



DISASTER RISK REDUCTION & *Community Resilience*



UNESCO Chair on
Experiential Learning
for Sustainable Innovation
& Development
Amrita Vishwa Vidyapeetham
Kerala, India



UNESCO Chair on
Gender Equality and
Women Empowerment
Amrita Vishwa Vidyapeetham
Kerala, India





Compassion-Driven Pathways for Disaster Risk Reduction

Amrita's disaster risk management approach is grounded in applied research and driven by a strong social conscience to address the complex challenges of pre-disaster, disaster, and post-disaster scenarios. Through innovative thinking, integrated multidisciplinary research, and active engagement with vulnerable communities, our researchers develop real-world solutions that protect lives, livelihoods, and ecosystems across India and beyond.

3 Times

World Center of Excellence(IPL)

19⁺

Years of Landslide Research

1 Million⁺

Beneficiaries Impacted

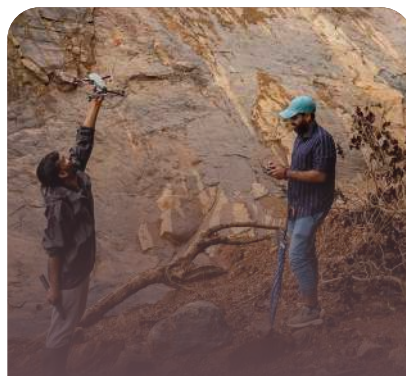
300⁺

Sensors Deployed in Western Ghats & Himalayas



Education for Life

Compassion-driven education that builds enduring values and inner strength of character.



Compassion-Driven Research

Scientific excellence directed toward serving the most vulnerable strata of society.



Global Impact

Bridging East and West through meaningful collaborations with world-class institutions.



Chancellor's Vision

"Recently, we have witnessed so many natural calamities and alarming changes in the global climate, including rapidly increasing global warming. These are challenging the further survival of this beautiful earth we live in. We should take into consideration how much we have been able to use research to serve the lowest and most vulnerable strata of society. In our approach to sustainable development, we should not forget that it is by strengthening the people at the base of the pyramid that the entire edifice of society becomes healthy and strong."

"If we could transform compassion from a mere word into a path of action, we would be able to solve 90 percent of the world's humanitarian problems."

- Mata Amritanandamayi Devi
Chancellor, Amrita Vishwa Vidyapeetham

Two decades of compassion-driven multi-hazard research.

2012



National Recognition & Policy Impact

- Parliamentary appreciation for landslide research
- NABARD Award for Rural Innovations (2012)
- Validation of scientific, technological, and societal impact
- Nationally acknowledged model for landslide risk reduction

2009



First Early Warning Issued

- Operationalization of early warning system
- Second major project granted by the Department of Information Technology, Government of India
- Data-driven risk alerts initiated
- Research output into life-saving public safety mechanisms

2008



India's First IoT-Based Field Laboratory

- 150+ sensors installed
- Real-time data transmission system established
- Field-scale monitoring integrated with simulation insights
- From research into real-world monitoring applications

2007



India's First Landslide Simulation Lab

- Large test bed (8-ton capacity, multi-trigger controlled)
- Smaller test bed (2-ton capacity, multi-trigger controlled)
- Enabled controlled simulation of landslide dynamics

2006



Institutional Project Initiation

- Formally launched through EU funding
- First Indian institution to receive EU support under the WINSOC Project
- Foundation laid for structured landslide research

2005



Triggering Event: Landslides in Munnar

- 13 lives were lost
- Recurring evacuation during every monsoon
- Persistent fear and vulnerability
- Urgent need for scientific intervention



World's First AI & IoT Based Landslide Early Warning System

Operational Since 2018



India's First Landslide Laboratory

Established in 2008



India's Pioneer in Landslide Early Warning

2 Decades of 24/7 Monitoring

Early Warnings Issued

2009 2011 2013 2018 2019 2020 2021 2022 2023 2024 2025



World Center of Excellence

World Centre of Excellence on Landslide Risk Reduction (WCoE) for the 3rd time in a row by the International Programme on Landslides (IPL)



IPL-KLC Award for Success

Won the prestigious International Program on Landslides, Kyoto Landslide Consortium (IPL-KLC) Award for Success in recognition of landslide research



Averted Disaster Award

Winner of the 2023 ADA award for outstanding Disaster Risk Management (DRM) intervention



NABARD Award 2012

Award for Rural Innovations in the academic and research category by India's apex development financial institution

MAJOR RESEARCH FOCUS AREAS



Landslide Early Warning Systems

AI-IoT systems detecting and forecasting landslides 3–24 hrs ahead.



Flood Monitoring & Mitigation

Hydrological modelling, EWS, and crowd-sourced flood mapping.



GLOF-Induced Hazards

Site investigations of Sikkim, Chamoli & glacier-lake outbursts.



Earthquake Studies & Resilient Structures

Damage-limiting buildings with replaceable energy dissipators.



Drought Management

Climate-responsive crop systems and supplemental irrigation.



Wetland Management

Mangrove mapping, carbon stock and methane flux modelling.



Multi-Hazard Monitoring & Early Warning

Mangrove mapping, carbon stock and methane flux modelling



Carbon Sequestration

Sentinel-based estimation of CO and CH₄ in tropical estuaries.



Disaster Risk Reduction

Frameworks linking science, policy, and community resilience.



Tsunami & OceanNet Observatory

INCOIS-linked Tsunami Ready and IoT-enabled marine internet.



Ecological Assessments

Coastal morphology, sand-mining impact, biodiversity surveys.



Climate Adaptation

Co-designed solutions for smallholder farmers & rural India.

AI-Integrated IoT System for Detection & Early Warning of Landslides

What began as a research prototype - funded by the European Commission under FP6 as the world's first wireless sensor network for landslide detection - became a real-world lifeline through the compassionate vision of Amrita's Chancellor, Sri Mata Amritanandamayi Devi (Amma). She redefined the project's trajectory, ensuring deployment beyond the lab to actively protect vulnerable communities.

First deployed in Munnar (Idukki, Kerala) in 2009 — a region where 14% of the territory is landslide-prone — the system has issued advanced warnings every monsoon since. From 2018, a second deployment in the Sikkim–Darjeeling Himalayas (co-funded by the Ministry of Earth Sciences and the Sikkim SDMA) has expanded coverage to over 300 sensors monitoring deep-earth, hydrological and meteorological parameters in real time.

Active Deployment Sites

- Western Ghats (Since 2009)
- North-East Himalayas (Since 2018)
- Karnataka - Kodagu (MoU 2023)
- Odisha - Gajapati (MoU 2024)



5,000⁺

Lives Impacted
in Western Ghats
& Himalayan
deployments

33m⁺

Depth
Multi-layer
heterogeneous
sensing

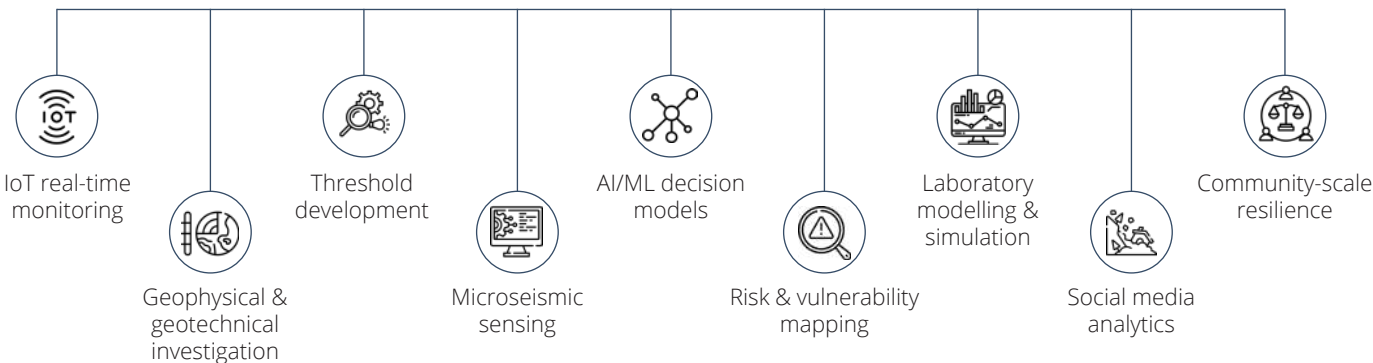
Upto 24h

Ahead-Forecast
AI/ML enabled
nowcast &
forecast

300⁺

Sensors
Continuous
real-time
monitoring

INTEGRATED RESEARCH STREAMS



LANDSLIDE RESEARCH IN DEPTH

From microseismic sensing to India's first landslide simulation laboratory.



INDIA'S FIRST MEDIUM & LARGE-SCALE FACILITY.

Movement-Based Landslide Laboratory

- 4.6 m × 2.6 m × 2 m test bed; up to 24 t of soil at depths of 4 ft.
- Variable slope angle from 0° to 45° with adjustable triggers.
- Rainfall simulator with accurate raindrop-size distribution.
- Seepage simulator covering varied infiltration rates.
- Coupled 8-ton and 2-ton multi-trigger test beds for comparative studies



Sensing & Communication System

Multi-Layer Heterogeneous Sensing

More than 33 m of subsurface coverage capturing rainfall, moisture, pore pressure, microseismic and movement signatures

Context-Energy-Aware Edge Nodes

Self-managing edge devices balance compute, communication and battery life across remote, harsh terrain.

Real-Time Fault-Tolerant Communications

Adaptive software architecture maintains continuous data flow during link failures, monsoons and power events.



Ai/ML-Enabled Decision Support: Nowcast & 24-Hr Forecast

Site-specific and regional rainfall thresholds combine with multi-parameter AI models to deliver nowcast reliability when real-time feeds are interrupted, and to extend the warning horizon up to 24 hours ahead — giving communities and authorities critical preparation time before extreme events.

IoT-Driven Microseismic Sensing

Distributed microseismic IoT system detects subsurface movement signatures, enabling early identification of slope-failure precursors. Indukala et al., IEEE Access, 2024.

Geophysical & Geotechnical Investigation

ERT, SRT, GPR, LiDAR & photogrammetric drones, ADCP, DGPS and spectroradiometers feed multi-modal models calibrated against laboratory analyses.

Citizen Science & Tracker App

Multi-level Landslide Tracker App + Amrita Kripa enable spatio-temporal crowd-sourced reporting that complements sensor data and boosts community resilience.

Dynamic Regional Early-Warning Platform

Powered by • Artificial Intelligence • Social Data Mining • GeoInformatics • Satellite Products

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10 Vulnerable Regions Targeted by Amrita Kavach

Sikkim	Arunachal Pradesh	Assam	Meghalaya	Himachal Pradesh
Uttarakhand	Karnataka	Kerala	Andhra Pradesh	Tamil Nadu Hills

LANDSLIP — Indo-UK-Italy Consortium

LANDSLIP — Landslide Multi-Hazard Risk Assessment, Preparedness and Early Warning in South Asia — links natural and social sciences in a multidisciplinary, participatory approach. Amrita leads efforts on:

- Bringing social media data into multi-hazard risk assessment.
- Improving forecast reliability for hydrologically controlled landslides.
- Co-produced research with national and district stakeholders.

Consortium Partners



Real-Time Risk Dashboard - Karnataka

Operational ArcGIS dashboard developed jointly with the Karnataka State Natural Disaster Monitoring Centre. Visualises risk evolution at sub-district scale alongside automated bulletins, evacuation protocols

and risk-communication modalities — turning scientific outputs into actionable inputs for the District Magistrate and emergency response teams.

SPOTLIGHT - Kodagu, Karnataka

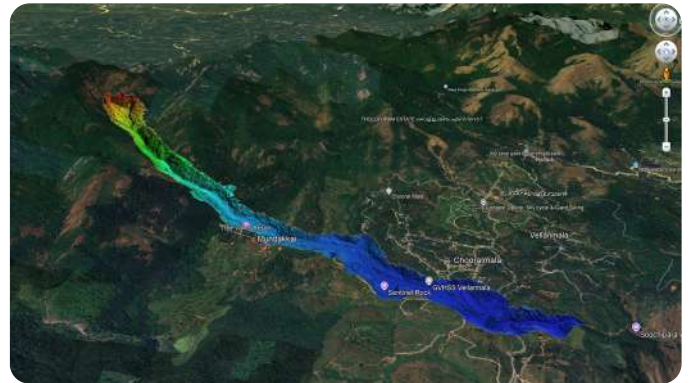
MoU (2023) with Karnataka State Natural Disaster Monitoring Centre. Researchers have developed and rigorously tested rainfall-threshold-driven landslide dynamic maps that predict and monitor real-time landslide occurrences across the Kodagu region — a markedly more precise approach to forecasting.

SITE INVESTIGATIONS- MEGA DISASTERS

Wayanad - Western Ghats

Wayanad Multihazard · 30 July 2024

Approximately 572 mm of rain in 48 hours triggered a 6-km cascading event of landslide, debris flow and downstream flooding. Amrita's response combined GPM IMERG satellite rainfall, KSDMA/IMD rain-gauge data, ERT-based water-table investigation and SRT bedrock surveys. Trigger analysis applied Caine (1980) thresholds together with regional rainfall accumulation models to attribute antecedent and real-time precipitation to the cascading hazard chain.



South Lhonak Glacial Lake Outburst

North Sikkim Glop · October 2023

A catastrophic glacial-lake outburst at South Lhonak Lake released a devastating flash flood down the Teesta River, destroying the Chungthang Dam. Building on a 2013 Current Science study by Dr Remay S. N., Amrita researchers analysed Landsat 5 / 7 imagery (1990s–2022) and CORONA data, documenting 1.6 km of lake-length expansion at an average rate of 0.027 km² per year as climate-driven glacier retreat reshaped the high-Himalayan landscape.



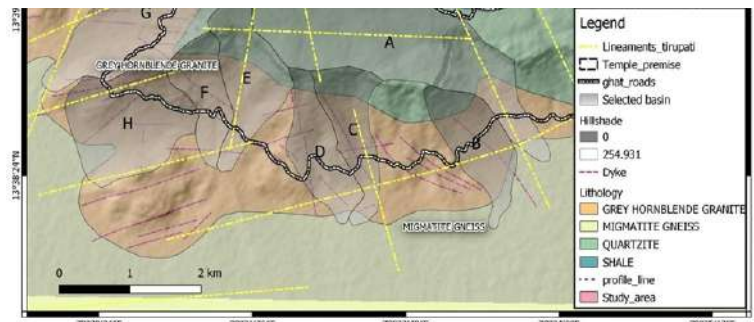
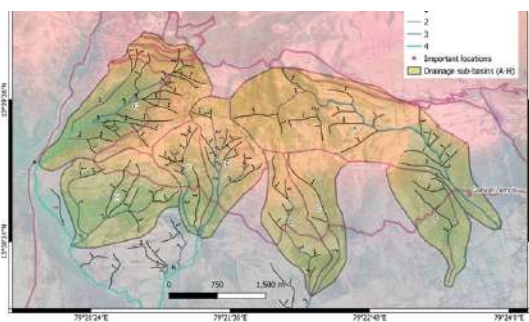
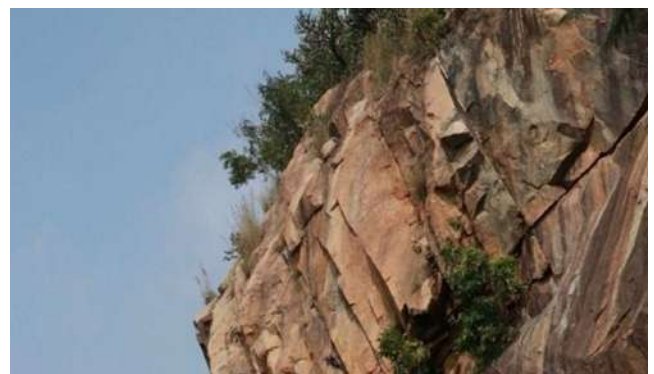
ADDITIONAL FIELD INVESTIGATIONS

- **Chamoli Glacier Break**
- **Joshimath Subsidence**
- **Tapovan Barrage**

Multi-directional cracking, road subsidence and barrage damage documented across Uttarakhand sites - informing future Himalayan EWS deployments and dynamic risk maps that combine geological, hydrological and anthropogenic stress factors.

A Novel Application of Catchment Approach to Assessment of 2021 Rockfall and Landslide Vulnerabilities in Tirumala Hills, Andhra Pradesh, India

Published in the Journal of the Geological Society of India, this study applies a catchment-based approach to assess landslide vulnerabilities in Tirumala Hills after the 2021 extreme rainfall. By analyzing sub-basins, drainage patterns, and geological conditions, the authors identify high-risk zones, especially sub-basin G. The study highlights the combined impact of geological features and human activities, offering a systematic framework for improved hazard assessment and mitigation planning.



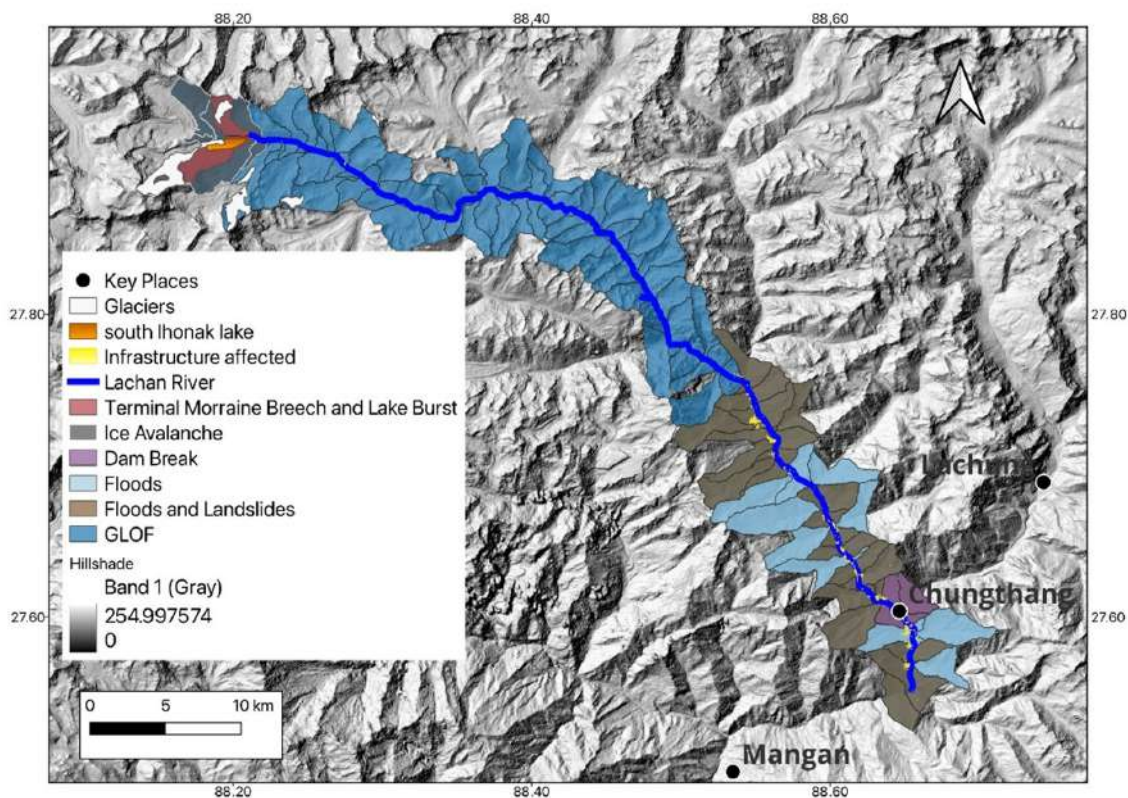
Landslides – Multi-Hazards Dynamics and Disaster Risk Reduction Through Integrated Participatory Community Approaches

In the Journal of the Geological Society of India (Vol. 100, August 2024), Sudesh Kumar Wadhawan explores landslides within a multi-hazard framework, emphasizing their interaction with floods and earthquakes. The article highlights the importance of community participation, citizen science, and crowd-sourced data for early warning systems. It

introduces technology-driven solutions such as dynamic risk mapping using IoT, AI/ML, and geospatial tools, alongside a catchment-based approach. Aligned with the Sendai Framework, the study advocates integrating science, technology, and community engagement for effective disaster risk reduction.

AMRITAKRIPA: AN INDIGENOUS AI PLATFORM FOR CLIMATE RISK INTELLIGENCE

Integrating GLOF, landslide, flood and cyclone signals into a single decision-support framework.



The South Lhonak Lake GLOF (October 2023) followed a multi-stage cascade — intense rainfall triggered an ice avalanche, breaching the terminal moraine and releasing a peak discharge of $\sim 48,500 \text{ m}^3/\text{s}$. Floodwaters devastated the Lachen Valley across 473 km^2 , ultimately destroying the Chungthang (Teesta III) Dam. Graph-based hazard-network analysis confirmed dam collapse and downstream flooding as the highest-risk sequence nodes. (Ekkirala & Ramesh, Scientific Reports, 2026)

Five Coupled Hazard Streams A Unified Ews Framework

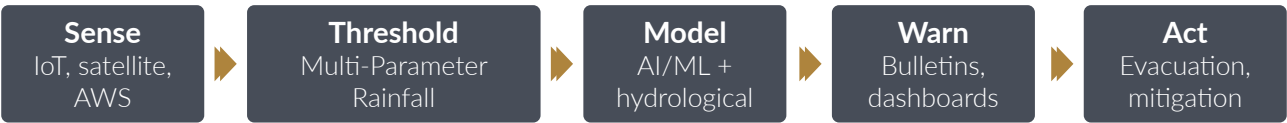


GLOF Hazards
Glacial-lake monitoring,
bathymetry & velocity profiling

Rainfall Triggers
GPM IMERG + rain-
gauge fusion; Multiple
thresholds



Decision-Support Pipeline



Why a Unified Framework Matters

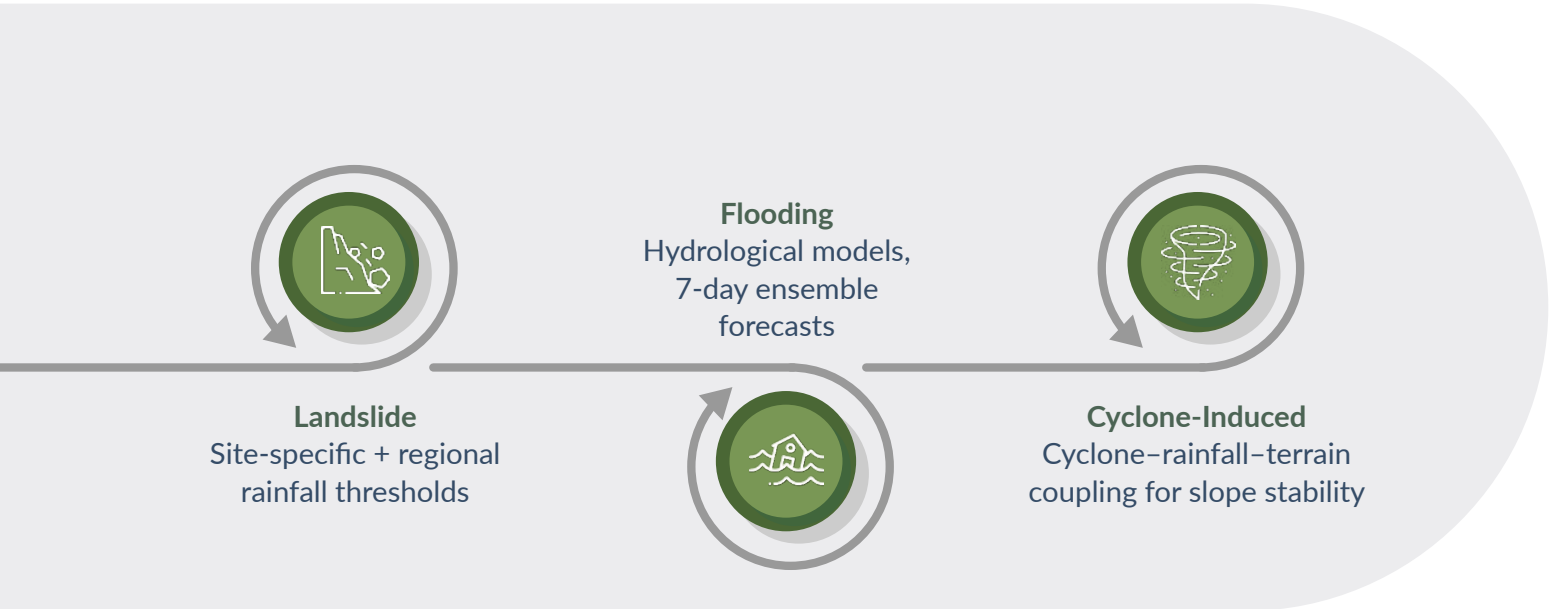
Cascading hazards rarely arrive in isolation. The 2024 Wayanad event began with extreme rainfall, amplified into landslide and debris flow, and ended in downstream flooding. Treating each hazard in a separate silo

would have missed the chain. A unified EWS framework couples signals across domains, sharpens thresholds, and turns a sequence of events into a single, coherent warning.

Gajapati, Odisha - Cyclone-Induced Landslides

Research Goal

An AI-driven EWS integrating real-time and historical rainfall data, soil and terrain analyses, and machine-learning prediction models. Cyclone Titli (2018) destroyed 20 villages and caused 48 fatalities in Odisha — motivating this research that targets the complex coupling between cyclones, rainfall and slope stability in eastern coastal India.



HYDROCLIMATIC EXTREMES IN A CHANGING CLIMATE

Addresses the dynamics evolving precipitation regimes in a changing climate. It encompasses the investigation of precipitation shifts, extreme rainfall processes including cloudbursts, drought development, and compound drought–heatwave interactions, alongside

their cascading environmental and societal impacts. By integrating advanced data analytics with machine learning and deep learning frameworks, the research seeks to advance mechanistic understanding, predictive skill, and climate risk assessment for extreme events.

Project :

Enhancing climate resilience in South Asia and China: Predicting precipitation shifts and their impacts for disaster risk reduction and resource security :

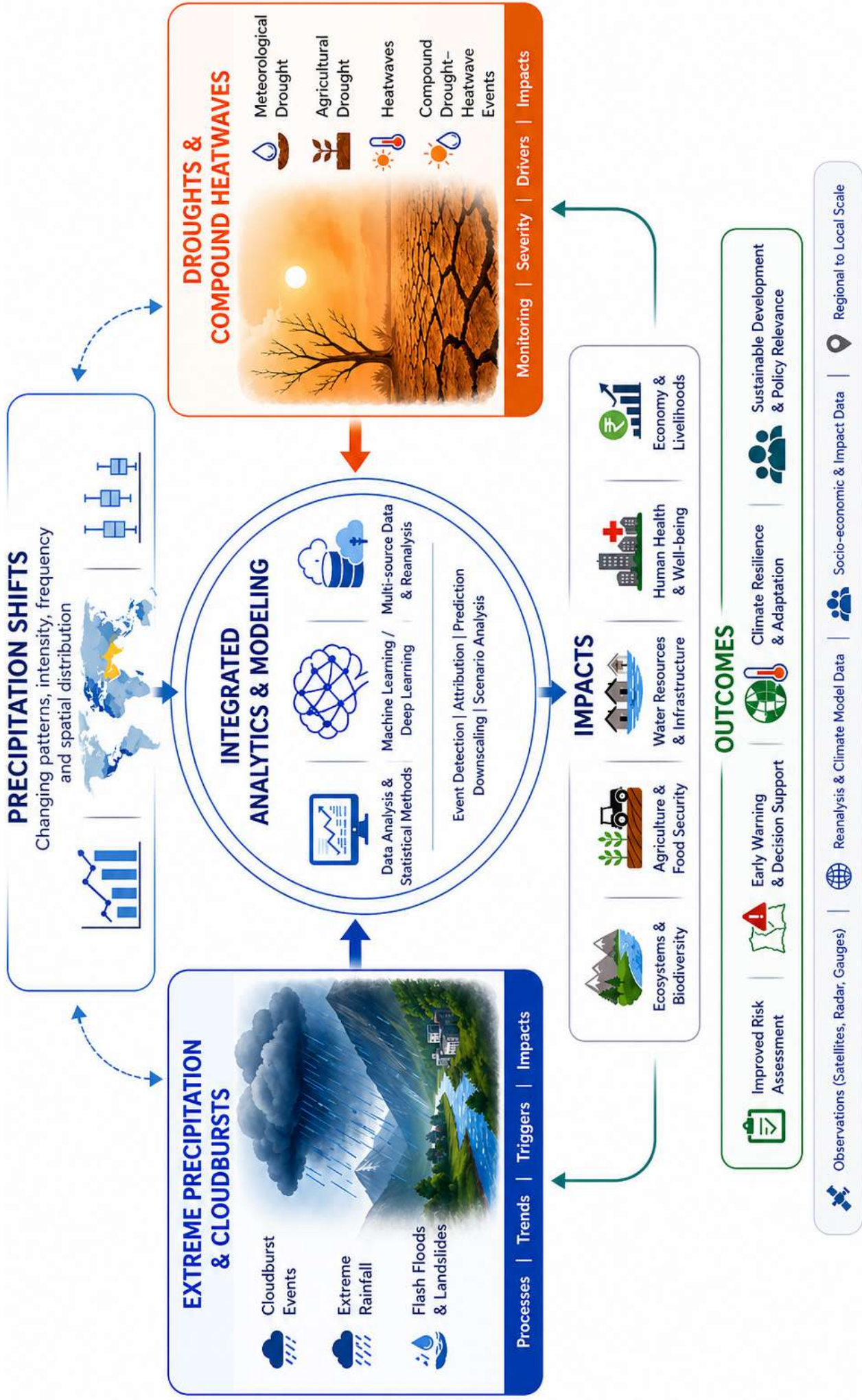
Granted by the Asia-Pacific Network
for Global Change Research

► *The project aims to :*

- Understand the changing precipitation patterns and phase transitions.
- Enhance climate resilience through enhanced knowledge, information, and capacity building
- Develop effective strategies to mitigate the impacts of extreme weather events and promote sustainable water, food, and energy security

► *Consortium Partners*

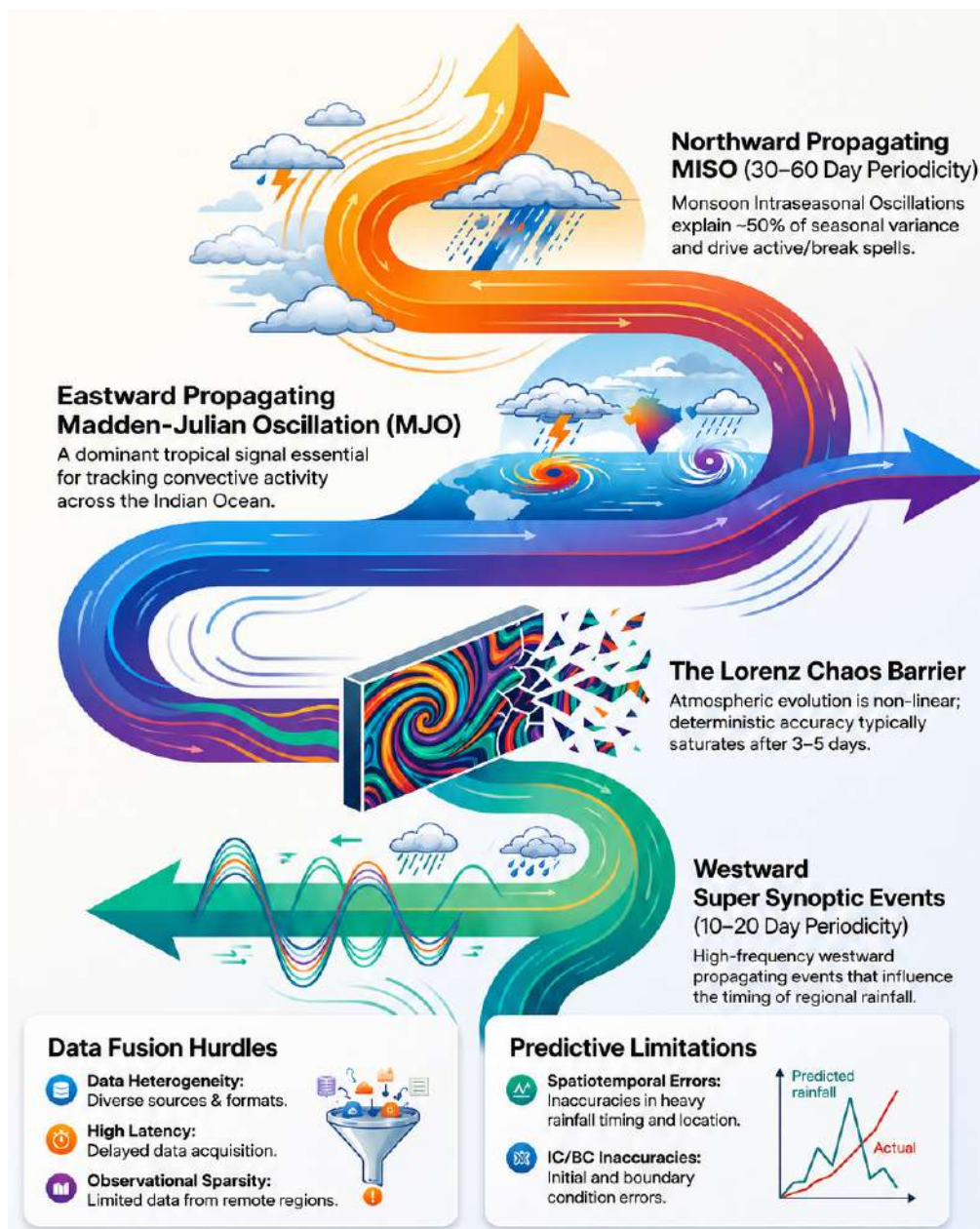
- The Small Earth Nepal
- Thribhuvan University, Nepal
- Jigme Namgyel Engineering College, Royal University of Bhutan
- Chinese Academy of Sciences, China
- Sher-e-Bangla Agricultural University, Bangladesh
- Nagoya University, Japan
- The Islamia University of Bahawalpur (IUB), Pakistan
- City College of New York, USA
- University of Rhode Island, USA
- University of Nevada, Reno



EXTENDED-RANGE FORECASTING OF DAILY RAINFALL

Extended-range forecasting of daily rainfall (10–30 days) integrates multisource meteorological datasets, including satellite observations, in situ measurements, reanalysis products, and numerical weather prediction outputs. By incorporating key atmospheric variables such as temperature, humidity, wind fields, and sea surface temperatures, it captures large-scale drivers including monsoon variability, the Madden–Julian Oscillation, and

other teleconnections. However, predictive skill is constrained by nonlinear atmospheric dynamics and data uncertainties. Advanced statistical and machine learning approaches enable effective data fusion and pattern extraction, improving forecast reliability and reducing uncertainty, thereby supporting early warning systems and informed decision-making in climate-sensitive sectors.



FLOOD MONITORING & MITIGATION



Disaster Management

Flood Early Warning System (Flood Ews)

A reliable hydrological modelling framework for the Beas and Sunkoshi Rivers in the Indian Himalayan region forecasts flooding up to 7 days in advance. The physics-aware machine-learning model produces an ensemble of river-flow simulations and minimises forecasting error — providing actionable lead time for preparedness against extreme flood events.

Indo-German

FloodEvac - Indo-German Initiative

Crowd-sourced urban flood monitoring combining smartphone reporting, computer-vision flood-depth estimation (using known dimensions of bridges, lamp-posts, vehicles) and a coordination suite linking government, NGOs and volunteers. Generates spatial-temporal flood-intensity maps for fine-grained relief deployment.

Trento Collab

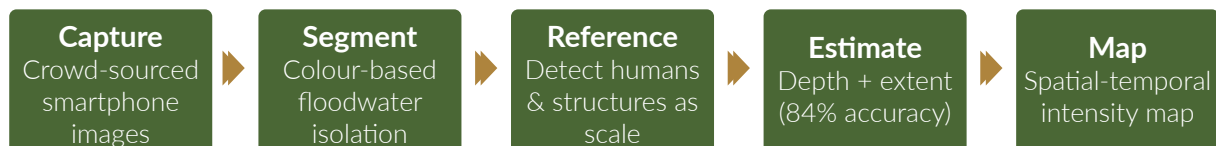
Munnar Floodplain Mapping (Kerala 2018)

Back-analysis of the August 2018 disaster combined hydraulic modelling, river geometry mapping, surface velocity and bathymetry. Discharge estimates from rating curves and HEC-RAS converged at ~630–1016 mS/s — informing future flood preparedness for the Munnar–Idukki landscape.

AI Flood-Extent Detection from Crowd-Sourced Images

A computer-vision pipeline estimates flood extent from random crowd-sourced imagery using colour-based segmentation, isolating floodwater by detecting and measuring brown-tone intensity and area. Flood depth is inferred by comparing submerged human

bodies and known reference objects in each frame. The framework achieves 84.24% classification accuracy and enables wide-scale exploration of flood-affected areas for resource allocation and rescue operations (Geetha et al., ICCSP 2017)



RESPONSE TOOLS-APPS, DRONES & TELE-HEALTH

Amrita Kripa

A high-performance crowd-sourced application coordinating large-scale distributed operations — directly linking survivors, providers, relief-camp coordinators, rescue teams, NGOs, volunteers and administrators.

12,000⁺
People Rescued

3,000⁺
Requests Logged

100,000⁺
Call-Centre Linkages

20
Languages



Amrita Unmanned Aerial Systems

Targeted medical-payload drop for inaccessible disaster sites

Born from the Kerala floods and Uttarakhand flash-flood crises, Amrita's UAV team has tested 21+ multi-rotor VTOL configurations to deliver scalable medical-payload drops — co-developed with State Disaster Management Authority experts and the university's aerial-robotics engineers.

- 21+ UAV variants tested across endurance and payload regimes.
- Multi-rotor VTOL for confined-area takeoff and landing.
- Indigenous, scalable design for state-level deployment.
- Ongoing collaboration with State DMAs.

Deployed In Parallel

Amrita Kripa + Wireless Sensor Network for Landslides - Kerala 2018

During the worst Kerala floods in 100 years, the Amrita Kripa app worked in parallel with the wireless landslide-detection network and the 24×7 Compassionate Kerala Call Centre — together saving thousands of lives across the state.



OCEANNET - AFFORDABLE MARINE INTERNET FOR ALL

OceanNet provides up to 60 km of network connectivity offshore, dramatically reducing casualties caused by communication failure during emergencies. A hierarchical point-to-multipoint long-range Wi-Fi backhaul links onshore base stations with low-cost receiver-broadcaster units installed on fishing vessels - and a boat-to-boat hopping mode extends signal far beyond the shoreline.

Innovative IoT-Based Open Ocean Observation

- Communication infrastructure within the OceanNet Digital Ecosystem (ODE).
- Sea-state, weather and disaster alerts delivered to fishing vessels.
- Direct INCOIS feeds: Potential Fishing Zones (PFZ), high-sea-wave alerts, weather forecasts and surface-temperature updates.
- Real-time tracking and localisation services for SOS calls.



Maritime Artificial IoT (MAIoT) · OceanNet Blockchain (EMERGING — 2024–2026)

MAIoT extends OceanNet to a knowledge ecosystem for ocean observation: sustainable fish-catch information, ocean-emergency warnings, pollution monitoring and wave-height & acidification observation. The OceanNet Blockchain framework adds decentralisation, transparency and data immutability — addressing five core livelihood issues for fisherfolk and improving resilience across coastal communities.

Coastal Erosion - Alappad, Kerala

A geospatial study of shoreline change along the sand-mining coast of Alappad combined remote-sensing analysis, ground-based field data and geospatial modelling to surface complex interactions between coastal processes and human activity. Results illuminate the dynamic morphology of Kerala's most vulnerable coastline and inform Tsunami Ready preparedness (Satish & Geetha, ICECCT 2021).



Ocean Observatory - Acidification Monitoring

Static monitoring nodes and a modified Ferrybox concept on ships of opportunity feed a delay-tolerant wireless network. Cloud-stored parameters: pCO₂, pH, temperature, salinity, pressure — informing tropical-estuary biogeochemistry.



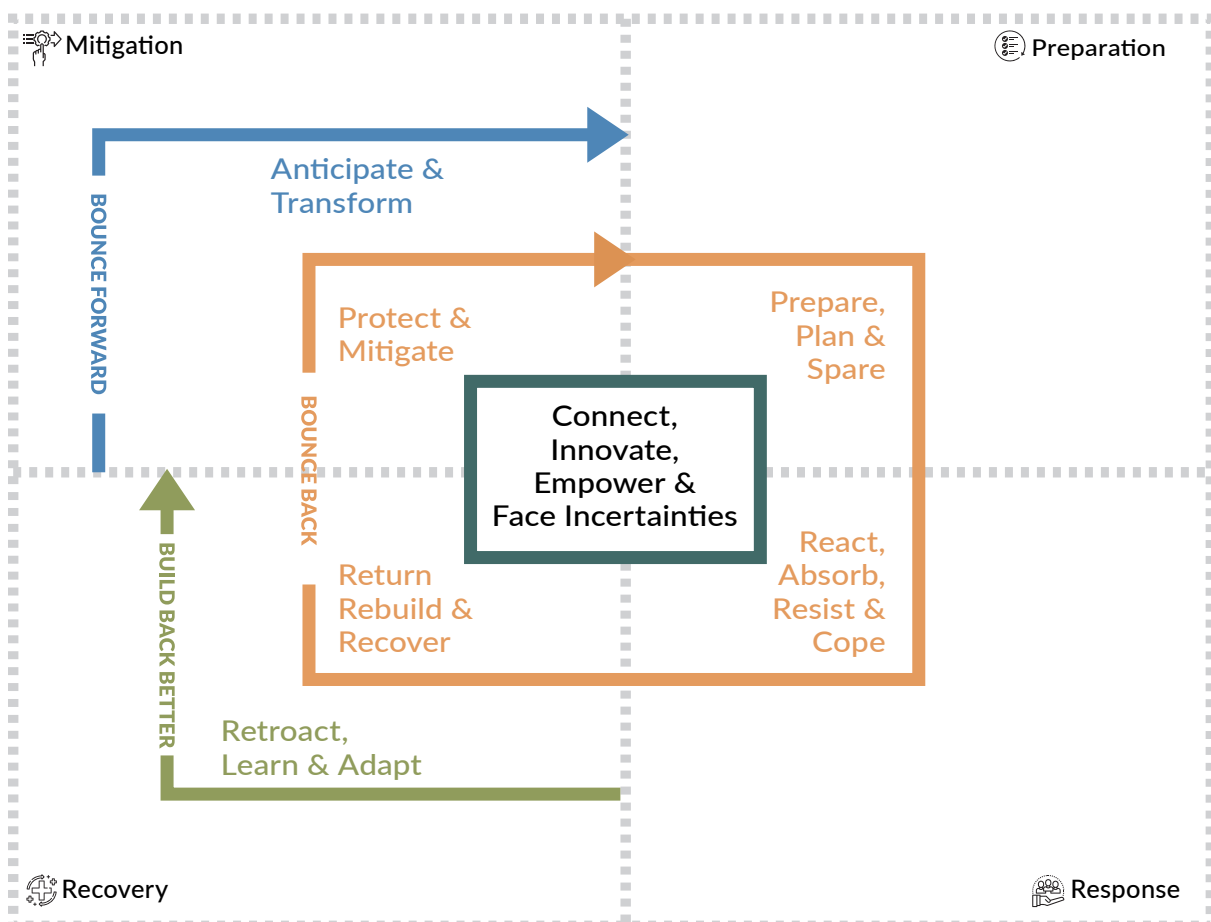
COMMUNITY RESILIENCE & DISASTER MANAGEMENT CYCLE, 2004 INDIAN OCEAN TSUNAMI

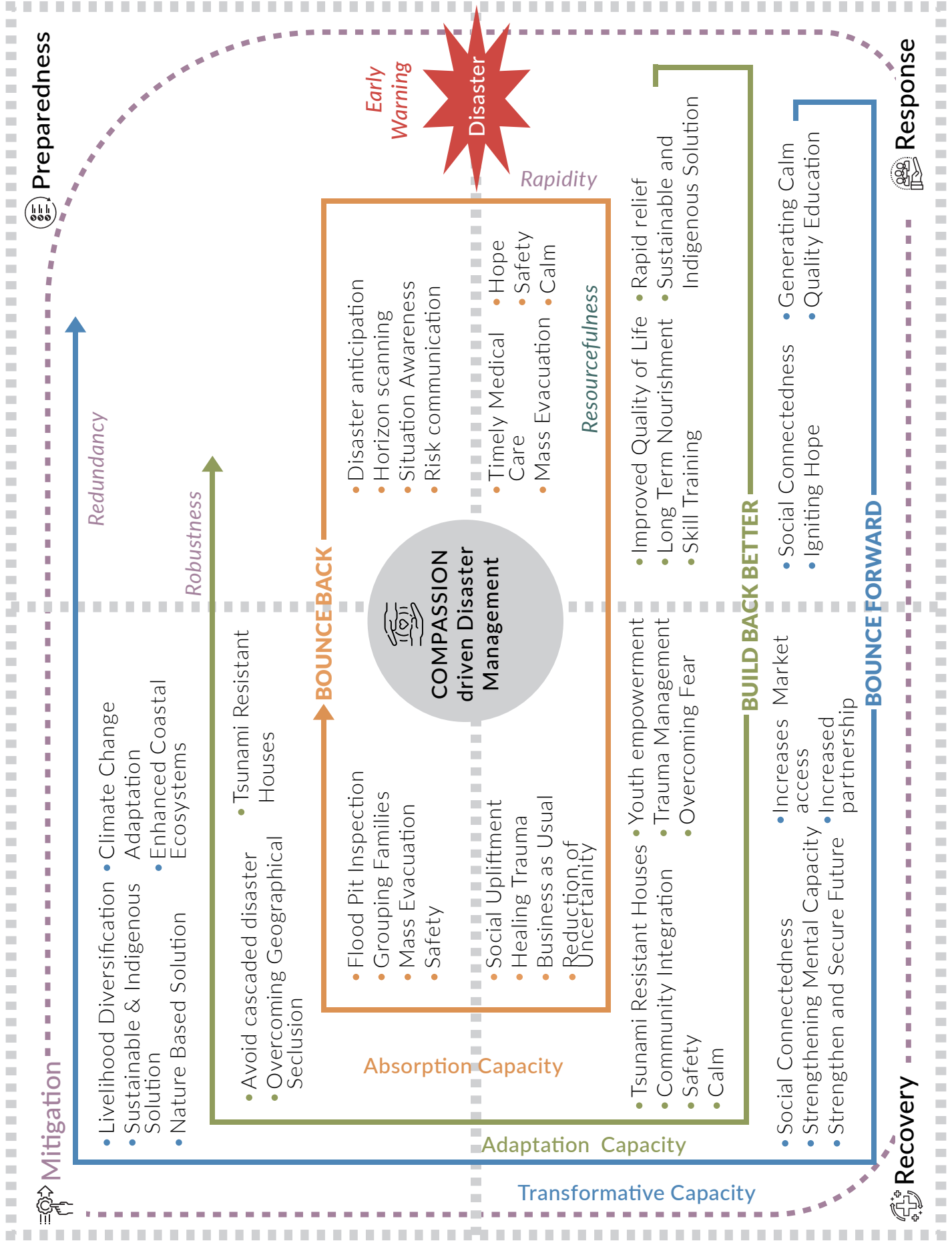
THE EVENT — 2004 Indian Ocean Tsunami, Alappad, Kerala

On 26 December 2004, a 9.1-magnitude earthquake off Sumatra unleashed a tsunami that claimed over 230,000 lives across 14 countries. Alappad — a narrow coastal island in Kerala and birthplace of Amma, Sri Mata Amritanandamayi Devi — was among the hardest-hit regions on India's west coast, with 142 lives lost and thousands of homes, boats, and livelihoods destroyed in minutes.

THE INTERVENTIONS — Compassion-Driven Community Resilience

Within 45 minutes of the first wave, Amma evacuated 3,000 people and ultimately ferried 20,000 survivors to safety by boat. What followed was unprecedented: 7 million meals served over five months, 6,400 tsunami-resilient homes built across four states and Sri Lanka, 900 students supported, 700 fishing boats distributed, and the Amrita Setu evacuation bridge constructed — transforming a devastated community into one more resilient than before the disaster.





CLIMATE, ECOSYSTEMS & COMMUNITY ADAPTATION

New research streams from carbon flux modelling to community-led climate adaptation.

Remote Sensing

Wetland Carbon - Ashtamudi Lake

Sentinel-5P TROPOMI and Sentinel-2 imagery quantify CO and CH₄ emissions across Kerala's Ramsar-listed estuary, where Kallada River freshwater meets seawater. Multi-sensor analysis reveals tidal and structural controls on biogeochemistry, yielding emission-flux models tuned for tropical estuarine systems.

Biodiversity

Mangrove Mapping - Kollam, Kerala

Landsat time-series combined with field spectra and biomass measurements deliver species-level classification maps of coastal mangroves. The framework is scalable: a transferable methodology for long-term mangrove monitoring that supports both conservation and climate-mitigation accounting.

International

Global Methane Flux - CH₄DAS

A novel methane data-assimilation system that ingests both in-situ and satellite observations of CH₄ flux and concentration. Co-developed with the Superpower Institute (Australia) and LSCE (Paris), CH₄DAS produces an improved global posterior flux density map for wetland emissions.

70%

Rice Farmland Left Fallow

90%

Irrigation Cut Via Crop Switching

03

SDGs Directly Addressed

Co-design

Participatory Approach

Sadivayal Village, Coimbatore - Sustainable Farming

Smallholder farmers in semi-arid South India face severe climate risks driven by erratic rainfall and water scarcity. In Sadivayal village, 70% of rice farmland is left fallow each year. Our participatory study co-designed three adaptation strategies with farmers: early sowing reduced terminal drought exposure; supplemental irrigation stabilised yields; and crop switching from rice to sorghum or maize cut supplemental-irrigation needs by up to 90%.

Soil Erosion in the Cauvery Watershed

Quantifying climate-change impact on soil erosion using the Revised Universal Soil Loss Equation (RUSLE), with sustainable mitigation strategies for affected communities.

EMPOWERING COMMUNITIES FOR RESILIENCE

Tsunami Ready - Amrita+ Ioc/Unesco + Incois · Launched June 2022

Initiated by the Intergovernmental Oceanographic Commission (IOC) of UNESCO, the Tsunami Ready programme follows a community-performance-based model engaging the public, community leaders and emergency-management agencies. Alappad — devastated by the 2004 Indian Ocean Tsunami — is the first launched site, with adjacent coastal regions targeted for the next phase.



Compassionate Call Center for Disaster Relief and Response

24×7 helpline launched during the 2018 Kerala floods. Within 5 days the team fielded 25,000+ calls and connected 100,000+ flood victims to government, Navy, NDRF, Kerala State Police, fishermen and volunteer agencies. Over 400 AYUDH Amritapuri volunteers worked across three shifts.

SANKALP — Skill Acquisition

Skill Acquisition and Knowledge Awareness for Livelihood Promotion has trained 4,500+ Self-Help Group members across 9 states (Kerala, Tamil Nadu, Odisha, Uttar Pradesh, Gujarat, Rajasthan, Haryana, Uttarakhand, Himachal Pradesh) — including transgender SHG cohorts and other minority groups.

AmritaSREE Self-Help Groups

Launched by Amma in 2006 to build climate-resilient communities. Now 300,000+ women participate, accessing vocational education, start-up capital, microcredit and microsavings — equipping economically vulnerable women to launch cottage-industry businesses that buffer against climate shocks.

COMMUNITY RESILIENCE RESOURCE CENTRES (CRRC)

14

Hubs

200

Spokes

300+

Projects

25

States

2,200+

Communities

1 Million+

Beneficiaries



Health



Livelihood & Skill



Education



Agriculture



Water

Featured Research - Community Preparedness

- Empirical study of women's SHGs for tsunami readiness (Alappad).
- Multi-hazard temporary shelter planning, Pullinkunno, Kutanad.
- Gender in warning-dissemination & sheltering (community-level multi-risk).
- SREE dashboard — sustainability and resilience for community engagement.

COMMUNITY RESILIENCE — KERALA FLOODS 2018

Within five days of the Amrita Kripa launch the team logged 3,000+ entries in real time, fielded 25,000+ helpline calls, and connected 100,000+ flood victims with rescue and relief services across Kerala — saving thousands of lives in the worst floods in 100 years.

INTERNATIONAL

05

Joint Research
Centres

10

International
Projects

25

Research
Partners

03

UNESCO
Chairs

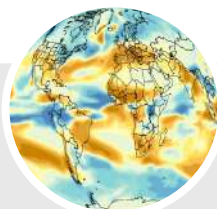
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Industry
Collaborators

Joint Centers of Excellence



Center of
Geospatial
Excellence on
Spatial Analysis
and Modeling



Climate
Change Risk
Assessment
Modeling and
Multi-hazard
Management



Center for
Numerical
Simulations
of Landslides
and Real time
monitoring of
Natural Disasters



POLITECNICO
MILANO 1863



Earth sciences,
mineral
prospecting
and disaster
management



British
Geological
Survey



Hydrometeorological
monitoring, flash
floods, floods
and droughts,
groundwater,
climate change and
natural hazards



ISTITUTO DI SCIENZA E TECNOLOGIE
DELL'INFORMAZIONE "A. FAEDO"

COMMUNITY RESILIENCE RESOURCE CENTRES (CRRC)

14

Hubs

200

Spokes

300+

Projects

25

States

2,200+

Communities

1 Million+

Beneficiaries



Health



Livelihood & Skill



Education



Agriculture



Water

Featured Research - Community Preparedness

- Empirical study of women's SHGs for tsunami readiness (Alappad).
- Multi-hazard temporary shelter planning, Pullinkunno, Kutanad.
- Gender in warning-dissemination & sheltering (community-level multi-risk).
- SREE dashboard — sustainability and resilience for community engagement.

COMMUNITY RESILIENCE — KERALA FLOODS 2018

Within five days of the Amrita Kripa launch the team logged 3,000+ entries in real time, fielded 25,000+ helpline calls, and connected 100,000+ flood victims with rescue and relief services across Kerala — saving thousands of lives in the worst floods in 100 years.

INTERNATIONAL CALIBRE

05

Joint Research
Centres

10

International
Projects

25

Research
Partners

03

UNESCO
Chairs

200⁺

Industry
Collaborators

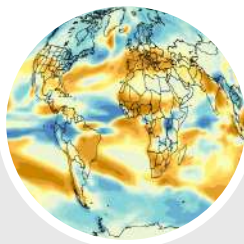
Maor Research Partners



Joint Centers of Excellence



Center of
Geospatial
Excellence on
Spatial Analysis
and Modeling



Climate
Change Risk
Assessment
Modeling and
Multi-hazard
Management



Center for
Numerical
Simulations
of Landslides
and Real time
monitoring of
Natural Disasters



Earth sciences,
mineral
prospecting
and disaster
management



Hydrometeorological
monitoring, flash
floods, floods
and droughts,
groundwater,
climate change and
natural hazards





Payload Drone

Matrice 350 rtk

Max payload: 2.7kg
Altitude: 5,000m
Flight time: 55-min / Battery
Max Speed: 23 m/s

LiDAR + RGB

Zenmuse L2

High-precision 3D scanning
Long-range LiDAR detection

Detection Range:
450m (@50% reflectivity, 0 klx)
250m (@10% reflectivity, 100 klx).

Accuracy: Vertical: 4 cm,
Horizontal: 5 cm (at 150m altitude).

Point Rate: 240,000 pts/s,
with up to 5 returns.



Geophysical Instrumentation & Consultancy

State-of-the-Art Terrain Investigation Solutions

Electrical Resistivity Tomography (ERT)

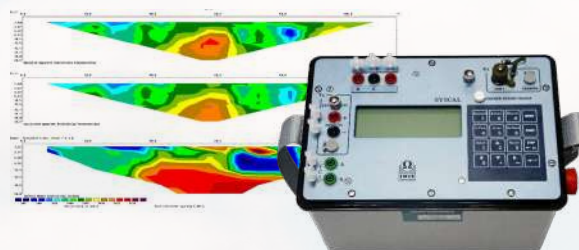
SYSCAL R1Plus Standard & Switch

A non-invasive geophysical technique that images subsurface soil and rock layers by measuring electrical resistivity variations.

Depth of Investigation: Up to 100 m

Electrode Spacing: 5 m & 10 m

Types of Survey: 2D, and 3D Resistivity Imaging



Acoustic Doppler Current Profiler

SATLab - Trimaran mounted ADCP

An instrument that measures water current velocity, flow direction, and river/ocean bathymetry using the Doppler shift of acoustic signals.

Speed- 0.1 – 6 m/s | Endurance- 40 km @ 1.5 m/s

Accuracy- (V) Single: 1.5m (H), 2.5m (V)

SBES- 200 kHz Accuracy ± 0.01 m + 0.1% of water depth
Depth range 0.15 - 300m

Spectroradiometer

Spectral Evolution RS-3500

Measures the intensity of electromagnetic radiation (light energy) across a range of wavelengths for Soil and mineral analysis, remote sensing & satellite calibration.

Spectral Range: 350-2500 nm (covering UV-VIS-NIR).

Spectral Resolution: 2.8 nm @ 700 nm
8 nm @ 1500 nm | 6 nm @ 2100 nm

Detectors: 1x 512-element Si array (UV-VIS-NIR)

2x 256-element TE-cooled extended InGaAs arrays (SWIR)



Seismic Refraction Tomography (SRT)

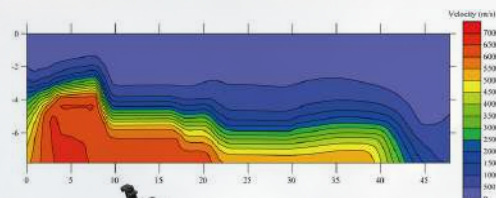
PASI GEA-24

A geophysical method that maps subsurface layers by analyzing the travel time of refracted seismic waves.

Depth of Investigation: Up to 50m

Geophone Spacing: 5m

Types of Survey: 2D and 3D



Ground Penetrating Radar (GPR)

GSSI-UtilityScan

A non-destructive geophysical technique that uses high-frequency electromagnetic waves to detect and image subsurface features.

Max Depth: 10 m (35 ft)

Antenna Frequency: 350 MHz

Optional Software: RADAN 7 for
UtilityScan, RADAN



DISASTER RISK
REDUCTION
& *Community Resilience*



Amrita vishwa Vidyapeetham

www.amrita.edu