Climate Risk and Adaptation

Building climate resilience isn't optional - it's essential for safeguarding lives, livelihoods, and ecosystems. The increasing risks from climate change—such as rising temperatures, extreme weather events, and socio-economic disruptions—are placing lives, infrastructure, and ecosystems under growing stress. These risks demand urgent action and are the basis for building resilience and adaptive capacity. We focus on designing and implementing locally grounded, evidence-based adaptation solutions that prioritise the most vulnerable. From strengthening early warning systems through hyper-granular risk assessment to mainstreaming climate resilience in policy and infrastructure, our work is rooted in equity and long-term resilience building. We collaborate with governments, communities, and global partners to embed climate resilience across sectors, ensuring adaptation finance reaches those who need it most. Because climate adaptation is not just a response - it's a responsibility.

Developing a Multi-Hazard Risk and Vulnerability Atlas for Mumbai (MHVRA), 2023-2024

Project Background

Mumbai, one of India's largest and most densely populated coastal megacities, faces a complex and growing array of climate and disaster-related risks. The city's vulnerability stems from both its geographic exposure and expanding urban footprint. Recurrent hazards such as floods, landslides, cyclones, fires, and chemical spills have repeatedly tested the resilience of its infrastructure and communities.

With climate change accelerating the intensity and frequency of extreme events, the need for a scientific and integrated risk management framework has never been more urgent. In response, in collaboration with Esri India, we were commissioned by UNDP and the Brihanmumbai Municipal Corporation (BMC) to develop a Multi-Hazard Risk and Vulnerability Atlas (MHVRA) for the city. By translating climate risk into localised, actionable intelligence, this initiative paves the way for mainstreaming adaptation into disaster management, urban governance, and infrastructure planning - making Mumbai a safer and climate-resilient city.

Our Role

As the lead technical partner, we played a pivotal role in designing and delivering the risk atlas with a strong climate adaptation lens. Key contributions included:

- **Integrated Climate Risk Modelling:** Incorporated past hazard events and projected climate scenarios (based on IPCC pathways) to map future risks and exposure hotspots in the city.

- **Vulnerability Assessment: Conducted multi-dimensional assessments** that combined socio-economic indicators with spatial hazard data to identify vulnerable populations and infrastructure at risk.

- **Climate Adaptation Planning: Developed actionable recommendations for adaptation** - such as early warning systems, green-blue infrastructure planning, and climate-resilient housing - to inform BMC's disaster risk reduction and climate resilience strategies.

- **Data-Driven Decision Support: Leveraged GIS and advanced spatial analytic**s (in partnership with Esri India) to build a dynamic, visual platform that enables city officials to plan, respond, and invest more effectively in resilience.

- **Institutional Strengthening:** Enabled capacity building within BMC and aligned the outputs with national frameworks such as the National Disaster Management Plan (NDMP) and the State Action Plan on Climate Change (SAPCC).

The Multi-Hazard Risk and Vulnerability Atlas is more than just a mapping tool - it is a strategic climate adaptation instrument. It strengthens Mumbai's institutional readiness for managing compound climate risks, enhances the integration of climate science into urban planning, and equips decision-makers with a real-time, spatially explicit platform for resilient development.
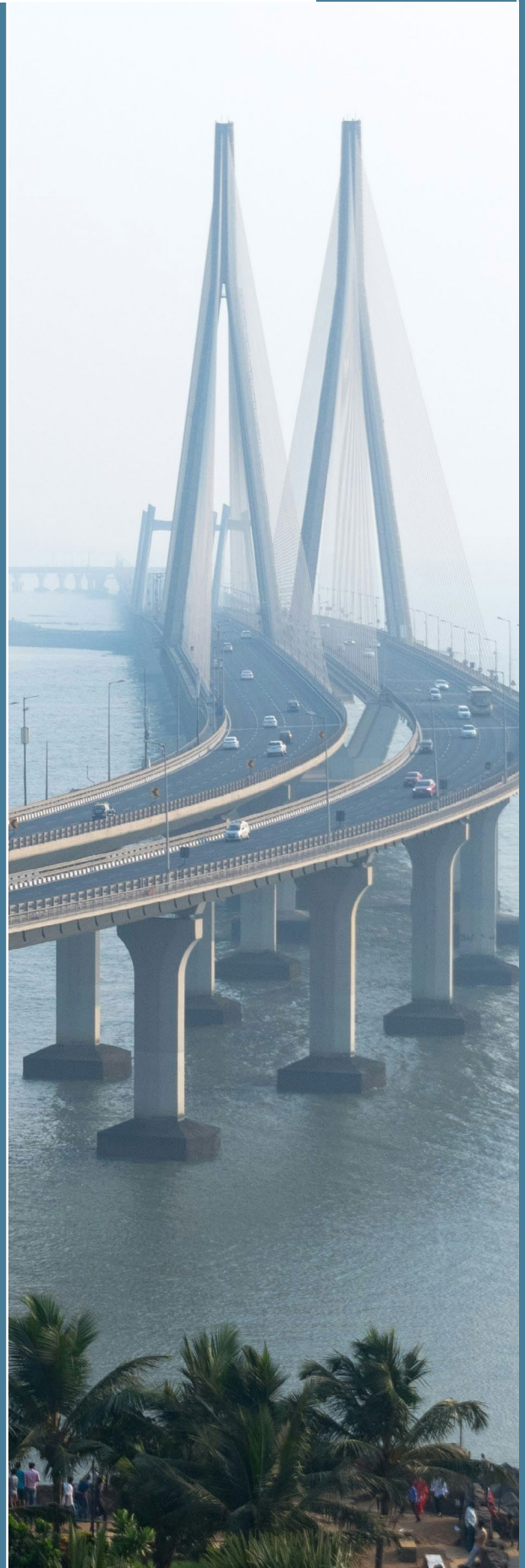
Scenario-Based MHVRA Integration into Mumbai's Command-and-Control System (CCS), 2025-Ongoing

Project Background

As climate-related hazards intensify, real-time, data-driven decision support systems are essential for building resilient urban governance. Building upon the foundation of Phase I (Mumbai's Multi-Hazard Risk and Vulnerability Atlas), Phase II integrates scenario-based hazard modelling directly into the Command-and-Control System (CCS) at the Brihanmumbai Municipal Corporation (BMC) headquarters. This critical advancement transforms risk assessment into operational intelligence—enabling anticipatory, responsive, and adaptive disaster management.

Our Role

We lead the technical design and integration of the hazard simulation and risk analysis platform into Mumbai's CCS, using advanced GIS tools and live data processing systems in collaboration with Esri India. Our contributions include:

- **Real-Time Climate Hazard Modelling**: Using remote sensing and GIS-based scenario modelling to simulate the spatial and temporal impact of hazards like floods, cyclones, heatwaves, and landslides under projected climate conditions.
- **Automated Impact Scenarios:** Embedding dynamic hazard impact simulations that auto-generate response-ready dashboards and reports within the CCS.
- **Live Data Feeds Integration:** Enabling authorities to monitor, evaluate, and respond to rapidly evolving hazard conditions using weather, tidal, and rainfall telemetry systems.
- **Decision Support for Emergency Response:** Creating algorithms to identify cascading impacts and suggest prioritised interventions across critical infrastructure, transport, health, and vulnerable populations.
- **Adaptation Strategy Alignment:** Supporting city-level climate resilience plans with scenario-informed mitigation and adaptation strategies aligned with IPCC projections and national frameworks.

Outcomes & Impact

Enhanced Decision-Making: Institutionalizes data-driven and anticipatory risk governance in Mumbai.

Real-Time Crisis Management: Enables city authorities to shift from reactive to proactive response models.

Resilience Mainstreaming: Strengthens long-term disaster preparedness through actionable forecasting.

Community-Level Impact

30,85,410+
people expected to benefit from improved preparedness

16,84,600+
women reached through gender-sensitive risk analysis

$49 billion+
in estimated loss and damage averted by 2070 (based on IPCC sea-level rise projections)

Program Management and Design Consultancy – Himachal Pradesh Disaster Risk Reduction and Preparedness (HPDRRP) Program, 2025-Ongoing

Project Background

The Himachal Pradesh Disaster Risk Reduction and Preparedness Program (HPDRRP) is a flagship initiative of the Government of Himachal Pradesh (GoHP) supported by the Agence Française de Développement (AFD). HPSDMA is the nodal implementing agency for the project. The program aims to strengthen disaster and climate resilience among state systems and local communities, while transitioning Himachal Pradesh toward a comprehensive risk reduction framework. Its focus is on resilient infrastructure, strengthened governance, and community preparedness.

The program is structured around 20 projects under three core components:

- Enhancing Disaster Risk Governance – strengthening institutional capacities, risk understanding, and knowledge management for specific hazards like floods, glof, landslides, cloudbursts among others.

- Strengthening Disaster Preparedness – scaling up early warning systems and enhancing emergency response capacities.

- Promoting Mitigation Measures – deploying eco-DRR strategies and nature-based solutions (NbS) to effectively mitigate risks.

Our Role

We as the program management and design consultancy agency ensure the design, management, and delivery of the program across all three components. Our role spans technical support, procurement, compliance, reporting, and institutional capacity building.

Core responsibilities include:

Technical, Design & Management Support

- Daily project management and coordination with the Program Management Unit (PMU) and Project Implementation Units (PIUs) for enhancing climate resilience

- Support for preparation of Detailed Project Reports (DPRs) for such as HCDRR, supporting EWS, Supported by GIS based DSS. Support in drafting tender documents, Terms of Reference (ToRs), and technical specifications for procurement of goods and works, that supports CRI/DRI.

Compliance & Safeguards

- Ensuring adherence to GoHP procurement policies and AFD requirements, including environmental and social safeguards.

- Maintaining and updating Environmental & Social Management Plans (ESMPs).

- Implementing the Gender Action Plan and producing gender implementation reports to support CRI/DRI.

Capacity Building

- Providing on-the-job training to PIU staff for improved program delivery.

- Enhancing institutional capacities to sustain program outcomes beyond the project lifecycle.

Program Financial Management

- Planning and monitoring expenditures against allocated budgets.

- Supporting transparent financial reporting to GoHP and AFD.

Multi-Hazard Risk Mapping for 9 Pilot Cities/ MMDA's in Ghana, Green Cities and Infrastructure Programme, 2024–2025

Project Background

Ghana's urban centres are facing the twin pressures of rapid urbanisation and escalating climate risks. Unplanned growth, infrastructure deficits, and vulnerable informal settlements especially in the northern regions make cities highly susceptible to floods, heatwaves, and other hazards. To address these challenges, the Green Cities and Infrastructure Programme (GCIP), under the UK Foreign, Commonwealth & Development Office (FCDO) urban portfolio, is supporting transformative urban resilience planning.

The initiative seeks to build inclusive, sustainable, and climate-resilient cities by strengthening early warning systems, risk-informed planning, and investments in climate-resilient infrastructure. It is anchored within the Ghana Urban Risk Observatory, a strategic effort to institutionalise urban resilience through data-driven governance.

Our Role

As a core technical partner, alongside PwC UK and Triple Line Consulting, we are leading the development and operationalisation of a multi-hazard climate risk assessment framework in pilot cities of Northern Ghana. Our work includes:

- **Designing a Robust Risk Mapping Methodology:** Developing an evidence-based framework to identify hazard-prone areas, climate vulnerabilities, and exposure of infrastructure and populations.

- **Building a Dynamic Climate Risk Dashboard:** Developing an AI- and predictive analytics-powered city-level dashboard to visualise evolving risks and support proactive urban decision-making, fully integrated into the Ghana Urban Risk Observatory platform.

- **Training & Capacity Building:** Producing user-friendly toolkits and delivering training to equip local institutions to conduct climate risk assessments and use the dashboard for planning and response.

1,89,33,711+
people expected to benefit from enhanced climate resilience

36,39,573+
women targeted through inclusive urban risk planning

USD 300 million+
in potential annual Loss and Damage costs projected to be averted

Climate Proofing of Social Resilience Program, 2024-2025

Project Background

Bangladesh remains one of the most climate-vulnerable countries globally, with increasing climate-induced shocks threatening the wellbeing of its most vulnerable populations. Recognizing that social protection systems must evolve to address these risks, ADB's Second Strengthening Social Resilience Program (SSRP) aims to integrate climate and disaster resilience into national safety nets.

The project supports the Ministry of disaster management and relief (MoDMR) Government of Bangladesh in designing climate-proofed social protection programs that can proactively respond to hazards through anticipatory action, early warning systems, and inclusive program design. Special emphasis is placed on empowering women, enhancing institutional capacity, and embedding resilience into policy and operational frameworks.

Our Role

As technical lead, we are working closely with MoDMR and ADB to embed climate adaptation into Bangladesh's social protection workfare program, especially, on the EGPP (Employment generation program for the poorest). Our key contributions include:

- **Policy & Institutional Analysis:** Reviewing national policies to identify gaps and recommend actionable measures for mainstreaming climate adaptation.

- **Program Design for Climate-Resilient Safety Nets:** Designing inclusive, risk-informed social protection programs with early warning systems, disaster preparedness, and anticipatory actions.

- **Gender-Responsive Adaptation Planning:** Crafting targeted strategies to address vulnerabilities of women and marginalised groups, ensuring equitable resilience-building.

- **Capacity Building & Community Engagement:** Training government stakeholders, local institutions, and communities - especially women-led groups - on climate action and disaster response.

- **Stakeholder Consultations:** Leading inclusive dialogues with national and subnational actors to co-create locally grounded solutions.

Quezon City Cooling Energy Roadmap, 2025-Ongiong

Project Background

Quezon City, one of the largest and most densely populated urban centers in the Philippines, faces intensifying climate challenges driven by rising temperatures and rapid urbanisation. Heat stress is already affecting public health, exacerbating energy poverty, and increasing demand for cooling — particularly among vulnerable groups, low-income households, and the informal sector.

In response, the Quezon City Cooling Energy Roadmap has been commissioned by C40 Cities to provide the city with a structured, evidence-based plan to manage cooling demand in a sustainable and inclusive manner. The initiative, running from June to December 2025, has two central objectives:

- To assess the impacts of rising urban heat on residents' health, energy access, and demand for cooling.

- To develop a comprehensive cooling strategy and roadmap that is fully integrated into the Local Climate Change Action Plan (LCCAP), ensuring that cooling interventions contribute to broader climate resilience and low-carbon development goals.

The project places special focus on informal settlements, social housing, and public infrastructure, ensuring that solutions address the needs of the most vulnerable while strengthening the city's overall climate resilience.

Our Role

We, through Triple Line (as Lead JV partner), are leading the technical design, analysis, and stakeholder engagement for this assignment, supported by a team of five multi-disciplinary experts.
Our role spans the full project cycle:

Strategic Analysis & Knowledge Generation

- Undertaking institutional and governance assessments related to cooling.

- Mapping the links between urban heat, energy poverty, and health outcomes.

- Developing evidence-based models of future energy demand associated with cooling.

Cooling Strategy & Roadmap Development

- Designing an actionable roadmap structured across four thematic areas:

  - 1. Policy and Institutional Strengthening
  - 2. Infrastructure and Technology
  - 3. Data and Monitoring Systems
  - 4. Awareness and Capacity Building

- Developing evidence-based models of future energy demand associated with cooling.

Stakeholder Engagement & Inclusion

- Facilitating broad consultations with city officials, civil society, and communities.

- Ensuring gender equality, disability, and social inclusion (GEDSI) are integral to planning and implementation.

- Building ownership of the roadmap through co-creation with local stakeholders.

Project Leadership & Oversight

- Coordinating delivery through a diverse expert team including a GIS and economic modelling specialist, a GEDSI expert, an energy efficiency expert, and researchers, under the leadership of Pepe Monroy (Team Leader).

Departmental Disaster Management Plans (DDMPs) – Nagaland, 2025

Project Background

Nagaland's geographic and climatic profile makes it highly susceptible to a range of natural hazards such as earthquakes, landslides, floods, cyclones, forest fires, and drought-like conditions. These hazards, particularly severe during monsoon seasons, frequently disrupt infrastructure, public services, and livelihoods across the state.

To institutionalise disaster preparedness and mainstream risk-informed governance, the Government of Nagaland, in line with the Disaster Management Act, 2005, is strengthening departmental capacities by developing tailored Departmental Disaster Management Plans (DDMPs). These plans aim to ensure that every department can effectively anticipate, prepare for, and respond to disasters in a coordinated and timely manner.

Our Role

We are delivering technical expertise to design 10 robust District Disaster Management Plans (DDMPs), strengthening preparedness and response capacities across critical state departments.

Our work includes:

- **Department-Specific Risk Assessments:** Mapping historical and emerging risks relevant to each department's operations using district-level data and hazard profiles.

- **SOP Development and Emergency Protocols:** Outlining clear standard operating procedures (SOPs) for preparedness, early warning, response, and recovery.

- **Institutional Role Mapping:** Defining roles and responsibilities of departments during different phases of the disaster management cycle to ensure coordinated action.

- **Inventory & Resource Mapping:** Developing resource directories and emergency mobilisation plans, including personnel, logistics, and assets.

- **Template-Based Scale-Up:** Supporting all remaining departments in populating a standardised DDMP template, ensuring scalability and institutional capacity building across government.

This initiative will both enhance Nagaland's departmental disaster response capacity also serve as a model for replication in other Indian states seeking to embed disaster resilience within departmental governance structures.

Technical Advisory Services on Green Infrastructure Design – Scaling up Urban Upgrading Project (SUUP), Vietnam, 2019-2021

Project Background

Vietnam's rapidly growing provincial cities face increasing risks from climate-induced water hazards such as floods, sea-level rise, and storm surges. To support sustainable and climate-resilient urban growth, the World Bank initiated SUUP aimed at integrating green infrastructure and resilience principles into urban development strategies across seven secondary cities.

The project sought to mainstream climate adaptation into city master planning and infrastructure development, ensuring that investments were not only environmentally sustainable but also responsive to evolving climate risks.

Our Role

As key technical advisor, we undertook the following:

- **Conducted a multi-hazard vulnerability and risk assessment** to understand city-specific exposure to climate risks, with a focus on water-related hazards.

- **Reviewed and provided inputs on city master plans,** recommending integration of green infrastructure and climate-resilient urban design principles.

- **Developed climate-resilient infrastructure design guidelines** tailored for each city, aligning with the best global practices.

- **Led targeted capacity development efforts** for urban planners and municipal staff to enhance long-term institutional readiness for climate-resilient urban development.

Through these efforts, we helped embed sustainability and resilience at the heart of Vietnam's urban development trajectory, ensuring that vulnerable cities can better withstand future climate shocks.

State of Extreme Events Across India, 2024

Project Background

Climate extremes are intensifying across India, disrupting lives, livelihoods, and infrastructure with growing frequency and unpredictability. To address the urgent need for a high-resolution, science-driven view of these risks, we partnered with Esri India to conduct a pioneering district-level assessment of climate extremes nationwide.

Our study, "State of Extreme Events," examined the pentad to decadal trends of heatwaves, floods, droughts, and cyclones over 50 years (1973 - 2023), using the AI-enabled Climate Risk Observatory (CRO) platform we developed with Esri India. This dynamic tool provided detailed, spatial-temporal insights into the frequency, intensity, and shifting patterns of climate disasters at the sub-regional level. The study revealed that:

- **85% of India's districts** are exposed to one or more extreme climate events.

- **45% of districts** are experiencing a swapping trend between droughts and floods, underlining growing climate volatility.

The findings underscore the urgent need for:

- **National-level Climate Risk Observatory (CRO)** to facilitate real-time, risk-informed decision-making.

- Dedicated **Infrastructure Climate Fund (ICF)** to finance resilient and adaptive infrastructure.

- Nature-based solutions include the **revival and protection of mangroves, wetlands, and forest ecosystems.**

Our Role

We led the **technical design, spatial analysis, and multi-decadal modelling** for this study in collaboration with Esri India. Specific contributions included:

- **Development and application of the CRO platform** integrating climate models, ensemble simulations, and downscaled projections to assess district-level climate hazards.

- **Compilation of a 50-year catalogue** of climate extremes, offering insights into historical baselines and future vulnerability pathways.

- Identification of **non-linear trends and emerging compound hazards** using advanced data science and GIS analytics.

- **Production of the evidence-based issue brief:** State of Extreme Events - which serves as an advocacy and planning tool for national, state, and district authorities.

Through this landmark study, we are helping shape India's climate resilience discourse by bridging science, data, and policy to inform better planning, investment, and climate governance.

Infrastructure for Climate Resilient Growth (ICRG) Programme, 2016–2020

Project Background

The ICRG Programme was a 43-month Technical Assistance (TA) initiative commissioned by the UK Foreign, Commonwealth and Development Office (FCDO) (formerly DFID) to support the Ministry of Rural Development (MoRD), Government of India. The programme was embedded within the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), India's flagship rural livelihoods scheme.

Implemented across 103 blocks selected from over 2,500 special-focus blocks, the programme targeted the most climate-vulnerable geographies in the states of Bihar, Odisha, and Chhattisgarh. Its core objective was to climate-proof rural infrastructure while building community-level resilience to extreme climate events like floods, droughts, and heatwaves.

ICRG promoted climate-smart design principles, enhanced frontline capacities, and supported long-term risk reduction through convergence with other rural development and environmental schemes.

Our Role

As part of the consortium delivering ICRG, we were responsible for implementing the programme across several key geographies. Our contributions included:

- **Training 35,000+ community members** and over **18,000 government functionaries from MGNREGA** and **allied line departments on climate-resilient infrastructure design and planning.**

- **Developing 27 training modules** and guidebooks on climate risk assessment, resilient rural asset creation, and community-based planning.

- **Integrating climate data and local knowledge into the preparation of durable and adaptive MGNREGA asset** designs.

- **Facilitating field-level capacity building and technical backstopping** through trained Climate Resource Persons and Panchayat-level planning.

Through ICRG, we directly contributed to mainstreaming climate resilience into MGNREGA implementation, ensuring more robust infrastructure and improved livelihoods for climate-sensitive rural populations.

Swiss Agency for Development and Cooperation (SDC), Embassy of Switzerland Preparation of Climate Adaptive Plans for 5 Districts in Madhya Pradesh, Uttarakhand, and Sikkim, 2019–2020

Project Background

Recognising the heightened vulnerability of communities to climate change, SDC launched a programme to embed climate resilience into state-level planning in India. Targeting three climate-sensitive states - Madhya Pradesh, Uttarakhand, and Sikkim - the initiative aimed to strengthen institutional capacity and promote district-level adaptive planning that informs state action.

The programme integrated sectoral climate adaptation strategies into government plans and schemes, directly benefiting vulnerable populations reliant on climate-sensitive sectors such as agriculture, water, and livelihoods.

Our Role

As the lead technical partner, we prepared Climate Resilient Development Plans for five pilot districts, setting the groundwork for scalable climate action.

- Madhya Pradesh: Tikamgarh, Dewas, and Gwalior   •   Uttarakhand: Pauri Garhwal   •   Sikkim: West Sikkim

Key contributions included:

- **District-Level Climate Vulnerability Assessments:** Identified region-specific climate risks and their impacts on communities, livelihoods, infrastructure, and natural resources.

- **Formulation of Climate Adaptive Plans:** Developed actionable, locally relevant climate resilience plans for each district, focusing on sectors such as agriculture, water resources, health, and biodiversity.

- **Capacity Building:** Conducted training and knowledge-sharing workshops for state nodal agencies and sectoral departments to strengthen their institutional capacity in climate adaptation planning.

- **Mainstreaming Resilience into State Planning:** Facilitated integration of climate adaptive strategies into existing development schemes and planning processes to ensure long-term sustainability.

Managing Monsoons in a Warming Climate, 2024

Project Background

In response to India's growing vulnerability to climate extremes, we led a pioneering study with Esri India to conduct a multi-decadal regional climatological assessment. Our research examined the complex linkages between rising temperatures, heatwaves, and extreme rainfall events, providing empirical evidence of how global warming is intensifying both heat-related stress and high-intensity rainfall - particularly in economically critical regions. Despite growing awareness among climate experts, we identified a significant gap in sector-wide and industrial understanding, which is limiting timely climate resilience actions - especially in India's major economic hubs.

Key highlights include:

- Mapping of **heatwave hotspots and futuristic population exposure** to heat risks.

- Identification of attributional correlations between **temperature rise** and extreme precipitation.

- Emphasis on spatial variability of physical climate risks using **geolocation-specific modelling.**

Our Role

We spearheaded the design and execution of the assessment, applying dynamic climatological models to simulate future risk scenarios. This included:

- **Designing India's first evidence-based heatwave and rainfall correlation model,** aligned with IPCC projections.

- Facilitating high-level stakeholder engagement with **government ministries, industry groups**, and civil society, including a strategic buy-in from **the Ministry of Commerce**.

- Advocating for the establishment of a **Heat Risk Observatory (HRO)** to support localised heat risk surveillance and forecasting.

- Recommending appointment of **Heat Risk Champions** to drive on-ground awareness and coordinated response.

- Promoting innovative financing options, including **blended finance mechanisms**, to enhance industrial and community resilience to heat and monsoon-linked risks.

This initiative has laid the foundation for a national-level strategy on industrial climate readiness, encouraging data-driven investments in resilience-building and adaptation measures.
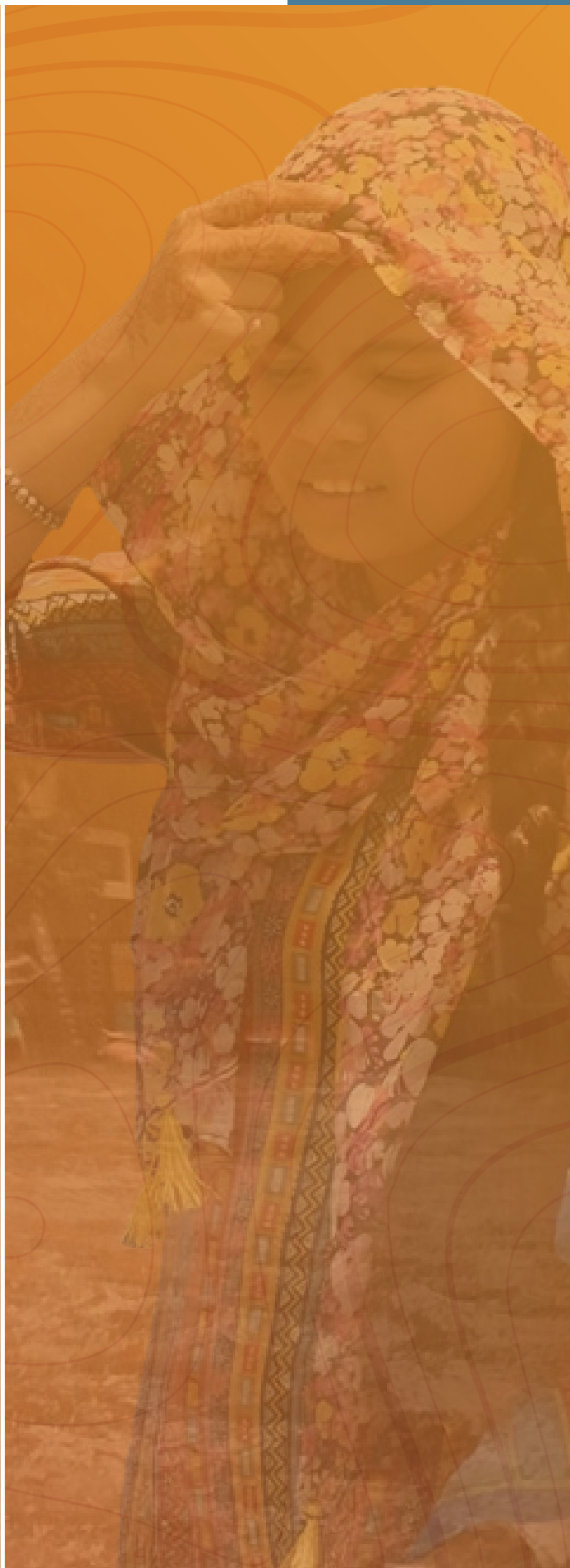
Strategy Support for Policies and Investments; India, Bangladesh & Sri Lanka, 2022-2024

Project Background

South Asia's agri-food systems are increasingly vulnerable to climate change, especially affecting smallholder farmers who are the primary food producers. Despite national commitments to adaptation, regional policy maturity varies, and investments remain heavily skewed toward mitigation.

To address this, the project focuses on strengthening the regional climate adaptation ecosystem specifically in agriculture by mapping investment landscapes, policy gaps, and partnership opportunities. The effort is designed to position climate-smart agriculture as a core adaptation strategy to ensure food and nutrition security in a warming world. The project also contributes t**o regional cooperation on climate and disaster risk resilience,** supporting forward-looking strategies for adaptation financing and implementation in **India, Bangladesh, and Sri Lanka.**

Our Role

We are leading the strategy support by:

- **Conducting a comprehensive climate adaptation scoping study** focused on agriculture and food systems in South Asia, particularly Bangladesh.

- **Mapping national and sub-national policies**, platforms, and entry points for climate-smart agriculture integration.

- **Providing investment-ready recommendations** for adaptation strategies across India, Bangladesh, and Sri Lanka to inform BMGF's long-term engagement.

- **Identifying opportunities for convergence** with global and regional climate financing mechanisms and multilateral cooperation.

- Facilitating consultations with public institutions, private investors, and civil society to catalyze **cross-sector partnerships** in support of smallholder resilience and food system adaptation.

By aligning policy landscapes with on-ground vulnerabilities and innovation pathways, we are enabling a systems-level transformation of agri-climate resilience efforts across the region.

Developing Model Heat Action Plan for Patna District, 2025–Ongoing

Project Background

Heatwaves in India are becoming increasingly frequent, intense, and prolonged due to climate change, with Bihar among the worst-affected states. In 2024 - one of the hottest years on record - Patna district faced extreme heat stress, resulting in severe health risks, loss of lives, and widespread disruption to daily life.

To address this, the Government of Bihar, in partnership with the United Nations Development Programme (UNDP), has launched the development of a Model Heat Action Plan for Patna district. This plan will provide district-specific, data-driven strategies to enhance resilience and preparedness for extreme heat events.

Our Role

We are leading the technical development of this pioneering Heat Action Plan by:Our work includes:

- **Hyper-Granular Risk Mapping:** Using AI/ML-driven climatological and meteorological models to produce real-time, sub-district heat risk data from satellite and local monitoring inputs.

- **Discomfort Index Estimation:** Incorporating temperature, humidity, and urban heat island effects to assess human health vulnerabilities across Patna.

- **Forecasting & Early Warning:** Developing predictive tools and protocols to enable timely responses and reduce heat-related casualties.

- **District-Level Action Framework:** Designing tailored, cross-sectoral response plans involving health, urban planning, disaster management, and community outreach.

- **Stakeholder Engagement & Capacity Building:** Conducting consultations and training to strengthen readiness among local authorities and first responders.

This initiative will not only enhance Nagaland's departmental disaster response capacity but also serve as a model for replication in other Indian states seeking to embed disaster resilience within departmental governance structures.

Integrated Urban Flood Management for the Chennai-Kosasthalaiyar Basin with ADB / Greater Chennai Corporation / Municipal Administration & Water Supply Department (Government of Tamil Nadu), 2023-2027

Project Background

Chennai, one of India's most flood-prone metros, is experiencing increasing frequency and intensity of extreme weather events due to climate change. Recurrent urban flooding - particularly in the Kosasthalaiyar Basin—threatens lives, livelihoods, infrastructure, and economic productivity.

To address this, the Government of Tamil Nadu, with support from the Asian Development Bank (ADB), has launched the Integrated Urban Flood Management for the Chennai-Kosasthalaiyar Basin Project. The project aims to:

- **Upgrade flood protection infrastructure** while enabling groundwater recharge.

- **Improve institutional preparedness of the Greater Chennai Corporation (GCC)** and local communities for urban flood events.

- **Ensure long-term sustainability** through strengthened operation and maintenance (O&M) systems for urban drainage infrastructure.

Our Role

We are engaged as the Institutional Strengthening and Reform Consultant to:

- **Integrate climate risk profiling and future climate scenarios** into the planning and implementation of flood management strategies.

- **Support policy-level interventions** that align with regional climate resilience frameworks and disaster mitigation cooperation.

- **Identify institutional gaps within GCC** and design a comprehensive roadmap to enhance capacity for flood preparedness, response, and system maintenance.

- **Facilitate cross-sectoral collaboration** across municipal, state, and multilateral agencies to ensure climate-adaptive, inclusive, and sustainable outcomes.

Through our work, we are enabling GCC to move from reactive flood response to proactive, risk-informed flood management - grounded in long-term resilience and institutional readiness.

Capacity Building on Sector-wise Climate Change Impacts and Adaptation – Mizoram, India, 2019

Project Background

As part of the Indo-German bilateral cooperation programme *CCA-NER*, the project aimed to strengthen climate resilience among rural communities in Northeast India. Under this initiative, GIZ partnered with the Ministry of Development of Northeastern Region (MoDoNER) and the state governments of Meghalaya, Nagaland, Sikkim, and Mizoram to operationalise climate adaptation plans aligned with India's Nationally Determined Contributions (NDCs) and the SDGs.

Our Role

We led the capacity-building efforts in Mizoram, with the following key responsibilities:

- **Design and development of comprehensive training modules** on sector-specific climate change impacts, vulnerabilities, and adaptation strategies tailored to the Mizoram context.

- **Multi-level capacity-building workshops** for state government stakeholders across line departments and administrative levels.

- **Orientation on the revised State Action Plan on Climate Change (SAPCC 2.0)** with emphasis on mainstreaming adaptation into local governance, planning, and budgeting processes.

- **Development of locally relevant adaptation strategies** linked to Mizoram's climate-sensitive sectors such as agriculture, water resources, and forests.

Through this initiative, we helped institutionalise climate knowledge and planning capabilities within state departments - paving the way for more informed, climate-resilient policy decisions across Mizoram.

Action Plan to Enhance Climate-Resilient Health Facilities in Madhya Pradesh, 2019

Project Background

With healthcare facilities increasingly vulnerable to the effects of climate change such as extreme heat, floods, water scarcity, and vector-borne diseases this project aimed to assess climate risks and propose adaptation strategies for public hospitals in Madhya Pradesh.

The project focused on mainstreaming climate resilience into the health infrastructure and operations at district and block-level facilities. The goal was to ensure uninterrupted healthcare services during climate-induced emergencies while reducing the sector's vulnerability to future risks.

Our Role

- Conducting climate risk assessments for healthcare infrastructure and essential services such as power supply, water, sanitation, and waste management.

- Identifying key vulnerabilities and gaps across infrastructure, staffing, emergency preparedness, and logistics.

- Developing a **practical guidance framework** for district and block-level hospitals to improve resilience in critical areas including:

  - Infrastructure and energy systems (backup power, cooling)
  - Medical waste disposal and infection control
  - Water supply and sanitation
  - Food supply and cold chain management

- Supporting knowledge dissemination and stakeholder engagement through capacity-building tools.

The action plan served as a **climate-smart operational blueprint** for strengthening Madhya Pradesh's public health system in the face of rising climate-related threats.

Forest Governance and Climate Change – MEL, 2017-2020

Project Background

Forests 2020, an initiative under the UK Space Agency's **International Partnerships Programme** (IPP), was a transformative effort aimed at protecting and restoring up to **300 million hectares of tropical forests.** Led by Ecometrica and a global consortium, the programme harnessed advanced satellite data and Earth observation tools to enhance forest monitoring and governance in six developing countries.

The project directly supported global climate and conservation mechanisms like **REDD+, FLEGT,** and national forest policies, aiming to reduce deforestation, improve biodiversity protection, and support climate change mitigation.

Our Role

IPE Triple Line led the **Monitoring, Evaluation, and Learning (MEL)** function for the Forests 2020 programme. Our core responsibilities included:

- **Designing and executing baseline, mid-term, and final evaluations** aligned with the programme's theory of change.

- Developing and tracking a results framework to assess progress against **key performance indicators.**

- Supporting outcome mapping for forest change monitoring, risk modelling, and institutional uptake of improved systems.

- Ensuring the integration and alignment of Forests 2020 with **International Climate Finance (ICF)** forestry initiatives, especially in Indonesia.

- Synthesising learnings to inform **forest governance polic**y dialogues and long-term capacity building within national forest monitoring agencies.

Through these efforts, IPE Triple Line contributed to evidence-based decision-making, helping institutional partners better leverage space-based technologies for sustainable forest management.

Preparation of Integrated Coastal Zone Management Plan (ICZMP) and Shoreline Management Plan, 2015-2017

Project Background

Odisha's 480 km-long coastline is ecologically diverse and economically vital, but also highly vulnerable to cyclones, coastal erosion, and climate change. Recognising the need for sustainable and risk-informed development, the ICZMP project was initiated to ensure a balanced approach to coastal zone protection, biodiversity conservation, and livelihood sustainability. The project aimed to:

- Promote conservation of sensitive ecosystems such as **Bhitarkanika National Park and Chilika Lagoon** (both Ramsar sites),

- Improve **resilience to extreme weather events,** and

- Enable **sustainable livelihood options** such as coastal fisheries and eco-tourism, through active community participation and institutional capacity building.

Our Role

We played a pivotal role in the planning, design, and operationalisation of Odisha's Integrated Coastal Zone Management Plan and Shoreline Management Plan. Key contributions included:

- **Development of integrated spatial plans** for coastal management using GIS tools, climate risk modelling, and land-sea interaction analyses.
- Preparation of **shoreline management strategies** to address erosion, sediment transport, and infrastructure vulnerabilities in high-risk zones.
- Design and implementation of **eco-sensitive tourism and fisheries management frameworks**, aligned with community needs and biodiversity protection.
- Capacity building of **Project Executing Agencies** (PEAs) on ICZMP principles, planning protocols, and environmental governance.
- Integration of **climate adaptation and disaster risk reduction** into land-use and natural resource management policies.

The plan provided a strategic foundation for long-term coastal sustainability and became a model for integrated planning and ecosystem-based management, contributing to India's national coastal resilience agenda.

The Climate Change and Sustainability (CCS) practice at IPE Global is committed to climate proofing a low carbon future for a cleaner and healthier world by providing solutions to manage environmental liabilities, strengthening resilience and adapting to climate change.

Scan for
Climate Deck

🌐 www.ipeglobal.com | ✉ ccs@ipeglobal.com | ipe@ipeglobal.com