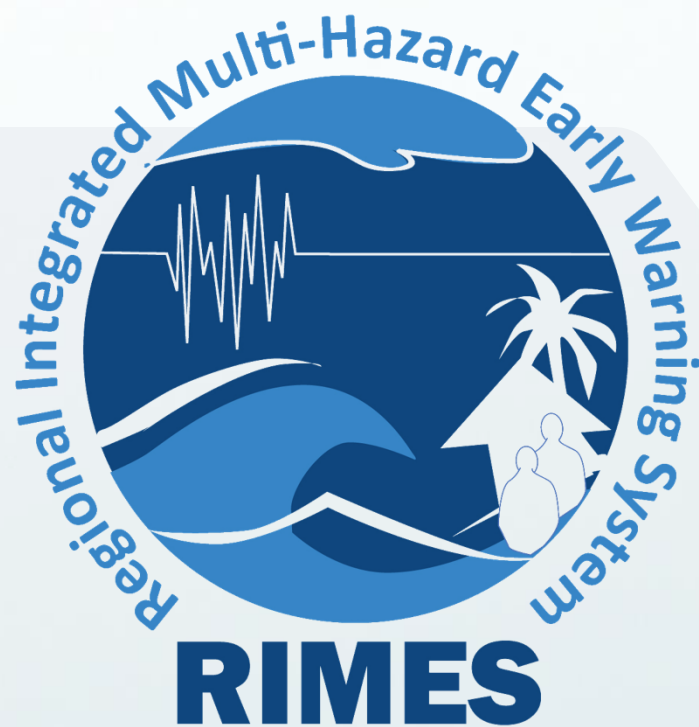


17th RIMES Council Meeting

Colombo, 7 May 2025

RIMES Programs 2009 - 2025



Presented by:
Raihanul Haque Khan



Overview

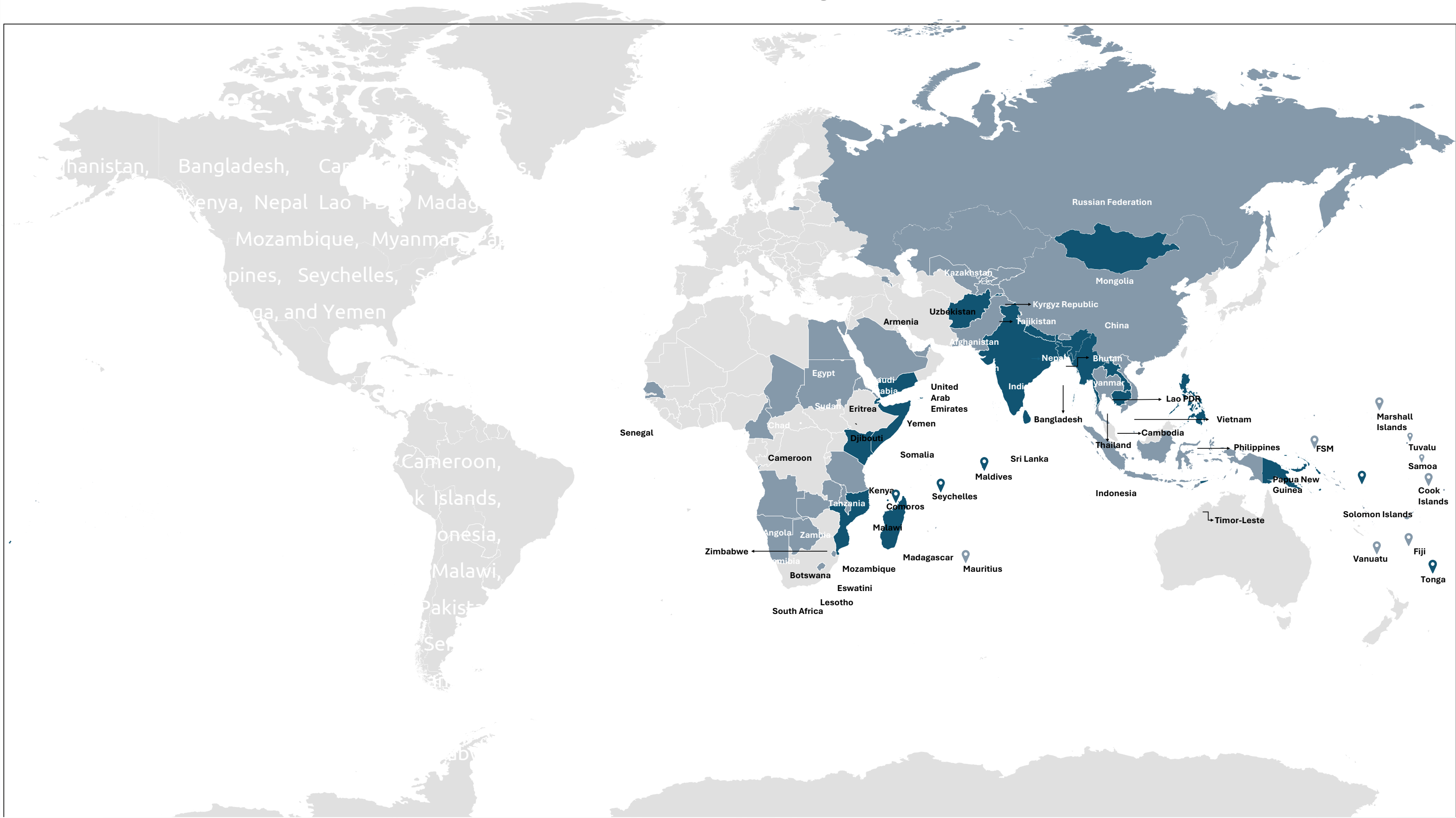
- Established on 30 April 2009 with Signing of RIMES Cooperation Agreement in Male, Maldives
- Founding Members : Comoros, Maldives, and Seychelles
- Registered with the UN under Article 102 of the UN Charter
- Intergovernmental, owned and managed by its Member States



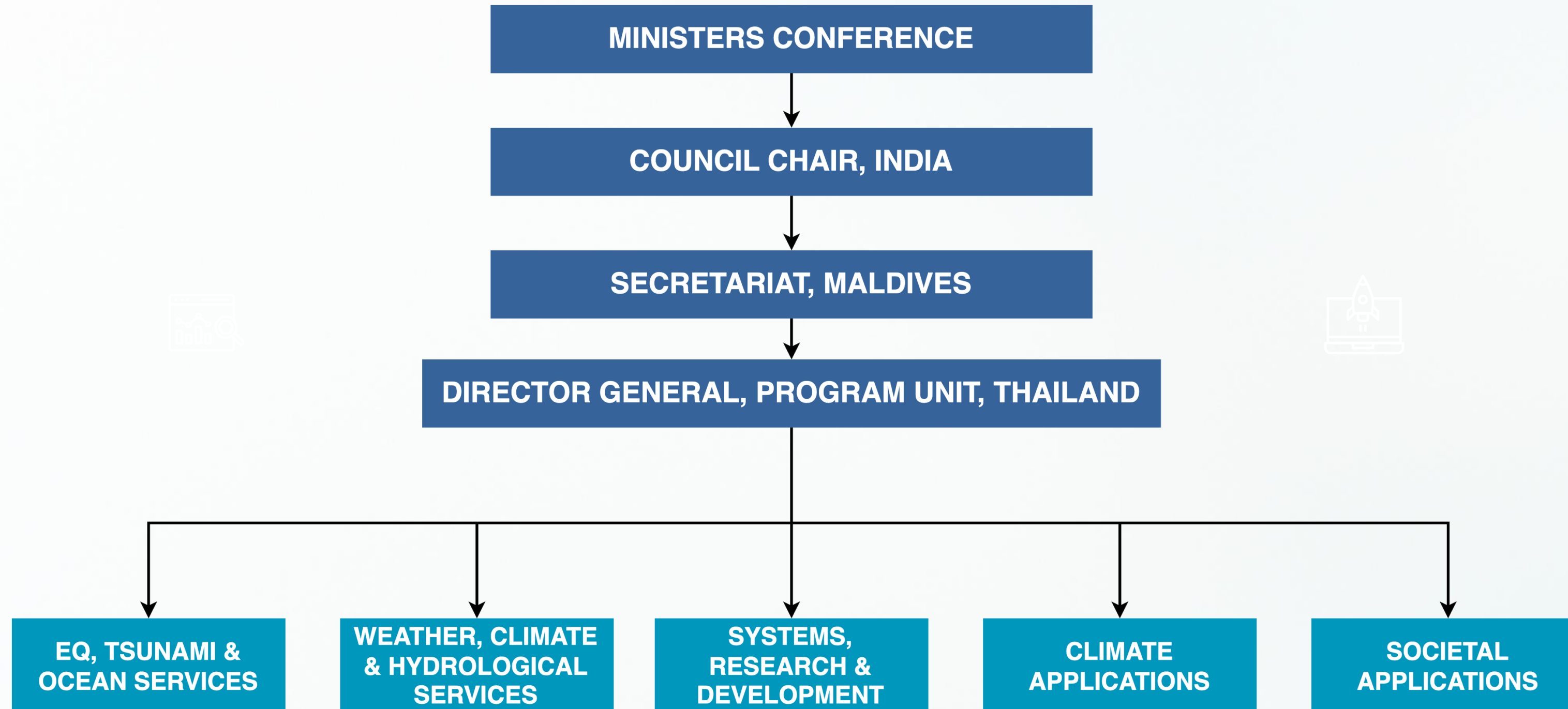
RIMES Member and Collaborating Countries

Member States

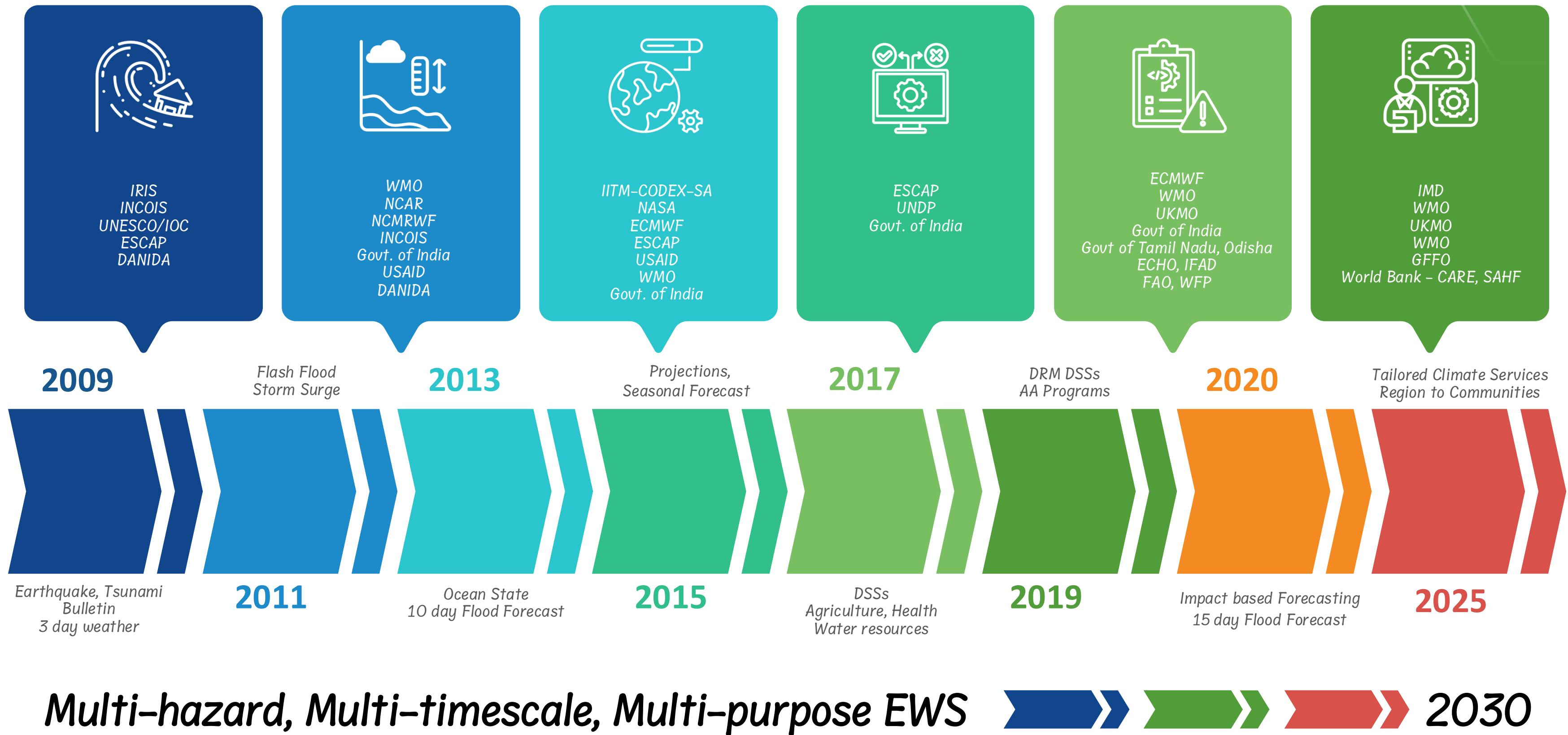
Collaborating Countries



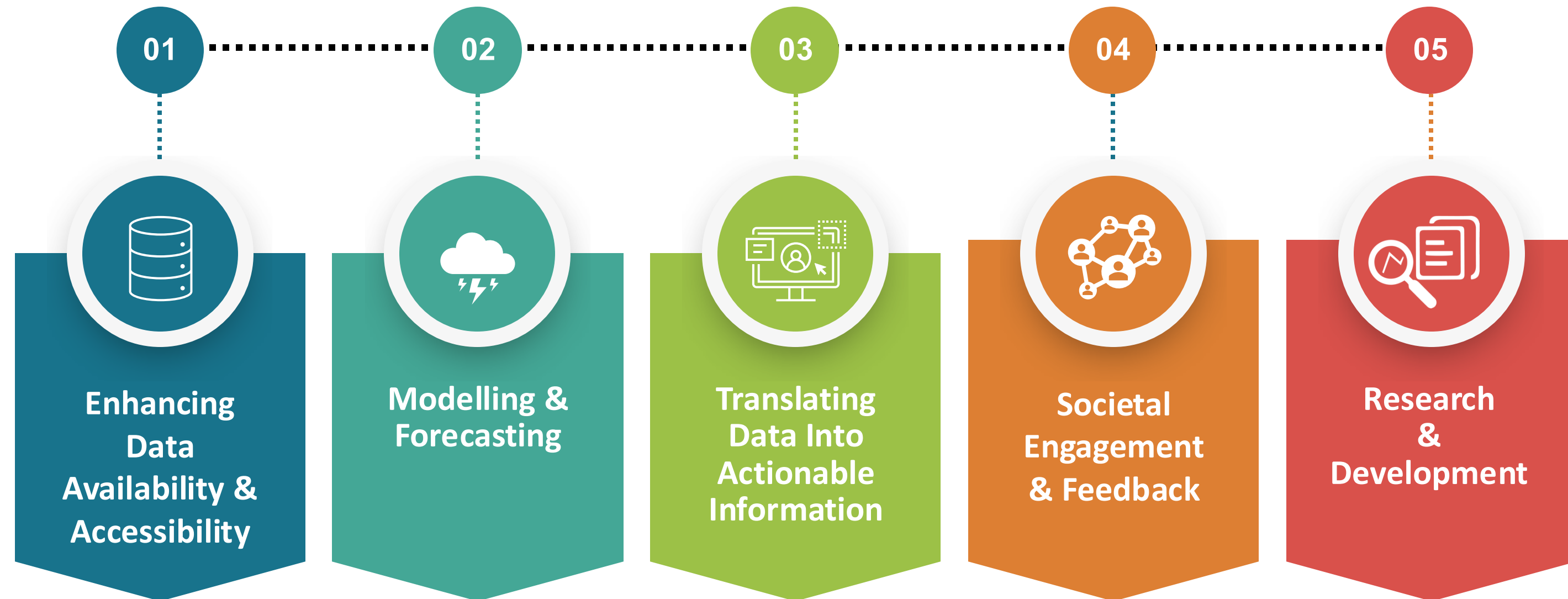
Organizational Structure



RIMES Milestones



RIMES Services



RIMES Services

01



Enhancing
Data
Availability &
Accessibility



Seismic



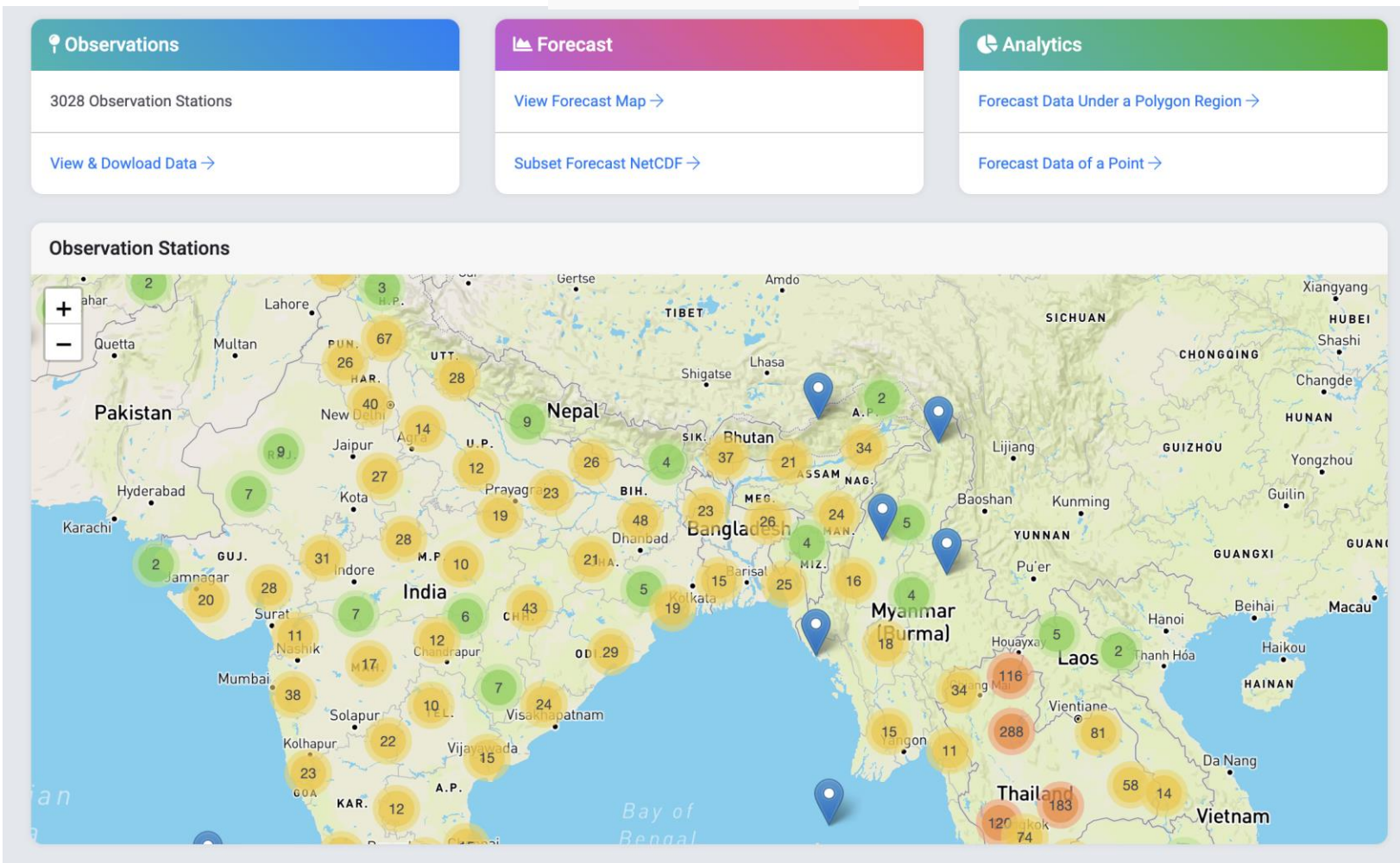
Oceanic



Hydrological



Meteorological

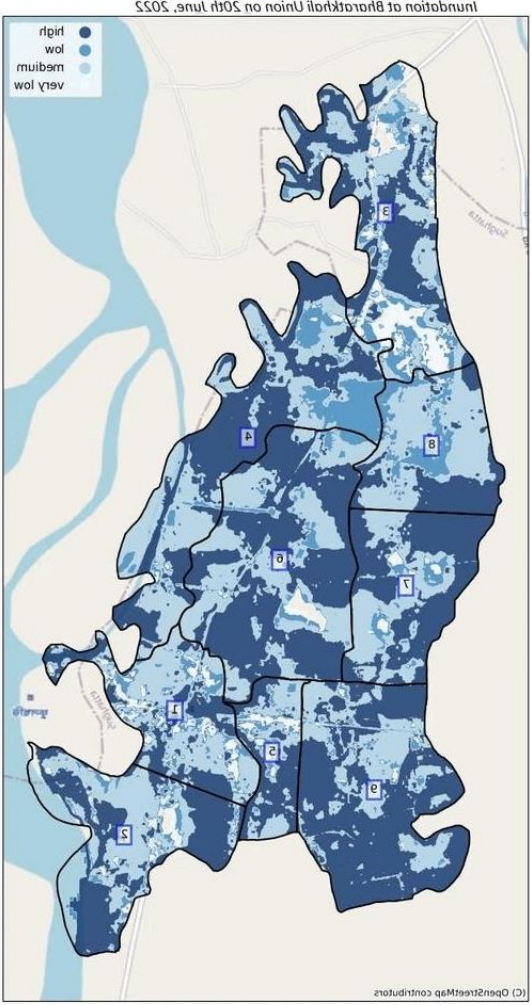
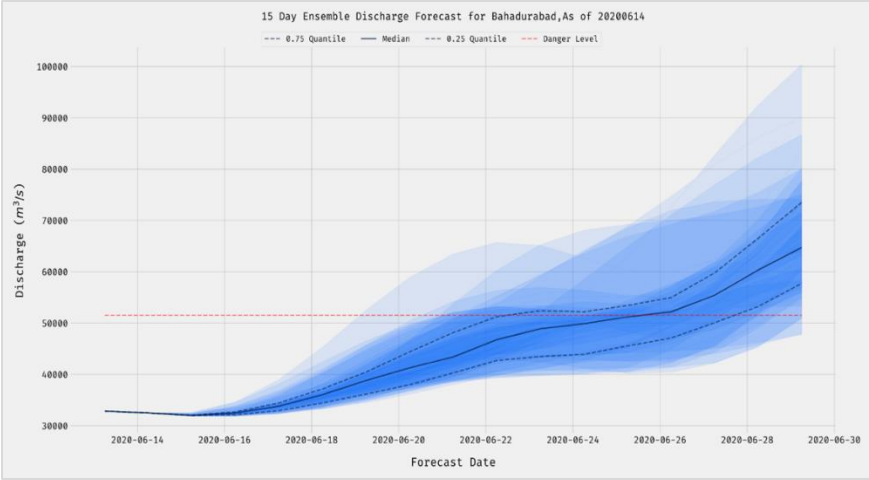
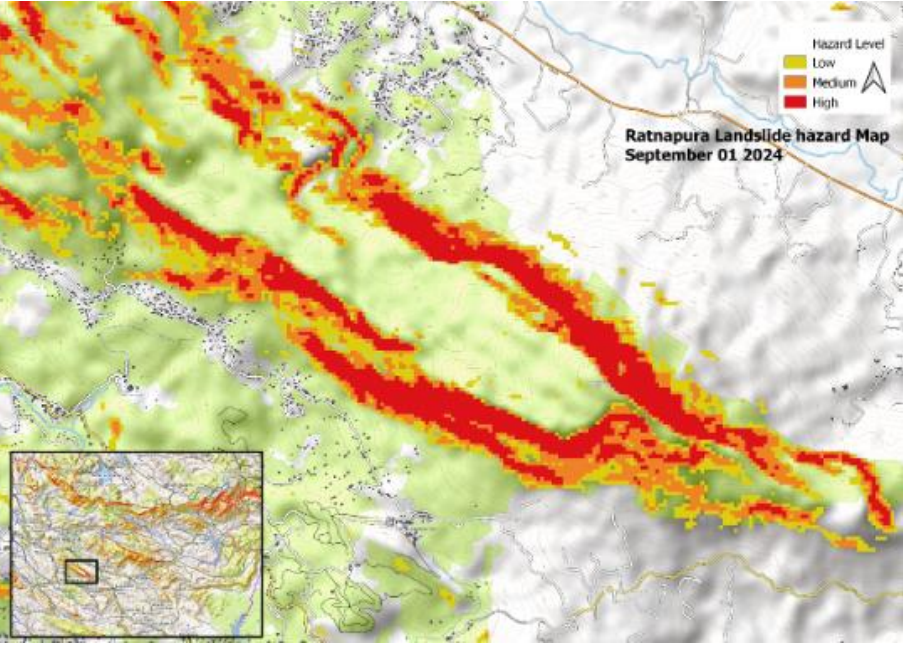
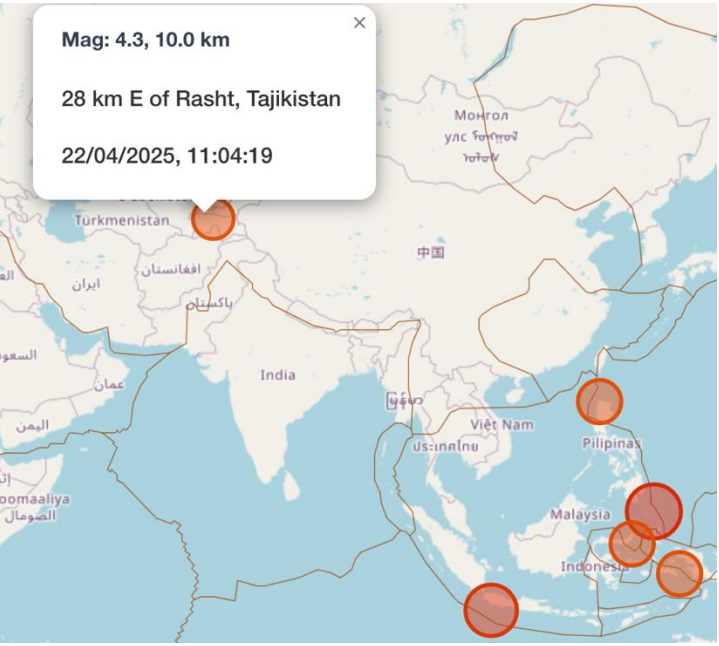
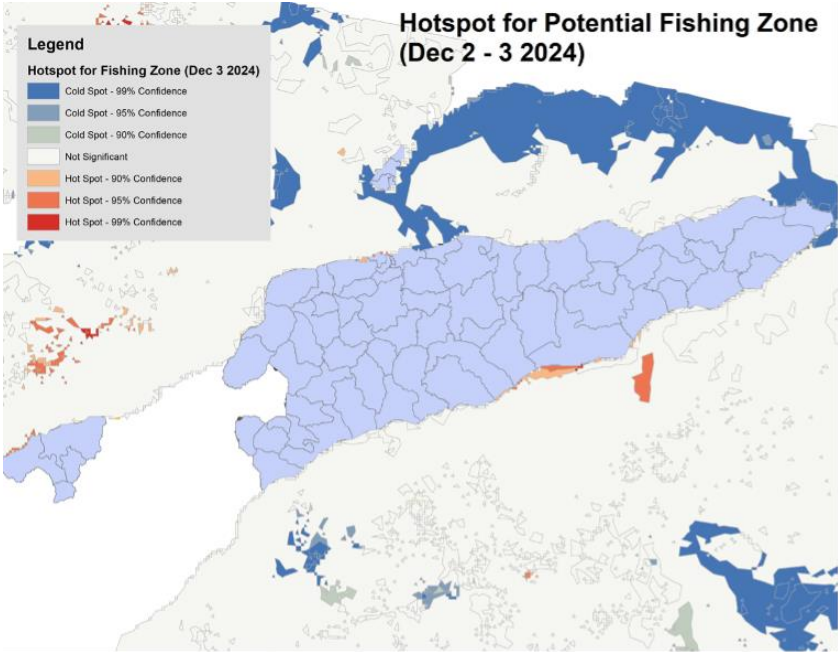
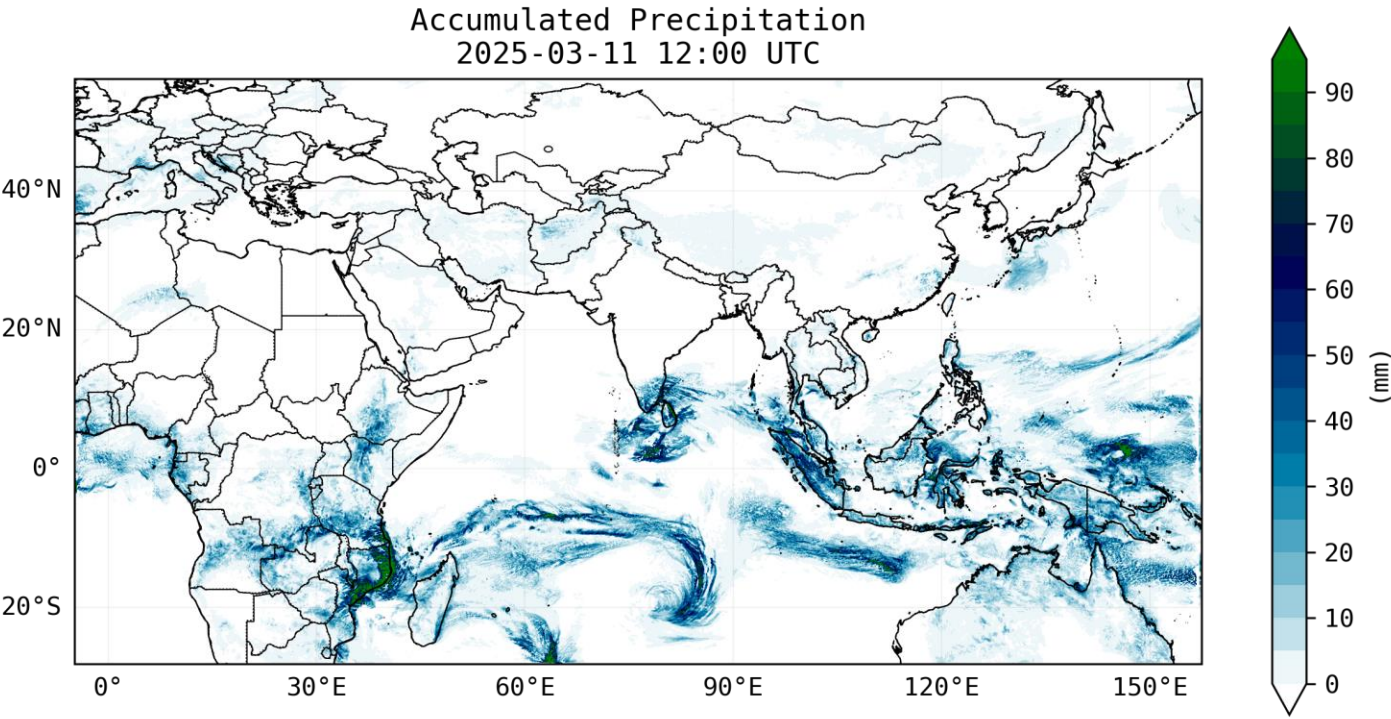


RIMES Services

02



Modelling & Forecasting



Weather
Forecasts



Extreme Event
Forecasts



Seasonal
Forecasts



Climate
Projections



Tsunami
Forecast



Ocean
Information



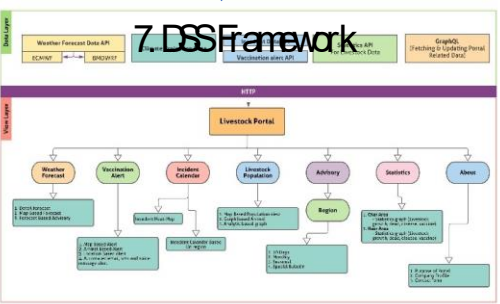
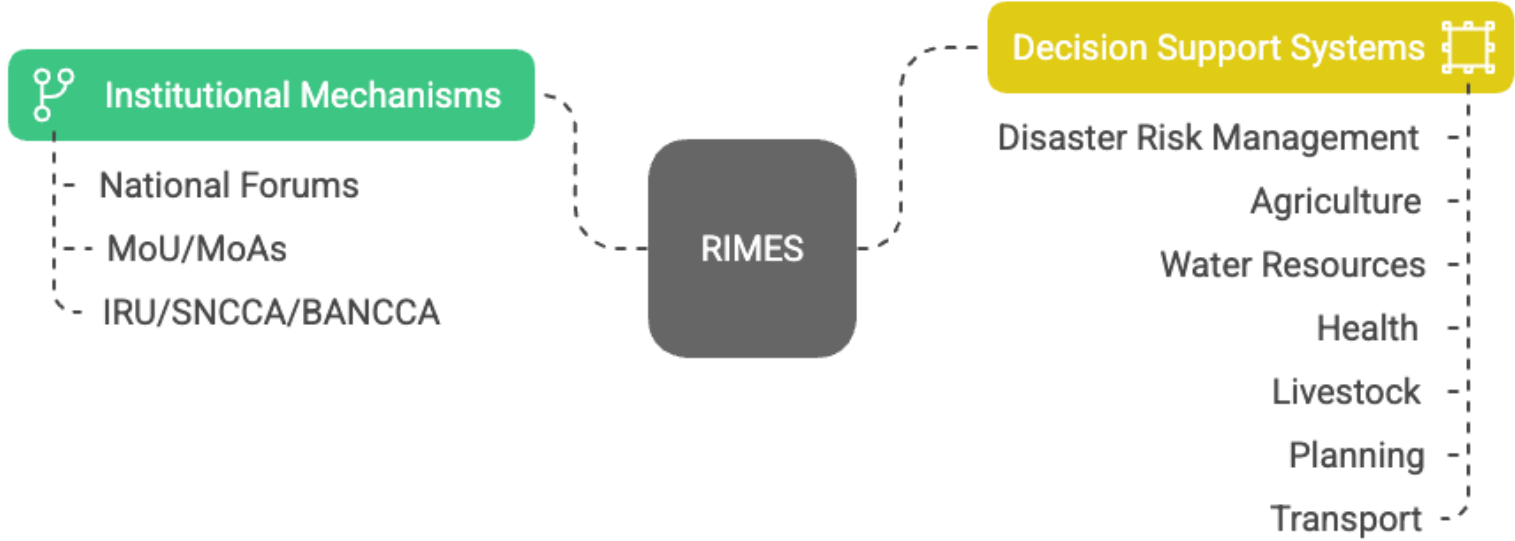
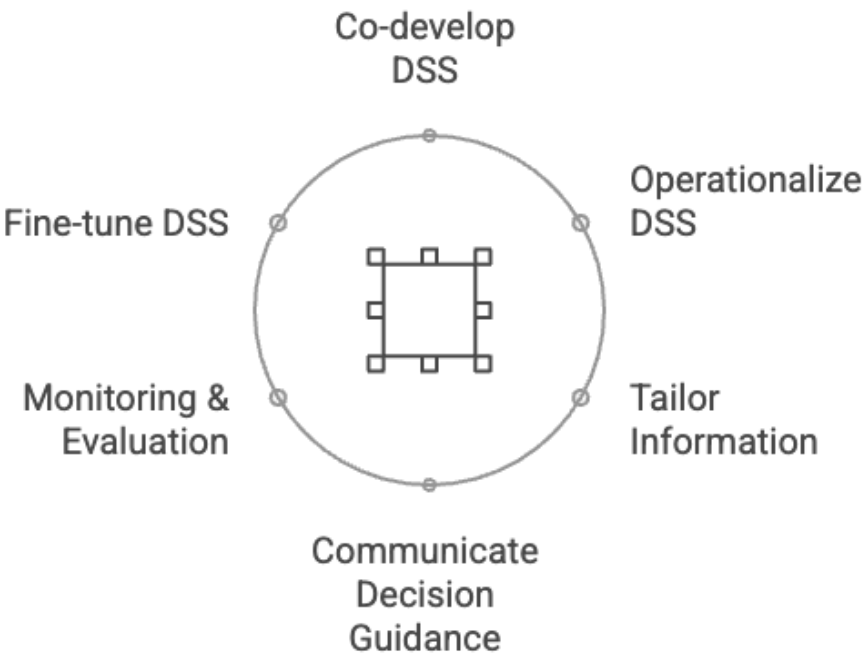
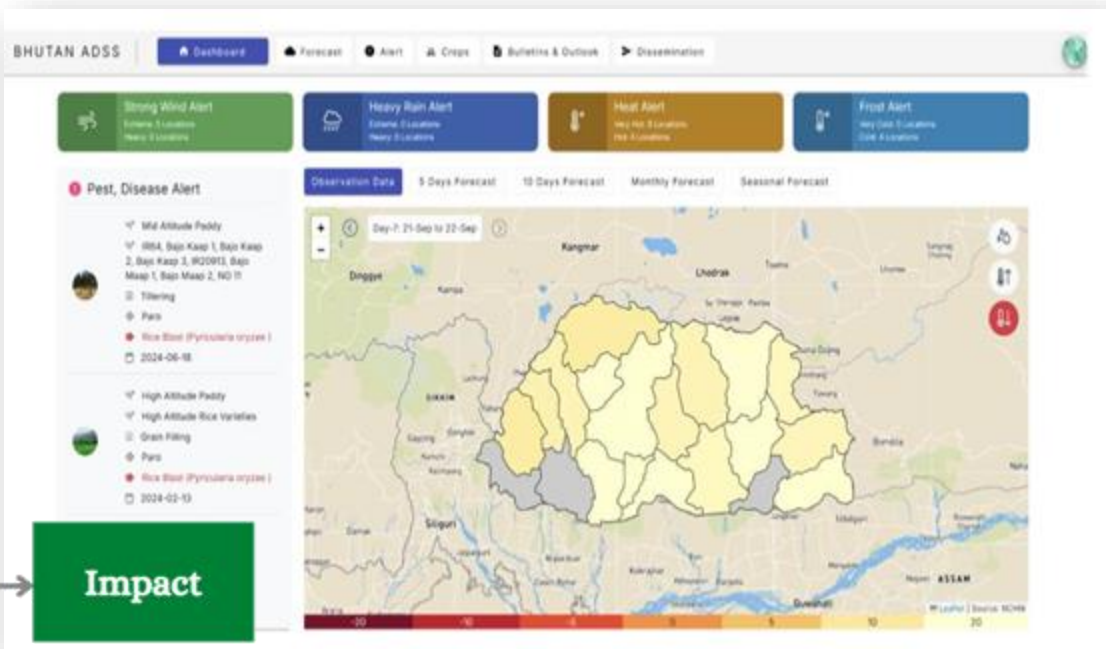
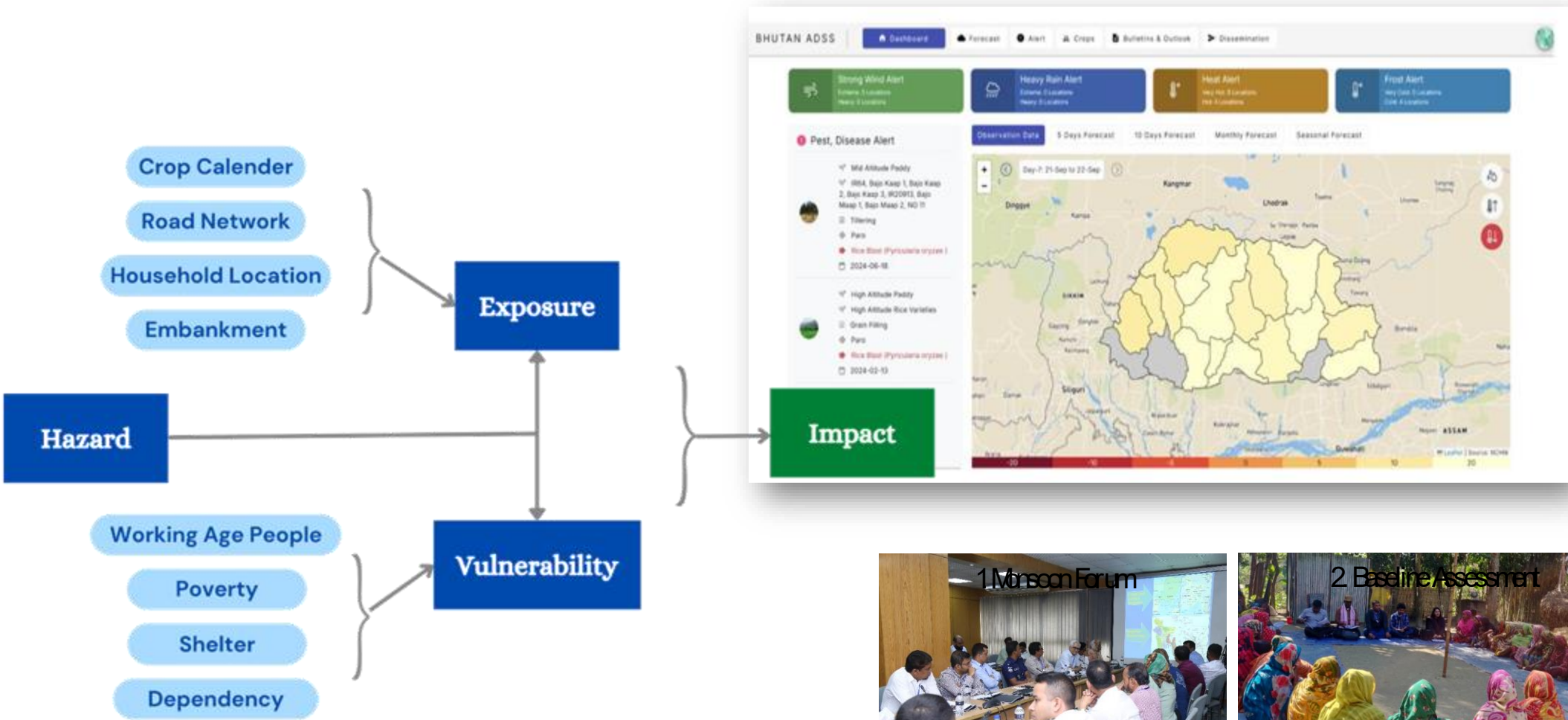
Capacity
Development



RIMES Services

03

Translating Data Into Actionable Information



RIMES Services

04



Societal
Engagement
& Feedback



Develop User-
Centric Early
Warning
System



Empower Local
Institutions



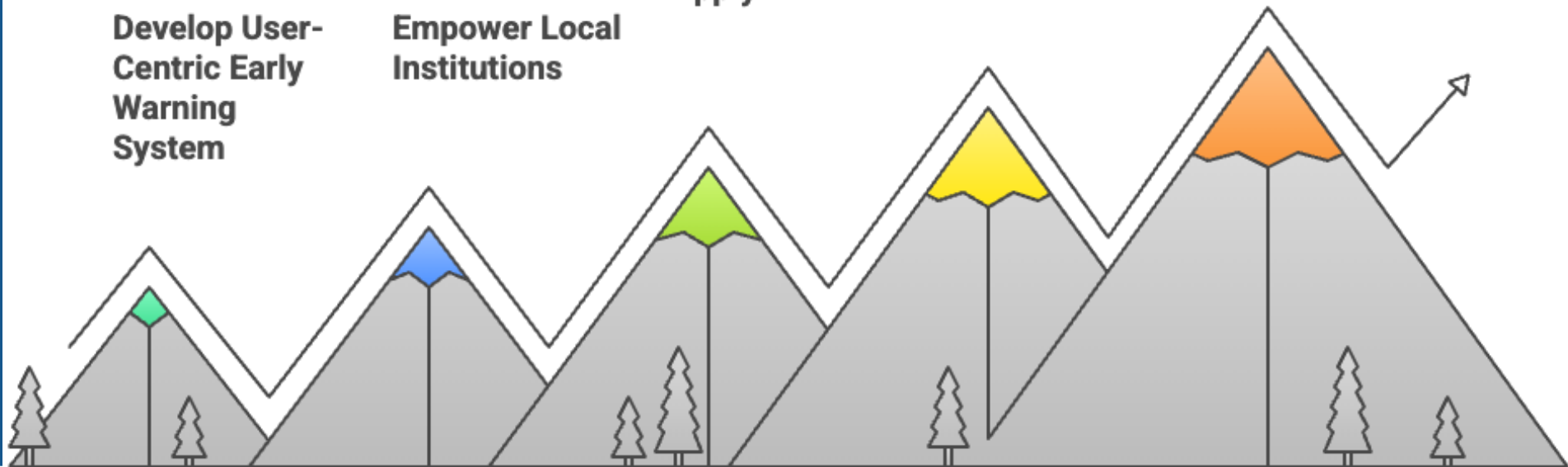
Build Capacity
to Interpret and
Apply



Document
Community
Feedback



Integrate
Feedback into
Climate
Services

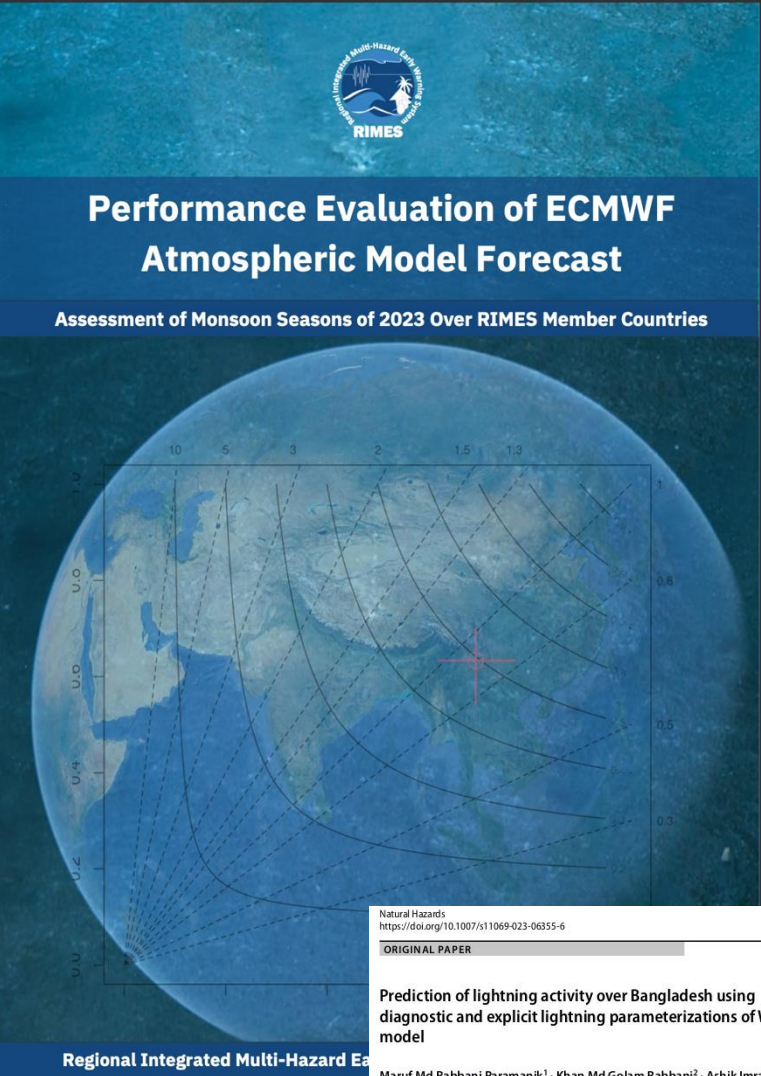
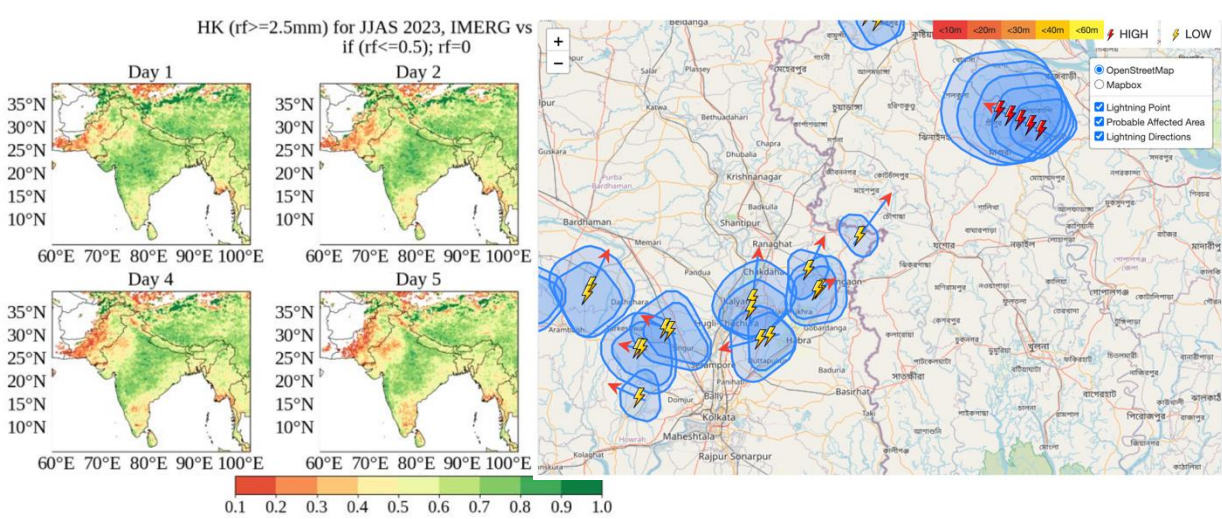
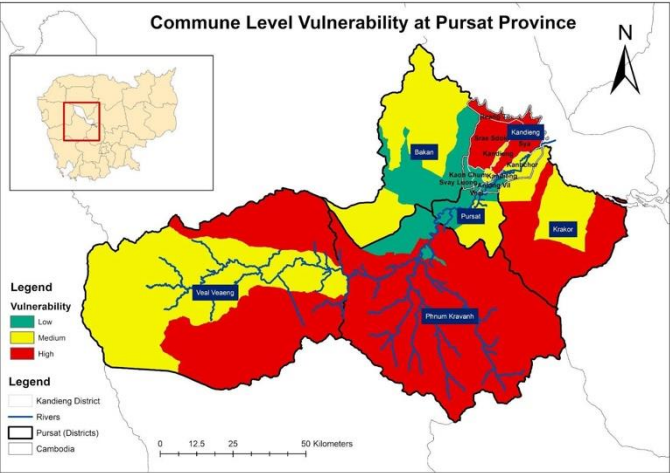
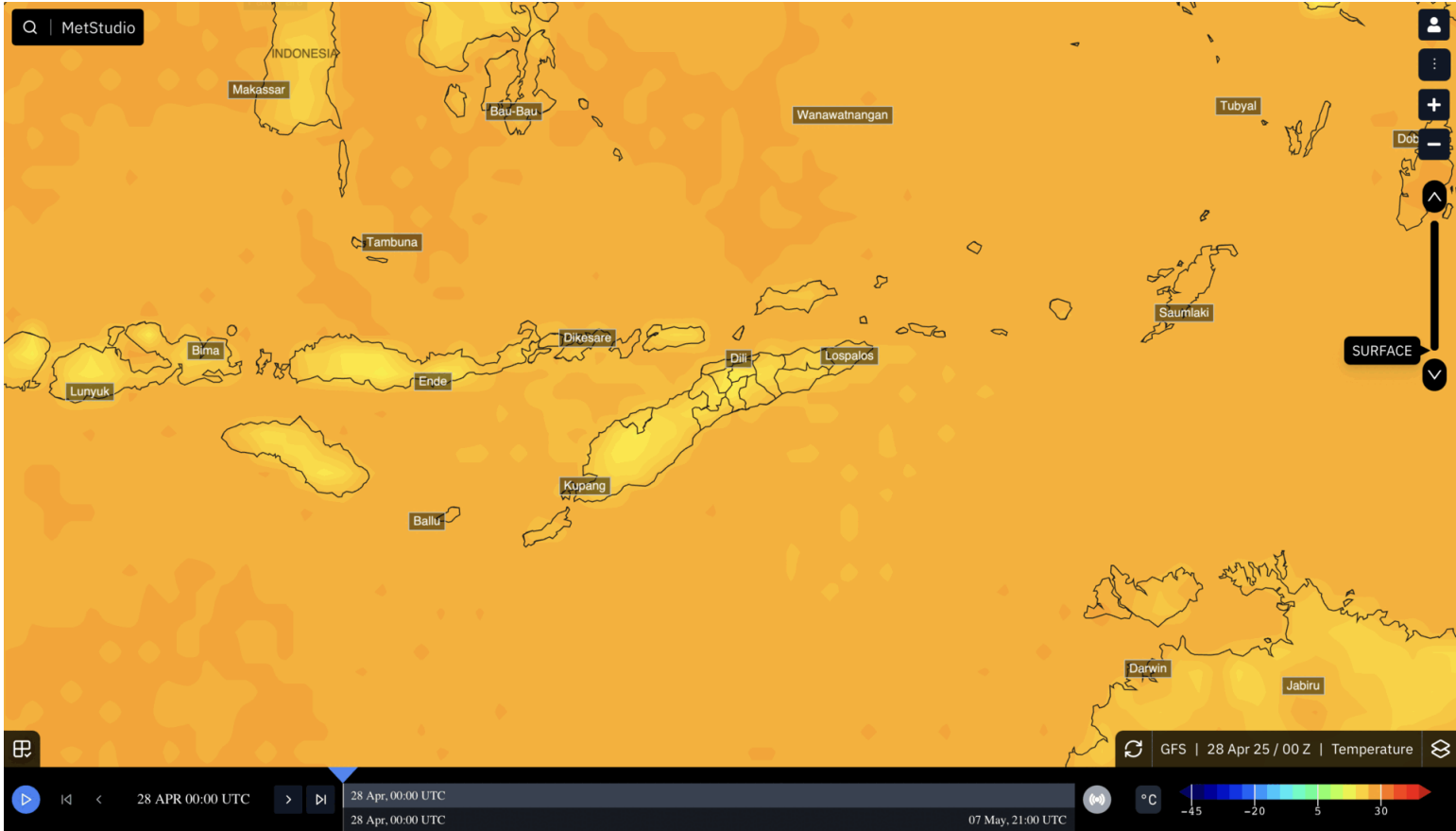


RIMES Services

05



Research & Development



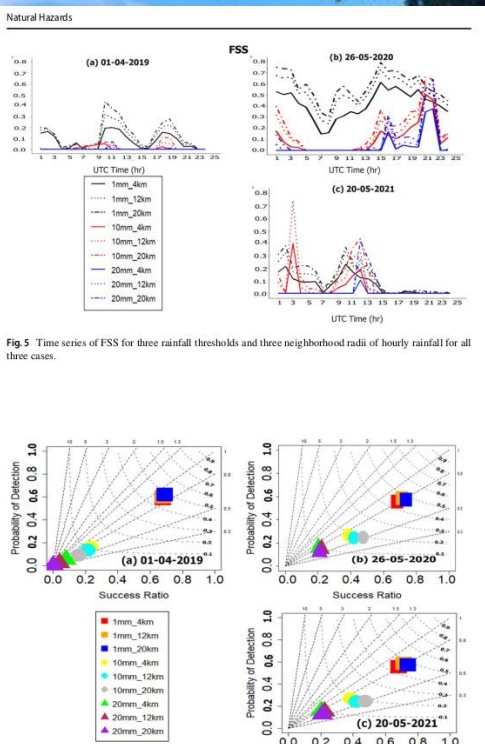
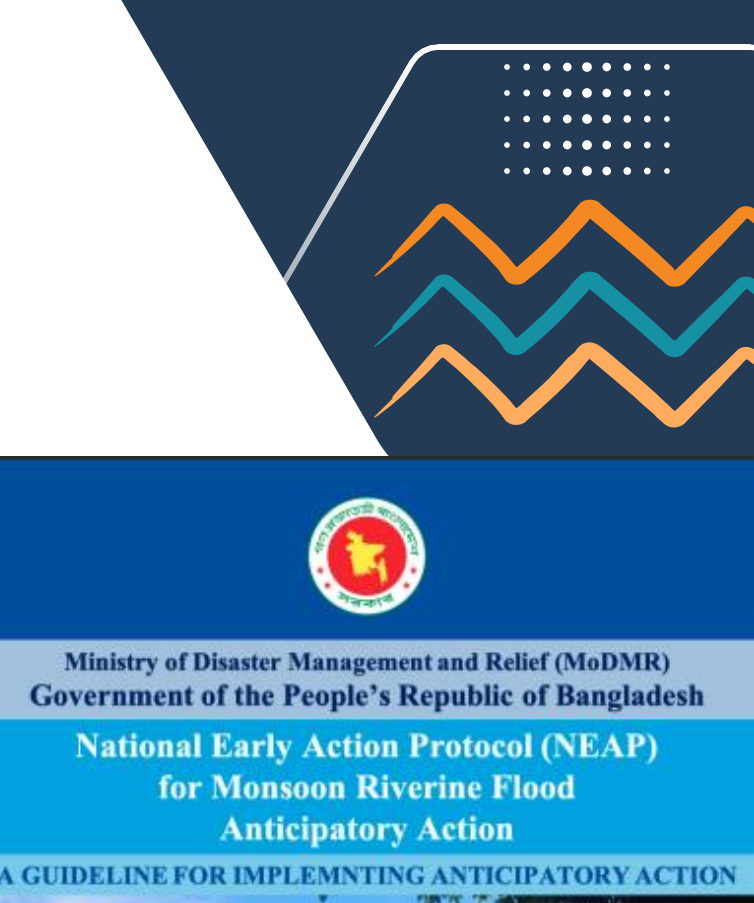
Prediction of lightning activity over Bangladesh using diagnostic and explicit lightning parameterizations of WRF model

Maruf Md Rabbani Paramanik¹ · Khan Md Golam Rabbani² · Ashik Imran³ · Md Jafrul Islam³ · Ishtiaque M. Syed³

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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




Technology Development



Accuracy Improvement


Last-Mile Communication

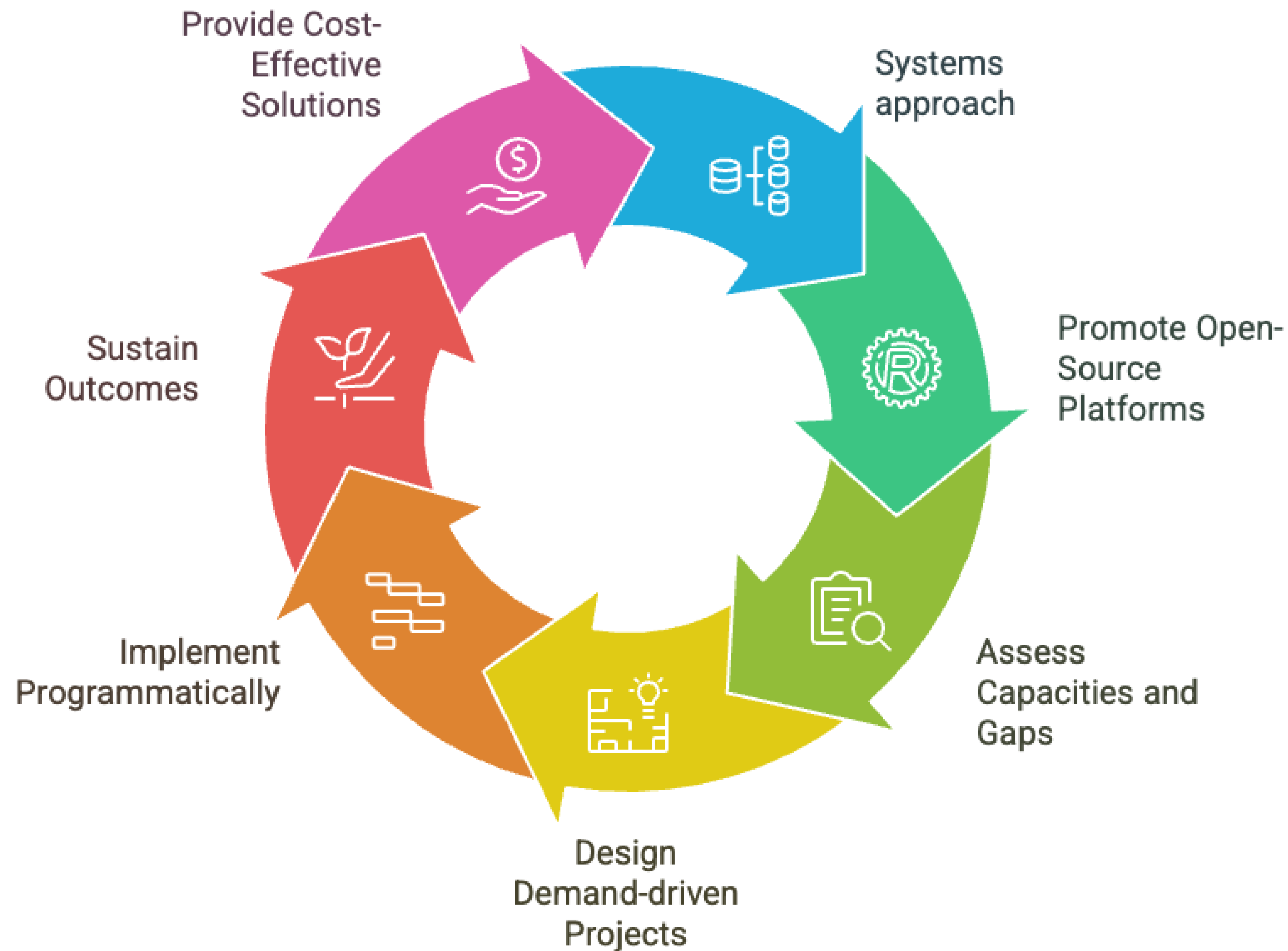

Capacity Building


Value Addition


Continuous Refinement


Demand Driven Services

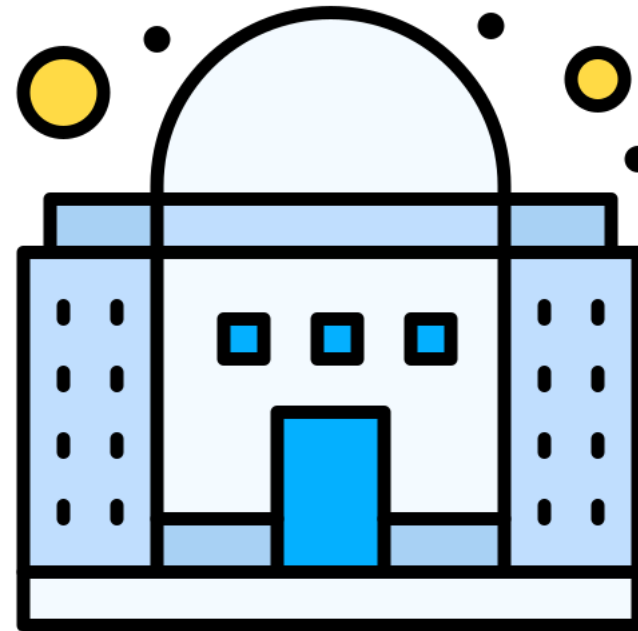
RIMES Programs: Unique Features



Connecting the Dots ...



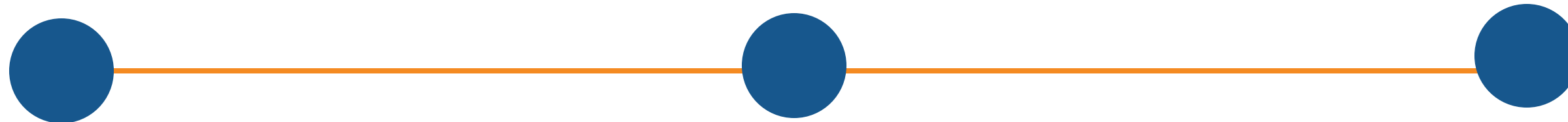
Science



Institutions



Communities



Towards Forewarned, Forearmed and Resilient Communities...



Thank You!