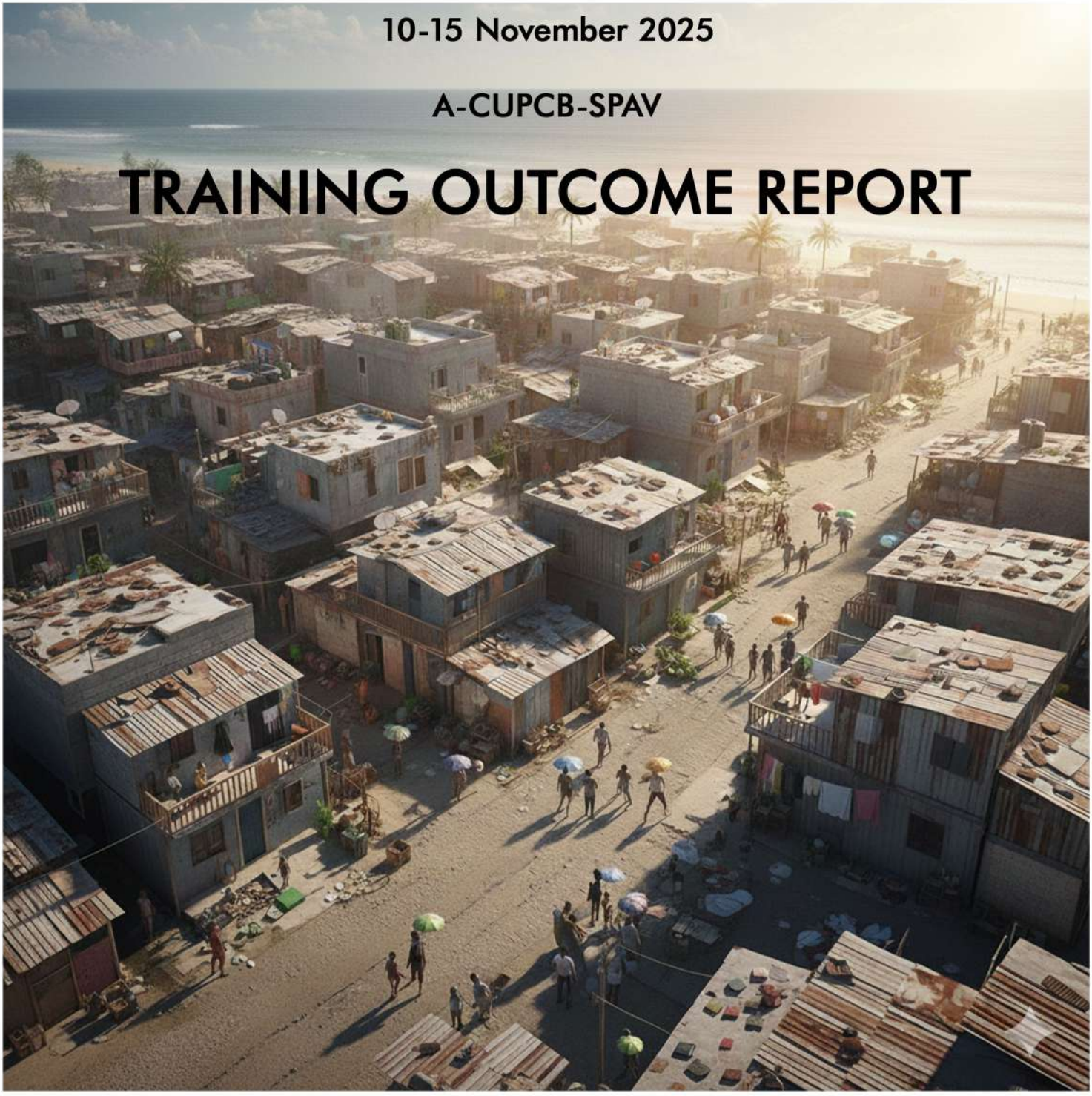
6 DAY CAPACITY BUILDING PROGRAMME
ON

BUILDING COASTAL DISASTER RESILIENCE: R3 STRATEGIES FOR FLOOD AND HEAT STRESS

10-15 November 2025

A-CUPCB-SPAV

TRAINING OUTCOME REPORT



Atal Mission for Rejuvenation and Urban Transformation

AMRUT Centre of Urban Planning for Capacity Building

A-CUPCB-SPAV

School of Planning and Architecture Vijayawada Estd.2008

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1. Summary Of Six Day Capacity Building Program (CBP)

"BUILDING COASTAL RESILIENCE: R3 STRATEGIES FOR FLOOD AND HEAT STRESS"

Andhra Pradesh, with its 974km coastline, remains one of India's most climate vulnerable states, facing recurrent cyclones, storm surges, saline intrusion, extreme rainfall, and rising urban heat stress across rapidly growing coastal cities such as Visakhapatnam, Kakinada, Machilipatnam, Vijayawada, and Nellore. Building coastal resilience through the R3 Strategy, Risk Reduction, Risk Assessment, and Risk Mapping has become central to the state's planning and disaster management approach. Risk Assessment efforts by APSDMA, IMD, INCOIS, and academic institutions now integrate cyclone track probabilities, flood depth estimation, socioeconomic vulnerability (housing quality, literacy, income groups, age profiles), and heat stress indicators such as land surface temperature, urban heat islands, and population exposure. These assessments are strengthened through GIS based Risk Mapping, which identifies inundation zones in the Krishna–Godavari delta, storm surge routes along the Bay of Bengal, drainage bottlenecks in urban centres, and heat hotspots around industrial belts, transport corridors, and dense settlements. Risk Reduction measures aligned with NDMA and CRZ norms include cyclone resistant shelters, strengthened coastal embankments, restoration of mangroves and wetlands (such as Krishna estuary wetlands), heat action plans with cool roofs (as in Vijayawada and Vizag), improved stormwater systems, blue–green infrastructure, early warning dissemination, and community-based evacuation planning. Together, the R3 approach enables Andhra Pradesh to transition from reactive disaster response to proactive and scientifically grounded resilience planning, safeguarding vulnerable coastal communities and supporting sustainable, climate resilient growth along its deltaic and urban coastal landscapes. The Capacity Building Program on "Building Coastal Resilience: R³ Strategies for Flood and Heat Stress" is designed to strengthen the capacity of urban planners, architects, engineers, and policymakers in addressing the dual challenges of flooding and heat stress in coastal environments. As coastal regions face escalating climate pressures, this program provides a comprehensive understanding of resilience-building strategies through an integrated Readiness, Response, and Recovery (R³) framework. This six-day intensive workshop combines expert lectures, demonstrations, field visits, and hands

on exercises. The sessions progressively build from conceptual foundations of coastal risks to advanced strategies for measuring, modelling, and mitigating climate-induced hazards.

1. OBJECTIVES OF THE CBP

1. To understand the interplay between coastal systems, climate change, and human settlements.
2. To Gain expertise in exposure mapping, vulnerability assessment, and flood modelling.
3. To Learn to apply the R^3 framework for adaptive planning and community-based resilience.
4. To develop skills to assess and mitigate urban heat stress through data-based field analysis.

2. SIX-DAY MODULES

The six-day Training Session was systematically structured to ensure a comprehensive understanding of disaster resilience, with each day dedicated to specific modules, expert lectures, and interactive activities. The Capacity Building Program (CBP) was organised into well-defined modules that covered scientific approaches to vulnerability assessment, governance mechanisms, spatial risk mapping, climate responsive planning, and community-based resilience strategies.

Module1: Foundations Understanding Coastal Systems and Risks

Session 1.1: Coasts and Coastal Communities in India the Living Edge of Resilience
Session 1.2: Coastal Hazards & Climate Change Implications for India
Session 1.3: The Need for Flood Resilience in Coastal Areas of Andhra Pradesh
Session 1.4: Institutional, Policy, and Governance Frameworks for Coastal Resilience

Module2: Tools & Mapping for Risk Understanding

(Exposure, Sensitivity & Flood Modelling)

Session 2.1: Climate Change and Hydrological Extremes
Session 2.2: Decoding Vulnerabilities in Coastal Hazards

Session 2.3: Hands-on Exercise Calculation of Vulnerability Index

Module3: Readiness, Response, and Recovery (R^3)

Session 3.1: Linking Theory with Practice

Session 3.2: Scientific Approaches, Measures, and Community Participation

Session 3.3: Adaptive Capacity and Response Preparedness using R^3 Strategy

Module4: Field Visit Mapping Risk, Vulnerability, and Adaptive Capacity

Module5: Heat Index Concepts & Measurements

Session 5.1: Introduction to Heat Index & Urban Heat Stress

Session 5.2: Environmental Monitoring Instrument Setup & Heat Index Calculation

Session 5.3: Field Walk & Microclimate Spot Survey

Module 6: Heat Index Application & Planning

Session 6.1: Planning & Design Strategies for Heat Mitigation

Session 6.2: Data Tabulation, Analysis, and Interpretation

Session 6.3: Group Presentations Integrating Flood & Heat Strategies

Session 6.4: Valedictory & Thanksgiving

Throughout the program, participants engaged deeply with both Flood and Heat Stress scenarios through multiple case study analyses drawn from coastal districts of Andhra Pradesh and other climate-vulnerable regions in India. To strengthen practical learning, the CBP integrated field visits to observe real-world conditions, hands-on exercises on developing Vulnerability Indices, Adaptive Capacity Scoring, and Composite Vulnerability Calculations using structured templates and datasets. In addition, participants gained experiential exposure to Heat Stress through the demonstration of instruments and digital simulation tools, enabling them to understand thermal discomfort, exposure levels, and the significance of microclimatic interventions. Together, these components ensured that the six-day training was immersive, application-oriented, and aligned with the objectives of building technical capacity for climate and disaster resilience.

2. Capacity Building Program Day Wise Schedule

Day 1: Foundations: Understanding Coastal Systems and Risks	
Day 1: Monday Morning Session10112025	
Time	**Session Details**
9:30 – 10:30 AM	Reporting of Participants and Registration Formalities Assembling of participants in the Conference Hall Welcome Address and Context Setting by Co-PI Introduction to the Centre of Excellence Centre Coordinator Inaugural address by Director SPAV Introduction of the participants and the SPAV -CBP Session Trainers
10:30 – 11:30 AM	**Coasts and Coastal Communities in India: The Living Edge of Resilience** Understanding 'Coasts' Significance of India's Coasts Coastal Challenges in India Coastal Communities: The Frontline of Change Linking Coastal Ecosystems, Urbanization, and Climate Risks Coastal Futures: The Living Edge of Resilience
11:30 – 11:45 AM	*Tea Break*
11:45 – 12:45 AM	**Coastal Hazards & Climate Change Implications for India** Introduction Key Coastal Hazards in India Climate Change Drivers Impacts on India's Coastal Regions Case Studies Current Adaptation and Mitigation Measures Challenges in Addressing Coastal Hazards Future Strategies and Recommendations
12:45 14:00 PM	*Lunch Break*
Day 1: Monday Afternoon Session	
14:00 – 15:00PM	**The Need for Flood Resilience in Coastal Areas of Andhra Pradesh** Foundations of Coastal Flood Risk in Andhra Pradesh Typology, Exposure & Vulnerability Impact Spectrum and Ecosystem Services Event Chronicles and Systemic Failures Comparative Lessons and Good Practices Toward Resilient Andhra Pradesh
15:00 – 15:15PM	Tea Break
15:15 – 17:00PM	**Institutional, policy, and governance A Review of Flood Risk and Resilience Frameworks in Andhra Pradesh** Understanding Flood Risk and the Need for Resilience Vulnerability, Exposure, and Causes of Risk Institutional and Policy Architecture Policy Frameworks and State Level Initiatives Risk & Resilience Frameworks for Action Global Best Practices and Application to Andhra's Coastal Cities

Day 2: Tools & Mapping for Risk Understanding (Theme: Exposure, Sensitivity & Flood Modelling)	
Day 2: Tuesday Morning Session11/11/2025	
Time	**Session Details**
9:30--10:30 AM	**Overview: Climate Change & Hydrological Extremes** Types of Floods Flood Modelling Approaches
10:30 -- 10:45 AM	*Tea Break*
10:45 --12:45 AM	**Overview: Climate Change & Hydrological Extremes** Tools and Technologies Applications of Flood Modelling Challenges in Flood Modelling Case Studies
12:45-14:00 PM	*Lunch Break*
Day 2: Tuesday Afternoon Session	
14:00 --15:30 PM	**Decoding Vulnerabilities in coastal Hazard** Definitions from UNDRR and emphasising on loss and damage aspect Fundamentals of 'vulnerability' assessments Exposure, Sensitivity Vulnerability
15:30 – 15:45	*Tea Break*
15:45 – 17:00 PM	Handson Exercise on Calculation of vulnerability index for coastal Hazards
Day 3: Readiness, Response, and Recovery (R3)	
Day 3: Wednesday Morning Session12/11/2025	
Time	**Session Details**
9:30 --11:30 AM	**Linking Theory with Practice**
11:30 -- 11:45 AM	*Tea Break*
11:45 –12:45 PM	**Scientific Approaches, Measures, and Community Participation for Mapping Vulnerability** Scientific Approaches to Flood Risk Assessment Technological & Tools for Risk Mapping Structural Measures for Flood Risk Management Non-Structural and Policy Based Flood Management Nature Based Solutions (NbS) and Hybrid Adaptation Community-Based Disaster Risk Management (CBDRM) & CBFRA
12:45 --14:00 PM	*Lunch Break*
Day 3: Wednesday Afternoon Session	
14:00 – 15:30 PM	**Adaptive capacity and the response preparedness with the 3R strategy** Introduction Conceptual Framework Risk & Resilience Frameworks in Andhra Pradesh
15:30 – 15:45 PM	*Tea Break*

15:45 – 17:00 PM	Adaptive Capacity Assessment Matrix Response Preparedness Actions Designing Flood Resilient Neighbourhoods Cluster
Day 4: Field Visit	
Day 4: Thursday Morning Session13/11/2025	
Time	**Session Details**
09:00 –17:00 PM	Field Visit to Map Risk, Vulnerability, Adaptive Capacity and to develop Response Strategy
Day 5: Heat Index Concept & Measurements	
Day 5: Friday Morning Session14/11/2025	
Time	**Session Details**
9:30 --10:30 AM	**Session 1 (Introduction to Heat Index & Urban Heat Stress)** Understanding Heat Index (HI) Introduction to Urban Heat Stress Urban Heat Stress in Coastal Indian Cities (AP Focus) Health Impacts of Heat Index & Urban Heat Stress Mapping & Monitoring Heat Index and Heat Stress Reducing Urban Heat Stress (Mitigation & Adaptation)
10:30-- 10:45 AM	*Tea Break*
10:45--12:45 PM	**Session 2 (Environmental Monitoring Instrument Setting):** Heat Index Calculation using Datasets & Introduction to Instruments – AWS, Temperature, Humidity, Air Velocity Probe & Online CBE Tool, Comfort Survey Format
12:45 -- 14:00 PM	*Lunch Break*
Day 5: Friday Afternoon Session	
14:00 –- 15:30 PM	**Session 3 (Exercise):** Field Walk & Microclimate Spot Survey and Mapping Heat Stress Zones on Site Maps
15:30 –- 15:45 PM	*Tea Break*
15:45 –- 17:00 PM	(Exercise): Field Walk & Microclimate Spot Survey and Mapping Heat Stress Zones on Site Maps, Comfort Survey
Day 6: Heat Index Application & Planning	
Day 5: Saturday Morning Session15/11/2025	
Time	**Session Details**
9:30 --10:30 AM	Session 1 (Lecture): Planning & Design Strategies for Heat Mitigation Climate Responsive Urban Planning Principles Urban Form & Morphology for Heat Mitigation Blue–Green Infrastructure Strategies Building Level Heat Mitigation Techniques Material & Surface Design for Thermal Comfort Public Space & Street Design for Shading and Cooling Nature Based Solutions for Heat Reduction TechnologyEnabled Heat Mitigation (Sensors, Cool Roofs, AI Based Monitoring)
10:30 --10:45 AM	*Tea Break*
10:45--12:45 PM	Session 2 (Exercise): Data Tabulation, Analysis, and Interpretation

12:45 -- 14:00 PM	*Lunch Break*
Day 5: Saturday Afternoon Session	
14:00 – 15:30 PM	Session 3 (Group Presentation): Group Presentations (for Both studies) Field work done and data collected on 4rth day was used to calculate Co by the participants for
15:30 --15:45 AM	*Tea Break*
15:45 – 16:30 PM	Session 4 (Group Presentation): Group Presentations (for Both studies) For software based simulation.
16:30 – 17:30 PM	Thanks giving and Valedictory.

3. CBP Trainers Team

Chief Patron Prof. Dr Ramesh Srikonda Director SPA Vijayawada & Principal Investigator	**Patron** Prof. Dr. Ayon Kumar Tarafdar Head ACUPCB -SPAV

	**Dr. Ramesh Srikonda** is the Director of the School of Planning and Architecture, Vijayawada. Since joining SPA Vijayawada in 2010, he has held key roles including Head of the Departments of Architecture and Planning, and Dean of Studies. He was instrumental in launching the M.Arch (Sustainable Architecture) program, focused on climate change and energy issues. Dr. Srikonda has published extensively in international journals and presented at numerous conferences. He has also led several research and consultancy projects, including assignments for the Government of Andhra Pradesh through SPA's Institutional Consultancy Cell
	**Dr. Prashanti Rao** is an Assistant Professor in the Department of Architecture at the School of Planning and Architecture, Vijayawada. With over 20 years of experience in architecture, urban planning, and sustainable development, she has contributed to several national projects, including the Low Emission Zone Plan for Vijayawada and the Erasmus+ BReUCom project. She has organized AICTE-ATAL, COA-TRC, GIAN programs, and international conferences. Her academic work includes books, book chapters (Springer, Intech Open), and journal publications. She has also held key administrative roles such as PhD Program Coordinator, COA Nodal Officer, Senate Member, and Chairperson of the Campus Development Committee.
	**Dr. Faiz Ahmed Chundeli** is an Assistant Professor at SPA Vijayawada, specializing in urban microclimate, energy efficiency, and thermal comfort. With a strong interdisciplinary background, he has led and contributed to several national and international research projects, including those under ICSSR, AMRUT, and Erasmus+ (BReUCom). His academic contributions span over 60 publications in reputed journals and conferences, and he has co-organized key events such as RLCP and EEPEUR. He has also held administrative roles including Associate Dean (Research), PG Program Coordinator (M. Arch Sustainable Architecture), and Senate Member.

	**Dr. Ayon Kumar Tarafdar** is a Professor at SPA Vijayawada with over 22 years of experience in academia, research, and planning practice. He leads the AMRUT Centre of Excellence on Climate-Sensitive Urban Development and has served as Dean (Academics and Planning), Head of the Department of Planning, and member of multiple academic and advisory bodies. A recipient of Norwegian Government fellowships, he has contributed to several nationally and internationally funded projects, including BINUCOM and BReUCom, and has supervised numerous award-winning theses across planning disciplines.
	**Mr. Rajeev R.** is an Assistant Professor in the Department of Planning at SPA Vijayawada, specializing in Environmental Planning. With over 11 years of professional and academic experience, he has been involved in a range of projects related to eco-sensitive zone planning, tourism frameworks, environmental assessments, and climate-resilient development. His work spans national and state-level assignments with organizations like NITI Aayog, MoHUA, and various state governments. He has presented papers at international conferences, published in peer-reviewed journals, and guided numerous undergraduate and postgraduate theses.
	Dr. Arpan Paul Singh is a faculty member in Department of Planning at the School of Planning & Architecture, Vijayawada. Trained in Civil Engineering, with a Master's in Urban Planning (VNIT Nagpur) and a PhD from IIT Kharagpur, his areas of interest are Development Finance, Project Management, and Environmental and Regional Planning. With an experience of more than 7 years, his work spans urban transitions, municipal finance, climate and coastal resilience, and spatial analytics. He has been part of urban and regional scale spatial planning projects including preparation of Amaravati CRDA Regional Plan.
	Dr. Anurag Bagade is an Assistant Professor at the School of Planning and Architecture, Vijayawada, with previous academic and research roles at SPA Bhopal. His areas of expertise include environmental sustainability, urban heat island mitigation, climate change adaptation, and GIS-based spatial planning. He has contributed to major regional and climate-resilient planning projects in collaboration with institutions such as UNICEF, the Ministry of Panchayati Raj, and academic partners abroad. Dr. Bagade has published extensively in peer-reviewed journals, presented at international conferences, and guided several postgraduate theses. He is also actively involved in capacity-building programs and has delivered expert lectures and training workshops across institutions and professional forums.

 Dr Garima Agarwal National Institute of Disaster Management	**Dr. Garima Aggarwal** brings over 24 years of experience in Disaster Risk Management (DRM), with expertise spanning urban resilience, risk assessment, disaster mitigation, disaster management planning, mainstreaming DRR, and institutional and policy strengthening. Over the course of her career, she has worked with the Ministry of Home Affairs (Government of India), United Nations Development Programme (UNDP) India, and the Government of NCT of Delhi, contributing significantly to national disaster management programmes, policy formulation and institutional capacity development across multiple sectors. From last 4.5 years, she is serving as Senior Consultant (Resilient Infrastructure). Her work in NIDM focuses on capacity building and risk-informed planning for mitigating disasters such as earthquakes, urban flooding, fires, and heatwaves.
 Dr. Santosh Pingale National Institute of Hydrology, Roorkee	**Dr. Santosh M. Pingale** is a Scientist-C at the National Institute of Hydrology, Roorkee, under the Ministry of Jal Shakti, Government of India. With over a decade of experience in research, teaching, and consultancy in water resources, he specializes in climate change, hydrologic and groundwater modelling, watershed management, and geospatial technologies. Pingale earned his Ph.D. in Water Resources Development from IIT Roorkee and holds an MTech in Irrigation & Drainage Engineering. He has worked in international academic institutions and has led multiple research and consultancy projects addressing real-world hydrological challenges, including those funded by NIH, MoES, and international partners. He serves as Associate Editor for the *Hydrological Sciences Journal* and Joint Editor for the *Indian Journal of Hydrology*, and is a reviewer for over 25 reputed journals. He has published 40+ research papers and has received prestigious fellowships, including the Canadian Commonwealth Fellowship. His academic efforts include guiding doctoral and master's research, organizing technical workshops, and contributing to curriculum development.

4. INAUGURATION OF CBP

The Capacity Building Program on *"Building Coastal Resilience: R3 Strategies for Flood and Heat Stress"* commenced on **10th November 2025** with the Inaugural and Welcome Session at SPA Vijayawada. Participants from government departments, disaster management authorities, academic institutions, and community development organisations attended the event, reflecting the multidisciplinary relevance of coastal resilience in Andhra Pradesh.

The session was addressed by:

- **Prof. Dr. Ramesh Srikonda**, Director, SPAV
- **Prof. Dr. Ayon Kumar Tarafdar**, Head, ACUPCB
- **Dr. Prashanti Rao**, Co -Principal Investigator
- **Dr. Faiz Ahmed C**, Co-Principal Investigator

In his inaugural address, **Prof. Dr. Ramesh Srikonda** emphasized the rising climate induced risks particularly floods, storm surges, and high heat index conditions affecting Andhra Pradesh's coastal districts. He highlighted SPA Vijayawada's role in fostering scientific thinking, evidence-based spatial planning, and field-based resilience approaches.

Prof. Dr. Ayon Kumar Tarafdar, Head ACUPCB, elaborated on the program's design and the vital role of integrating the R3 framework (Readiness–Response–Recovery) into both urban and rural coastal systems. He stressed the need for robust vulnerability mapping techniques and intersectoral collaboration.

As Coprincipal Investigators, both faculty members played a central role in setting the academic and practical tone for the program: Dr. Rao provided a thematic framing of coastal vulnerability in Andhra Pradesh, explaining the interconnected challenges of flood exposure**,** infrastructural sensitivity**, and** community level adaptive capacity**.**

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Figure 1 (Left and Right): Inaugural Session of the CBP on *Building Coastal Resilience: R3 Strategies for Flood and Heat Stress*

She discussed how scientific tools, GIS based mapping, and participatory assessments will be applied during the program to evaluate real world risks. Her remarks situated the six-day training within the broader need for integrated planning that combines climate analytics with community engagement.

Dr. Faiz Ahmed introduced the **Heat Index and microclimate dimension** of the program, outlining how temperature–humidity interactions, urban form, and materiality influence thermal stress in coastal environments. He presented an overview of instrument-based monitoring, field based microclimate surveys, and analytical approaches that participants would later undertake during the program. His address

underscored the importance of linking flood resilience with heat mitigation for holistic coastal planning. The inaugural session also provided participants with:

- An overview of the six thematic days
- Expected learning outcomes
- Details on field visits and hands on sessions
- Introduction to datasets, tools, and evaluation components
- Guidance for group based analytical work

The session concluded with an interactive exchange, where participants discussed the urgency of climate adaptation in Andhra Pradesh. With leadership from the Director, Program Head, and the two CoPIs **Dr. Prashanti Rao and Dr. Faiz Ahmed C** the inaugural session successfully laid the foundation for an intensive and transformative six-day learning journey focused on strengthening flood and heat resilience across coastal landscapes.

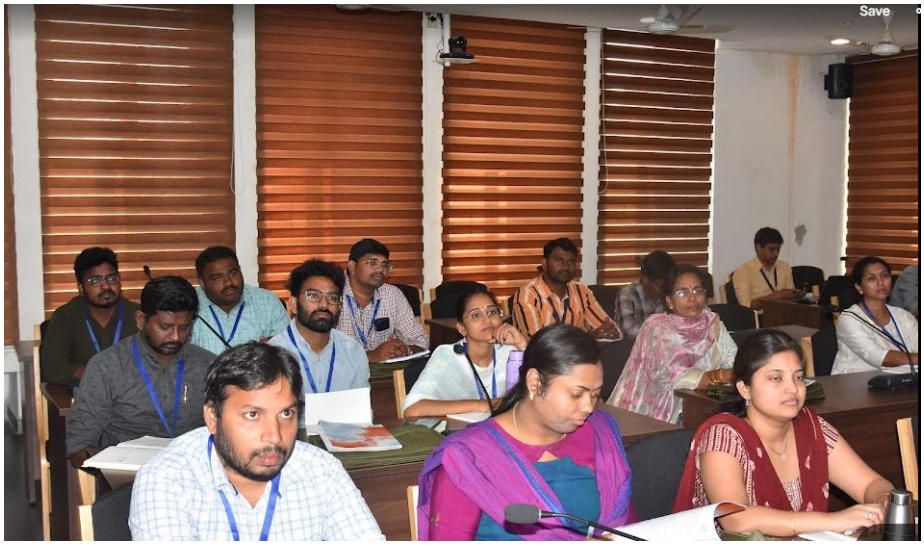


Figure 2: Inaugural Session, Participants attending for the CBP on *Building Coastal Resilience: R3 Strategies for Flood and Heat Stress*

5. SESSION PROCEEDINGS

5.1 Session-1: Coasts & Coastal Communities – The Living Edge of Resilience

(10:30–11:30 AM)

Expert: Mr. Rajeev R

This foundational session explored the ecological, geomorphological, and socio-economic significance of India's extensive coastline, with a special emphasis on coastal Andhra Pradesh. Mr. Rajeev provided a comprehensive overview of how coastal systems function as dynamic interfaces between land and sea, where physical processes, ecosystems, and human activities constantly interact. The session highlighted the intricate relationships among **mangroves, estuaries, beaches, sand dunes, creek systems, and tidal wetlands**, explaining how these natural formations regulate hydrology, mitigate storm impacts, and provide essential ecosystem services. By illustrating livelihood patterns such as **fishing, aquaculture, salt farms, coastal agriculture, and tourism-based occupations**, the session demonstrated how communities are intricately dependent on these fragile systems. Mr. Rajeev also discussed socio-cultural dimensions of coastal life traditional knowledge systems, indigenous coping practices, and collective community responses to environmental changes reinforcing the idea that resilience is not merely infrastructural, but deeply social and ecological.

Major Learning Points

Coastal zones are dynamic natural systems continuously shaped by tides, ocean currents, sediment transport, and seasonal monsoon cycles. These natural forces interact with human activities, where settlements, ports, aquaculture, and tourism significantly influence coastal morphology and, in turn, the vulnerability of these regions. The intricate relationship between people and their environment is evident in the way communities adapt to changing coastal conditions. Local practices ,such as interpreting storm signals, constructing climate-responsive dwellings, navigating

traditional fishing routes, and engaging in communal preparedness play a crucial role in enhancing resilience. Additionally, natural buffers like mangroves, sand dunes, and wetlands serve as vital protective barriers, mitigating the impacts of cyclones, flooding, and tidal surges, and thus preserving both ecosystems and livelihoods.

Figure 3 : Session 1 of the EDP by Mr. Rajeev R

This session successfully grounded participants in understanding coastal systems as living, interconnected environments where ecological health directly influences community resilience.

Session-2: Coastal Hazards & Climate Change Implications (11:45–12:45 PM)

Experts: Prof. Dr. Ramesh Srikonda & Dr. Arpan Paul

This analytical session provided an in-depth examination of the emerging climate risks confronting India's coastal regions. Through climate projection graphs, hazard maps, and historical disaster analyses, the experts explained how the warming climate is altering coastal hazard profiles and intensifying risks in Andhra Pradesh.

The session began with an overview of **global and national climate trends**, demonstrating how rising sea surface temperatures, shifting wind patterns, and increasing atmospheric moisture contribute to more frequent and severe extreme

weather events. Participants were introduced to key indicators such as **sea-level rise rates, heat index patterns, cyclone trajectories, storm surge heights, and IMD rainfall anomaly data**.

Figure 4 (Left and Right): Session 2 by Dr Ramesh Srikonda & Dr Arpan Paul

Prof. Ramesh discussed the implications of **changing monsoon behaviour**, where short-duration, high-intensity rainfall events increasingly lead to urban flooding, riverine inundation, and saturation of coastal lowlands. Dr. Arpan Paul elaborated on **salinity intrusion, coastal erosion, wetland degradation, and tidal flooding**, using case examples from Krishna–Godavari delta villages to illustrate differential district-level sensitivities.

Participants also learned how vulnerability is amplified in regions with dense settlements, weak drainage systems, unregulated landfills, and loss of natural buffers. The session connected scientific models with real-life coastal challenges, creating a strong link between climate drivers and community-level hazard outcomes.

Key Learnings

Climate change acts as a powerful driver in amplifying coastal hazards through multiple interconnected processes. Rising sea levels increase the frequency and extent of tidal flooding and allow storm surges to penetrate further inland, while warmer

ocean temperatures intensify cyclonic systems and expand their zones of impact. Along the coast, increased humidity further elevates heat stress, exacerbating risks to human health and productivity. Rainfall variability adds another layer of complexity, as high-intensity, short-duration rainfall events overwhelm both natural and engineered drainage systems, leading to flash floods, while erratic monsoon onset and retreat create cycles of drought punctuated by sudden flooding. In Andhra Pradesh, district-level climate sensitivity is particularly pronounced: the Krishna and Godavari deltas are highly vulnerable to inundation and salinity intrusion, coastal mandals experience rapid shoreline erosion and wetland loss, and urban centres face compounded heat stress due to dense built-up environments. Together, floods, heat waves, cyclones, and coastal erosion interact to form a multi-hazard coastal scenario, where overall vulnerability is shaped not only by climatic forces but also by socio-economic conditions, land-use patterns, and the capacity of existing infrastructure.

This session provided a critical scientific foundation for the rest of the training, enabling participants to connect macro-level climate trends with localized coastal risks, setting the stage for detailed vulnerability mapping and R3-based resilience planning.

5.3 Session-3: Need for Flood Resilience in Coastal Andhra Pradesh (14:00–15:00 PM)

Expert: Dr. Prashanti Rao

This session offered an in-depth analytical overview of why the coastal districts of Andhra Pradesh, particularly the **Krishna–Godavari delta region**, are among the most flood-prone landscapes in India. Dr. Prashanti Rao presented a systematic breakdown of the physical, climatic, hydrological, ecological, and socio-economic factors contributing to recurrent flooding, highlighting the urgent need for robust, science-driven flood resilience strategies.

Figure 5: Session 3 of the CBP by Dr Prashanti Rao

The session began by revisiting major flood events of the past two decades such as the **2009 Krishna Floods, 2015 East Godavari floods, and 2020 coastal inundations** to demonstrate how extreme rainfall, embankment breaches, river overflow, tidal surges, and backflow combine to create multi-layered flood risks. Participants examined **before-and-after satellite images, flood depth grids, and inundation maps** to understand how low-lying deltaic terrain, extensive canal systems, and river bifurcations amplify flood exposure. A critical component of the lecture focused on **land-use transitions**, including conversion of wetlands, salt pans, mangrove forests, and agricultural fields into built-up spaces. These changes have significantly weakened natural flood-buffering mechanisms and reduced the region's capacity to absorb or detain excess water. Dr. Rao explained how **encroachment on drainage channels, siltation of canals, unplanned peri-urban expansion, road embankments, and inadequate stormwater networks** further exacerbate flood vulnerability. Participants were also introduced to the **interplay between exposure, sensitivity, and adaptive capacity** across various administrative scales districts, mandals, and villages. Using case examples from Machilipatnam, Diviseema, Mummidivaram, Avanigadda, and Amalapuram, the session demonstrated how socio-economically weaker communities, fisherfolk settlements, and agriculturally

dependent villages face disproportionately high risks due to housing typologies, occupation patterns, and limited preparedness systems.

Key Participant Learnings

Andhra Pradesh's deltaic districts are categorized as "very high flood risk" zones due to a combination of geographical and human factors. These regions lie at extremely low elevations, have high population densities, and are intersected by dense canal networks, all while being situated close to major rivers and the Bay of Bengal. This makes them particularly vulnerable to the frequent convergence of riverine floods, cyclones, storm surges, and intense monsoon rains. The natural flood buffering capacity of these landscapes is further compromised by the loss of wetlands—such as marshes, tidal lakes, and mangroves—which traditionally help regulate water through storage, infiltration, and flow moderation. Additionally, encroachment and siltation in drainage channels slow down water evacuation, increasing both the depth and duration of flooding. Vulnerability also varies spatially: while district-level exposure may be high, sensitivity differs across mandals based on housing quality, income levels, and livelihood types. At the village level, factors such as micro-siting elevation, proximity to embankments, and drainage infrastructure play a critical role in determining the severity of flood impacts. The session enabled participants to recognize that flood resilience is not only a hydrological or infrastructural challenge but a **multi-dimensional issue requiring ecological restoration, land-use planning, community preparedness, and governance reforms.**

5.4 Session-4: Institutional, Policy & Governance Frameworks (15:15–17:00 PM)

Expert: Dr. Prashanti Rao

This session provided a comprehensive policy, governance, and institutional framework analysis for flood management and resilience building in India and Andhra Pradesh. Dr. Prashanti Rao unpacked the major national and state-level policies, legislative instruments, and operational guidelines shaping flood mitigation planning.

Participants were introduced to the **NDMA Flood Management Guidelines**, which outline structural and non-structural measures such as flood zone mapping, land-use regulation, reservoir operations, evacuation protocols, and early warning dissemination. The session also reviewed the **National Water Policy (2012)**, emphasizing integrated water resource management, ecological conservation, watershed planning, and groundwater–surface water balance. A detailed walkthrough of the **AP-SDMA (Andhra Pradesh State Disaster Management Authority)** framework showcased the key agencies, roles, and coordination mechanisms operative during disaster preparedness, response, and recovery. Dr. Rao explained how IMD, CWC, APSDMA, Revenue Department, Irrigation Department, and local bodies collaborate during flood alerts and emergency response cycles.

Participants learned about the functioning of **early warning systems**, including:

- IMD cyclone and heavy rainfall bulletins
- APSDMA real-time rainfall dashboards
- River gauge level monitoring
- District-level disaster management centres

Figure 6: Session 4 of the CBP by Dr Prashanti Rao

While highlighting strengths, the session also addressed **governance bottlenecks**, such as weak enforcement of zoning regulations in floodplains, lack of granular data, limited integration of scientific maps into planning decisions, and inconsistent inter-departmental coordination in rural and peri-urban regions. Challenges in mainstreaming community-driven approaches and gaps in post-disaster damage assessment mechanisms were also discussed.

Policy & Governance Insights Provided

India's disaster management and water policies provide a comprehensive framework for addressing flood and climate risks, combining both structural and non-structural approaches. The NDMA guidelines emphasize risk zoning, embankment maintenance, early warning systems, and community preparedness, while the National Water Policy advocates for watershed-based planning, water conservation, and ecological protection. In Andhra Pradesh, the State Disaster Management Authority (AP-SDMA) operates through a multi-tiered governance structure, involving committees at the state, district, mandal, and village levels to coordinate disaster preparedness and response. Early warning systems are supported by agencies like the IMD and APSDMA through dashboards, real-time river monitoring, and community-level dissemination. Despite these frameworks, significant governance gaps remain, including weak enforcement of land-use regulations, fragmented data systems, and limited integration of scientific research into planning and decision-making processes.

This session enabled participants to contextualize the scientific and technical sessions within the broader institutional ecosystem and understand how governance quality directly influences flood and climate resilience outcomes.

5.5 Session-5 and 6: Climate Change & Hydrological Extremes (9:30 AM – 12:45 PM)

Expert: Dr. Santosh Pingale, NIH Roorkee

This intensive session provided participants with a scientific grounding in the hydrological and climatic processes that underpin flood generation in coastal Andhra Pradesh. Dr. Santosh Pingale began by presenting recent climate diagnostics and long-term hydrological datasets that illustrate how climate change is altering rainfall patterns, watershed functioning, and runoff behaviour in the region. Participants were introduced to **hydrological modelling frameworks**, focusing on how watersheds respond to varying rainfall intensities, soil saturation levels, catchment characteristics, and land-use patterns. Using real examples from the Krishna and Godavari basins, Dr. Pingale demonstrated how **rainfall–runoff relationships** evolve under climate stress, and how peak discharge values rise significantly during high-intensity, short-duration extreme rainfall events. The session covered **flood hydrographs**, including how they are constructed, interpreted, and used for decision-making. Dr. Pingale explained rising limb, peak discharge, recession limb, base flow separation, and time-to-peak—highlighting how these elements reflect watershed sensitivity under changing climate conditions. Participants also explored hydrological tools such as **Digital Elevation Models (DEMs)**, **flow accumulation maps**, **catchment delineation**, and **inundation depth modelling**. The importance of terrain slope, drainage density, river cross-section geometry, and upstream precipitation was emphasized in determining downstream flood severity.

Dr. Pingale guided participants through **return period analysis**, showing how statistical techniques (Gumbel distribution, Log-Pearson Type III, frequency curves) help estimate the recurrence likelihood of extreme flood events. Through sample datasets, participants calculated return periods and interpreted how climate change is shortening recurrence intervals transforming what were once 50-year or 100-year floods into more frequent events.

Figure 7(Left to Right): Session 5 and 6 of the CBP by Dr Santosh M Pingale Expert from NIH, Roorkee and Facilitation from CO-PI's

Key Learnings

Andhra Pradesh is witnessing a noticeable rise in extreme rainfall events, marked by an increased frequency of cloudbursts, more intense monsoon depressions and cyclones, and a greater volume of rainfall occurring over shorter durations. These shifts significantly impact flood severity, which is governed by a range of hydro-meteorological parameters such as catchment runoff coefficients, soil moisture levels, infiltration capacity, intensity duration frequency (IDF) curves, and the interaction of river stages with coastal tides and winds. Advanced tools like Digital Elevation Models (DEMs), hydrographs, and catchment datasets are crucial in identifying low-lying vulnerable areas, mapping flow concentration pathways, and estimating flood routing and water accumulation zones. Interpreting return periods statistical representations of how frequently extreme events are likely to occur further helps in understanding

flood risk. However, climate change is altering these probabilities, making what were once rare events increasingly frequent, and challenging traditional assumptions of flood recurrence and preparedness. By the end of the session, participants gained the ability to interpret hydro-meteorological datasets and appreciate the scientific basis of flood prediction and hydrological behaviour in coastal contexts.

5.6 Session7: Decoding Vulnerabilities in Coastal Hazards
(14:00 – 15:30 PM)
Expert: Prof. Dr. Ayon Kumar Tarafdar

This session shifted focus from physical hydrology to **human vulnerability**, presenting a comprehensive framework for understanding how environmental hazards interact with socio-economic systems. Prof. Dr. Ayon Kumar Tarafdar introduced the foundational concept of **Exposure–Sensitivity–Adaptive Capacity**, explaining its relevance in coastal hazard assessment. Participants learned how **exposure** varies according to elevation, proximity to river mouths, distance from the coastline, settlement density, and location within the floodplain. Examples from Srikakulam, and Machilipatnam illustrated how settlements with similar geographic proximity can differ drastically in their exposure based on topography and structural protection.

Sensitivity was discussed through indicators such as:

1. Housing typology (kutcha, semi-pucca, pucca)
2. Livelihood dependence (agriculture, fishing, daily wage)
3. Age demographics (children, elderly population share)
4. Social vulnerability (women-led households, disability percentages)
5. Health conditions and access to services

Participants recognized that even moderately exposed communities can face severe impacts if their sensitivity is high.

The final component of the framework—**adaptive capacity**—included access to early-warning systems, evacuation routes, shelters, financial reserves, social networks, and institutional support. Prof. Tarafdar emphasized that adaptation capacity determines whether a community can prepare, respond, and recover effectively.

Figure 8 : Session 7 of the CBP by Prof. Dr Ayon Kumar Tarafdar , Centre Head ACUPCB SPAV

The vulnerability of settlements in coastal and riverine regions of Andhra Pradesh is shaped by a complex interplay of physical exposure, social sensitivity, and infrastructure readiness. Areas located at lower elevations are naturally more prone to water accumulation, resulting in longer durations of inundation during flood events. Settlements near river confluences experience intensified flood risks due to the convergence of multiple water flows, while coastal communities are uniquely exposed to compound hazards riverine flooding, tidal surges, and cyclone-induced storm surges often occurring simultaneously or in rapid succession.

Sensitivity to flooding varies based on the socio-economic characteristics of the population. Poorly constructed housing structures, often lacking durable materials or proper elevation, are more susceptible to structural failure during heavy rains or high winds. Livelihoods based on agriculture and fishing prevalent in many rural and peri-urban areas are especially vulnerable, as floods can destroy crops, contaminate water

sources, and damage fishing infrastructure, leading to prolonged economic disruption and slow recovery. Additionally, certain demographic groups such as the elderly, children, persons with disabilities, and women are disproportionately affected due to limited mobility, caregiving responsibilities, and reduced access to timely support, making them more sensitive to the impacts of disasters.

The capacity of infrastructure to support resilience plays a decisive role in shaping overall vulnerability. The presence and quality of flood shelters, accessible and well-maintained evacuation routes, functional drainage systems, and robust embankments can significantly reduce the impact of floods. Conversely, inadequate or poorly maintained infrastructure can increase exposure and delay emergency response. The functionality of health centres, especially during flood events, is critical for addressing injury, waterborne diseases, and other health risks. Similarly, maintaining road connectivity ensures timely evacuation, supply delivery, and post-disaster recovery. Collectively, these factors highlight the need for a holistic, integrated approach to risk reduction that considers not just the physical geography but also the socio-economic and infrastructural fabric of vulnerable communities.

This session allowed participants to appreciate vulnerability as a **multi-dimensional and dynamic concept**, influenced by ecological, social, infrastructural, and economic factors.

5.7 Session-8 Hands-On Exercise: Vulnerability Index Calculation (15:45 – 17:00 PM)

Experts: Dr. Arpan Paul & Mr. Rajeev R

This hands-on session enabled participants to apply the vulnerability concepts learned previously. Working in teams, they used structured datasets to compute a **Composite Vulnerability Index (CVI)** using the following steps: Participants reviewed exposure, sensitivity, and adaptive capacity indicators and learned how to justify their inclusion based on scientific literature and field relevance. Experts guided participants through

min–max and z-score normalisation techniques to bring indicators onto a comparable scale.

Figure 9 : (Left to Right) Session 8 of the CBP by Mr Rajeev R and D Arpan Paul

Weighting approaches such as:

1. Equal weightage
2. Expert judgement
3. AHP-style reasoning

Participants assigned weights based on indicator relevance.

1. Multiplying normalized values with weights
2. Summing sub-indices to obtain final CVI scores
3. Ranking settlements into Low, Moderate, High, and Very High vulnerability

Participants were asked to sketch **draft exposure–sensitivity vulnerability maps**, highlighting clusters of high-risk areas. This session strengthened their analytical, computational, and spatial reasoning abilities.

5.8 Session-9: Linking Theory with Practice
(9:30–11:30 AM)

Expert: Dr. Garima Agarwal, National Institute of Disaster Management (NIDM)

This highly engaging and analytical session bridged the gap between academic concepts of disaster resilience and their real-world implementation. Dr. Garima Agarwal presented a series of national and regional case studies to highlight how disaster risk reduction principles translate into operational strategies during extreme climate events. The session examined four major case studies:

a. Cyclone Fani (Odisha, 2019)

During the session, participants gained valuable insights into how the state of Odisha has emerged as a national and global model for disaster risk reduction, particularly in managing cyclones and coastal hazards. The state's success lies in its comprehensive and multi-tiered early warning systems, which integrate meteorological data, satellite monitoring, and ground-level information to provide timely and accurate alerts. These warnings are disseminated through a well-coordinated network involving district administrations, local governance bodies, media channels, and digital platforms, ensuring that messages reach even the most remote and vulnerable communities.

Participants also learned about Odisha's strong community outreach mechanisms, which include public awareness campaigns, school safety programs, mock drills, and the active participation of local volunteers and self-help groups. These grassroots-level initiatives have been critical in building a culture of preparedness and trust between authorities and residents.

Another key area of learning was the state's robust evacuation protocols. Odisha has institutionalized well-rehearsed and scalable evacuation procedures that are activated in advance of incoming cyclones. These protocols involve pre-identified evacuation routes, transportation arrangements, and designated safe zones to ensure the swift and orderly movement of at-risk populations.

Importantly, the state's investment in functional, multipurpose cyclone shelters has played a transformative role in safeguarding lives. These shelters are strategically located, well-maintained, and equipped with basic amenities to accommodate large groups, including vulnerable individuals such as the elderly, children, and persons with disabilities.

Dr. Agarwal emphasized Odisha's "zero-casualty approach" as a landmark achievement and a globally recognized best practice in disaster risk governance. This approach reflects a strong political will, institutional preparedness, and community engagement all essential elements for reducing disaster-related mortality. The state's experience provides a replicable framework for other coastal and disaster-prone regions seeking to strengthen resilience and adaptive capacity.

b. Krishna Basin Floods (Andhra Pradesh & Telangana, 2009 and 2020)

The case study of the **Krishna Basin floods** in Andhra Pradesh and Telangana—specifically the events of **2009 and 2020** provided participants with a grounded understanding of large-scale flood dynamics and management challenges in the region. Using hydrological maps, satellite imagery, and impact assessments, the session explored how excessive upstream river discharge led to **backflow effects**, exacerbating flooding in downstream areas. Participants examined how such backflow, particularly during peak monsoon conditions, overwhelmed both natural and engineered drainage systems and contributed to prolonged inundation in low-lying areas. A significant focus was placed on **reservoir management challenges**, including the complexities of coordinated releases from major dams such as Srisailam, Nagarjuna Sagar, and Prakasam Barrage. The floods underscored the delicate balance between holding back water for storage and releasing it to prevent upstream flooding—often with limited forecasting lead time.

The session also highlighted the impact of urban flooding in key cities like **Vijayawada and Kurnool**, as well as in several Krishna delta villages. Participants analysed how

rapid urbanization, encroachments on natural drainage channels, and inadequate stormwater infrastructure aggravated flood impacts, especially in densely populated and economically vulnerable areas. Additionally, post-flood **rehabilitation issues** were discussed, including delays in compensation, housing reconstruction, loss of livelihoods, and long-term disruption to education and healthcare services in affected communities. These experiences revealed systemic gaps in disaster response and recovery planning.

By revisiting these major flood events, the session contextualized the **R3 framework Risk Reduction, Response, and Recovery**—within Andhra Pradesh's own flood history. This helped participants link theoretical resilience strategies to real-world applications, emphasizing the importance of integrated water management, early warning systems, and long-term community-based recovery planning

c. Kerala Floods (2018–2019) – Community-Led Response

The session highlighted the critical role of community-driven response mechanisms during disasters. Local volunteer networks and grassroots rescue operations were shown to be highly effective in bridging gaps before formal aid arrives. Decentralized governance systems enabled quicker decision-making and localized action, enhancing the efficiency of emergency responses. A striking example was the role of Kerala's fishing communities referred to as the "Kerala Navy", who mobilized their boats and local knowledge to carry out life-saving rescue missions during floods. This case powerfully demonstrated how strong community capital and trust can significantly reduce disaster impacts and support faster recovery.

Key Takeaways

The session underscored that **early warning is only effective when it leads to early action**. Issuing alerts through meteorological agencies or disaster dashboards is not sufficient unless these warnings are clearly communicated and prompt communities to take timely steps such as evacuation, securing property, and reaching shelters. This requires robust last-mile communication systems that are trusted, accessible, and multilingual, particularly in vulnerable rural and coastal areas.

A critical area of focus was the **design and planning of cyclone and flood shelters**. Participants discussed how shelter infrastructure must go beyond just physical construction. Key considerations include their proximity to at-risk communities, structural resilience against high winds and flooding, the inclusion of essential services such as water, sanitation, electricity, and space for livestock, as well as the availability of safe and clearly marked **evacuation routes**. Poorly located or inaccessible shelters can undermine evacuation efforts, especially for the elderly, children, and persons with disabilities.

The importance of **institutional coordination** was highlighted as essential for timely and effective disaster response. Seamless collaboration among multiple departments Revenue, State Disaster Management Authorities (SDMAs), local governance bodies, police, fire services, and health departments is necessary for pre-disaster planning, real-time response, and post-disaster recovery. Inter-agency drills, shared protocols, and clearly defined responsibilities help avoid confusion and duplication of efforts during critical times.

Finally, **community preparedness** was recognized as the foundation of any successful disaster management strategy. Locally-rooted awareness campaigns, school education, mock drills, and the activation of trained **volunteer networks** ensure that people know how to respond when disasters strike. Social cohesion and trust within communities also enhance response efficiency, as people are more likely to support one another and act collectively when they feel informed and included. Together, these elements form a holistic and inclusive approach to disaster resilience. This session enabled participants to understand how theoretical resilience frameworks manifest in real crisis conditions, especially in multi-hazard coastal environments.

Figure 10 (Left to Right): Session 9 by Dr Garima Aggarwal, Expert from NIDM, New Delhi and Facilitation from CO-PI's

5.9 Session-10: Scientific Approaches & Community Participation in Mapping Vulnerability

(11:45 AM – 12:45 PM)

Expert: Dr. Prashanti Rao

This session introduced a structured methodology for **vulnerability assessment** integrating scientific techniques with participatory community-based approaches.

Figure 11: Session 10 by Dr Prashanti Rao

Dr. Prashanti Rao presented the **technical workflow** of vulnerability mapping, covering:

1. **Household Surveys**:
   Data collection on housing condition, income, health, access to services, past hazard experiences, and social vulnerability variables.
2. **Transect Walks**:
   Participants learned how-to walk-through settlements systematically to identify risk indicators such as drainage obstructions, low-lying areas, fragile houses, and livelihood hotspots.
3. **Participatory Risk Mapping (PRM)**:
   Communities were shown as co-creators of hazard maps, using local knowledge of flood depths, evacuation routes, and high-risk households.
4. **Social Vulnerability Scoring**:
   Utilizing indicators such as gender vulnerability, age distribution, disability, economic fragility, and household dependencies.

The session emphasized how **scientific datasets (DEMs, LULC maps, hydrology layers)** and **community datasets (perceptions, lived experiences)** complement each other to create a holistic vulnerability profile.

Insights for Participants

While technical tools such as satellite imagery, GIS, and remote sensing provide valuable accuracy in assessing hazards and mapping risk, they must be complemented by community engagement to capture ground realities. Local contexts, such as informal settlements, seasonal livelihood patterns, or blocked drains are often missed or misrepresented in satellite interpretations. Therefore, field visits, participatory mapping, and direct dialogue with residents are essential to validate data and understand lived experiences. Truly effective **vulnerability mapping** blends quantitative data with **qualitative insights**, ensuring that both statistical indicators and

community knowledge inform risk assessments and decision-making. This session prepared participants for the field-based exercises that followed on Day 4.

5.10 Session-11: Adaptive Capacity & Response Preparedness using R3 (14:00–17:00 PM)

Expert: Dr. Prashanti Rao

The extended afternoon workshop focused on operationalizing the **R3 (Readiness–Response–Recovery)** framework for coastal resilience planning. Dr. Rao guided participants through structured tools to evaluate adaptive capacity at the village and settlement levels.

Figure 12: Session 10 by Dr Prashanti Rao

1. **Readiness (Pre-Disaster Preparedness)**

It was a key area of assessment during the session, focusing on how well communities and systems are equipped before a disaster strikes. Participants evaluated the **availability of emergency kits** at the household level, including essentials like food, water, first-aid, flashlights, and important documents. The level of **awareness among residents** about risks, evacuation protocols, and safe practices was also examined.

Functionality and reach of **early-warning dissemination systems**, such as sirens, SMS alerts, and community messengers, were assessed for their ability to prompt timely action. The **strength of social networks** played a crucial role in preparedness, enabling information-sharing and collective response. Finally, the **readiness of critical infrastructure**, including cyclone shelters, drainage systems, and accessible roads, was evaluated to determine the community's capacity to withstand and respond to an impending hazard.

2. Response (During Disaster)

During the session, participants explored key components of **response capacity during disasters**, emphasizing the importance of timely and coordinated action. **Access to shelters and their capacity** to accommodate vulnerable populations were assessed, focusing on location, safety standards, and basic amenities. The **readiness of health services**, including availability of medical staff, emergency supplies, and mobile health units, was seen as critical for addressing injuries, disease outbreaks, and mental health needs. **Real-time communication mechanisms**, such as public announcement systems, mobile alerts, and community-level coordination channels, were highlighted as essential for guiding evacuation and response efforts. Additionally, the **operational roles of Self-Help Groups (SHGs), ward volunteers, and village committees** were recognized as vital, with these local actors often serving as first responders, information disseminators, and support providers for relief distribution and community mobilization.

3. Recovery (Post-Disaster Rehabilitation)

It focuses on restoring normalcy and building long-term resilience in affected communities. Key priorities include **livelihood restoration**, ensuring that people engaged in agriculture, fishing, or informal work can return to stable income sources through financial aid, tools, or alternative opportunities. The **repair and reconstruction of damaged homes and critical infrastructure**, such as roads, water supply, and electricity, is essential for resuming daily life. **Compensation mechanisms** must be timely, transparent, and equitable to support those who have suffered losses. Beyond immediate relief, **long-term rehabilitation** involves rebuilding social systems, providing psychosocial support, and restoring public services. Importantly, recovery is also a chance to **reduce future vulnerability** by

integrating risk reduction into housing designs, land-use planning, and community infrastructure, promoting safer and more resilient settlements.

Participants used practical worksheets to:

I. Score adaptive capacity indicators
II. Identify systemic strengths and weaknesses
III. Develop **micro-level readiness and response plans** tailored to rural, peri-urban, and coastal settlements
IV. Understand interconnections between immediate response and long-term resilience

Dr. Rao also introduced **scenario-based planning exercises**, allowing participants to design stepwise responses to hypothetical flood and heat stress situations.

5.11 Session-12 Field Visit for Ground Verification & Applied Learning (9:30AM–17:00 PM)

The fourth day of the program was entirely devoted to **on-ground experiential learning**, enabling participants to directly observe the complex interplay of flood dynamics, environmental challenges, socio-economic vulnerabilities, and microclimatic variations in two representative coastal settlements—**Kara Agraharam** and **Bandar Kota**. These two villages, located within the Krishna delta system, present distinct but complementary typologies of coastal risk, making them ideal for field-based study. The field visit aimed to reinforce the theoretical frameworks of the previous sessions by exposing participants to **real-world hazard conditions**, local governance mechanisms, and the everyday resilience practices of coastal communities.

Figure 13: Field Study by Participants at Village Bandar Kota , near Machilipatnam district

Figure 14: Field Study by Participants at Village Kara Agraharam, near Machilipatnam district

Figure 15: Discussion of participants of Outcome with Co-PI's

5.12 Session13: Heat Index & Urban Heat Stress (9:30–10:30 AM)

Expert: Dr. Anurag Bagade

This introductory lecture on the Heat Index (HI) provided participants with a comprehensive understanding of how temperature and humidity interact to shape human thermal comfort under coastal climatic conditions. Dr. Anurag Bagade began by explaining the **scientific principles underlying HI calculations**, showing how even moderate temperatures can feel significantly hotter when relative humidity is high a condition frequently observed in the Krishna–Godavari delta. Participants were introduced to the concept of **apparent temperature**, and how the National Weather Service (NWS) methodology quantifies heat stress based on air temperature and humidity combinations. Using graphical charts and case examples from Andhra Pradesh, Dr. Bagade demonstrated how coastal settlements often experience disproportionately high HI values during pre-monsoon and post-monsoon months.

The lecture deepened participants' understanding of how **urban form and materials** influence microclimate conditions. The following factors were discussed in detail:

a. **Absorptive and reflective properties of built surfaces** (concrete, asphalt, metal sheets).
b. **Street canyon geometry**, which affects air flow and heat trapping.
c. **Presence or absence of vegetation**, which alters humidity, evapotranspiration, and shading.
d. **Surface roughness and ground cover**, which determine heat uptake and night-time cooling.

Dr. Bagade linked these physical drivers to **public health impacts**, explaining how heat extremes increase risks of dehydration, heat exhaustion, heat stroke, cardiovascular stress, and productivity decline. Case examples from recent heatwaves in Andhra Pradesh illustrated how vulnerable demographics—elderly populations, children, outdoor labourers, and coastal fishing communities—face higher exposure.

Key Learning Outcomes

The session deepened participants' **scientific understanding of the Heat Index**, explaining how temperature and humidity combine to influence perceived heat stress. The **role of humidity** was emphasized, showing how high moisture levels in the air reduce the body's ability to cool itself through sweating, making it feel significantly hotter than the actual temperature. Participants also examined how **urban microclimates** are shaped by factors such as built density, surface materials, lack of vegetation, and shading, which can trap heat and intensify discomfort. The discussion highlighted the importance of recognizing **early health indicators of heat stress**, including dehydration, dizziness, and fatigue, particularly among vulnerable groups like the elderly and outdoor workers. Special attention was given to **coastal Andhra Pradesh**, where high humidity levels, sea breeze variations, and changing land use patterns contribute to unique and growing heat vulnerabilities.

5.13 Session-14 Instrumentation & HI Calculation
(10:45 AM – 12:45 PM)

Expert: Dr. Faiz Ahmed C

In this technically intensive session, participants gained hands-on experience with environmental monitoring equipment used for microclimate assessments. Dr. Faiz Ahmed C demonstrated the operational procedures and calibration steps for a variety of field instruments, including:

Instrumentation Introduced

I. **Automatic Weather Stations (AWS)**: Real-time measurement of temperature, humidity, wind speed, and radiation.
II. **Digital Temperature & Humidity Sensors**: Used for localized measurements at pedestrian height (1.1–1.5 m).
III. **Air Velocity Probes**: Capturing wind movement along streets, building edges, and open spaces.
IV. **Infrared Surface Temperature Guns**: Assessing heat retention of roads, walls, pavements, and roofs.
V. **CBE Thermal Comfort Tool**: An online platform for analysing comfort ranges based on environmental variables.
VI. **Comfort Survey Instruments**: Structured questionnaire formats for capturing people's subjective comfort under varying heat conditions.

Participants collected **real-time readings** from both indoor and outdoor environments, and computed Heat Index values using simplified calculation sheets and digital tools. They observed the influence of humidity spikes on the HI curve and learned how instrument placement (sun vs shade, height, orientation) affects accuracy. This session equipped participants with the ability to conduct **scientific microclimate assessments** independently in real-world field settings.

Figure 16: (Left to Right) Sessions By Dr Faiz Ahmed CH

5.14 Session-15 Field Walk & Microclimate Spot Survey (2:00 – 5:00 PM)

Facilitators:

- **Dr. Faiz Ahmed C**
- **Dr. Anurag Bagade**

The afternoon session took participants outdoors to apply the principles learned earlier in the day. Teams were organized into groups and assigned specific transects for conducting **microclimate spot surveys**. They used instruments to record:

Key Parameters Measured

I. Shaded vs. unshaded temperature differences
II. Surface temperatures across asphalt, concrete, tiled pavements, bare soil, and vegetation
III. Wind patterns and channelling effects between buildings
IV. Tree canopy influence on ambient temperature and humidity
V. User comfort perceptions, captured through short interviews and comfort surveys

Participants compared sites with different built forms wide vs. narrow streets, open grounds vs. dense built-up areas, and vegetated vs. non-vegetated spaces.

These observations were later used to construct heat stress maps, highlighting clusters of high thermal exposure.

Figure 17: Sessions by Dr Faiz Ahmed CH

5.14 Session-15 Data Analysis & Interpretation (10:45 AM – 12:45 PM)

Expert: Dr. Faiz Ahmed C

In this session, participants analysed the comprehensive **heat stress datasets** collected during the microclimate field survey conducted on Day 5. The exercise aimed to help participants understand how temperature, humidity, wind patterns, surface materials, and shading collectively influence the spatial variation of heat stress across different settlement typologies. Participants used their recorded measurements ambient temperature, relative humidity, surface temperature, wind velocity, and comfort survey responses to generate **Heat Index profiles**, identify microclimate disparities, and interpret patterns of thermal discomfort across various urban and rural settings.

Assessment of Apparent Temperature and Heat Index Thresholds
Participants began by analysing apparent temperature—the perceived heat

experienced by the human body—as opposed to actual measured temperature. This highlighted the disparities between thermometer readings and how hot it actually feels, especially under high humidity conditions. By applying the Heat Index (HI) formula, they identified zones that crossed critical thresholds such as “Caution,” “Extreme Caution,” and “Danger,” which signal increasing levels of health risk from heat stress.

Field Mapping of Heat Zones

Using real-time field measurements and observations, participants mapped the spatial distribution of heat intensity across different urban typologies. High Heat Index zones were found in areas such as narrow, unshaded streets, dense built-up clusters, and structures with tin or metal roofing, which absorb and radiate heat. In contrast, moderate HI zones included areas with partial shading from trees or buildings, as well as mixed-use zones with intermittent vegetation. The most comfortable conditions, or low HI zones, were observed in spaces with dense tree canopies, proximity to water bodies, or good natural ventilation.

Microclimate Parameters and Human Comfort

To understand the causes behind these variations, participants examined several microclimate parameters, including the temperature difference between shaded and unshaded spaces, and the thermal properties of urban surfaces like concrete pavements, rooftops, and building facades. They also assessed the presence and functionality of wind corridors, which help disperse heat, and studied how vegetation contributes to localized cooling. Finally, through surveys, participants gathered human comfort responses, providing insight into how residents experience and adapt to heat stress in different urban settings.

This integration helped them understand how physical environments amplify or mitigate heat stress.

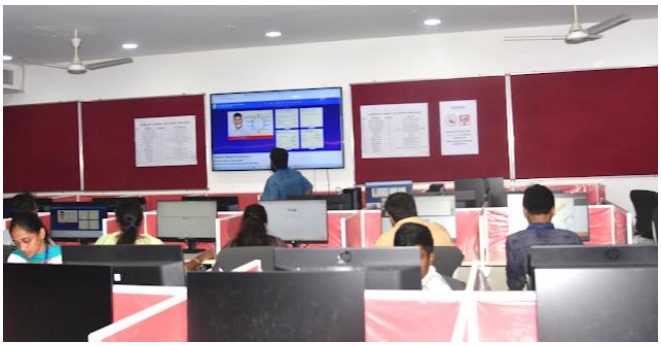


Figure 18: Sessions by Dr Faiz Ahmed CH

6. Valedictory

The six-day Capacity Building Program concluded with a formal **Valedictory Session** on the evening of 15 November 2025. The closing ceremony served as a reflective platform to review the academic, technical, and field-based learning achieved during the program, and to acknowledge the contributions of experts, coordinators, and participants.

The session was chaired by:

I. **Prof. Dr. Ramesh Srikonda**, Director, SPAV
II. **Prof. Dr. Ayon Kumar Tarafdar**, Head, A-CUPCB
III. **Dr. Prashanti Rao**, Co-Principal Investigator
IV. **Dr. Faiz Ahmed C**, Co-Principal Investigator

Figure 19- (Left To Right) Summarization from PI Dr Ramesh Srikonda and Head ACUPCB Dr Ayon Kumar Tarafdar, followed by Thanks Giving to all Participants and Co Members by Dr Prashanti Rao CO-PI

At the conclusion of the program, the Coordinators provided a concise summary highlighting the core themes explored over the six-day workshop. The sessions began with an overview of the **foundations of coastal systems**, examining natural dynamics, climate change impacts, and key coastal hazards. This was followed by in-depth discussions on **flood vulnerability assessment**, including analysis of exposure, sensitivity, and the application of the **R3 framework**—Risk Reduction,

Response, and Recovery. Participants then engaged in **field-based mapping exercises** in Kara Agraharam and Bandar Kota, where they gathered real-world data on flood-prone areas. The workshop also included **Heat Index assessment and microclimate measurements**, leading to the mapping of **heat stress zones** in different urban contexts. Finally, the program concluded with a focus on **planning and design strategies** aimed at enhancing resilience across vulnerable coastal regions of Andhra Pradesh, integrating both scientific tools and community-based approaches. Emphasis was laid on the unique design of the program, which blended scientific lectures, hands-on training, field verification, and multi-hazard planning exercises.

Participants shared their experiences, highlighting:

Several participants acknowledged this program as one of the most comprehensive and applied training experiences in coastal resilience offered in recent years. Experts commended the participants for their active engagement and quality of analytical outputs during group presentations. They encouraged participants to:

- Integrate scientific mapping into policy and planning practice
- Continue field-based investigations and community-level engagement
- Strengthen cross-sector collaboration to enhance resilience outcomes

The importance of mainstreaming **heat mitigation**, **flood preparedness**, and **nature-based solutions** into district and village-level planning was reinforced.

Certificates were presented to all participants in recognition of their successful completion of the program. The distribution ceremony acknowledged their commitment to enhancing resilience knowledge and contributing to climate-adaptive planning in their respective institutions and departments. A formal Vote of Thanks was delivered by the Organizing Committee, expressing gratitude.

Figure 20- (Left To Right) Felicitation to all Participants and Co Members by Dr Prashanti Rao CO-PI

Figure 21- Group photograph with all Participants and Organizing team of CBP

Special appreciation was extended to the Director and A-CUPCB leadership for supporting the program.

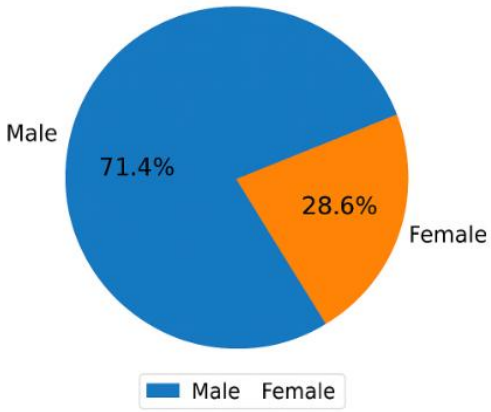
7. PARTICIPANT PROFILE

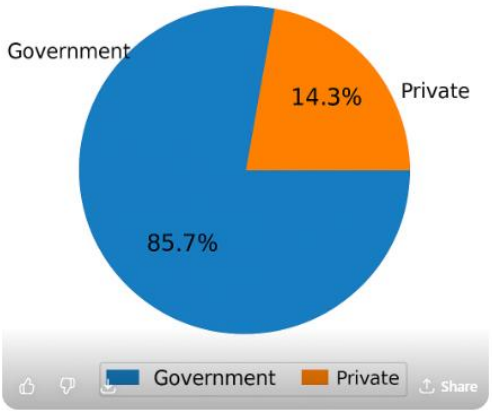
Registered and Attended

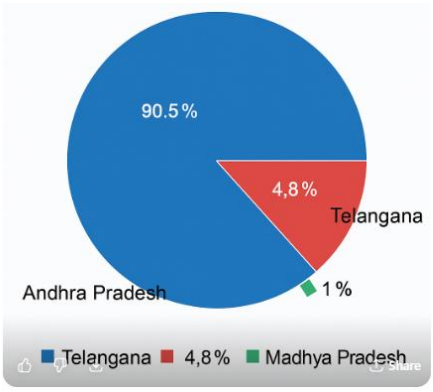
S. No.	Participant Name	Participant Number	Participant Organization	Participant Designation	Male/ Female
1	Bonda Kiran Kumar	CBP_25_01_01	Asso. Prof. & Dy. HoD, School of Architecture, KL Deemed to be University, Vaddeswaram, Guntur - 522302.	Employee with Private Industry	M
2	Parthib Deb	CBP_25_01_01	Department of General and Applied Geography, Dr. Harisingh Gour University (a central university), Sagar, Madhya Pradesh, India	Student (excluding PhD students)	M
3	SOMAINA ISLARY	CBP_25_01_01	School of Planning and Architecture, Vijayawada, Survey No.4/4, ITI Road, Vijayawada-520008, Andhra Pradesh, India.	Regular Employee with Government	F
4	Naveen Kanithi	CBP_25_01_01	Government of AP, Roads & Buildings Department. R&B HOD Office, Punammathota, Labbipet, Vijayawada, Andhra Pradesh 520010	Regular Employee with Government	M
5	MRUNMAYI DHAWAD	CBP_25_01_01	BHOOMI DESIGN STUDIO, HYDERABAD	Self-Employed	F
6	RAJEEV NALLAGATLA	CBP_25_01_01	SCHOOL OF PLANNING AND ARCHITECTURE VIJAYAWADA	Regular Employee with Government	M
7	Keertana Lingamaneni	CBP_25_01_01	3rd Floor, APCRDA Project Office, Tulluru, Amaravati, A.P, 522237	Contractual Employee with Government	F
8	Kuntamukkula Harshitha	CBP_25_01_01	Planning Wing, APCRDA, Amaravati, Andhra Pradesh	Contractual Employee with Government	F
9	Y Moses	CBP_25_01_01	APCRDA- Lenin Centre, Vijayawada - 520002	Contractual Employee with Government	M
10	KURRA GOPIKRISHNA	CBP_25_01_01	MA&UD AP	Regular Employee with Government	M
11	KOLASANI CHIRANJIVI VENKATA SATYANARAYANA	CBP_25_01_01	MA&UD AP	Regular Employee with Government	M

12	Ganji Naga Pushpa	CBP_25_01_01	Sachivalayam-5, Sitaram Puram, Jaggaiahpet Municipality.	Regular Employee with Government	F
13	YELURU POOJITHA	CBP_25_01_01	Eluru Municipal Corporation, MAUD AP	Regular Employee with Government	F
14	YAGATI HARI KRISHNA	CBP_25_01_01	ELURU MUNICIPAL CORPORATION, MAUD AP	Regular Employee with Government	M
15	KATAM RAVI TEJA	CBP_25_01_01	Eluru Municipal corporation, MAUD,AP	Regular Employee with Government	M
16	MODUKURI GOPI	CBP_25_01_01	WARD PLANNING AND REGULATION SECRETARY-TOWN PLANNING DEPARTMENT-BAPATLA MUNICIPALITY-(MAUD)	Regular Employee with Government	M
17	Kapil	CBP_25_01_01	SPAV	Regular Employee with Government	M
18	Dr. POLEPALLI SIVA PRASAD	CBP_25_01_01	AST PROF, DEPT OF ARCH, SPA VIJAYAWADA	Regular Employee with Government	M
19	SIDDELA AVADESH	CBP_25_01_01	TENALI MUNICIPALITY, GOVERNMENT ANDHRA PRADESH.	Regular Employee with Government	M
20	Rudrapati Ramesh	CBP_25_01_01	Ward Planning and Regulation secretary	Regular Employee with Government	M
21	Arja Ravi Teja	CBP_25_01_01	Town Planning,Pedana municipality, MAUD.	Regular Employee with Government	M
Registered and Not Attended					
1	Naga Sai Mahesh Kanala	CBP_25_01_01	Andhra Pradesh Maritime Board	Contractual Employee with Government	M
2	Rajan M. Joseph	CBP_25_01_01	Town and Country Planning Department Kerala	Regular Employee with Government	M

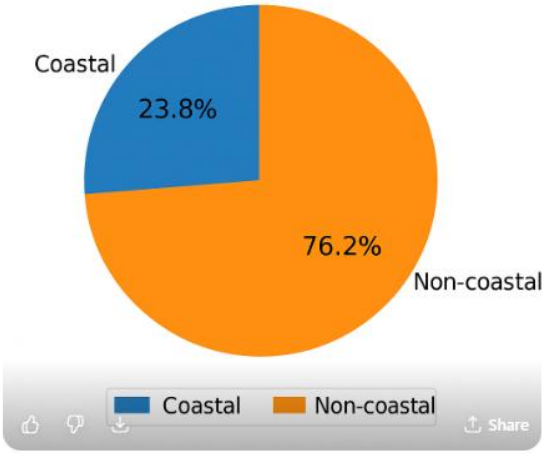
Participant Diversity

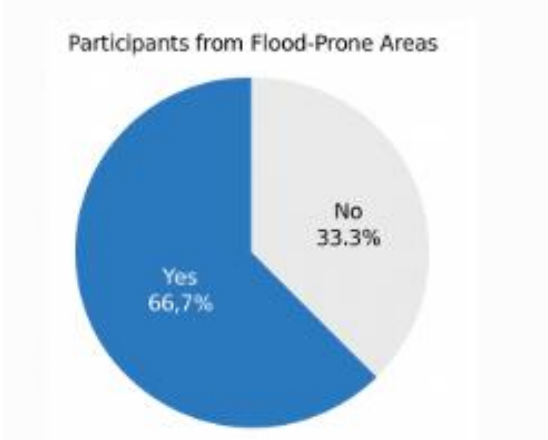




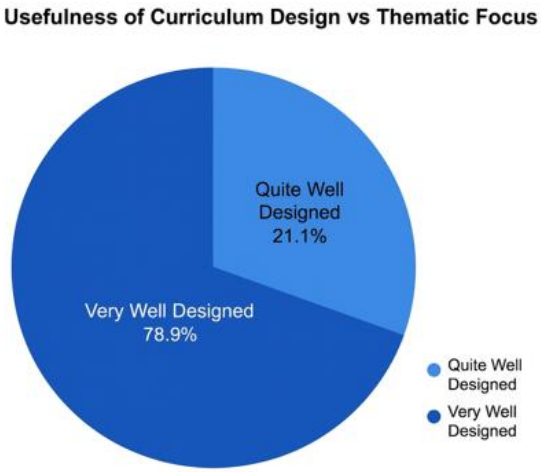


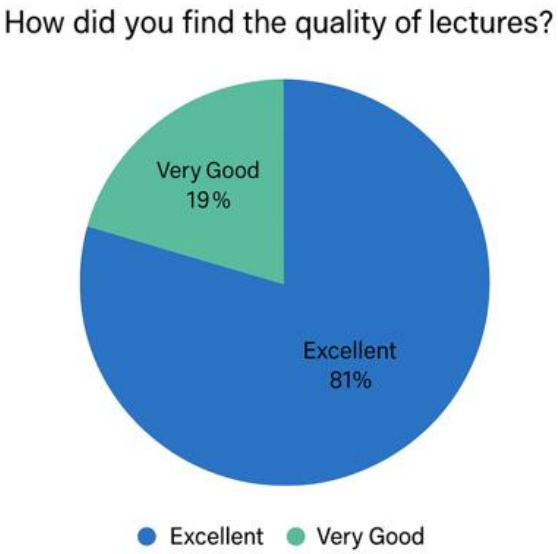
Participant's exposure to disaster

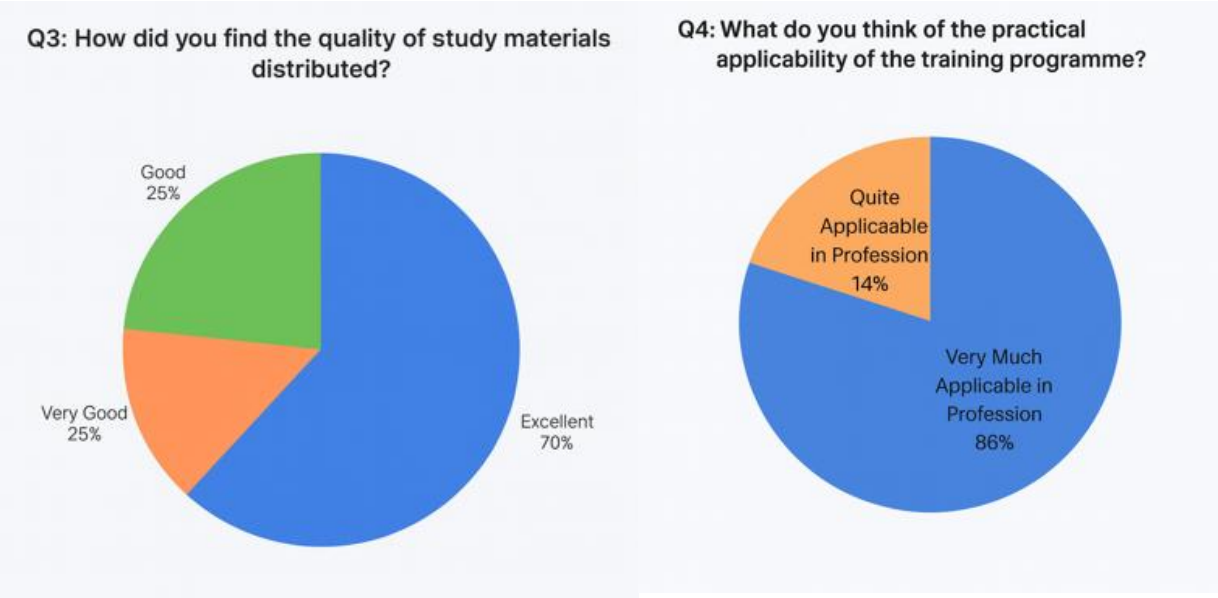




Participant Feedback





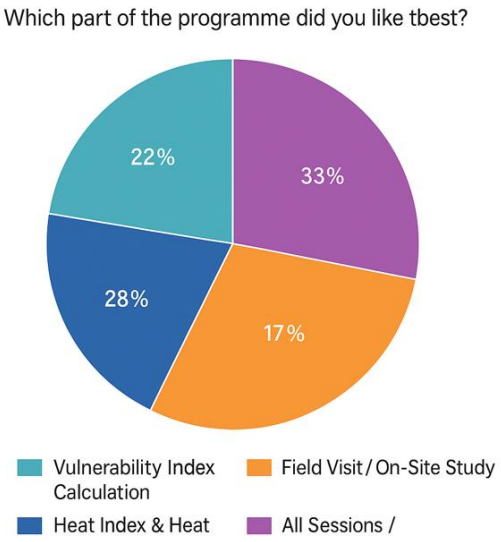


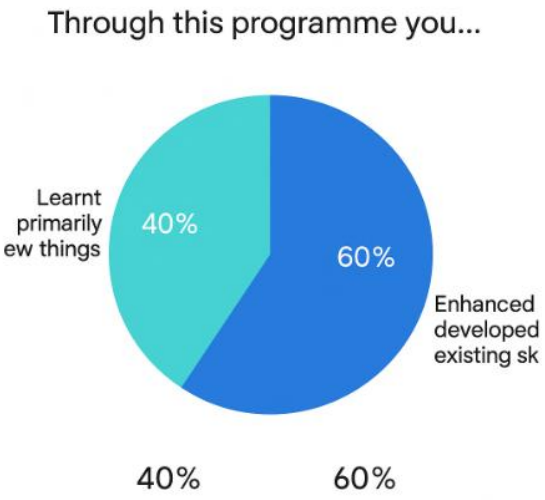
The participant feedback for the Capacity Building Programme was collected through Google Forms circulated by A-CUPCB, SPAV. A comprehensive analysis of the responses reflects a consistently positive experience across all six days of the programme. The feedback highlights the programme's strong academic structure, practical relevance, and meaningful engagement strategies.

Participants appreciated that the sessions offered a balanced combination of conceptual depth and emerging themes, enabling them to gain both foundational clarity and advanced professional insights. The carefully curated curriculum, as reflected in the high rating for "Very Well Designed," helped participants understand coastal resilience through an integrated lens of theory, field exploration, and analytical application.

A major strength repeatedly noted by participants was the experiential and hands-on learning component. The field visit to Bandar Kota and Kara Agraharam was highly valued, especially for its real-world exposure to flood-prone and heat-stress-affected environments. Participants described the field experience as "very useful," "highly contextual," and "a standout part of the programme." Through direct engagement with local households, community leaders, and on-ground conditions, participants gained practical insights into vulnerability assessment, drainage challenges, settlement risks,

and microclimatic variations. This enriched their understanding far beyond classroom-based learning.





Participants also expressed strong appreciation for the instrumentation and Heat Index measurement exercises, where they were able to use AWS sensors, humidity monitors, surface temperature guns, and comfort surveys. This direct engagement with scientific tools helped strengthen their technical confidence in conducting microclimate assessments and vulnerability analysis.

Another element that received enthusiastic feedback was the interactive role-play and group-based activities, particularly the stakeholder engagement simulation using the R3 framework. Participants felt these activities fostered collaborative learning, encouraged active participation, and nurtured critical thinking by allowing them to assume multiple administrative and community perspectives.

Several respondents mentioned that the overall programme delivery was structured, smooth, and professionally executed, with lectures rated as “Excellent” and study materials rated as “High Quality.” The integration of conceptual frameworks, analytical tools, field data, and multi-hazard approaches was seen as coherent and impactful.

Participants overwhelmingly indicated that the programme enhanced and developed their existing skillsets, while a significant proportion also felt that they gained new

knowledge that they had not been exposed to earlier. The practical applicability of the sessions to their professional roles particularly for municipal staff, planning professionals, and researchers was consistently highlighted. Finally, when asked about areas for improvement, most participants stated that they were fully satisfied with the programme, with only a small proportion suggesting minor enhancements indicating a generally high level of programme acceptance and satisfaction.

Program Overview

06 Days
Workshops & Labs
GIS and Mapping Training
Field Demonstrations
Drainage & Cooling Design Exercises
R^3 Action Planning

For Registration & Fee Details

SCAN HERE
Registration Deadline: 9 Nov 2025

Program Team

Coordinators

Prof. Dr. Ramesh Srikonda
Professor & Director, SPA Vijayawada
(Principal Investigator – PI)

Dr. Prashanti Rao
Assistant Professor, SPA Vijayawada
(Co-Principal Investigator – Co-PI)

Dr. Faiz Ahmed Ch
Assistant Professor, SPA Vijayawada
(Co-Principal Investigator – Co-PI)

Mr. Rajeev R
Assistant Professor, SPA Vijayawada

Dr.Arpan Paul Singh
Faculty, SPA Vijayawada

Patrons

Prof. Dr. Ramesh Srikonda
Professor & Director, SPA Vijayawada

Prof. Dr. Ayon K Tarafdar,
Head, A-CUPCB-SPAV

For registration, fee and other queries, visit our website:
https://acupcb.spav.ac.in/capacity-building/cbp_25_01/

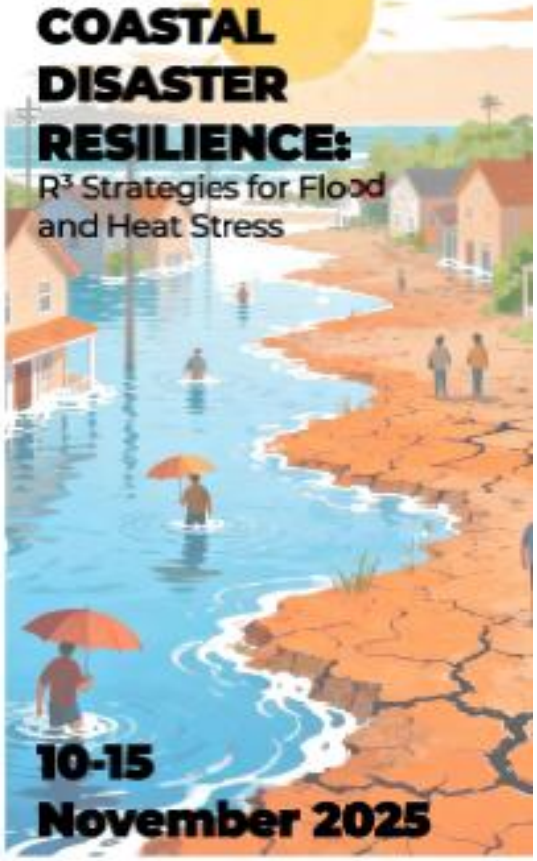
Organised by

योजना तथा वास्तुकला विद्यालय, विजयवाड़ा
School of Planning and Architecture, Vijayawada
An Institute of National Importance, MHRD, Govt. of INDIA

Capacity Building Program

BUILDING COASTAL DISASTER RESILIENCE:

R^3 Strategies for Flood and Heat Stress



10-15 November 2025

AMRUT Centre of Urban Planning for Capacity Building
A-CUPCB-SPAV

About the Program

Coastal communities are among the most vulnerable to climate-induced disasters, particularly floods and extreme heat events. These hazards cause severe loss of life, damage to infrastructure, displacement of populations, and economic disruption. With climate change intensifying the frequency and severity of such disasters, proactive and integrated pre- and post-disaster strategies have become critical.

This 6-day Capacity Building Program on Pre-Post Disaster Management through R³ (Risk Reduction, Assessment, Mapping) is designed to bridge these gaps. The program equips participants with tools, techniques, and frameworks to identify risks, strengthen preparedness, and implement localized action plans.

Beyond immediate disaster management, the program fosters long-term resilience and sustainable coastal development, aligned with the Sustainable Development Goals (SDG 11 – Sustainable Cities & Communities, and SDG 13 – Climate Action). It also supports policy development, governance strengthening, and climate adaptation pathways to safeguard urban populations in coastal regions.

Participants will engage in lectures, software training, field visits, and applied simulations that combine theoretical knowledge with hands-on experience, ensuring both practical skills and a deeper understanding of resilience planning.

Who Should Attend

The program is designed for Students, Urban Local Body officials, planners, engineers, architects, disaster managers, academics, NGOs, and community leaders engaged in climate adaptation and coastal resilience.

Outcomes

- Applied understanding of R³ framework
- GIS-based hazard & vulnerability mapping
- Drainage and cooling design exercises
- Development of localized resilience strategies
- Pilot project concepts for flood & heat stress
- Action planning and decision-support tools

Program Structure

DAY 1 — Foundations: Understanding Coastal Systems and Risks
- Inaugural & Welcome Session
- Importance of Coasts and Coastal Communities
- Coastal Hazards & Climate Change: Implications for India
- Need for Flood Resilience in Coastal Areas of AP
- Risk & Resilience Frameworks
- Case Study Workshop / Discussion

DAY 2 — Tools & Mapping for Risk Understanding
- Exposure Mapping for Coastal Flood Risk
- Vulnerability Mapping of Coastal Systems
- Hands-on: Rapid Flood Risk Assessment Methods
- Flood Modelling Approaches & Applications

DAY 3 — Field Visit
- Field Visit & Risk Assessment of Case Area
- Group Reflection & Discussion: Connecting Field Observations to Frameworks

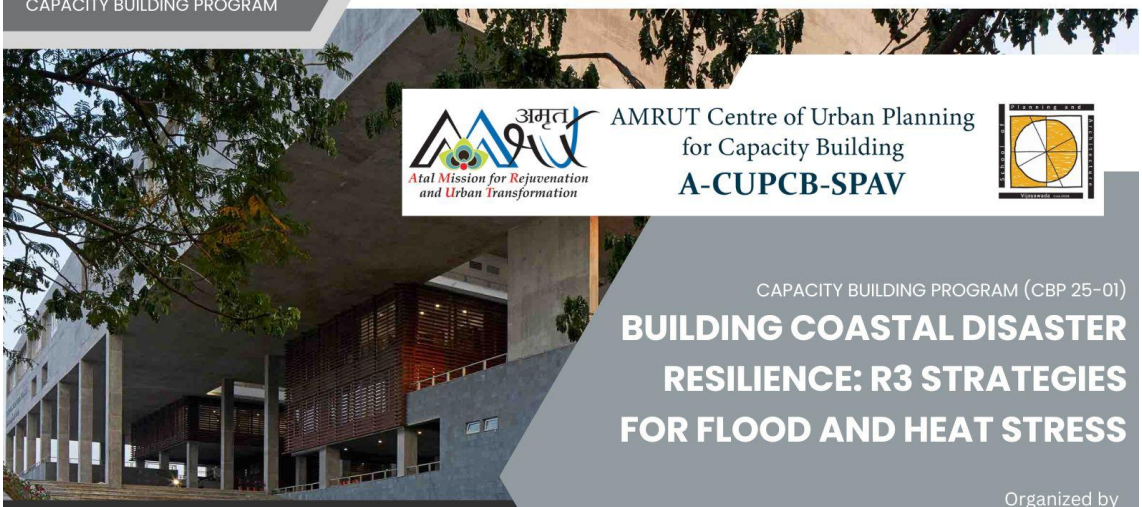
DAY 4 — Readiness, Response, and Recovery (R3)
- Coastal Flood Risk: Frameworks and Indicators
- Expert Session: Mitigation & Adaptation
- Group Presentations by Participants

DAY 5 — Heat Index – Concepts and Measurement
- Introduction to Heat Index & Urban Heat Stress
- Manual Heat Index Calculation using Datasets
- Instruments: AWS, Temperature, Humidity, Air Velocity Probe
- Field Walk & Microclimate Spot Survey
- Mapping Heat Stress Zones

DAY 6 — Heat Index – Application and Planning
- Planning & Design Strategies for Heat Mitigation
- Field Walk & Microclimate Spot Survey
- Mapping Heat Stress Zones on Site Maps

CBP_25_01 Poster

CAPACITY BUILDING PROGRAM



Atal Mission for Rejuvenation and Urban Transformation

AMRUT Centre of Urban Planning for Capacity Building

A-CUPCB-SPAV

CAPACITY BUILDING PROGRAM (CBP 25-01)

BUILDING COASTAL DISASTER RESILIENCE: R3 STRATEGIES FOR FLOOD AND HEAT STRESS

Organized by

AMRUT Funded Centre of Urban Planning for Capacity Building
School of Planning and Architecture, Vijayawada

10-15 November 2025
Venue: SPA Vijayawada Campus

Capacity Building Program

This 6-day Capacity Building Program on Pre-post Disaster Management through R3 (Risk Reduction, Assessment, Mapping) for Floods and Heat Extremes for Coastal Communities aims to equip participants with practical knowledge and tools for assessing vulnerabilities, reducing risks, and creating effective disaster management strategies. The program blends theoretical sessions with hands-on GIS training, participatory mapping, and a field visit to enhance on-ground understanding.

Who should register?

Professionals from disaster management authorities, urban and regional planners, architects, municipal officials, environmental consultants, academicians, researcher scholars, PG students, NGOs, and community leaders engaged in coastal resilience and climate risk mitigation

About ACUPCB

The AMRUT Division of Ministry of Housing and Urban Affairs (MoHUA, Government of India) has recognised SPA Vijayawada as one of the few centers in the country, that shall undertake top notch, cutting edge research, projects, and training in the field of urban planning and climate sensitive development.

CALL FOR PARTICIPATION

6 DAYS | 18 SESSIONS | 45 CONTACT HOURS
2.5 CREDIT EQUIVALENT

PROGRAM DETAILS

- **DAY 1:** Inauguration & Foundation Concepts
- **DAY 2:** Risk Reduction Strategies
- **DAY 3:** Risk Assessment Tools & Techniques
- **DAY 4:** Risk Mapping & Decision Support
- **DAY 5:** Field Exposure / Site Visit
- **DAY 6:** Integration & Action Planning

COORDINATORS

Prof. Dr. Ramesh Srikonda
Principal Investigator
Professor & Director, SPA Vijayawada

Dr. Prashanti Rao
Co-Principal Investigator
Faculty - SPA Vijayawada

Dr. Faiz Ahmed C
Co-Principal Investigator
Faculty - SPA Vijayawada

Dr. Arpan Pal
Course Instructor
Faculty - SPA Vijayawada

Mr. Rajeev R
Course Instructor
Faculty - SPA Vijayawada

PATRONS
Prof. Dr. Ramesh Srikonda, Director, SPAV
Prof. Dr. Ayon K Tarafdar, Head, A-CUPCB-SPAV

SCAN FOR REGISTRATION

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For Registration, Fees and other details, visit our website: www.acupcb.spav.ac.in
https://acupcb.spav.ac.in/capacity-building/cbp_25_01/

Reading Material Cover Page

6 Day Capacity Building Programme on Building Coastal Disaster Resilience: R3 Strategies for Flood and Heat Stress

10-15 November 2025
A-CUPCB-SPAV

Atal Mission for Rejuvenation and Urban Transformation

AMRUT Centre of Urban Planning for Capacity Building

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