own capacities and gaps
- ✧ Provides better insights to decision makers on EWS strengths of communities to capitalize on, and specific issues to address
- ✧ guides development interventions in communities, for more impactful investments

COMMUNITY EARLY WARNING SYSTEM AUDIT

A functional, reliable and effective early warning system (EWS) is an essential prerequisite for reducing loss of lives and livelihood assets. A people-centered EWS is comprised of equally important and interconnected components: risk knowledge, monitoring and warning service, dissemination and communication, and response capability (in Figure 1).

Figure 2 elaborates these components of people-centered EWS, involving scientific, institutional and societal processes through an interconnected, end-to-end chain. Gaps in any of the components of the end-to-end processes could lead to failure of the EWS.

Figure 1. EWS Components

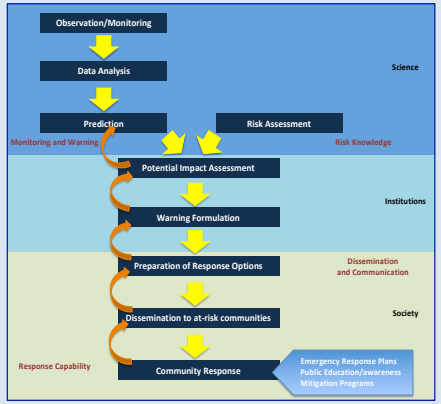


Figure 2. Science, institutional and societal processes in a people-centered EWS

The Regional Integrated Multi-Hazard Early Warning System (RIMES) developed this EWS Audit tool to systematically assess the functionality and readiness of Community level EWS, through a set of criteria. The EWS Audit is recommended to be conducted, in communities, on regular basis (at least once a year) to ensure functionally of the community level EWS and to direct interventions to address residual and emerging gaps.

Community Early Warning Audit Form

Basic Information

Local Government Unit Name: _____ Area: _____

Population: _____

Natural hazards affecting/has the potential of affecting the community:

- ☐ Earthquake
- ☐ Tsunami
- ☐ Landslide
- ☐ Cyclones
- ☐ Heavy Rainfall
- ☐ Flood
- ☐ Strong Wind
- ☐ Storm Surge
- ☐ Others *(Please specify)* _____

Governance structure:

1. Risk Knowledge

Are historical hazards and extreme events, and their impacts, documented and discussed with different stakeholders regularly *(at least once a year)*?

☐ Yes ☐ No

If not, why? _____

Are hazard thresholds identified?

☐ Yes ☐ No

If yes, specify *(hazard-specific; use additional sheet as necessary)* _____

Are the vulnerable population/members of the community identified relative to various magnitudes of specific hazards?

☐ Yes ☐ No

If yes, who are these and what are the factors that contribute to their vulnerabilities? *(Please identify, per hazard; use additional sheet as necessary).* _____

Are hazard maps available for every hazard? ☐ Yes ☐ No

Are risk maps available for every hazard? ☐ Yes ☐ No

Are these updated regularly? ☐ Yes ☐ No If yes, how often? _____

ASSESSMENT TEAM'S NOTES FOR RISK KNOWLEDGE

Strengths:

Weaknesses:

Recommendations:

2. Local Hazard Monitoring

How does the community monitor hazards?

Tsunami

- ☐ Monitoring for "natural signs"
- ☐ Others *(Please specify)*

Rain-induced landslide

- ☐ Rain Gauge
- ☐ Others *(Please specify)*

How does the community monitor hazards?

- ☐ Hydro-meteorological hazards
- ☐ Rain Gauge
- ☐ Calibrated and well maintained improvised rain-catching equipment
- ☐ Water level gauge(s) *(Please specify location[s]. If necessary, use additional sheet.)*
- ☐ Others *(Please specify. If necessary, use additional sheet.)*

Is there any indigenous hazard prediction that is practiced by the community?

☐ Yes ☐ No

If yes, provide details_____

Community monitoring equipment / tools have designated observer(s)?

☐ Yes ☐ No

Designated observer(s) properly trained?

☐ Yes ☐ No

ASSESSMENT TEAM'S NOTES FOR LOCAL HAZARD MONITORING

Strengths:

Weaknesses:

Recommendations:

3. Communication and Coordination Mechanism

Primary Warning Focal Person(s)
(Please tick appropriate box/boxes.)

- ☐ Ward/Village Tract Administrators
- ☐ Village Administrators
- ☐ Ward/Village Tract/Village DPC official
- ☐ Others *(Please specify. Use extra sheet as Necessary)*

Focal area for coordination
(Please tick appropriate box/boxes)

- ☐ Ward/Village Tract/Village Administration Office
- ☐ Community Center(s)
- ☐ Others *(Please specify. Use extra sheet as necessary)*

Secondary/Back up Focal Person(s)

☐ Yes ☐ No

If yes, identify back-up focal person(s):

1) _____
2) _____
3) _____
4) _____
5) _____
6) _____
7) _____
8) _____
9) _____

Directory of message recipients available at the operation center?

☐ Yes ☐ No

Directory updated annually or more frequently?

_____

Approved communication flowchart posted at the operation center?

☐ Yes ☐ No

If no, give reason: _____
_____

Communication and coordination protocol established (mandated and practiced)?

☐ Yes ☐ No

Diagram for communication and coordination (flow of communication from primary warning focal person to recipients).

ASSESSMENT TEAM'S NOTES FOR COMMUNICATION AND COORDINATION MECHANISM:

Strengths:

Weaknesses:

Recommendations:

4. Warning Reception

Through what channel/s is the community receiving warning information: *(Functionality of at least 3. Please tick appropriate boxes.)*

- ☐ Telephone / Fax
- ☐ Mobile Phone (Call and SMS)
- ☐ AM / FM radio
- ☐ VHF/HF Radio Transceivers
- ☐ Television
- ☐ Early Warning Tower
- ☐ Police Communication
- ☐ Military Communication
- ☐ Internet
- ☐ Others *(Please specify. If necessary, use additional sheet.)*

From where are the warning information coming from?

- ☐ DMH/RRD
- ☐ Township Administration
- ☐ Adjacent communities
- ☐ Others *(Please specify)*

Are warning information properly logged in in Information Log Book?

☐ Yes ☐ No

If no, give reason:
_____
_____
_____

ASSESSMENT TEAM'S NOTES FOR WARNING RECEPTION

Strengths:

Weakness:

Recommendations:

5. Local Warning Customization

Are risk maps/risk information applied in customizing local warnings? ☐ Yes ☐ No

Are currently observed conditions in the community integrated into warnings? ☐ Yes ☐ No

Are information of various timescales, and corresponding uncertainties, integrated into warnings?

☐ Yes ☐ No

Is community capacity for customizing/converting forecasts/warnings into risk information for various sectors available?

☐ Yes ☐ No

If no, are warnings communicated in the form it is received in?

☐ Yes ☐ No

ASSESSMENT TEAM'S NOTES FOR LOCAL WARNING CUSTOMIZATION

Strengths:

Weaknesses:

Recommendations:

6. Warning Dissemination

Through what channels does the community disseminate warning information? *(Functionality of at least 3. Please tick appropriate boxes)*

- ☐ Telephone
- ☐ Mobile Phone (Call and SMS)
- ☐ VHF/HF Radio
- ☐ Flag Warning Signals
- ☐ Person to Person
- ☐ Alarm /siren
- ☐ Bell
- ☐ Public Address System / megaphone
- ☐ Indigenous device *(Please specify)*
- ☐ Others *(Please specify. If necessary, use additional sheet.)*

Are the identified equipment dedicated for community use?

☐ Yes ☐ No

If no, why and how are these equipment mobilized? _____
_____
_____

ASSESSMENT TEAM'S NOTES FOR WARNING DISSEMINATION

Strengths:

Weaknesses:

Recommendations:

7. Community Preparedness

Compliance with the following:

- ☐ Ward/Village Tract/Village DP Committee
- ☐ Updated, tested and practiced Disaster Preparedness and Response Plan/Contingency Plan
- ☐ Standard Operating Procedures for responding to warning information (required actions for different warning levels)
- ☐ Trained community response teams
- ☐ Updated directories of EW focal persons in various levels
- ☐ Regularly updated hazard maps
- ☐ Regularly updated resource maps
- ☐ Regularly updated risk maps
- ☐ Inventory of families/persons that will mostly be affected by hazards, including their evacuation center assignment(s)
- ☐ Evacuation shelters located in hazard-safe zones
- ☐ Sufficient number of evacuation centers/shelters in hazard-safe zones for hazard-specific vulnerable population

Evacuation shelter facilities:

- ☐ Water ☐ Power ☐ Cooking paraphernalia
- ☐ Designated areas for women, elderly and children
- ☐ Committee to take care of persons with special needs
- ☐ Others

- ☐ Safe evacuation routes, per hazard, identified
- ☐ Signages to safe evacuation routes established in conspicuous areas in the community
- ☐ Access to transportation system for evacuation etc., during emergencies
- ☐ Mechanisms for accessing food and water in emergency cases
- ☐ Sufficient first aid/medical kit
- ☐ Awareness Programs conducted on regular basis (at least annually)
- ☐ Education, information, and communication (IEC) Materials: EW Posters, streamers, signboards, etc. for key hazards posted in conspicuous areas in the community
- ☐ EW/DRM Trainings
- ☐ Multi-hazard simulation drill (at least annually)
- ☐ Annual visit/dialogue with higher level DPCs for provision of feedback and discussion of relevant concerns
- ☐ Others *(Please specify; use extra sheet if necessary)*

ASSESSMENT TEAM'S NOTES FOR COMMUNITY PREPAREDNESS

Strengths:

Weaknesses:

Recommendations:

8. Response Options

Are response options identified by using risk maps?

☐ Yes ☐ No

If yes, how? _____

Are information of various timescales (e.g. observed information, daily, 10 days, monthly, seasonal forecasts, climate change projections) seamlessly integrated into planning and decision-making?

☐ Yes ☐ No

If yes, how? _____

Are required/recommended actions for various warning levels, per hazard, identified and understood by decision-makers and the vulnerable population and sectors?

☐ Yes ☐ No

If yes, what are these? _____

Are required actions for different hazard magnitudes and various levels of impacts (e.g. moderate, severe, worst cases), for each hazard, identified and can be activated immediately in various vulnerable sectors?

☐ Yes ☐ No

If yes, what are these? _____

Are mechanisms for immediate mobilization of required resources for responding to warning information available?

☐ Yes ☐ No

If yes, what are these? _____

Are required/recommended actions for high impact, low lead time events/hazards identified and understood by decision-makers and the vulnerable population?

☐ Yes ☐ No

If yes, what are these? _____

Can these actions be readily activated among vulnerable population, upon perception of hazard indicators in the community?

☐ Yes ☐ No

If yes, what are these? _____

Are mechanisms for immediate mobilization of required resources for mobilizing community action, with respect to high-impact, low lead time events/hazards in place?

☐ Yes ☐ No

If yes, what are these? _____

ASSESSMENT TEAM'S NOTES FOR RESPONSE OPTIONS

Strengths:

Weaknesses:

Recommendation(s):

9. Feedback Arrangements

Is there a mechanism for communicating feedback to the township DPC, DMH, and RRD?

☐ Yes ☐ No

Is yes, describe/define the mechanism: _____
_____
_____

Are there identified focal points in the township DPC, DMH, and RRD for regularly receiving feedback?

☐ Yes ☐ No

If yes, identify these focal points: _____
_____
_____

How often are feedback communicated? _____
_____

Are there responses from Township DPC, DMH and RRD to feedback conveyed?

☐ Yes ☐ No

If yes, provide detail: _____
_____
_____

Were there improvements in the warnings/risk information received based on earlier-provided feedback?

☐ Yes ☐ No

If yes, what are these? _____
_____
_____

ASSESSMENT TEAM'S NOTES FOR FEEDBACK MECHANISM

Strengths:

Weaknesses:

Recommendations:

SUMMARY

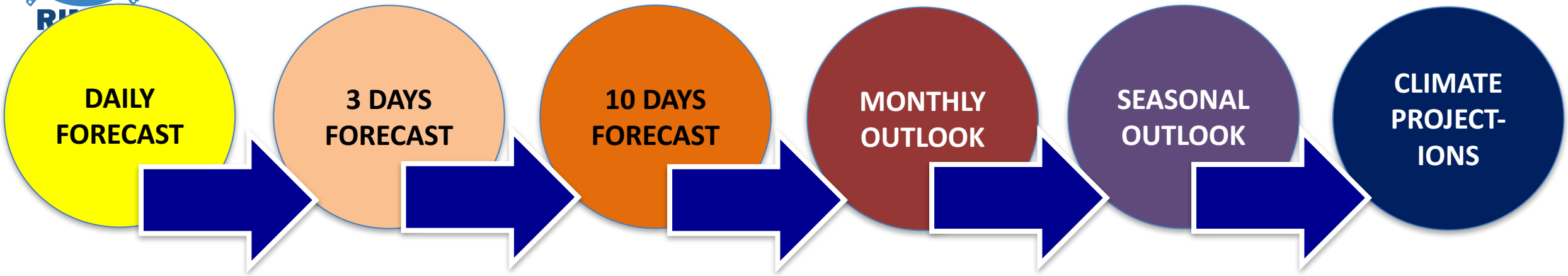
Guidelines	Evaluation Result	
1. Risk Knowledge	☐ Satisfied Criteria	☐ Needs Improvement
2. Local Hazard Monitoring	☐ Satisfied Criteria	☐ Needs Improvement
3. Communication and Coordination Mechanism	☐ Satisfied Criteria	☐ Needs Improvement
4. Warning Reception	☐ Satisfied Criteria	☐ Needs Improvement
5. Local Warning Customization	☐ Satisfied Criteria	☐ Needs Improvement
6. Warning Dissemination	☐ Satisfied Criteria	☐ Needs Improvement
7. Community Preparedness	☐ Satisfied Criteria	☐ Needs Improvement
8. Response Options	☐ Satisfied Criteria	☐ Needs Improvement
9. Feedback Arrangements	☐ Satisfied Criteria	☐ Needs Improvement

Key/Priority Recommendations

Signatures of Evaluation Team Members:

Date Evaluated:

COMPLEMENTING THE CAPACITY DEVELOPMENT OF USERS: NMHSs RESPONDING TO REQUIREMENTS OF INSTITUTIONS AND COMMUNITIES



DEVELOPMENT OF FORECAST OF DIFFERENT TIMESCALES BY DOM IN SRI LANKA BASED ON MONSOON FORUM STAKEHOLDER DEMANDS

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

FORECAST TRANSLATION: OPPORTUNITIES, RISKS, AND RESPONSE OPTIONS ANALYIS

Agriculture: End of Dry Season/Beginning of Wet Season

OBSERVATION

- Sufficient rainfall in the past few weeks/months
- Water levels are high in rivers, reservoirs, tanks

FORECAST

- 1-3 days
- 5 days
- 10 days
- monthly
- seasonal

ACTIVITY

- Land preparation

OPPORTUNITIES

- Availability of water for early land preparation and planting; and sustaining crops
- Storing of rainwater in ponds and other water harvesting facilities to be used as needed

RESPONSE OPTIONS

- Assistance to farmers re: other crop requirements
- Provision of water harvesting facilities
- Regulation of reservoirs for expansion of water resources services

THREATS

- Heavy and continuous rainfall could result to flooding

RESPONSE OPTIONS

- Regulation of water releases in reservoir
- Establishment of flood mitigation measures in farms and in relevant facilities/areas

RIMES

STAKEHOLDER DEMANDS: 9th Monsoon Forum, Myanmar, October 2012

ENHANCED GENERATION OF FORECAST/WARNING INFORMATION

- Upgrading and expansion of weather stations
- Capacity building in application of tools (i.e. GIS) for enhanced spatial analysis of databases
- 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 forecast translation (agro-advisory 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

TWIN CAPACITY DEVELOPMENT PROCESS

SESAME

Development of decision-support system for translating forecast into crop-relevant information

Facilitating easy access of advisories through sms, Facebook, and mobile application

Facilitating feedback

FARM SCHOOL

Enhancing farmers' receptivity and capacity in ingesting multi-timescales information into plans and decisions

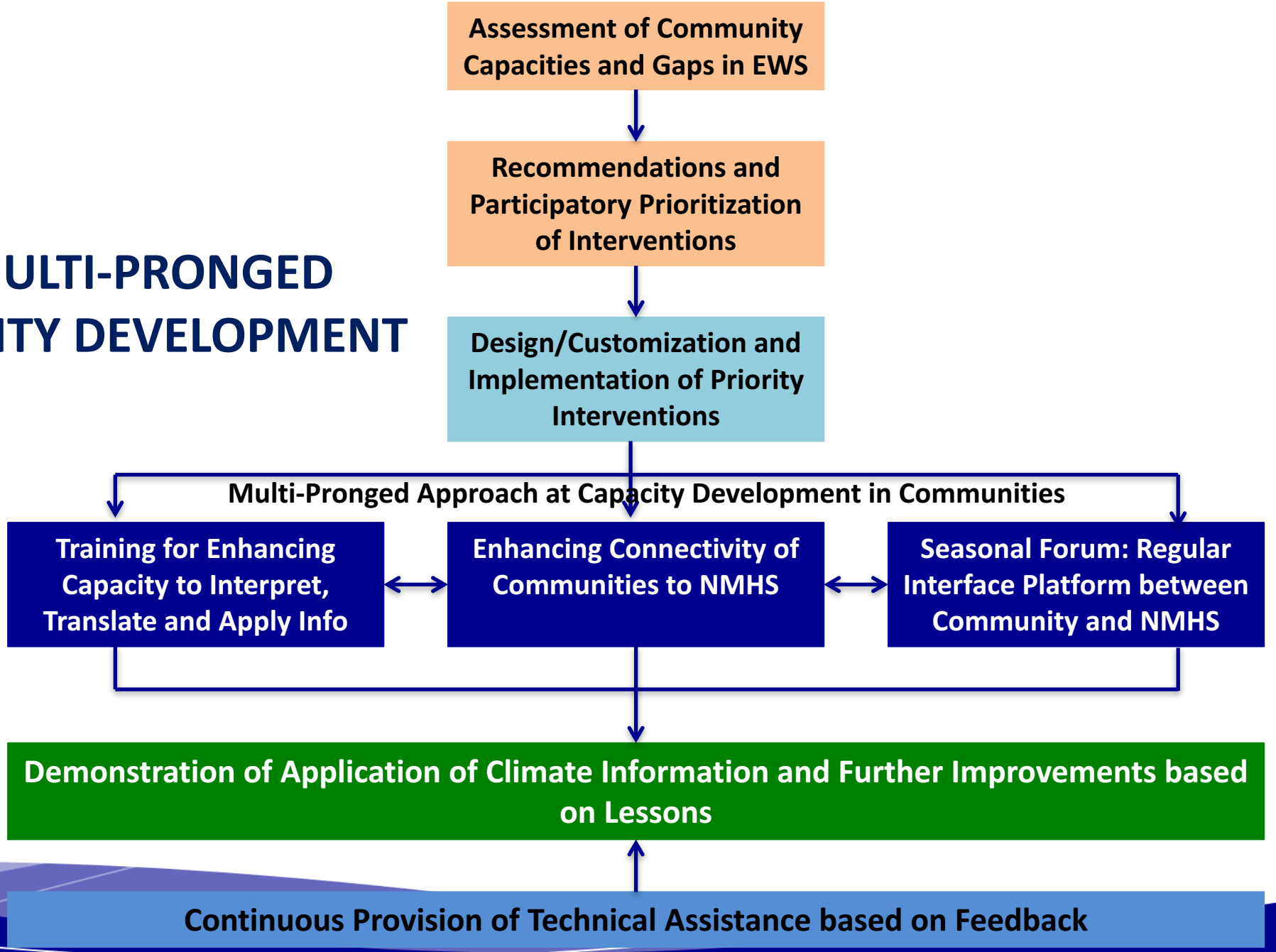
Facilitating regular discussions between farmers, extension workers and DMH for feedback and further capacity development

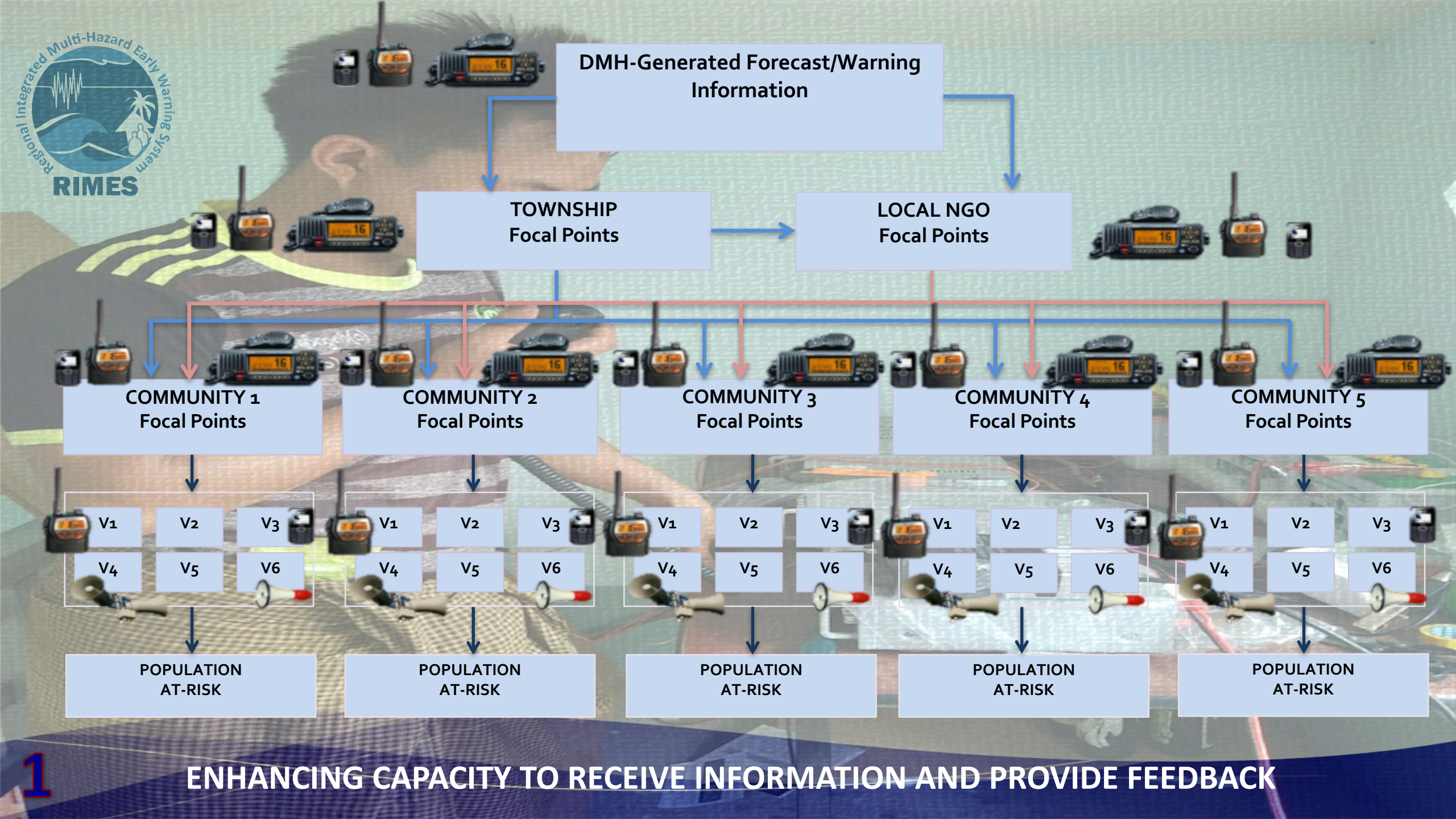
FARMERS

Application of information for resources and risks management

Capacity building process is imbedded in DMH and Ministry of Agriculture in Myanmar. RIMES serves as a facilitating institution

PARTICIPATORY, MULTI-PRONGED APPROACH AT CAPACITY DEVELOPMENT





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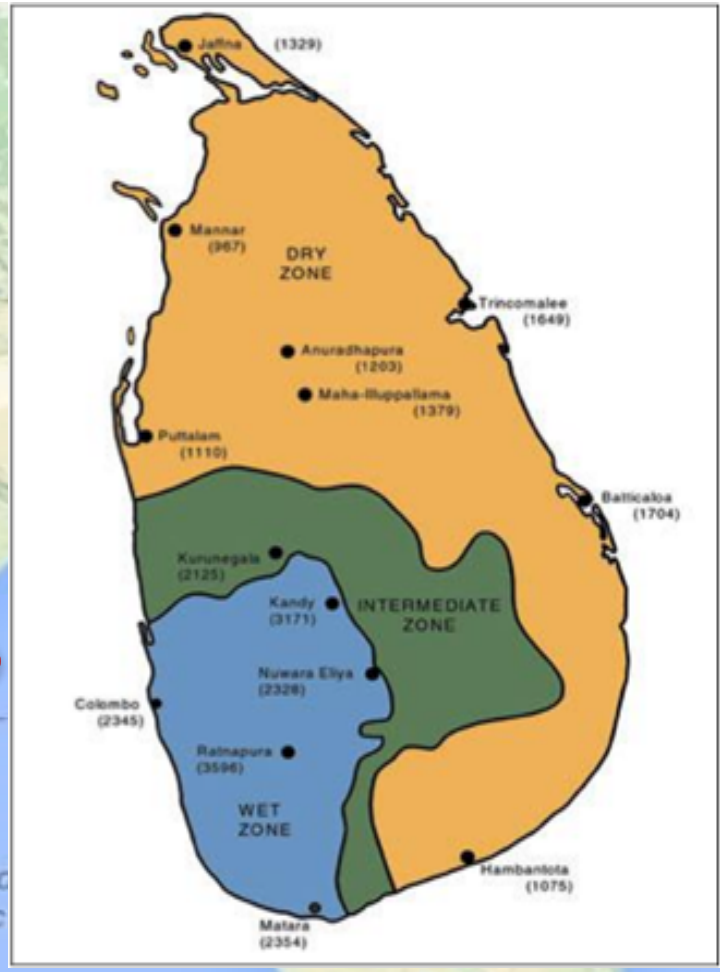
ENHANCING CAPACITY TO RECEIVE INFORMATION AND PROVIDE FEEDBACK

INFORMED RESOURCES AND RISKS MANAGEMENT:

Circumventing El Nino impacts into economic gains – examples from Sri Lanka

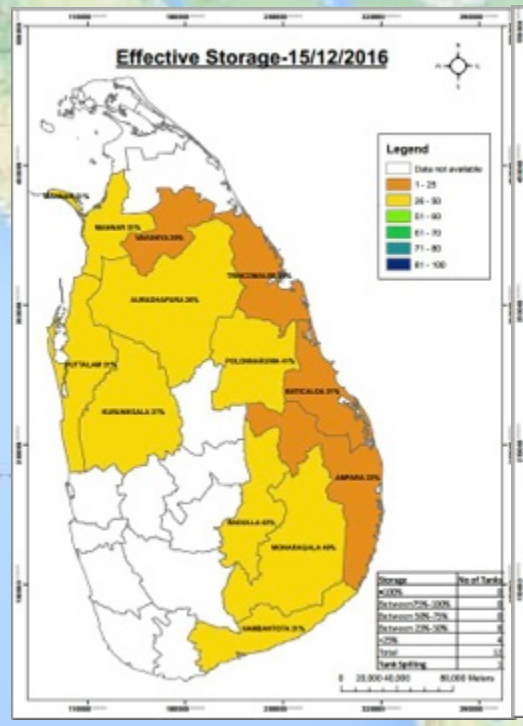
- 2014 Yala Season: productivity in Sri Lanka's Batticaloa District (dry zone) despite 2 consecutive seasons of suppressed rainfall
- 2015 Yala Season: 96% cultivation rate despite extended dry spells and suppressed rainfall
  - 23% increase against 5-year Yala season average
  - Increase in cultivation of other field crops compared to 2014 Yala Season
- October 2015 – February 2016: managing reservoirs for reducing flood events – savings of USD 41 Million

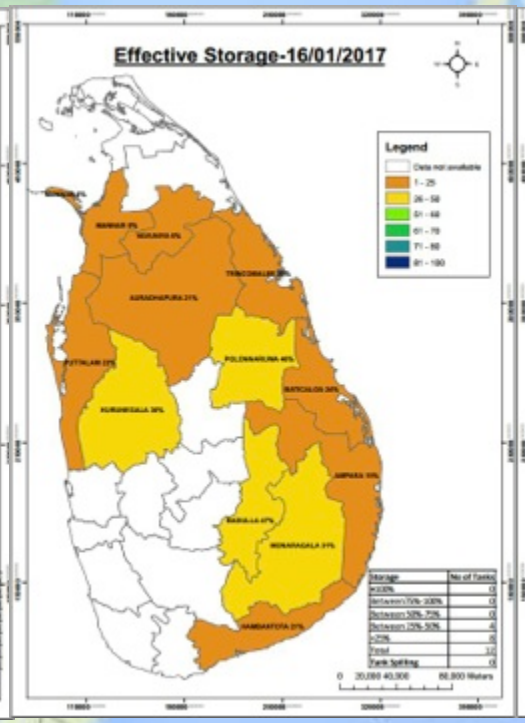


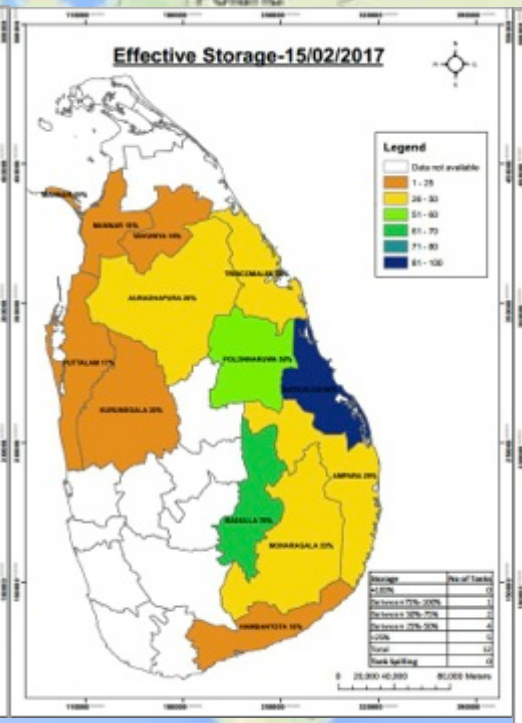
INFORMED RESOURCES AND RISKS MANAGEMENT:

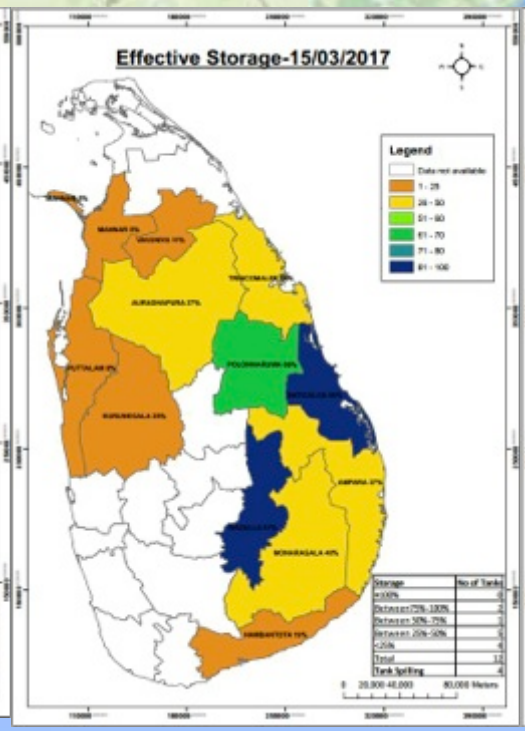
Reducing impacts of extreme climate events: 2016-2017 drought

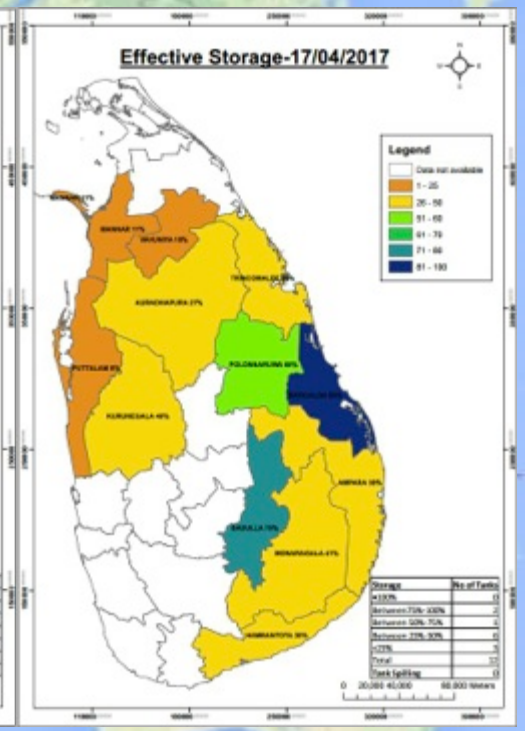
- October 2016-mid-May 2017: extreme water deficit in many areas in Sri Lanka, resulting to widespread drought











Data reported by Department of Irrigation, Sri Lanka

15th Monsoon Forum, Colombo

INFORMED RESOURCES AND RISKS MANAGEMENT:

Reducing impacts of extreme climate events: 2016-2017 drought

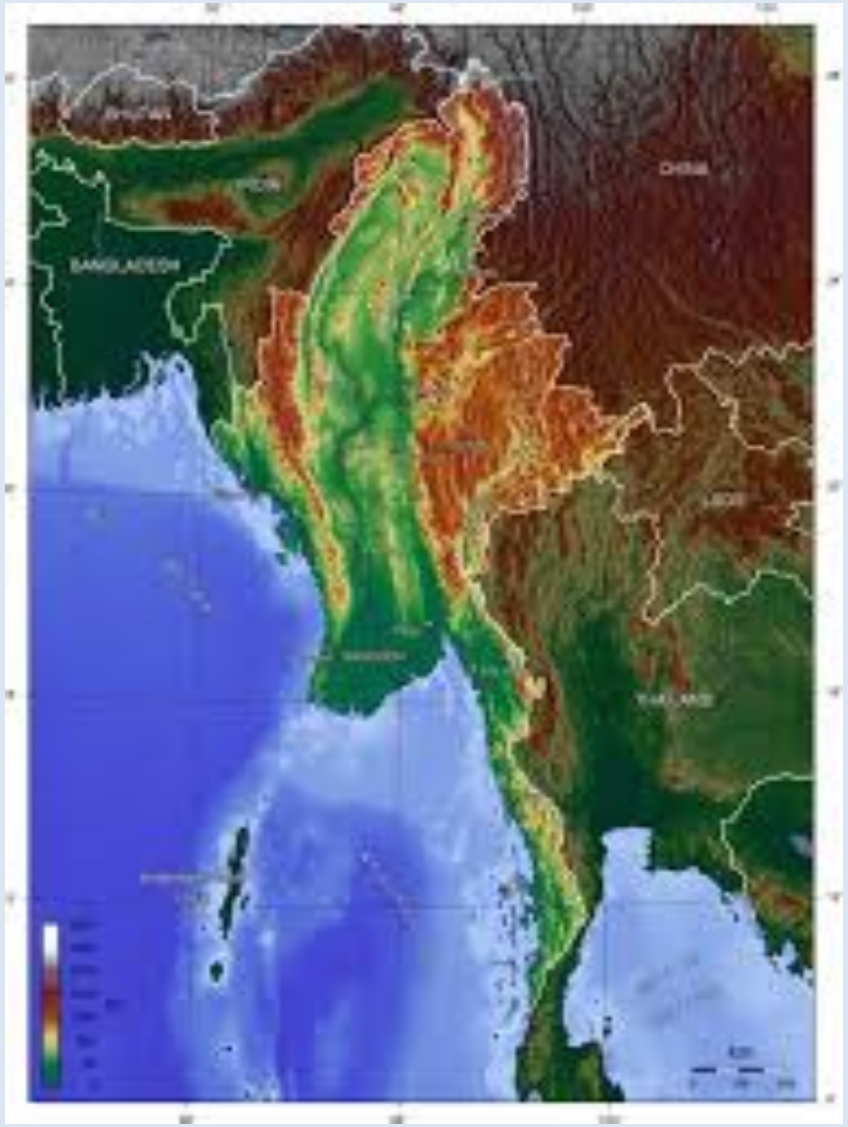
- Based on analysis of available water in reservoirs and tanks, and forecast from DOM, DOA and DOI issued advisories to farmers for:
  - reduction of land preparation period for optimizing benefits from intermittent rainfall for crop planting
  - limiting cultivation extent to what can be supported by available water, considering higher probability of below normal rainfall for *Maha* cultivation season
  - cultivation of short-duration, drought-resistant varieties
  - foregoing cultivation in water-critical areas
  - utilization of tank storages for crop growth only, and not for replanting

Losses in farmer investments were significantly reduced; reports on crop casualties were not as high as in other major drought events

INFORMED RESOURCES AND RISKS MANAGEMENT:

From Hazard to Resource: Cyclone Maarutha, April 2017, Myanmar

- April is typically a very dry month in Myanmar
- Farmers in the Central Dry Zone are usually drying harvested crops during the month
- Cyclone Maarutha formed in the Bay of Bengal on 15 April 2017, made a landfall in Myanmar's Rakhine Region on 16 April 2017, and started dissipating on 17 April 2017
- Timely receipt of information and provision of advisories by DOA officials and extension workers, through SESAME, not only enabled farmers in the CDZ to save their harvested crops from being damaged, but also enabled them to immediately prepare farm inputs and facilitate early planting of 3-month variety of sesame
  - planted in mid-April, instead of the usual mid-May
  - recorded good harvest in July; first good harvest in 7 years



CHALLENGES AND LESSONS LEARNT

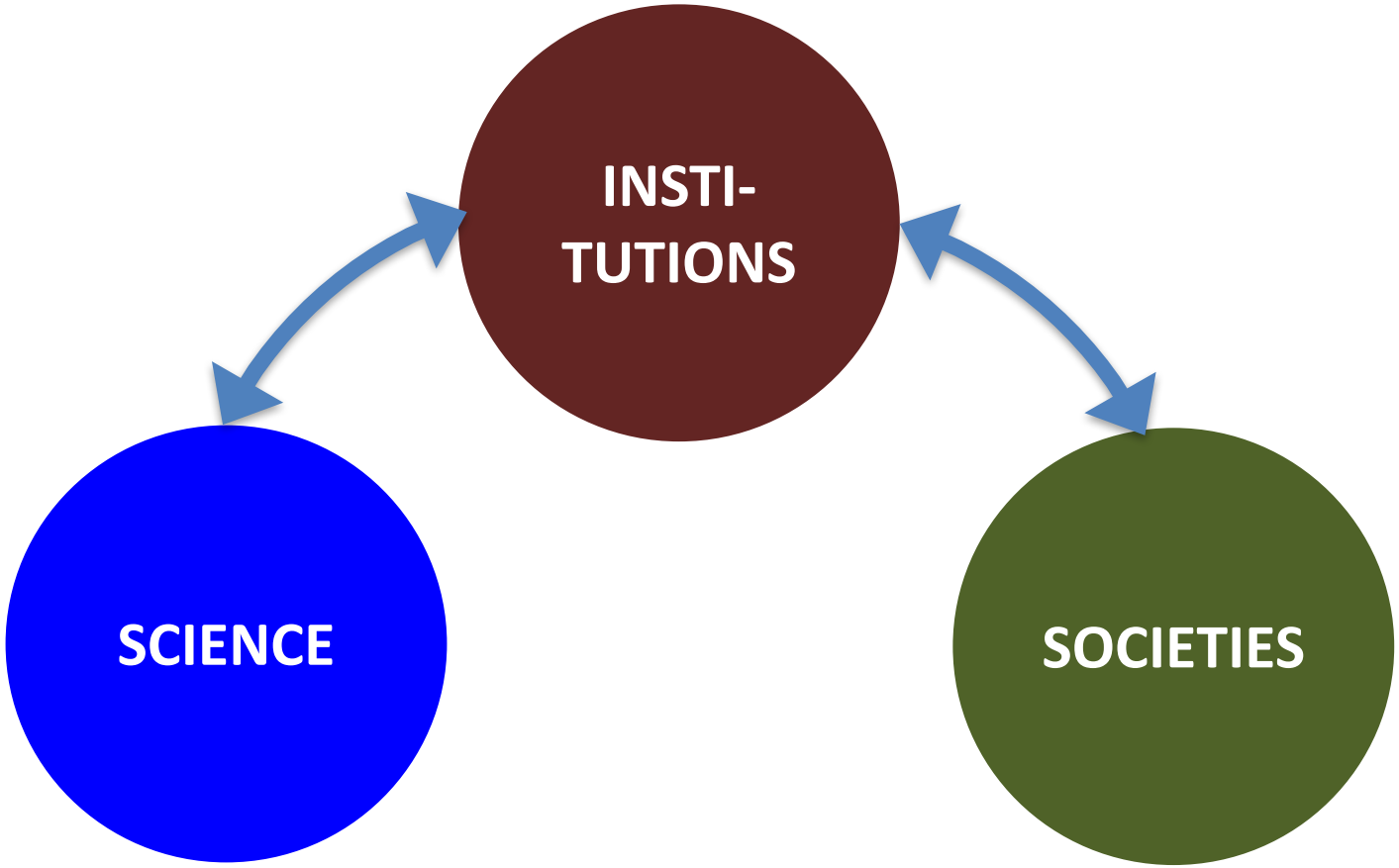
- EWS is widely recognized as key to effective disaster risk reduction; investments, however, by many governments remains low end-to-end EWS capacity development

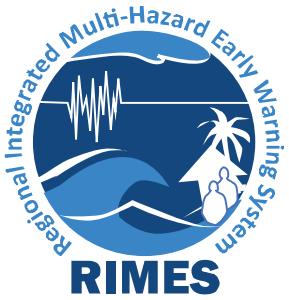
- Capacity development interventions have to be continuous and sustained to be fully integrated into institutions and communities

- Capacity building of institutions and communities vis-à-vis new extremes/shocks

SOCIETAL APPLICATIONS

Bridging science to institutions and communities for societal welfare





Thank you very much

for your attention