

Sub-Theme: Managing Water in Climate Related Risks Reduction

Topic: Early Warning System for Climate Risk Reduction

Background:

Climate change is reshaping the frequency, intensity, and spatial distribution of hydro-meteorological hazards in India. Floods, once largely confined to flood-prone river basins and coastal plains, are increasingly affecting new regions due to extreme rainfall events, cloudbursts, rapid urbanization, glacier retreat, and changing monsoon dynamics. Vulnerable regions such as the Himalayas and coastal zones are experiencing heightened risks from flash floods, debris flows, Glacial Lake Outburst Floods (GLOFs), cyclones, storm surges, tsunamis, and compound flooding. In this evolving risk landscape, Early Warning Systems (EWS) represent one of the most effective tools for climate risk reduction and disaster resilience. Global and national frameworks—including the Sendai Framework for Disaster Risk Reduction, the Paris Agreement (CoP21), the Sustainable Development Goals (SDGs), the Prime Minister of India’s 10-Point Agenda on Disaster Risk Reduction, and the UN Secretary-General’s “Early Warnings for All (EWS4All)” initiative—underscore the central role of end-to-end, people-centred early warning systems. In addition, the trade-off between conservation storage in reservoirs, and flood cushion, has become more complex, necessitating forecast-based reservoir operations supported by real-time hydro-meteorological data. Further, Dam Safety Act further emphasizes the need for comprehensive monitoring and early warning systems for all reservoirs to ensure operational safety and climate resilience. Also, systematic monitoring of glacial lakes and prioritization for vulnerability assessment, followed by targeted studies and mitigation measures, is therefore the need of the hour.

Objective:

This session aims to bring together policymakers, practitioners, researchers, and technology developers to share knowledge, innovations, and experiences in designing and implementing effective early warning systems.

Expected Outcome:

The audience will be better informed on the emerging flood risks, multi-hazard early warning systems, reservoir operations under climate uncertainty, data integration, and collaborative partnerships that enhance preparedness and response across vulnerable regions.