RIMES Programs Overview

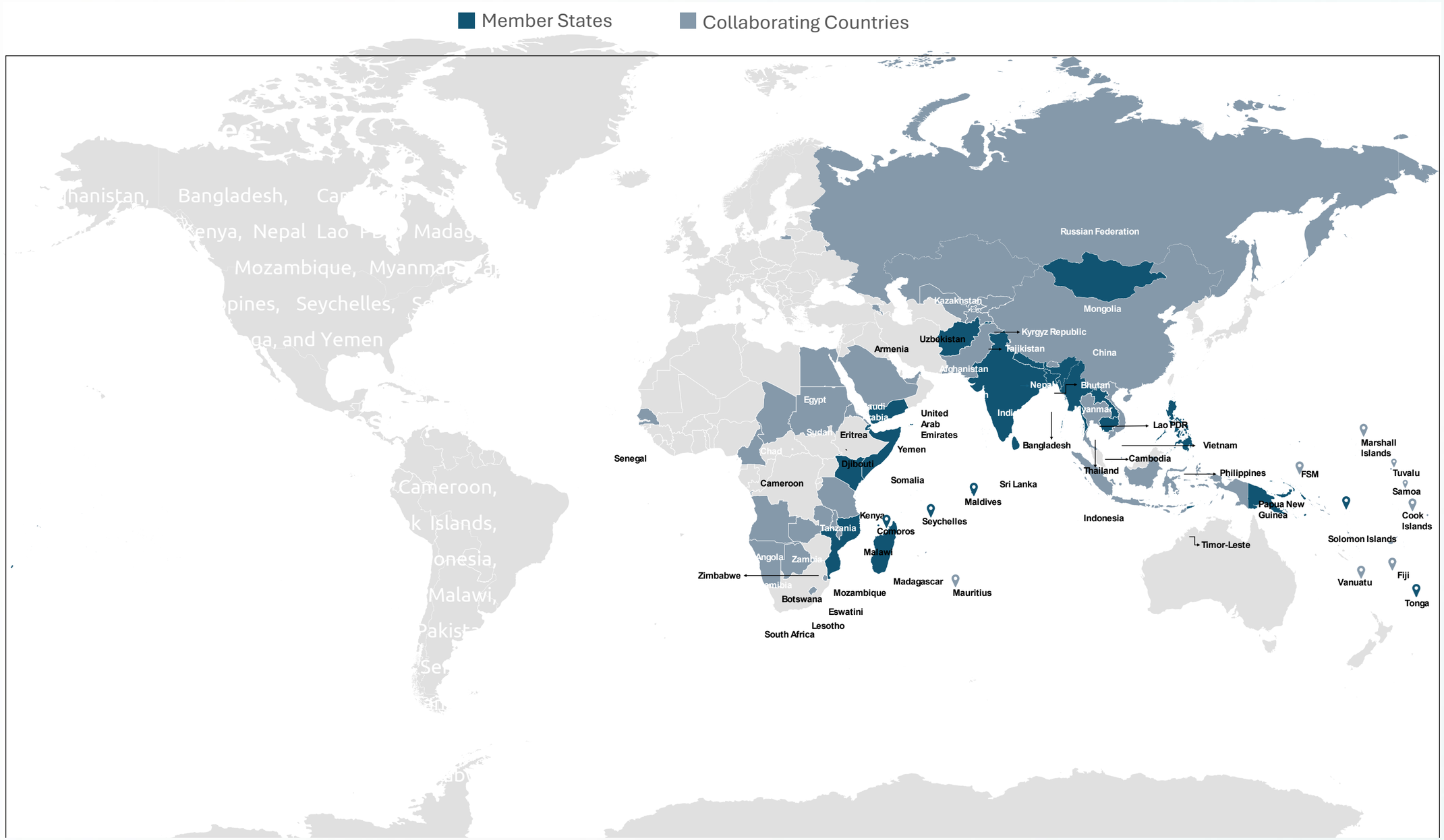
Regional Integrated Multi-Hazard Early Warning System

RIMES

Overview

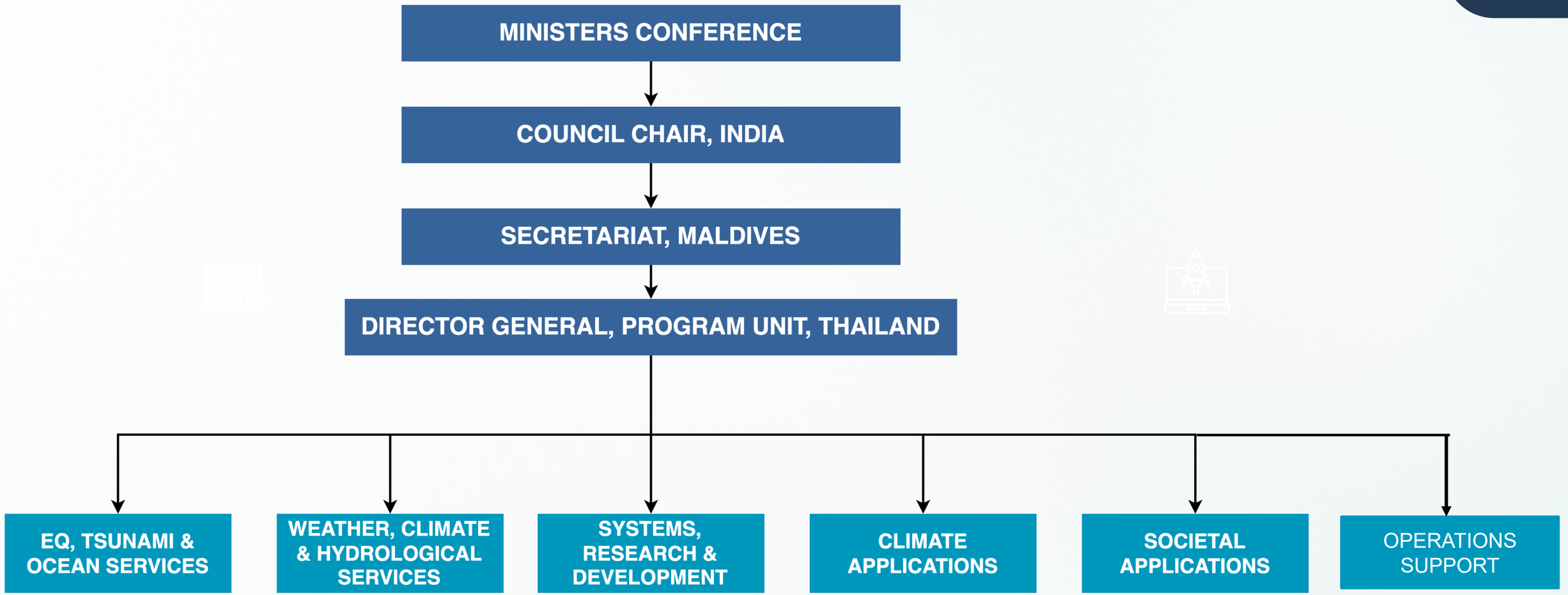
- Established on 30 April 2009 with Signing of RIMES Cooperation Agreement in Male, Maldives
- Founding Members : Comoros, Maldives, and Seychelles
- Registered with the UN under Article 102 of the UN Charter
- Intergovernmental, owned and managed by its Member States

RIMES Member and Collaborating Countries



Regional Integrated Multi-Hazard Early Warning System
RIMES

Organizational Structure



Regional Integrated Multi-Hazard Early Warning System
RIMES

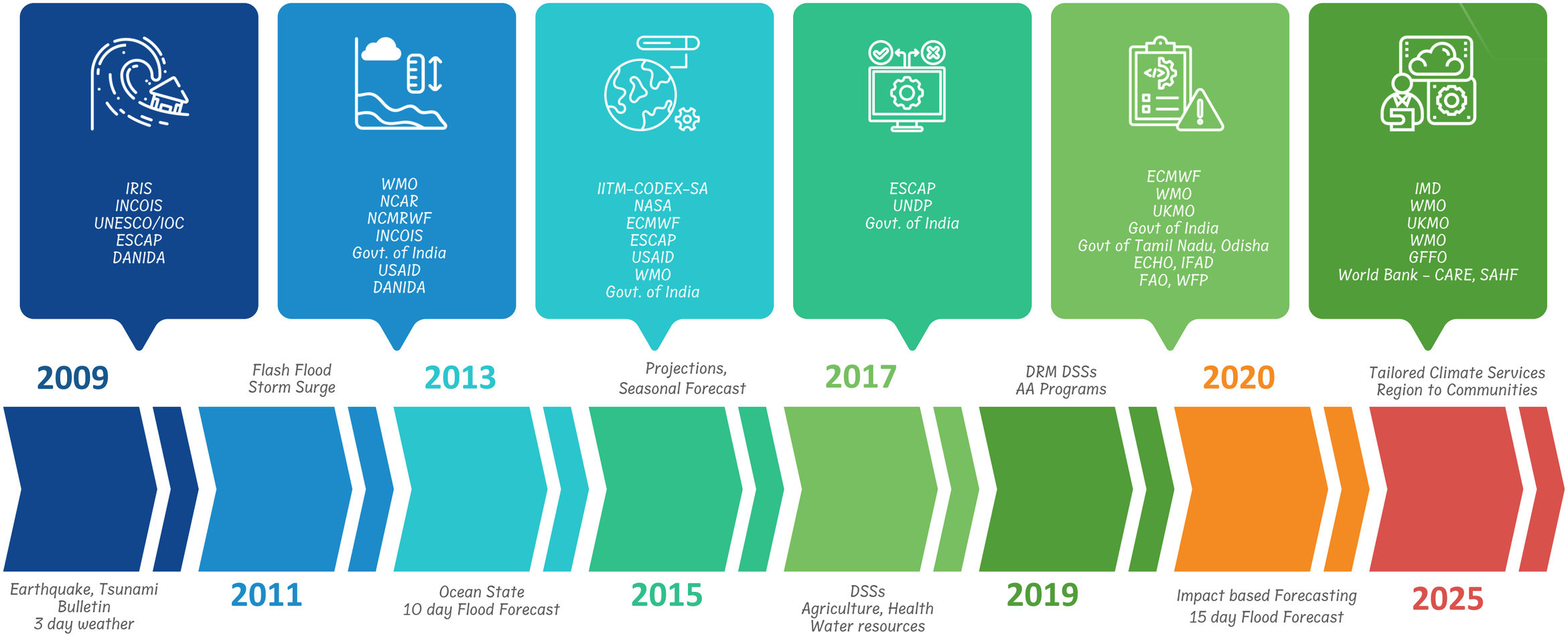
4TH MINISTERIAL CONFERENCE

"Actionable Early Warnings and Climate Services for All"

https://mc4.rimes.int/

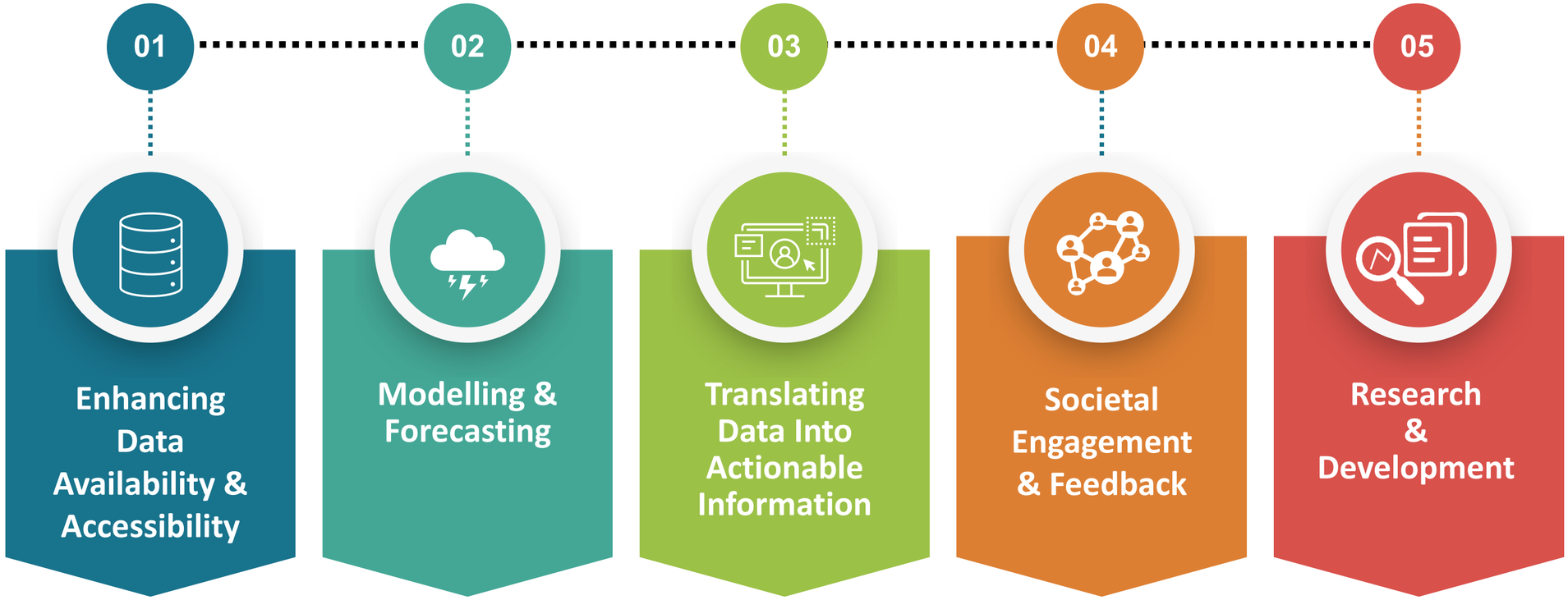
Colombo, 2025

RIMES Milestones



Multi-hazard, Multi-timescale, Multi-purpose EWS 2030

RIMES Services



RIMES Services

01

Enhancing Data Availability & Accessibility

DataX

Observations

3028 Observation Stations

View & Dowload Data →

Forecast

View Forecast Map →

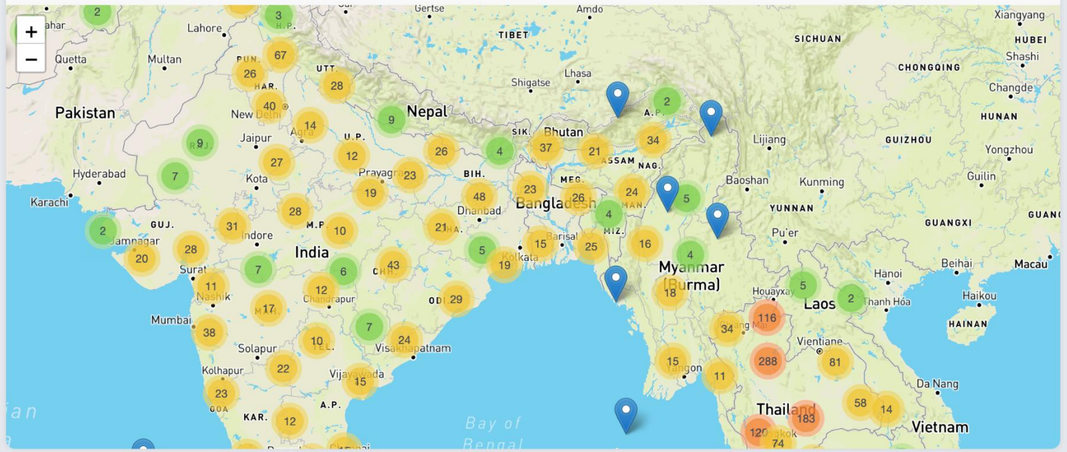
Subset Forecast NetCDF →

Analytics

Forecast Data Under a Polygon Region →

Forecast Data of a Point →

Observation Stations



Seismic

Oceanic

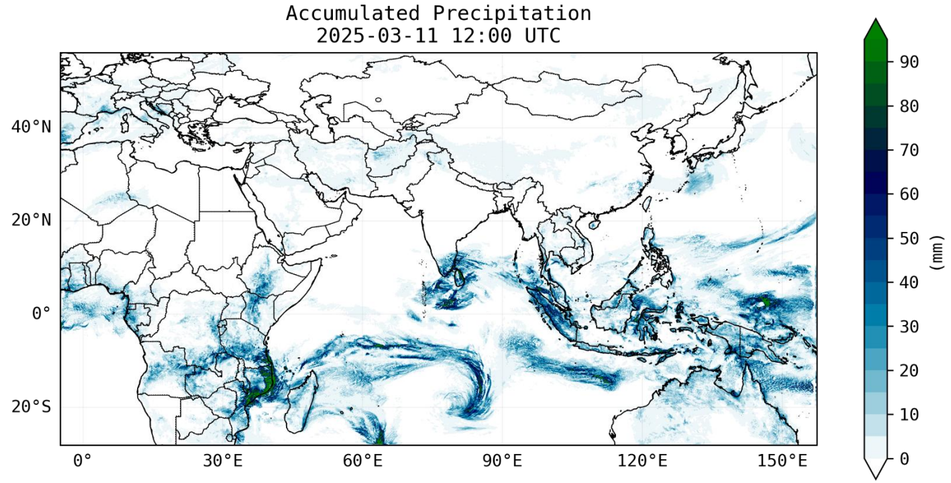
Hydrological

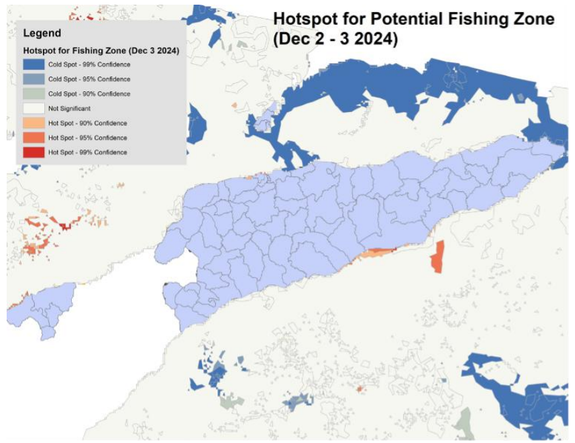
Meteorological

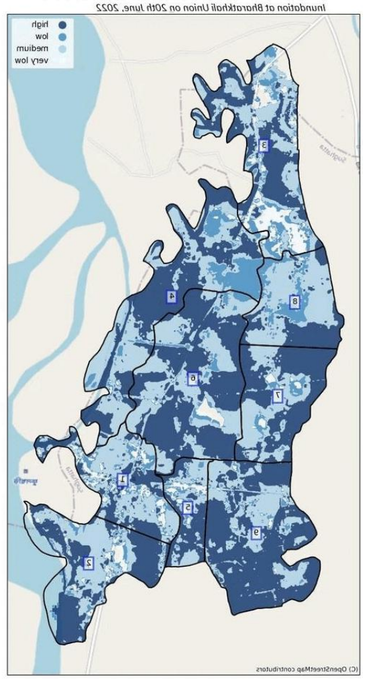
RIMES Services

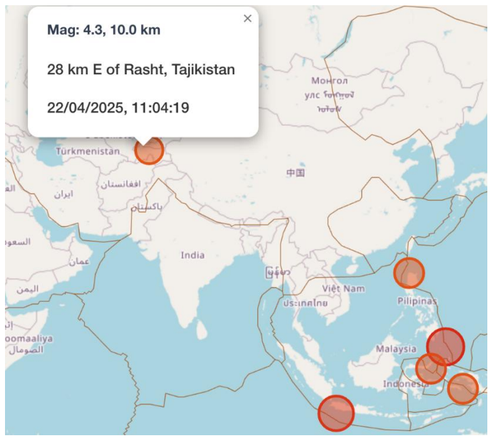
02

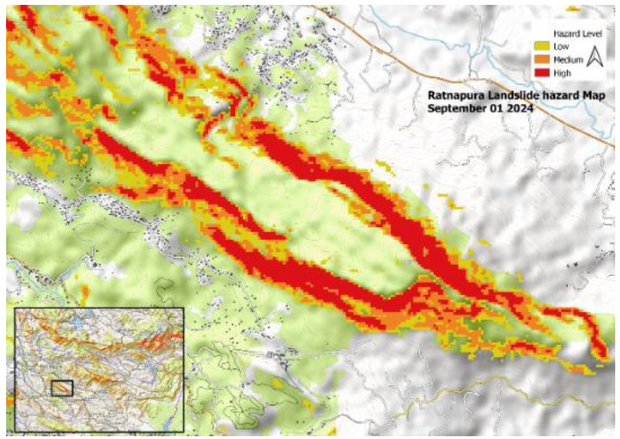
Modelling & Forecasting

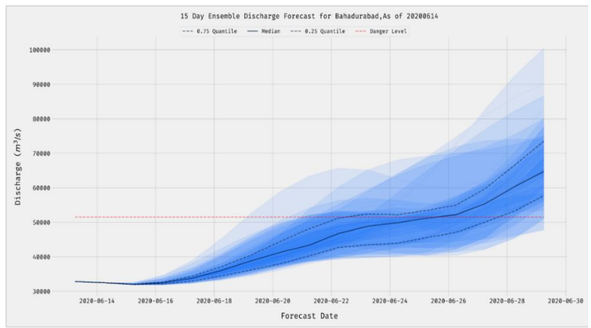












Weather Forecasts

Extreme Event Forecasts

Seasonal Forecasts

Climate Projections

Tsunami Forecast

Ocean Information

Capacity Development

RIMES Services

03

Translating Data Into Actionable Information

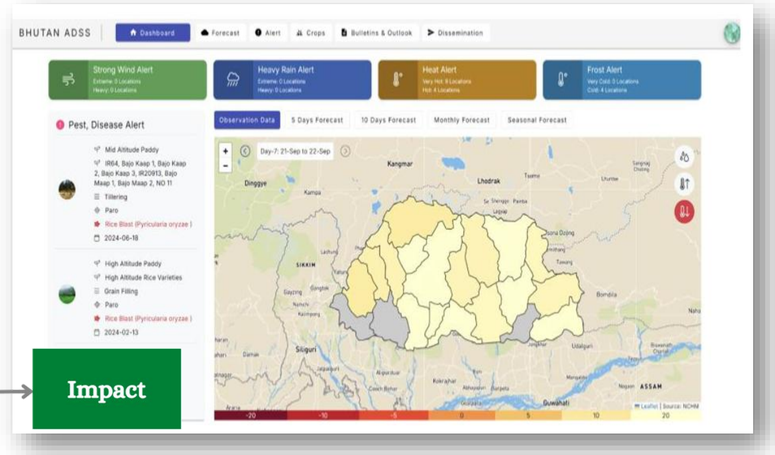
Crop Calender
Road Network
Household Location
Embankment

Exposure

Hazard

Working Age People
Poverty
Shelter
Dependency

Vulnerability



Impact

Co-develop DSS
Operationalize DSS
Tailor Information
Communicate Decision Guidance
Monitoring & Evaluation
Fine-tune DSS


1. Monsoon Forum


2. Baseline Assessment


3. Co-production Workshop


6. Consultation Workshops


5. Focus Group Discussion


4. Technical Working Group

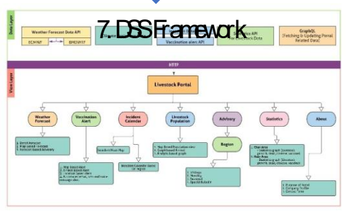
Institutional Mechanisms

- National Forums
- MoU/MoAs
- IRU/SNCCA/BANCCA

RIMES

Decision Support Systems

- Disaster Risk Management
- Agriculture
- Water Resources
- Health
- Livestock
- Planning
- Transport


7. DSS Framework

8. Decision Support System


Capacitating Farmers


Capacitating Extn Workers

RIMES Services

04

Societal Engagement & Feedback

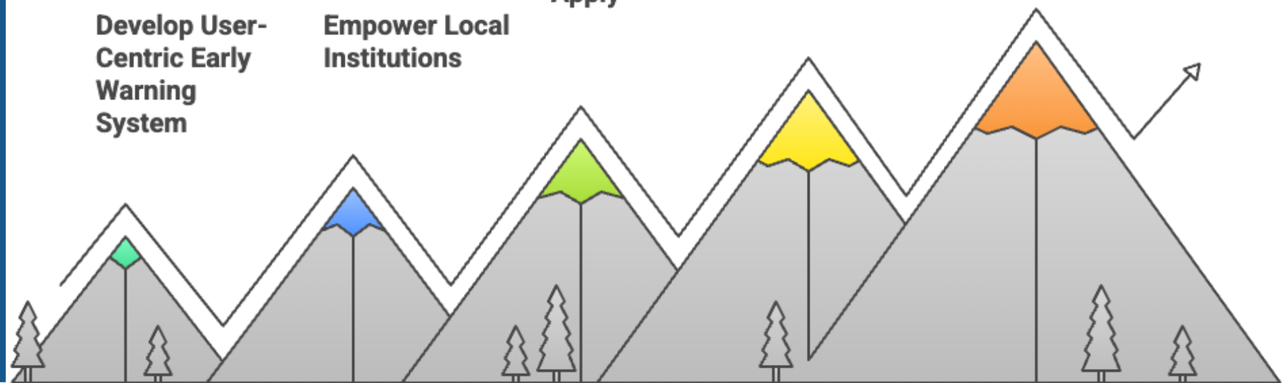
Integrate Feedback into Climate Services

Document Community Feedback

Build Capacity to Interpret and Apply

Empower Local Institutions

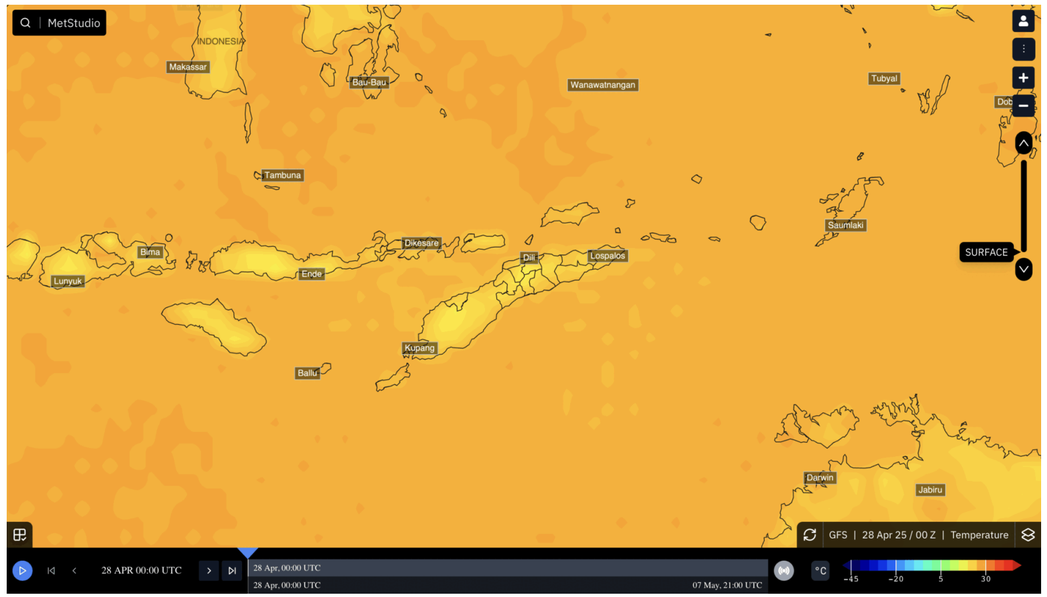
Develop User-Centric Early Warning System

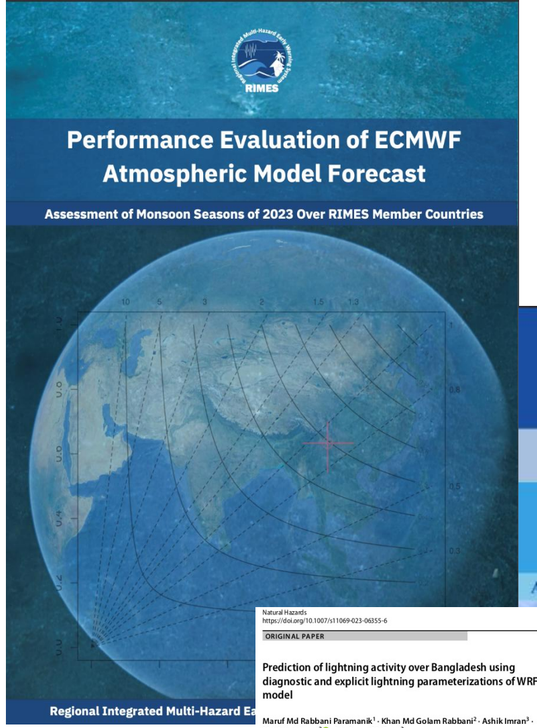


RIMES Services

05

Research & Development






Natural Hazards
https://doi.org/10.1007/s11069-023-06355-6

ORIGINAL PAPER

Prediction of lightning activity over Bangladesh using diagnostic and explicit lightning parameterizations of WRF model

Maruf Md Rabbani Paramanik[1] · Khan Md Golam Rabbani[2] · Ashik Imran[3] · Md Jafrul Islam[3] · Ishtiaque M. Syed[3]

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Abstract
Lightning discharge from thunderstorms is a major weather hazard that leads to substantial loss of lives and properties in Bangladesh, particularly in the pre-monsoon season (March–May) due to frequent lightning activity. In this study, numerical simulations in predicting the lightning flashes using diagnostic and explicit lightning parameterization options in WRF (Weather Research and Forecasting) model are performed for three selected pre-monsoon lightning events (01 April 2019, 26 May 2020 and 20 May 2021) over Bangladesh. Additionally, this study investigates the WRF model sensitivity to five microphysics and three planetary boundary layer schemes. The combination of Morrison and YSU (Yonsei University scheme) is found to be the best configuration by comparing the RMSE (root mean square error) of hourly area averaged rainfall. The lightning flash counts are estimated by using four diagnostic methods based on (1) maximum updraft intensity (w_{max}), (2) 20 dBZ cloud top, (3) level of neutral buoyancy, (4) Lightning Potential Index (LPI) conditioned to cloud hydrometeors and updraft, and (5) an explicit physics-based method from cloud electrification referred to as WRF-Elec. The WWLLN (World Wide Lightning Location Network) and NASA LIS (Lightning Imaging Sensor) observations are used to compare the simulated lightning flashes for the selected events. The study also analyzes 24-h (hour) accumulated rainfall that shows a good consistency with the observations from NASA GPM datasets. An assessment based on Fraction Skill Score (FSS) and performance diagrams is carried out to achieve deeper insights into the performance of model simulation in predicting rainfall. In a qualitative assessment framework, the spatial patterns of lightning flashes derived from WRF-Elec simulations, used for predicting the primary regions of lightning events, exhibit good agreement with observations.

Keywords Lightning parameterization · WWLLN · NASA LIS · PR92 · LPI · WRF-Elec

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Published online: 13 January 2024

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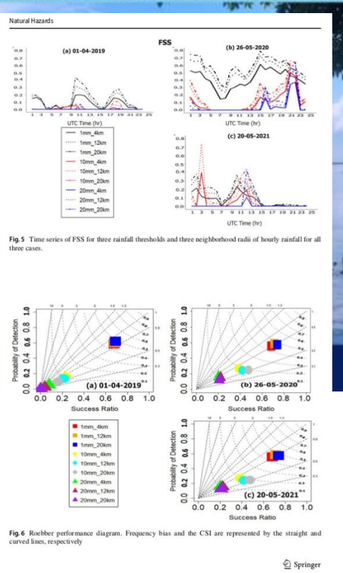
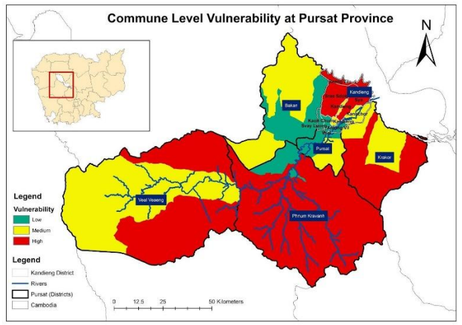
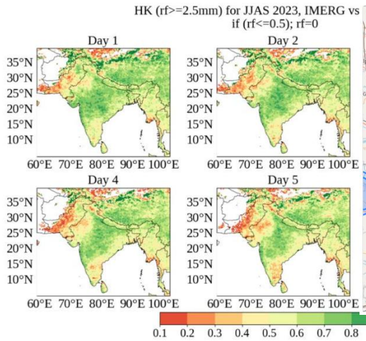

Natural Hazards





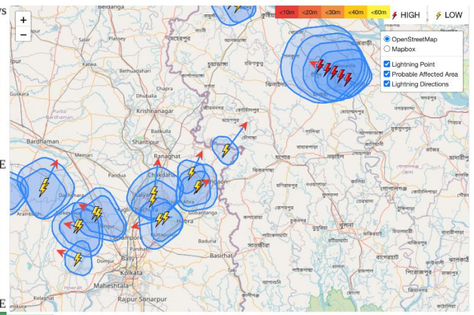


Fig. 5 Time series of FSS for three rainfall thresholds and three neighborhood radii of hourly rainfall for all three cases.

Fig. 6 Roebber performance diagram. Frequency bias and the CSI are represented by the straight and curved lines, respectively

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Technology Development

Accuracy Improvement

Last-Mile Communication

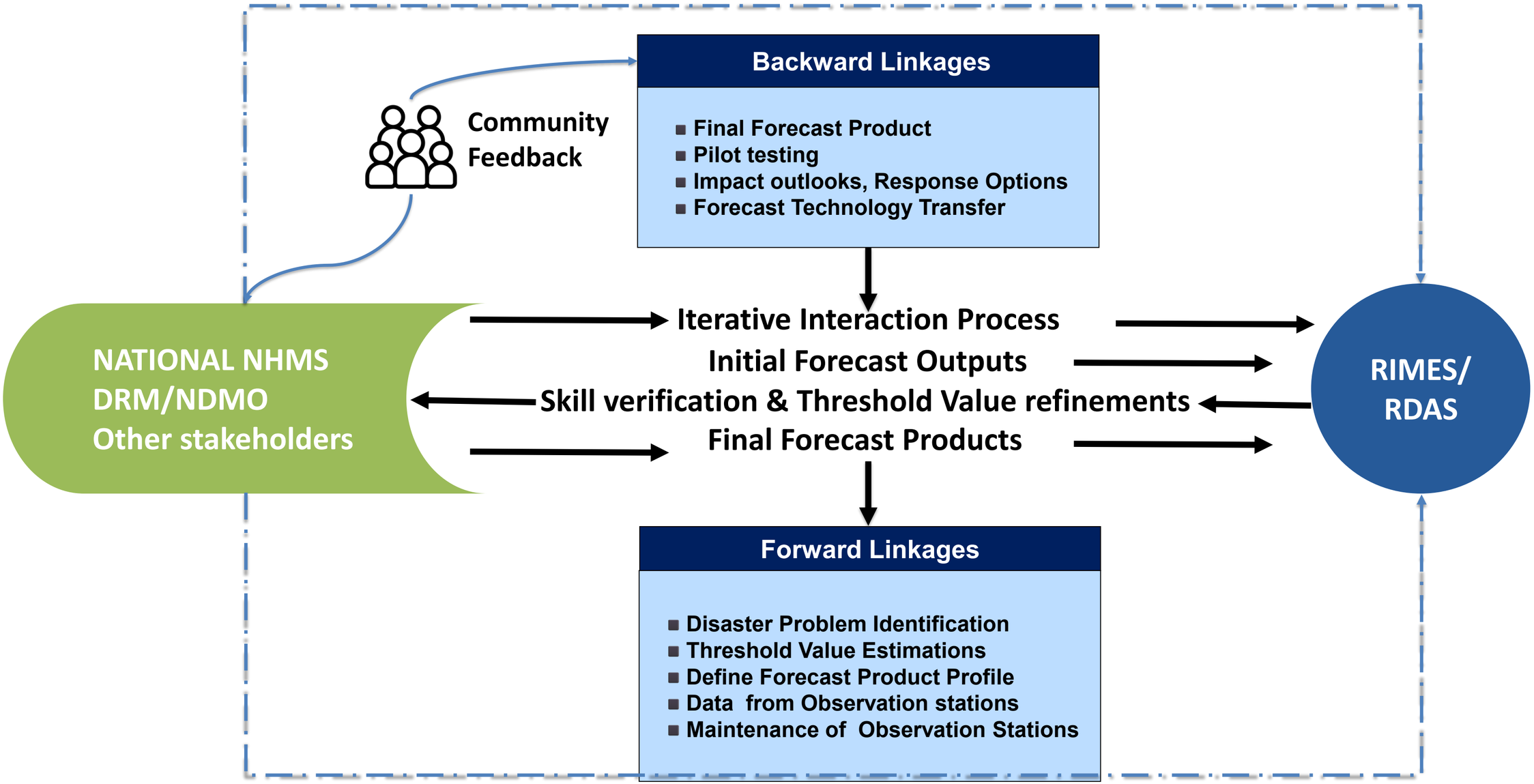
Capacity Building

Value Addition

Continuous Refinement

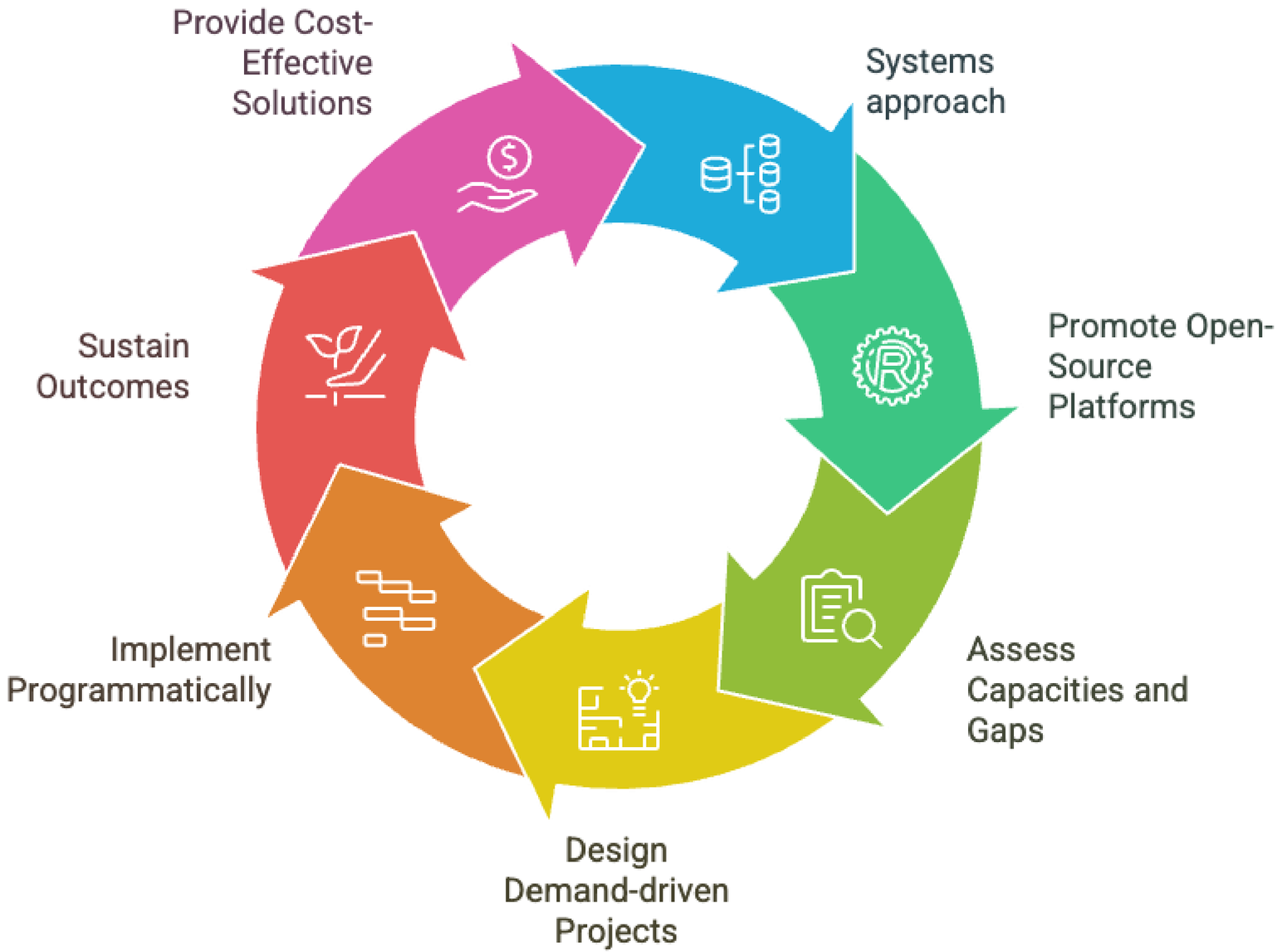
Demand Driven Services

MEMBER STATE and RIMES Interaction



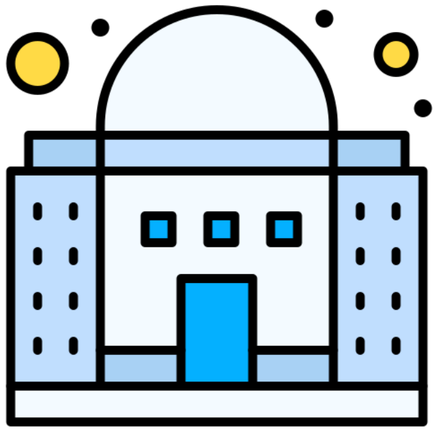
A Co-production Approach

RIMES Programs: Unique Features



Connecting the Dots …

Science



Institutions

Communities

Towards Forewarned, Forearmed and Resilient Communities...

Thank You!