



Brace for Impact: Ensuring Resilience in an Erratic Climate

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Impacting sustainable development at scale with data, integrated analysis, and strategic outreach

TRANSFORMATIONS

Low-carbon Economy

Energy Transitions

Power Markets

Industrial Sustainability

Sustainable Livelihoods

QUALITY OF LIFE

Clean Air

Sustainable Water

Sustainable Food Systems

Sustainable Cooling

Sustainable Mobility

ENABLERS

Sustainable Finance

Technology Futures

Circular Economy

Climate Resilience

International Cooperation

380+

Multidisciplinary team

510+

Peer-reviewed publications

650+

Roundtables & conferences

20+

Indian states engaged

180+

Bilateral & multilateral initiatives promoted

SPECIAL INITIATIVES

CEEW Green Finance Centre

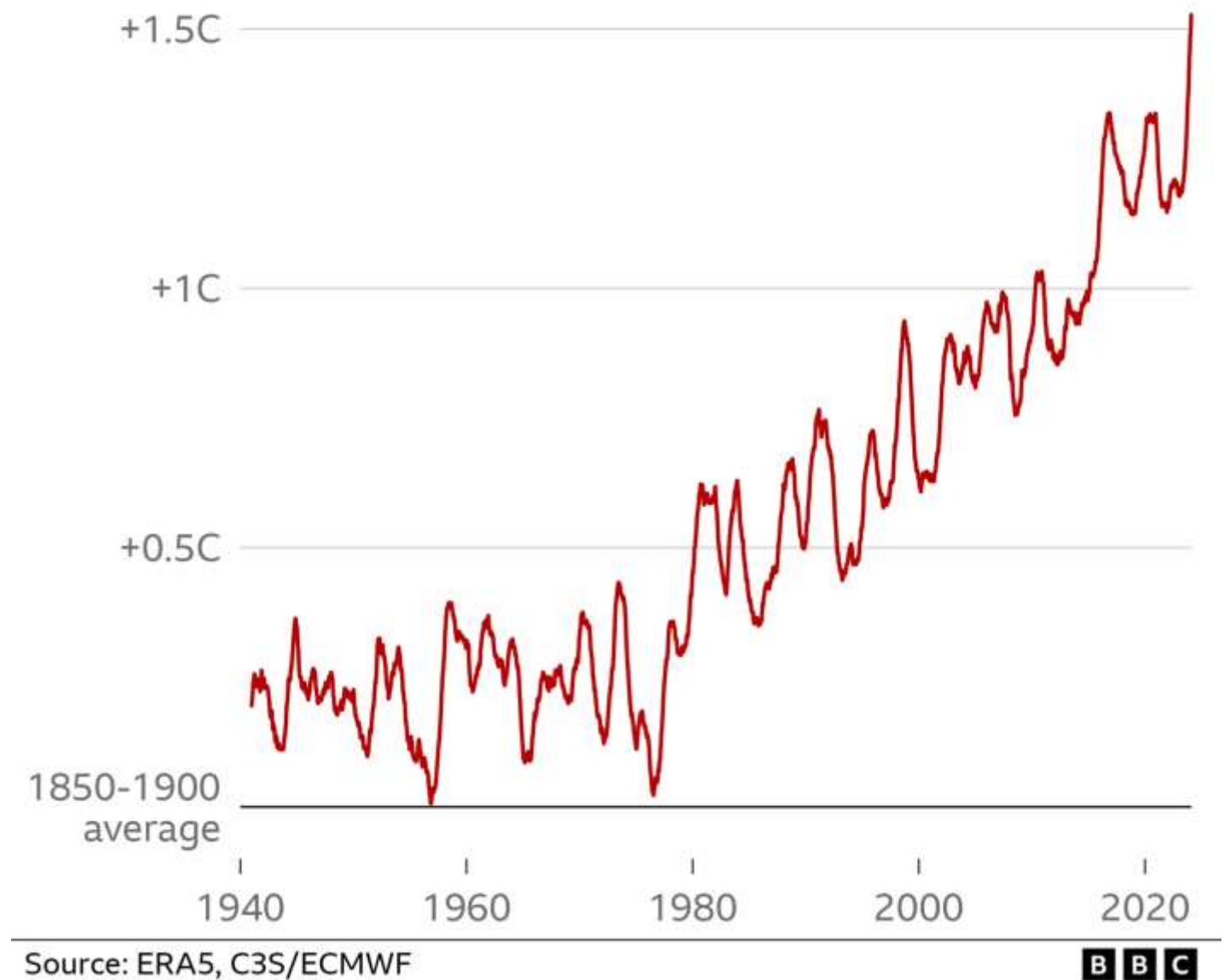
Powering Livelihoods

Emerging Economies

UP State Office

Global warming breaches the 1.5C threshold

- For the first time, in 2024, global temperature increased by more than 1.5C above pre-industrial levels (1850-1900 average)
- 1.5C was determined as a critical threshold in the Paris Agreement beyond which the costs of climate impacts begin to outweigh the costs of action
- 1.5C also brings us closer to several tipping points in the Earth system



CEEW's Climate Resilience Programme

Mapping and democratising fine-resolution climate information to support risk-informed decision-making



“The *climate resilience team* envisions a future where institutions, infrastructure, economies, and people are *insulated from the risks* of a changing climate.”

Supporting sub-national and local governments in advancing India's climate resilience

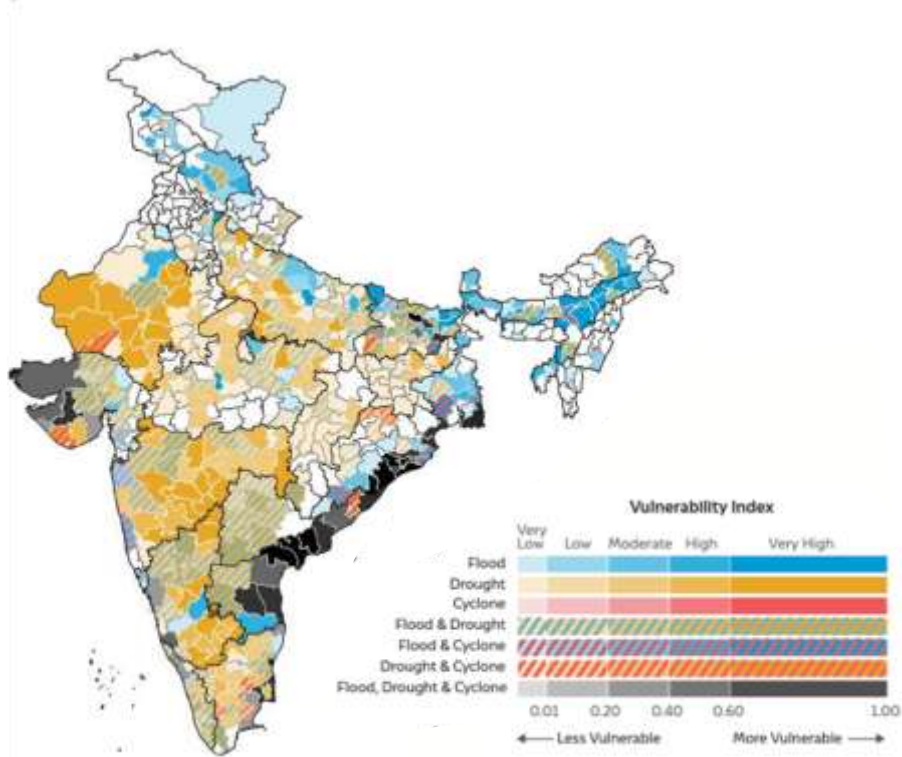


Conducting sector-specific physical risk assessment and proposing adaptation solutions



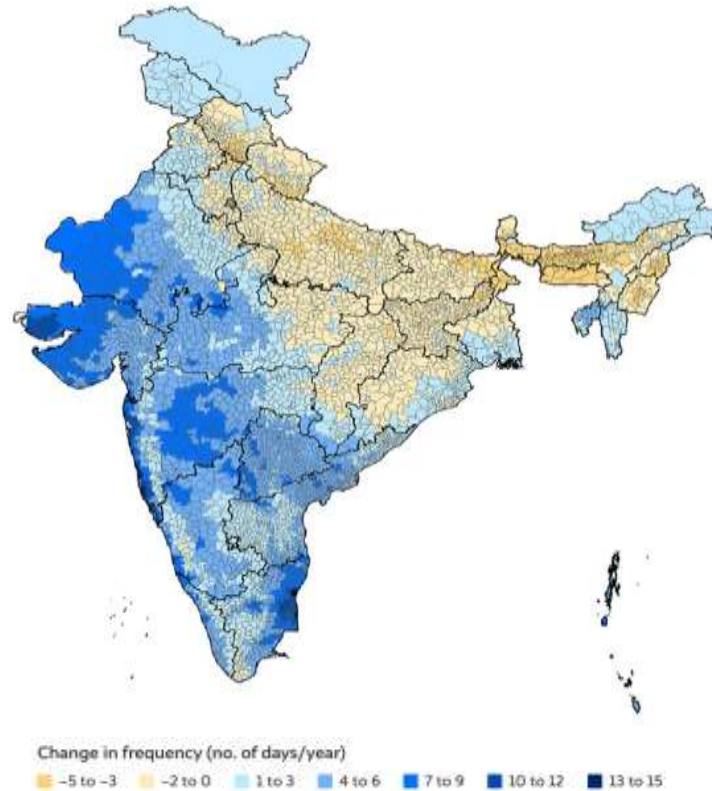
Rise in frequency and intensity of extreme climate events

Hotspots of extreme events



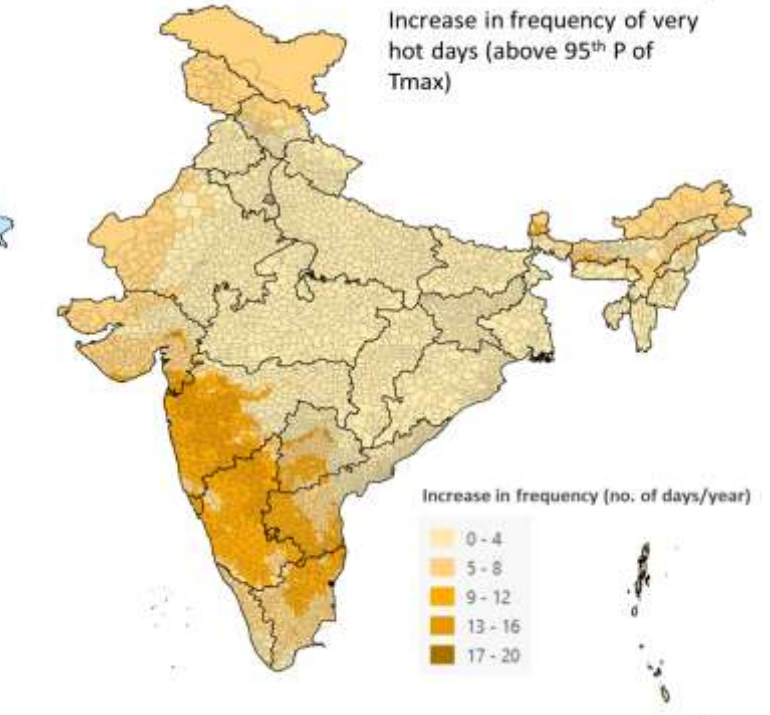
- **5 out of 20 Indians** are highly vulnerable to floods, cyclones as well as droughts.
- **More than 80%** of India's population lives in districts highly vulnerable to extreme hydro-met disasters

Change in heavy rainfall days



- **55% of tehsils witnessed an increase and 11 per cent witnessed a decrease** in southwest monsoon rainfall in the past decade (2012-2022)

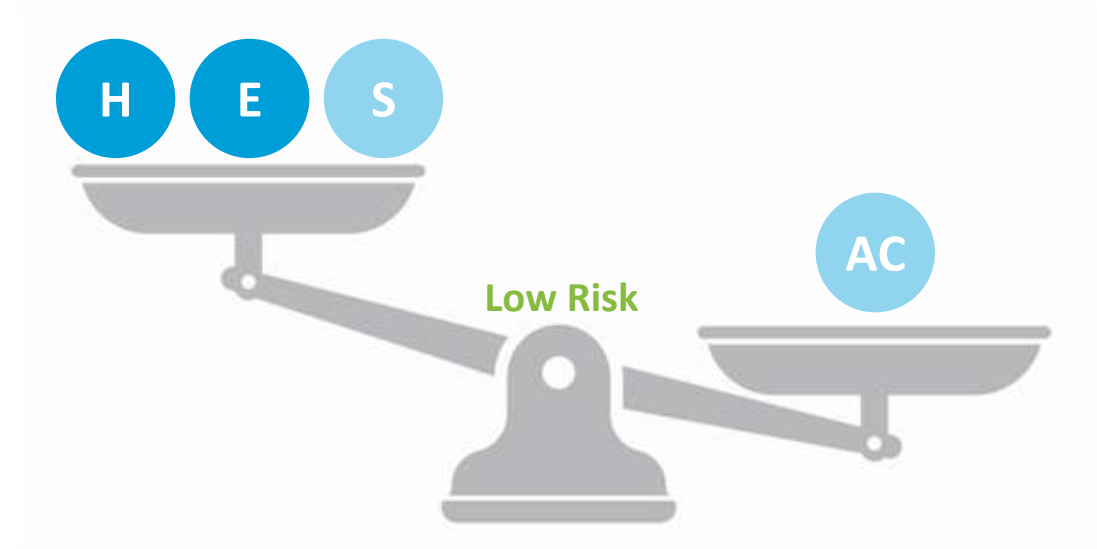
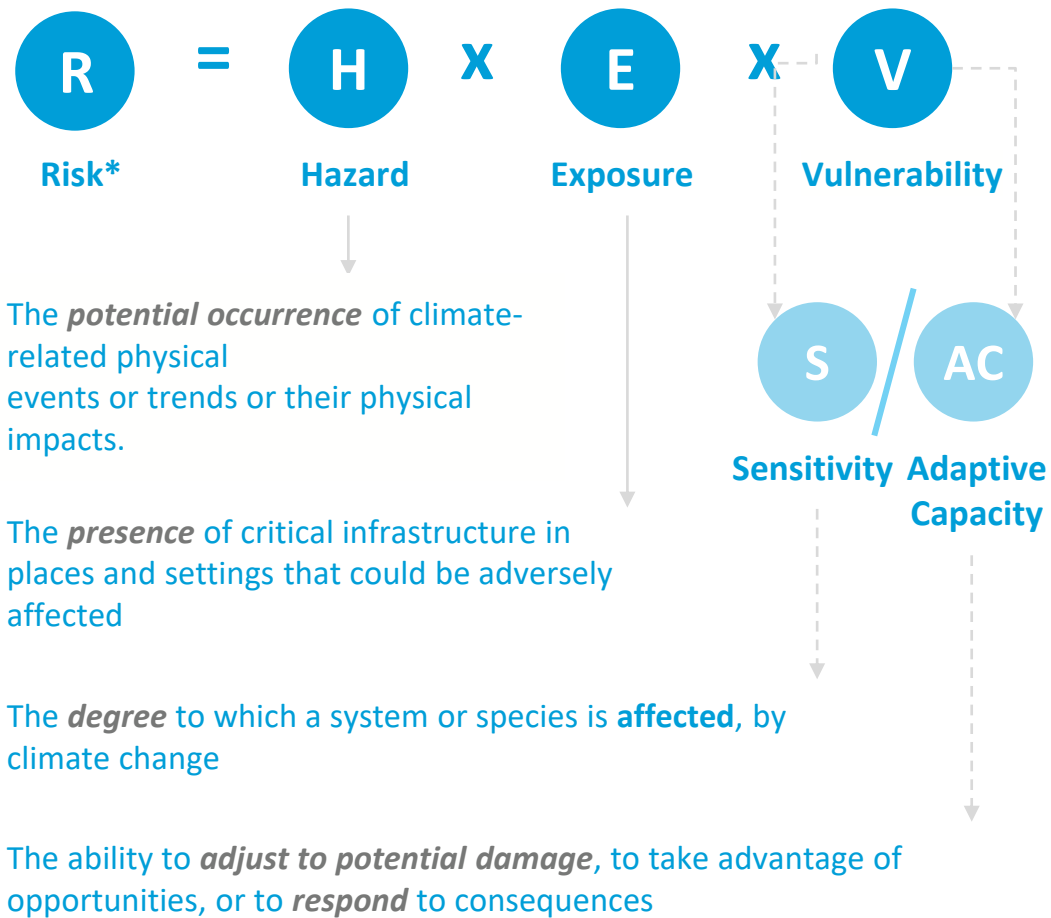
Increase in very hot days



- Current trends and future climate projections for India indicate an **escalation in the intensity, frequency, and duration of heat waves.**

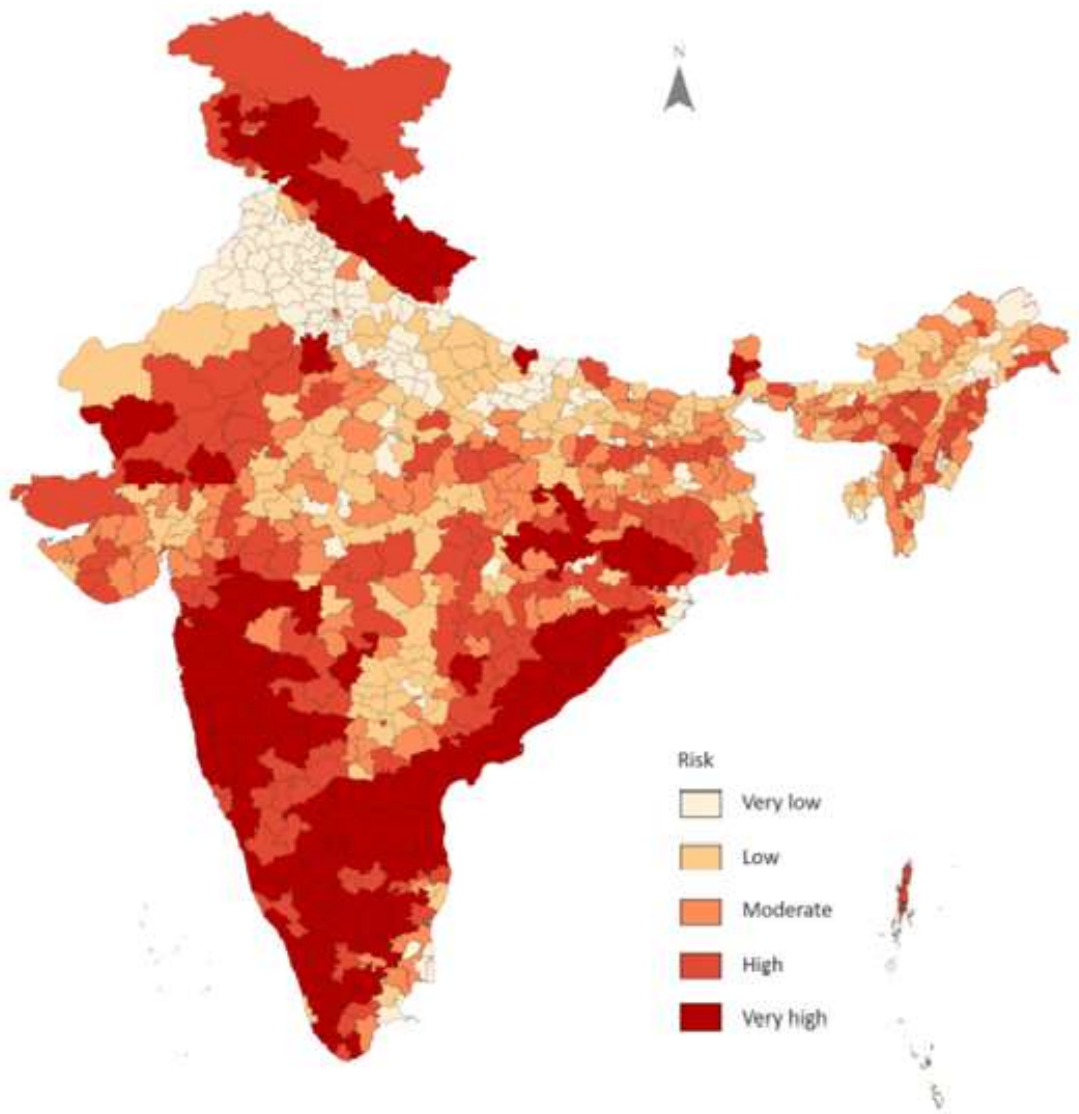
How do we estimate the climate 'risk' to a system?

- The IPCC AR5 defines risk as a function of **three components**
- A **composite index-based methodology** is used to measure indicator scores for each component



*This refers to the physical risk to the healthcare facilities within a district (in alignment with the IPCC definition), and not the transitional risks.

Climate Risk Assessment of India's Healthcare Sector



More than 40% of the Indian districts have health systems that face **high to very high climate risk**

Healthcare systems of

141 districts
in India fall under the **very high risk category**

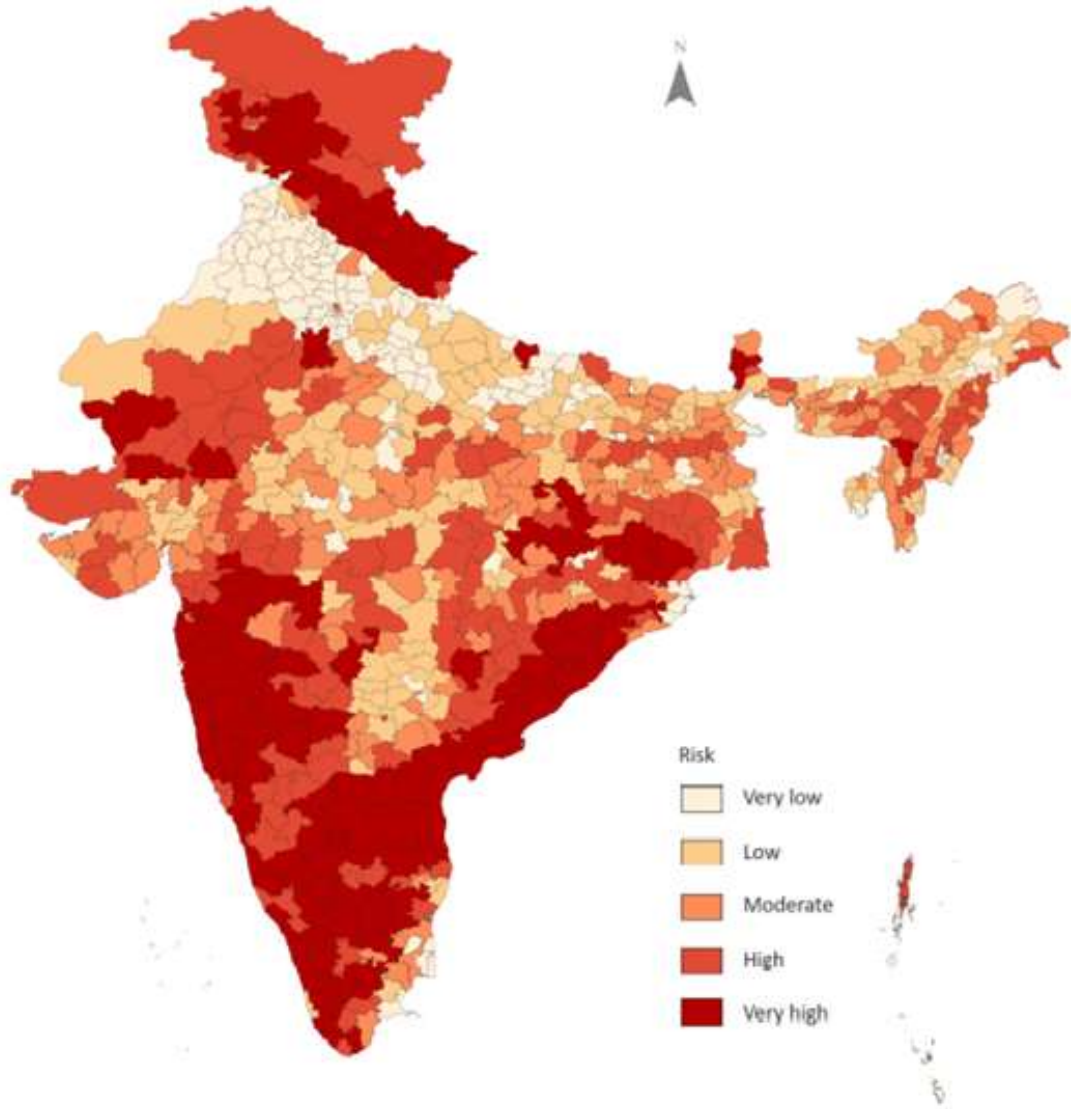
138 districts
in India fall under the **high risk category**

146 districts
in India fall under the **moderate risk category**

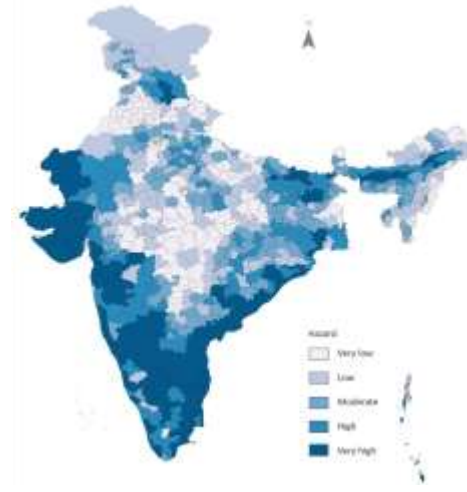
160 districts
in India fall under the **low risk category**

149 districts
in India fall under the **very low risk category**

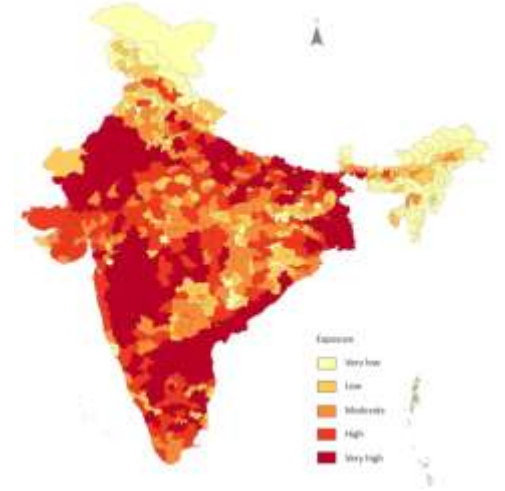
Climate Risk Assessment - Key Findings (Risk)



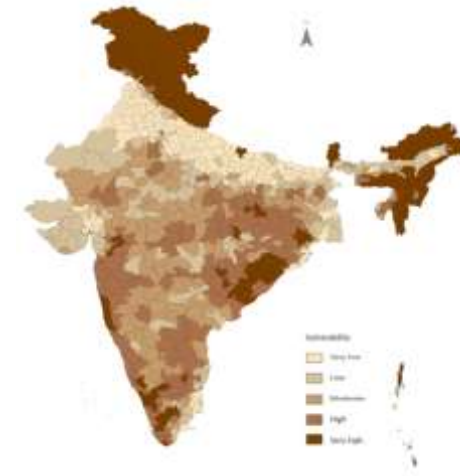
Hazard



Exposure

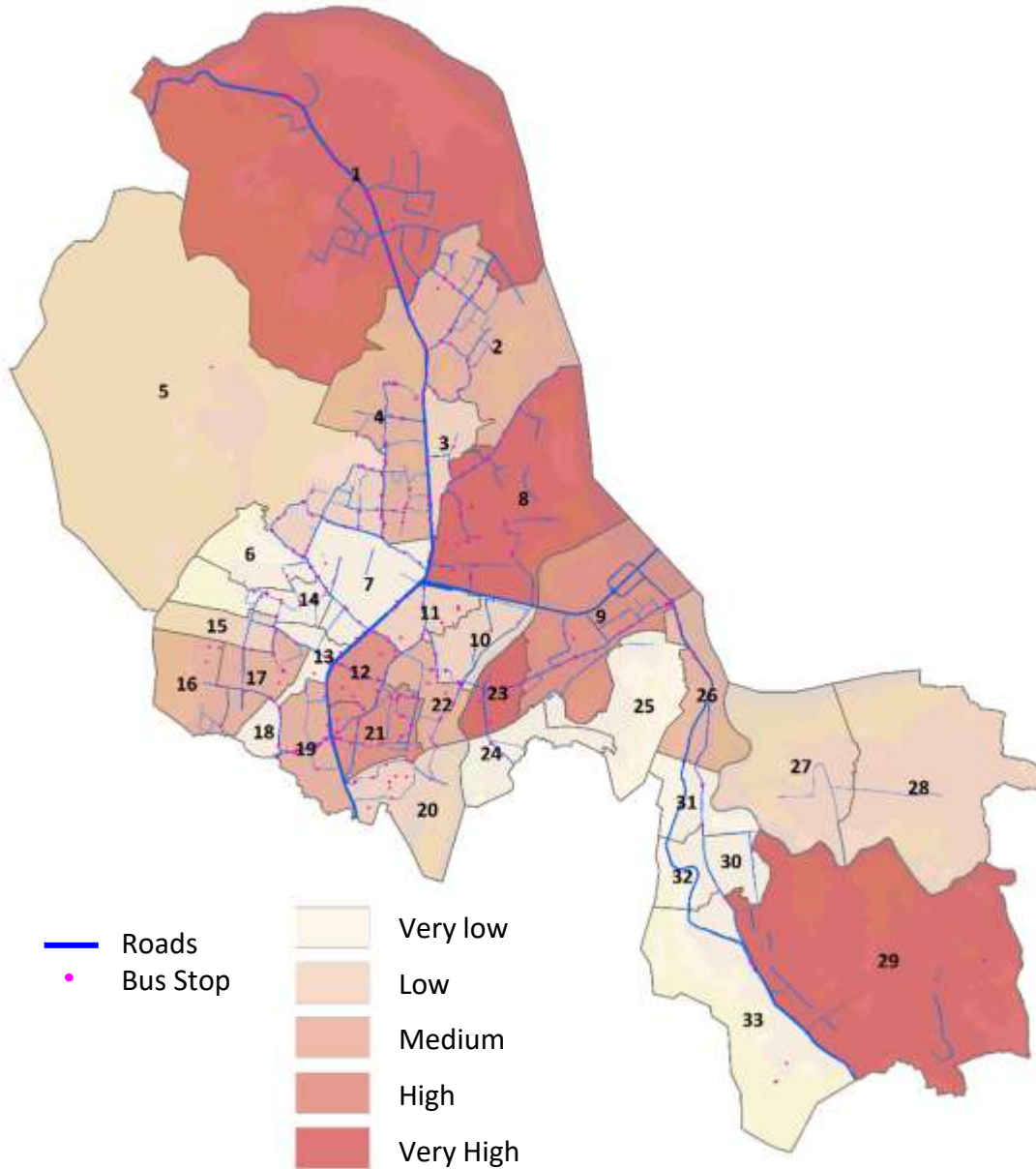


Vulnerability



Moving from National to Local Level

Risk to Transportation Sector

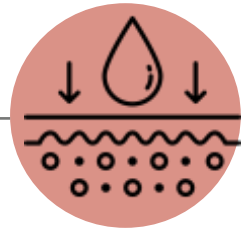


Key risk drivers for transport sector














Low network density and carrying capacity of roads in wards with high interdependent infrastructure

Lack of roads with CC material in areas with shortage in storm-water drainage



Existing and proposed infrastructure in flood susceptible areas

Proposed Adaptation Solutions for Transport Infrastructure

Timeline	Structural Solution	Non Structural Solutions
Lack of Storm Water Drainage - Meso Scale		
Short Term	 Nature Based Solutions such as bioswales, rain gardens, vegetated shoulders etc. to reduce pressure on sewage network	 Regular maintenance and cleaning of existing drains to prevent clogging
Medium Term	 Geocomposite Drainage Systems alongside roads and behind retaining walls, to prevent clogging  Construction of Storm Water Drainage channels  Installation of Permeable Pavements to enhance water percolation	 Planning policies to prevent construction on natural drainage paths of the city.
Long Term	 Elevation of Roads in flood prone area	
Non-Compliance with Regulations		
Short Term		 Compliance with NDMA and IRC Guidelines for structural safety  Development of road review mechanism for periodical maintenance
Roads with top material as Cement Concrete		
Short Term		 Developing regulations for sustainable road materials
Medium to Long Term	 Retrofitment of roads with porous concrete and light colored asphalt material for heat and flood resilience	

Thank you

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