ESCAP RISK AND RESILIENCE PORTAL

An Initiative of the Asia Pacific Disaster Resilience Network

Bridging the science policy gap for informed disaster and climate action

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ESCAP
Economic and Social Commission for Asia and the Pacific

The motivation behind the Risk and Resilience Portal

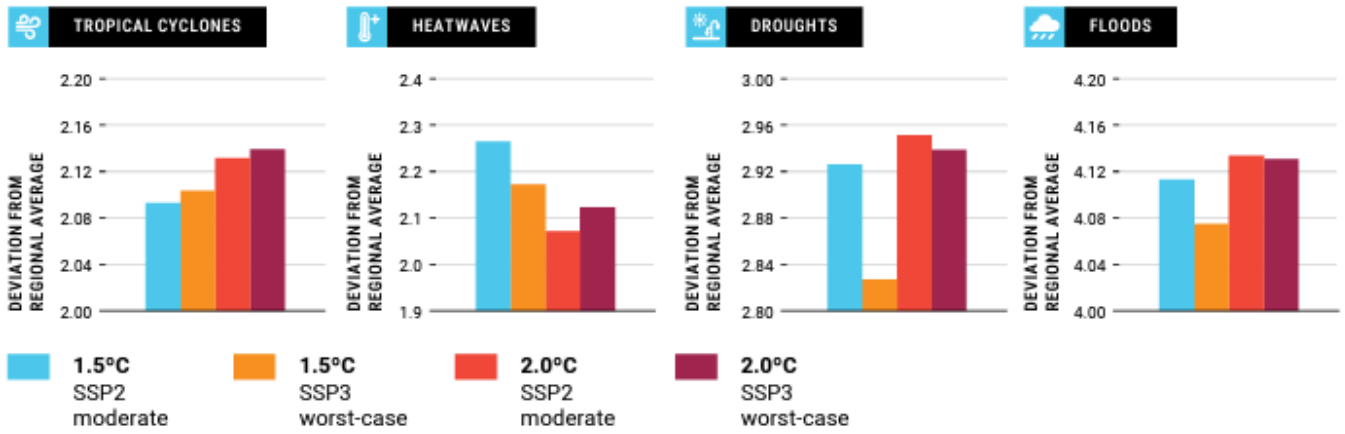
GLOBAL

Translating global risks to the region

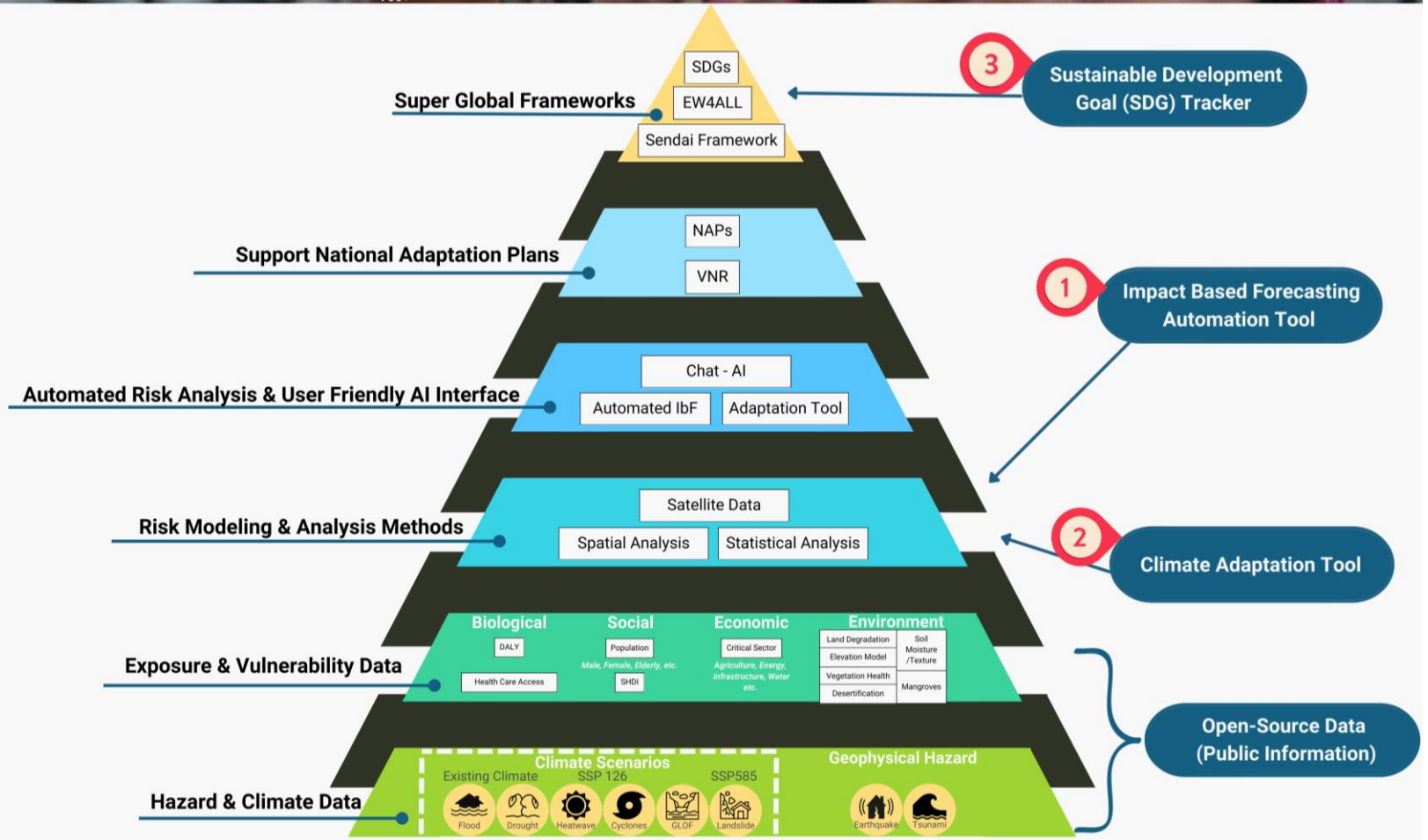
	present +1.1 °C	+1.5 °C	+2 °C	+4 °C
Temperature Temperature of the hottest day in a decade increases (+°C)	+1.2 °C	+1.9 °C	+2.6 °C	+5.1 °C
Drought Drought occurring once in a decade happens x times more frequently	2 × more frequent	2.4 ×	3.1 ×	5.1 ×
Precipitation What used to be the wettest day in a decade now occurs x times more frequently	1.3 × more frequent	1.5 ×	1.8 ×	2.8 ×
Tropical cyclones Proportion of intense tropical cyclones increases (%)		+10 %	+13 %	+30 %

Based on IPCC's Sixth Assessment Report, Working Group I. © FMI and Ministry of the Environment, 2021. Climateguide.fi

ASIA-PACIFIC REGION



Data architecture of the Portal



The Portal is built on a state-of-the-art data intensive and risk analytics

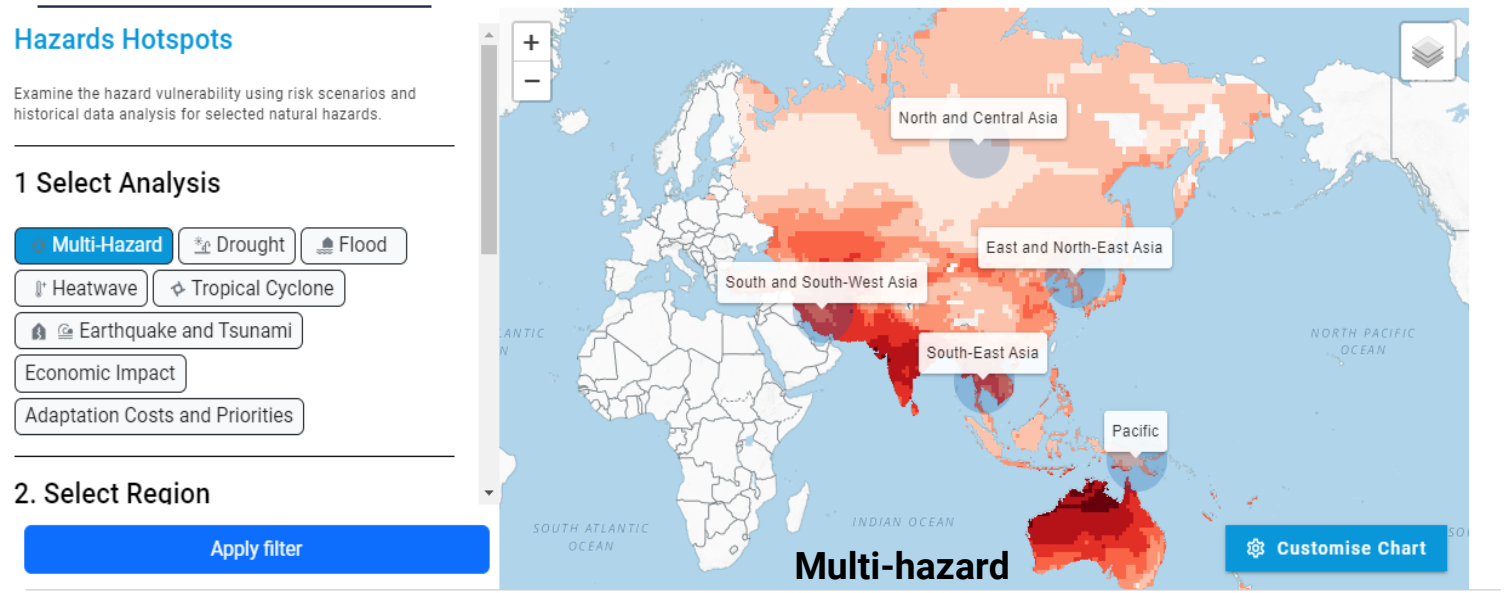
1. **ONE data ecosystem analyzing multiple datasets**
2. **ONE methodology for data interoperability**
3. **AI-based models and tools for adaptation**

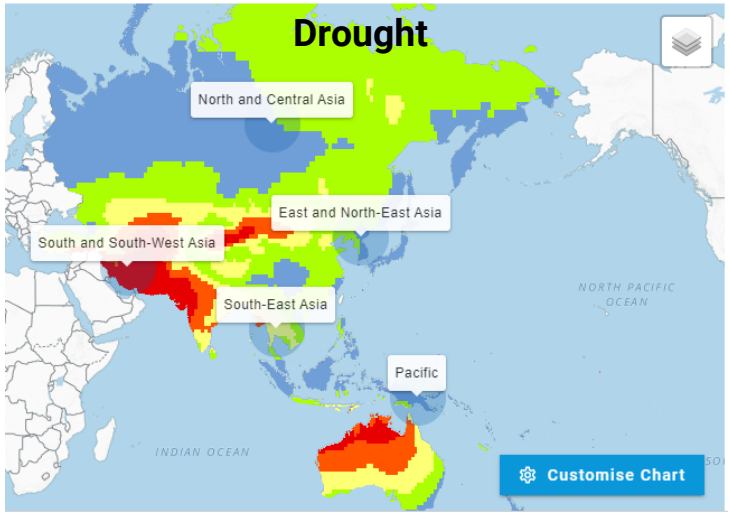
Integration of CMIP6 Global Climate Data

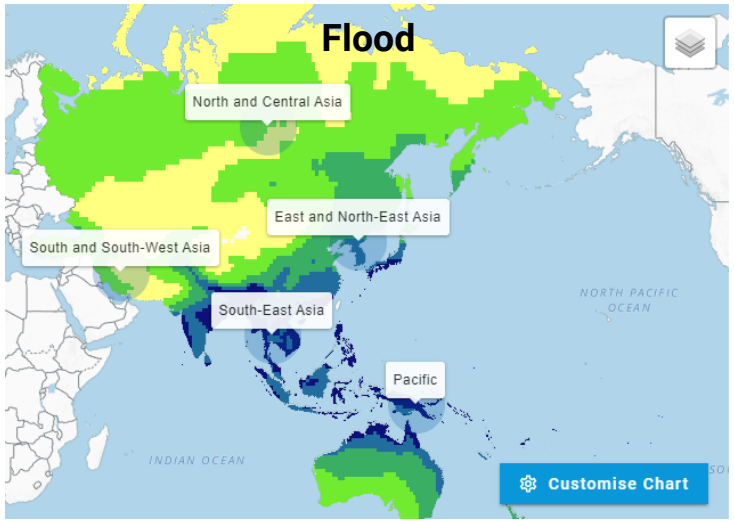
IPCC AR6 climate provides the latest and most accurate climate projections.

How does warming translated to changing risk of floods, drought, heatwaves and tropical cyclones.

Captures multi-hazard risk under baseline, 1.5 and 2 Degrees.





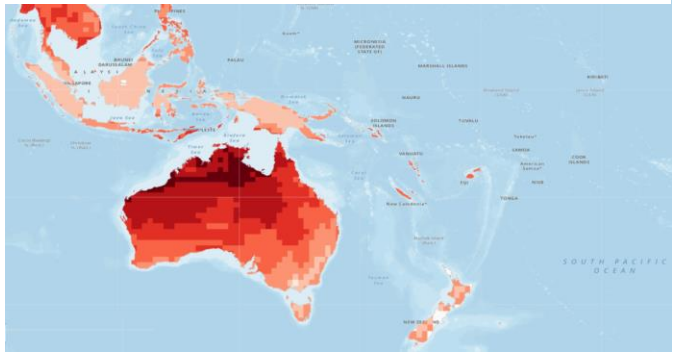


Transboundary hazard and impact analysis

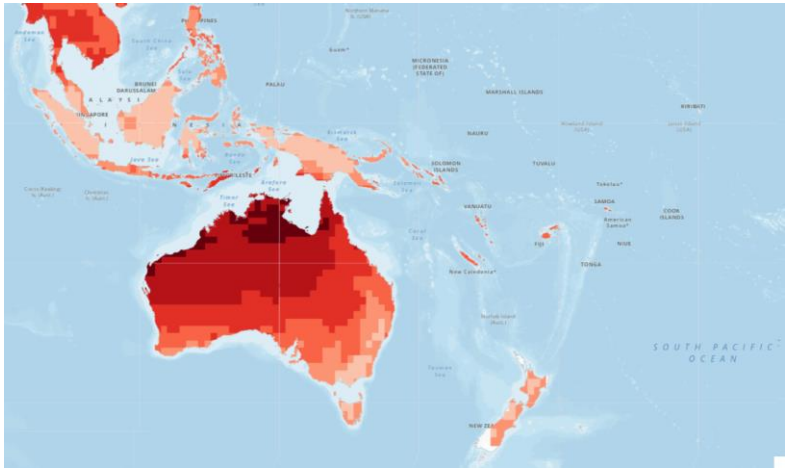
PACIFIC

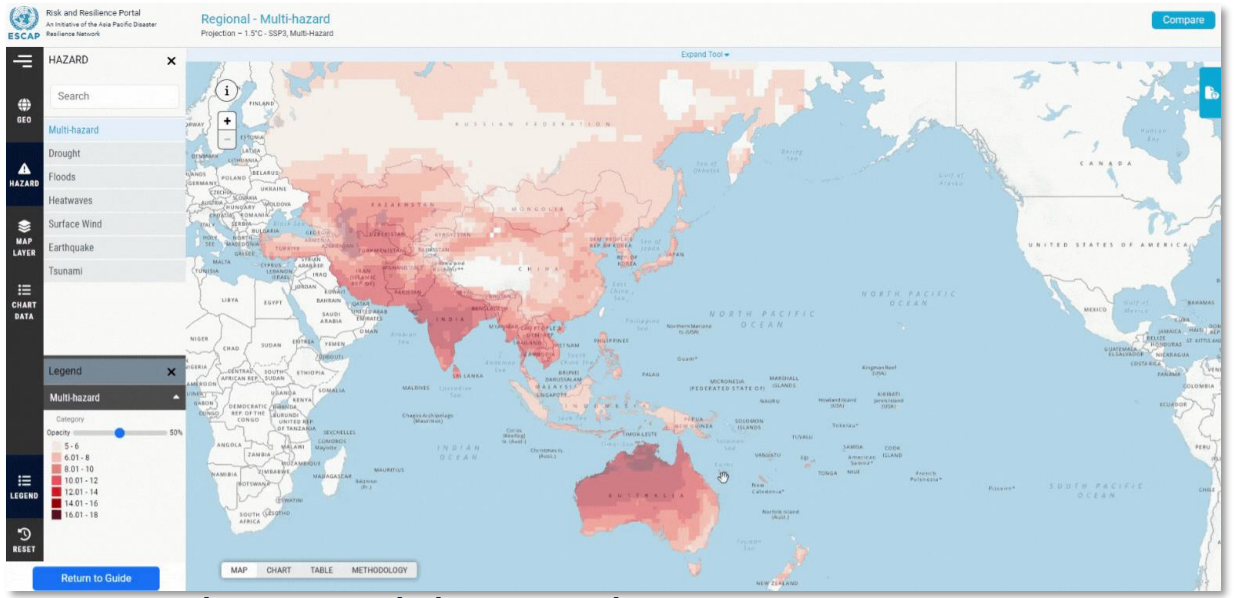
A valuable asset to support the 2050 Blue Pacific Strategy

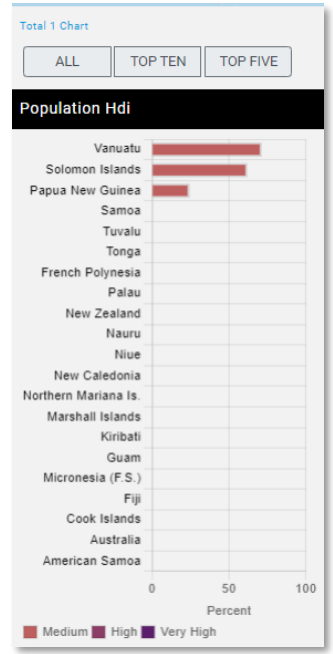
Flood Baseline



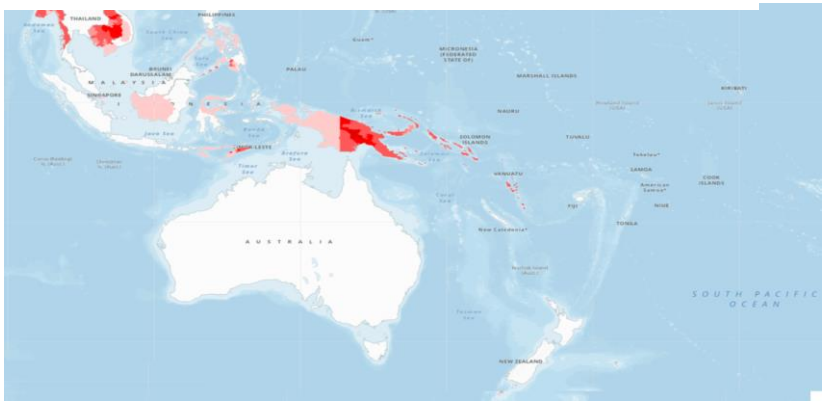
Multi-hazard 2°C SSP3







Population with low/medium HDI

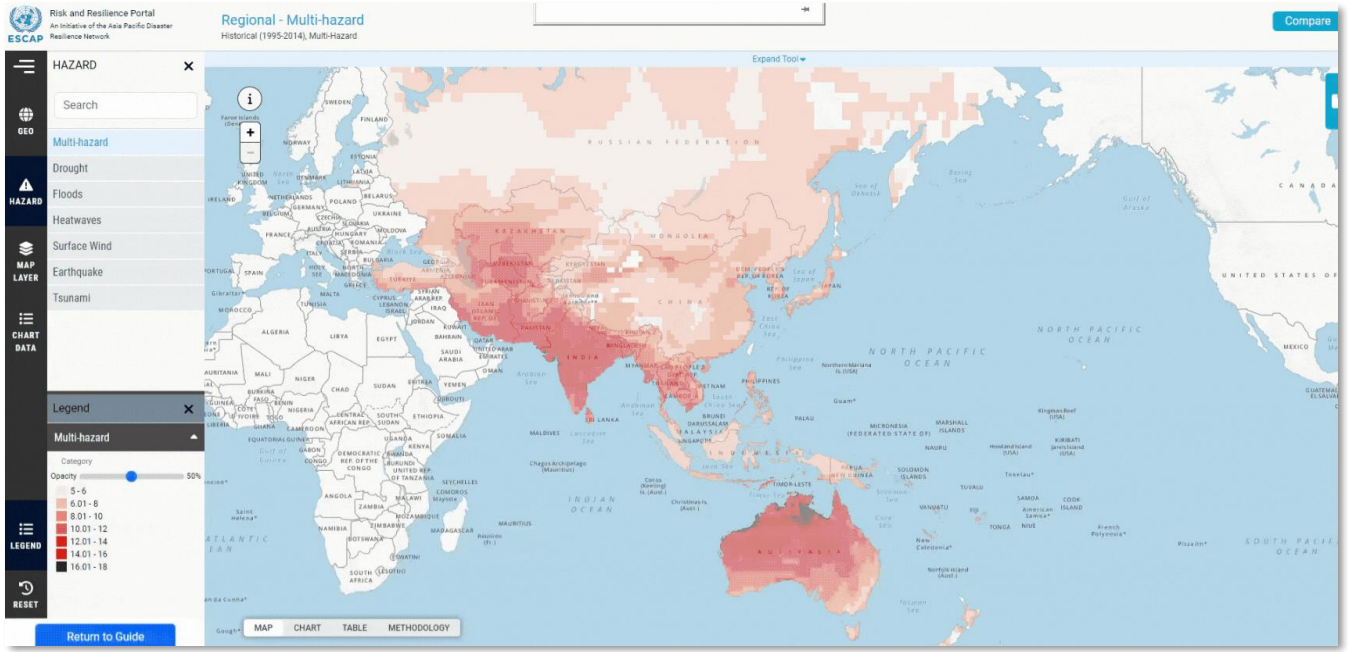


Knowing where emerging at-risk communities will be in the future

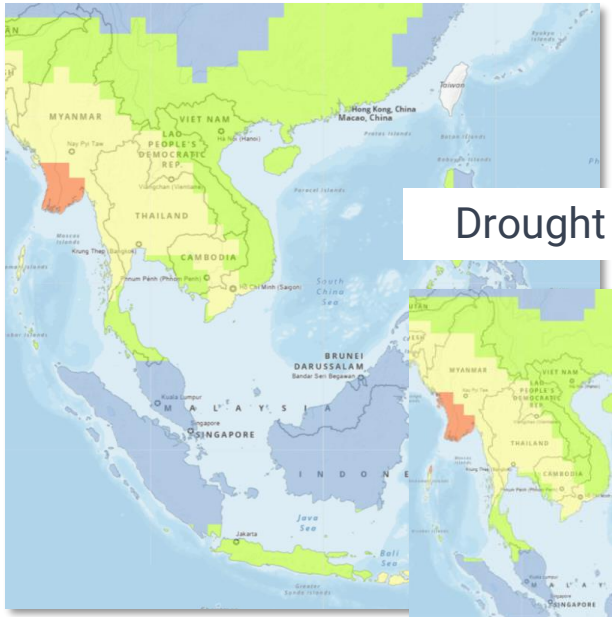
Transboundary hazard and impact analysis

ASEAN

Provide the evidence base for the ASEAN Regional Plan of Action for Adaptation to Drought

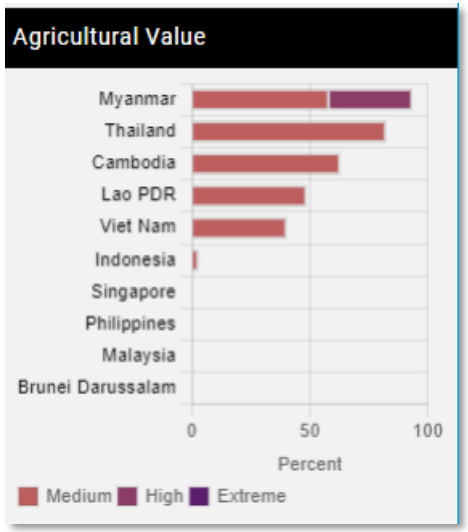


Drought Baseline



Drought 2°C SSP3

Agriculture Production



How much of the subregion's agriculture value is exposed to drought in the future.

Transboundary hazard and impact analysis

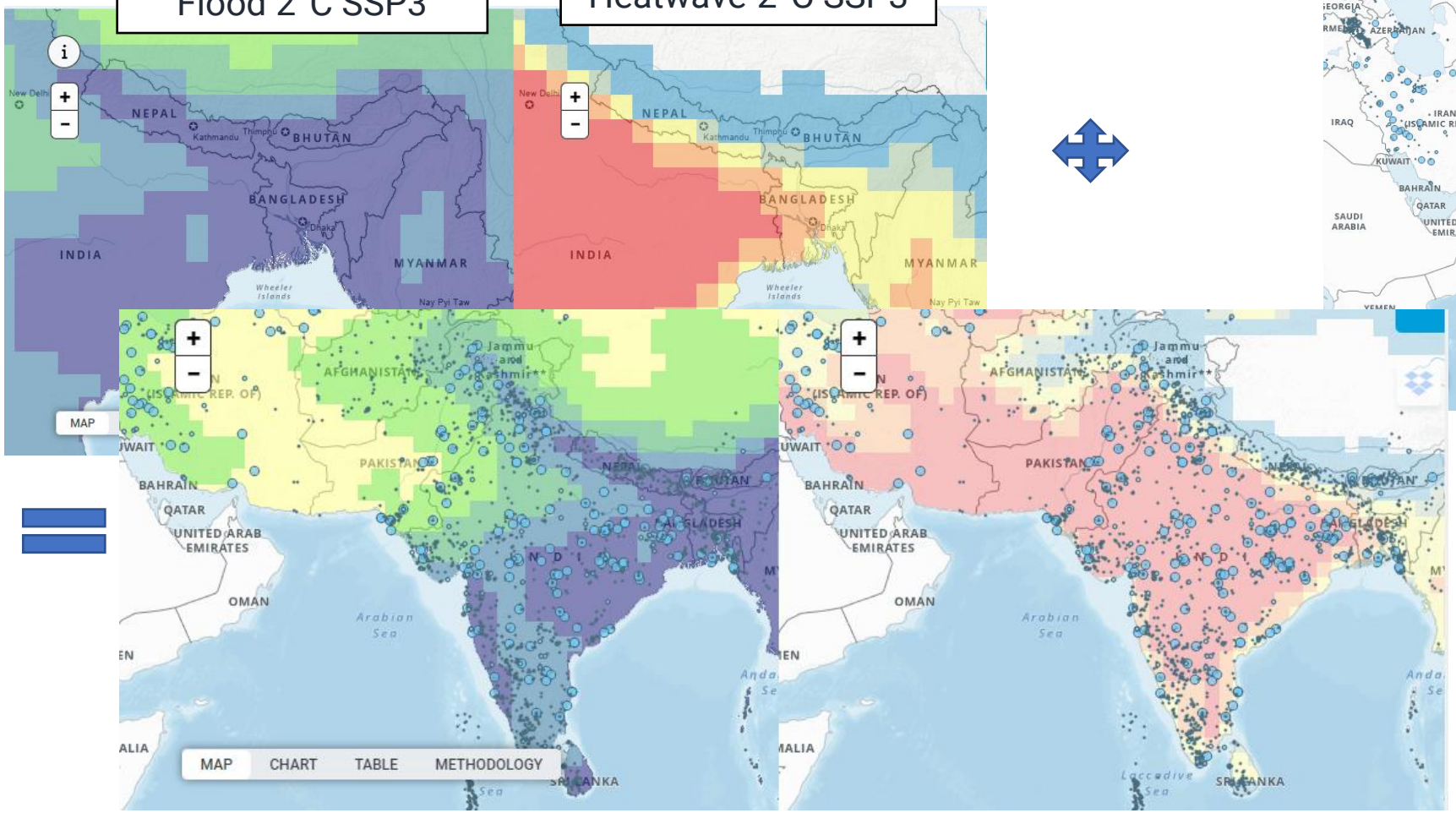
SAARC

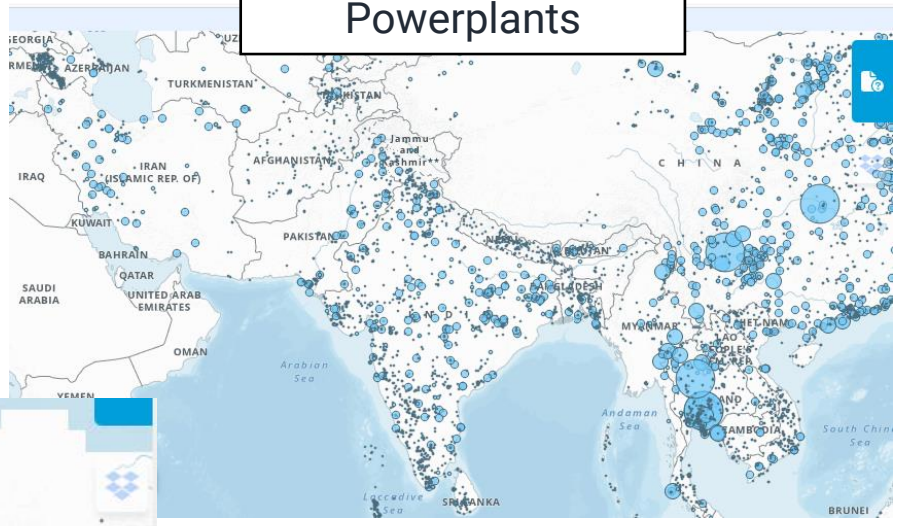
Facilitate collaboration to tackle intersecting transboundary climate risks and shared challenges

Flood 2°C SSP3

Heatwave 2°C SSP3

Powerplants





Understanding where future power plants should be built and where infrastructure needs to be resilient to multiple hazards under 2°C warming

Customized downscaling of global climate data

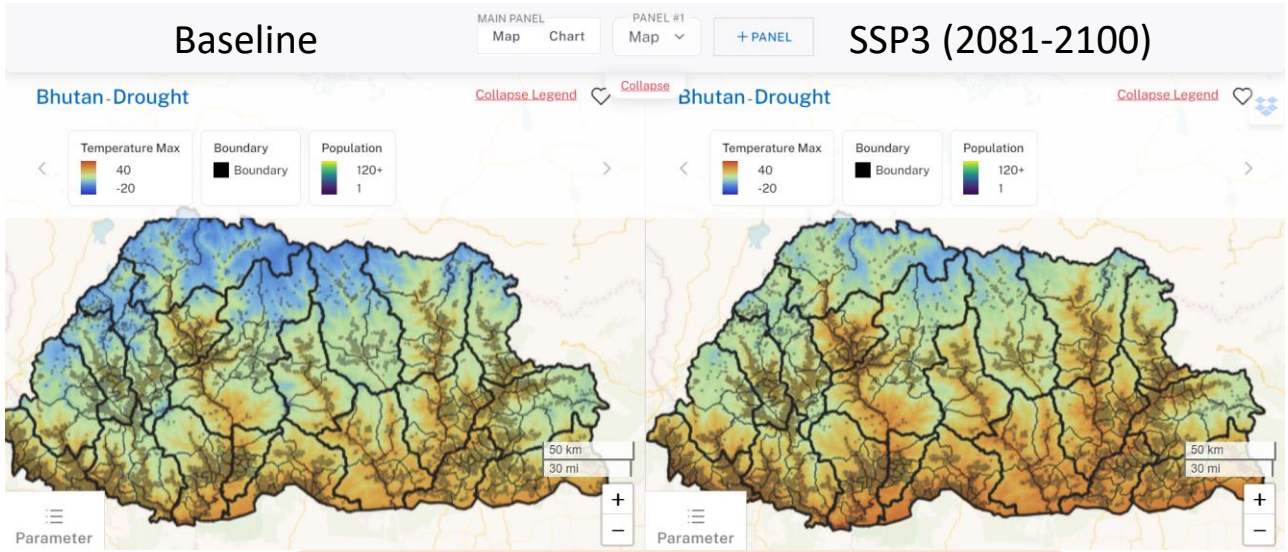
Downscaled climate projection to 1 x 1 resolution for pilot countries

Maldives

No risk at baseline but alarming increase under 2 degrees for sea level rise

High impact on future coastline infrastructure

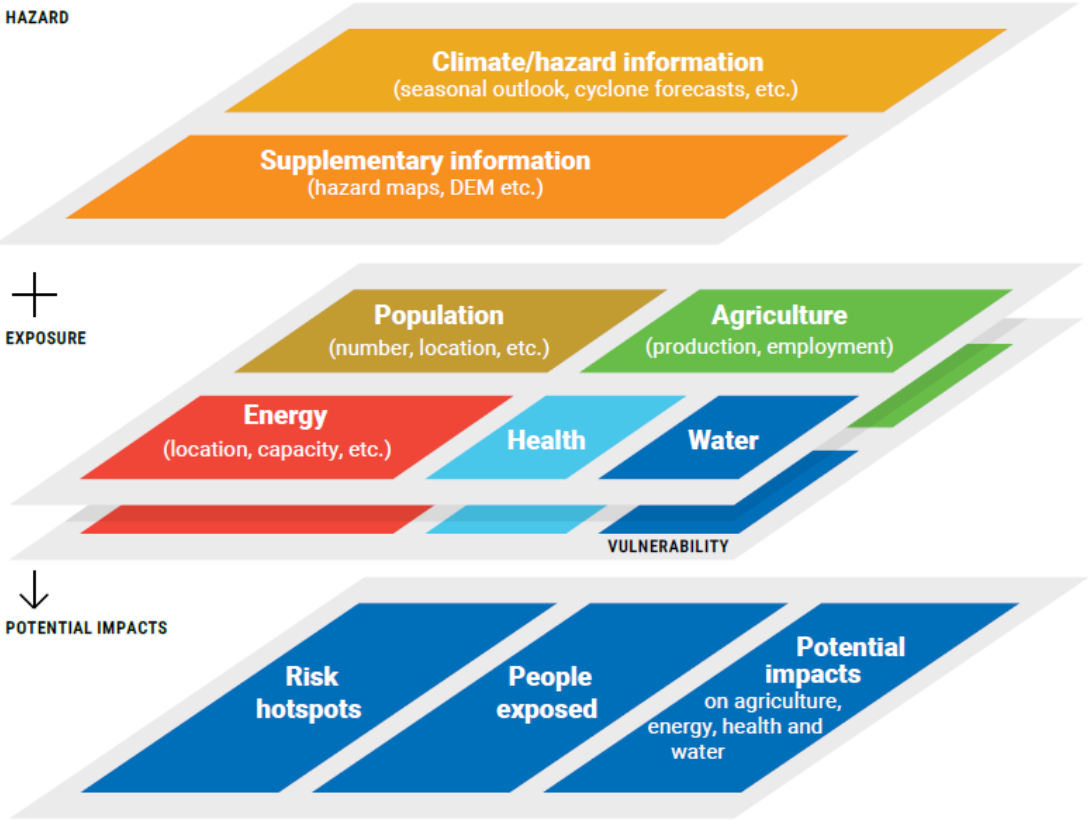
Bhutan



Risk of high temperatures is a threat for GLOFs and other hazards

High impact on future hydropower infrastructure

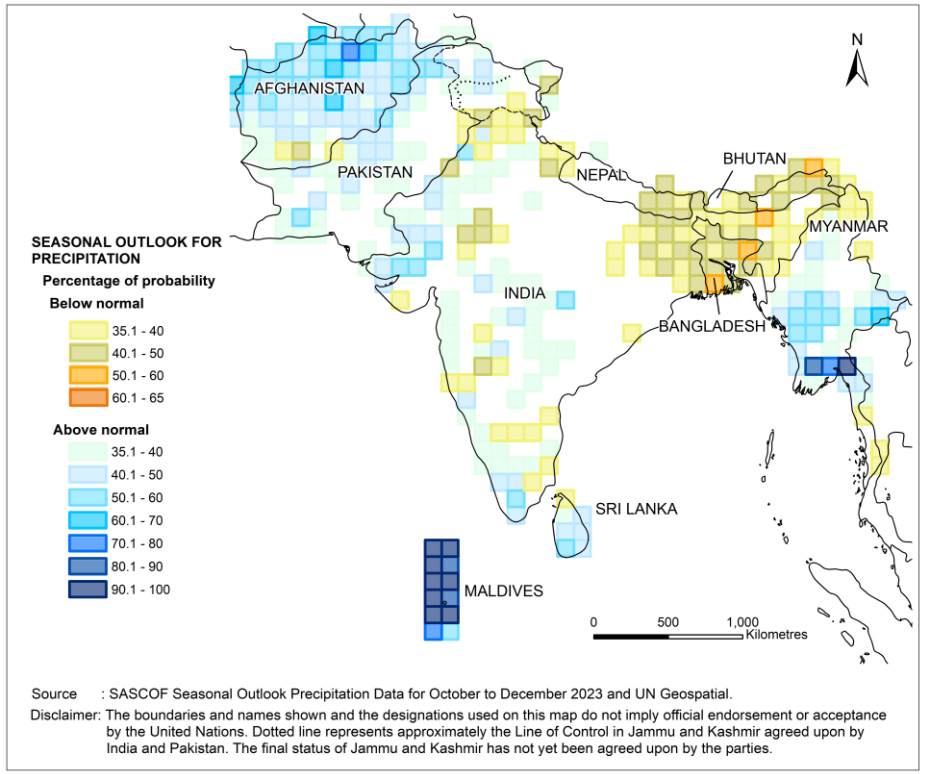
To support Early Warning Systems and EWS4All, ESCAP's impact-based forecasting in outlook forums on the Portal follows WMO Global Framework for Climate Services



Source: ESCAP (2022) APDR – Pathways to Adaptation and Resilience in South and South-West Asia Overview of the work of secretariat and the UN system at the regional level. ESCAP/CDR/2021/INF/1

SSWA Seasonal Outlook for precipitation December 2023 to February 2024

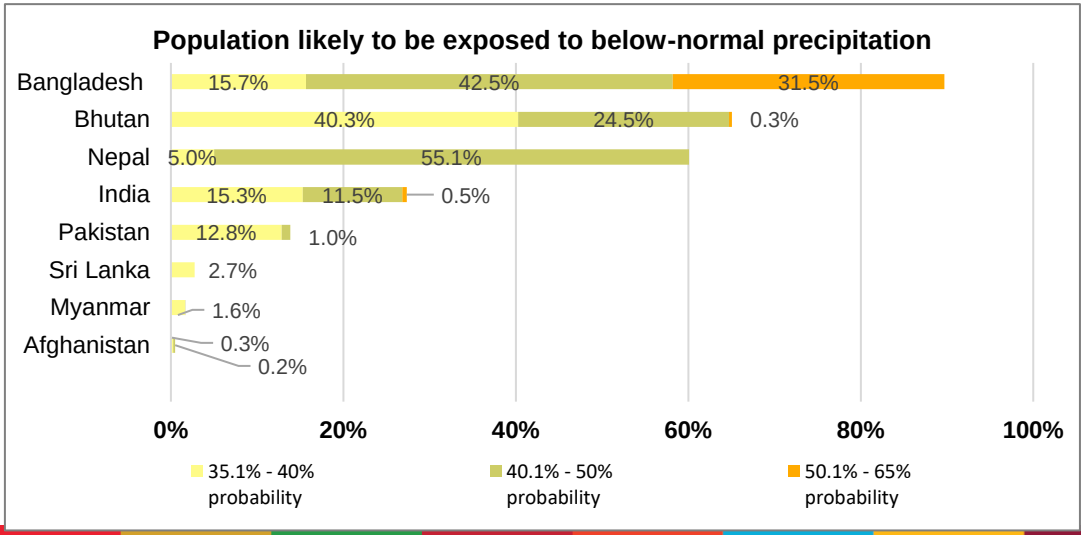
Areas of attention for precipitation

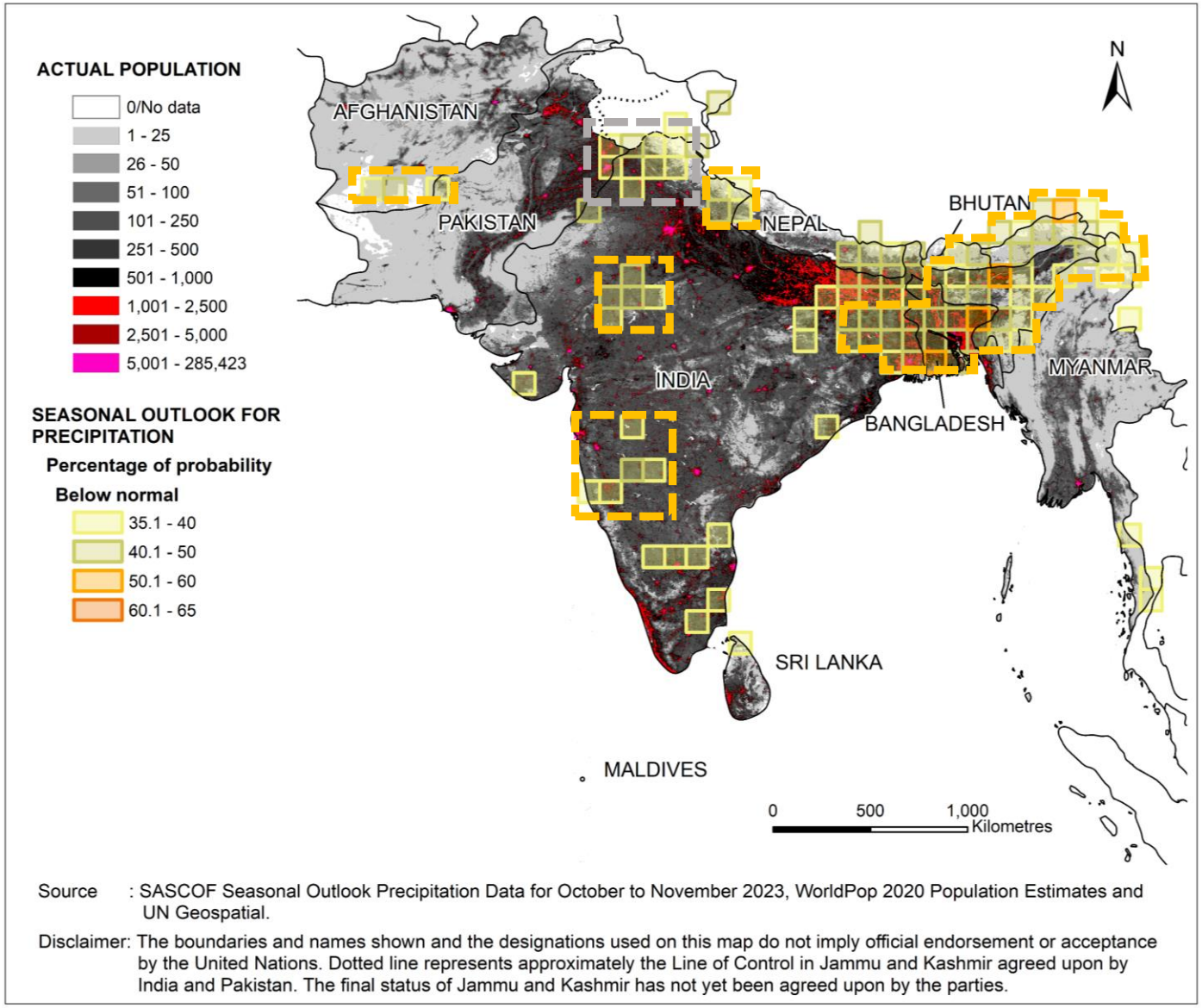


Estimation of population likely to be exposed to below-normal precipitation – SASCOF 2023

Country	Total population 2022 (thousands) ESCAP statistics	Percent of population exposure			
		35.1% - 40% probability of below normal precipitation	40.1% - 50% probability of below normal precipitation	50.1% - 65% probability of below normal precipitation	Below normal precipitation
Afghanistan	41,129	0.3%	0.2%	0.0%	0.5%
Bangladesh	171,186	15.7%	42.5%	31.5%	89.7%
Bhutan	783	40.3%	24.5%	0.3%	65.1%
India	1,417,173	15.3%	11.5%	0.5%	27.3%
Maldives	524	0.0%	0.0%	0.0%	0.0%
Myanmar	54,179	1.6%	0.0%	0.0%	1.7%
Nepal	30,548	5.0%	55.1%	0.0%	60.1%
Pakistan	235,825	12.8%	1.0%	0.0%	13.9%
Sri Lanka	21,832	2.7%	0.0%	0.0%	2.7%
Total	**1,973,178**	**14.0%**	13.0%	**3.1%**	30.2%

In total, **30.2%** population of this region are likely to be exposed to **more than 35%** probability of below-normal precipitation.





Source : SASCOF Seasonal Outlook Precipitation Data for October to November 2023, WorldPop 2020 Population Estimates and UN Geospatial.

Disclaimer: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations. Dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties.

Automated Seasonal Impact-Based Forecasting with Machine Learning

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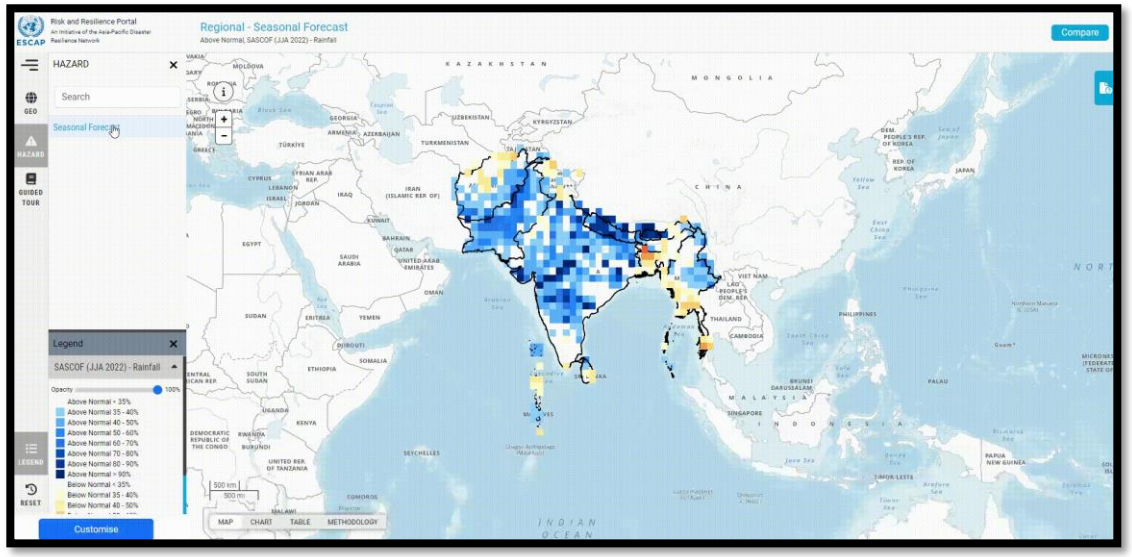
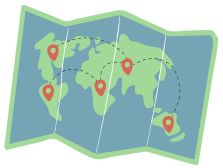


INPUT*

- Population data
- Infrastructure data
- Hazard data
- Boundary data



OUTPUT

- Exposure and intensity zone of hazards
- Map & exportable table

**Georeferenced and classified data*

GEOSPATIAL PYTHON AUTOMATION SCRIPT

GEOSPATIAL PRE-PROCESSING → PROCESS IDENTIFICATION → GEOSPATIAL EXPOSURE ANALYS

- Setting Coordinate Reference Systems
- Setting resolution
- Classifying hazard (based on intensities, create different hazard intensity zones)

- Auto recognize type of infrastructure / population data

- Calculate exposure to all infrastructure and population
- Overlay & count exposure

Tracking Progress in and Climate SDGS

Using this along with the risk analytics countries can inform their DRR and NAP strategies

Pooling data from ESCAP SDG Gateway to track disaster and climate related SGDs

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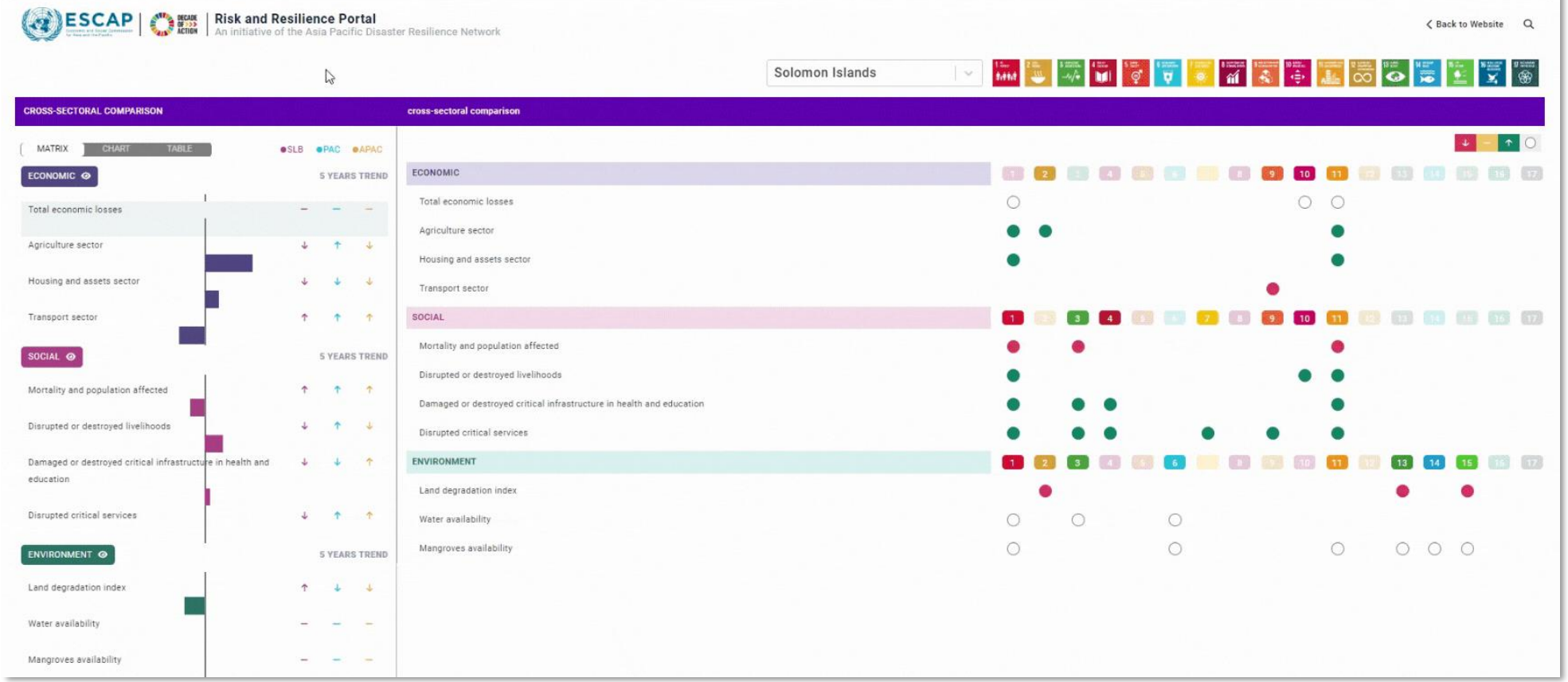


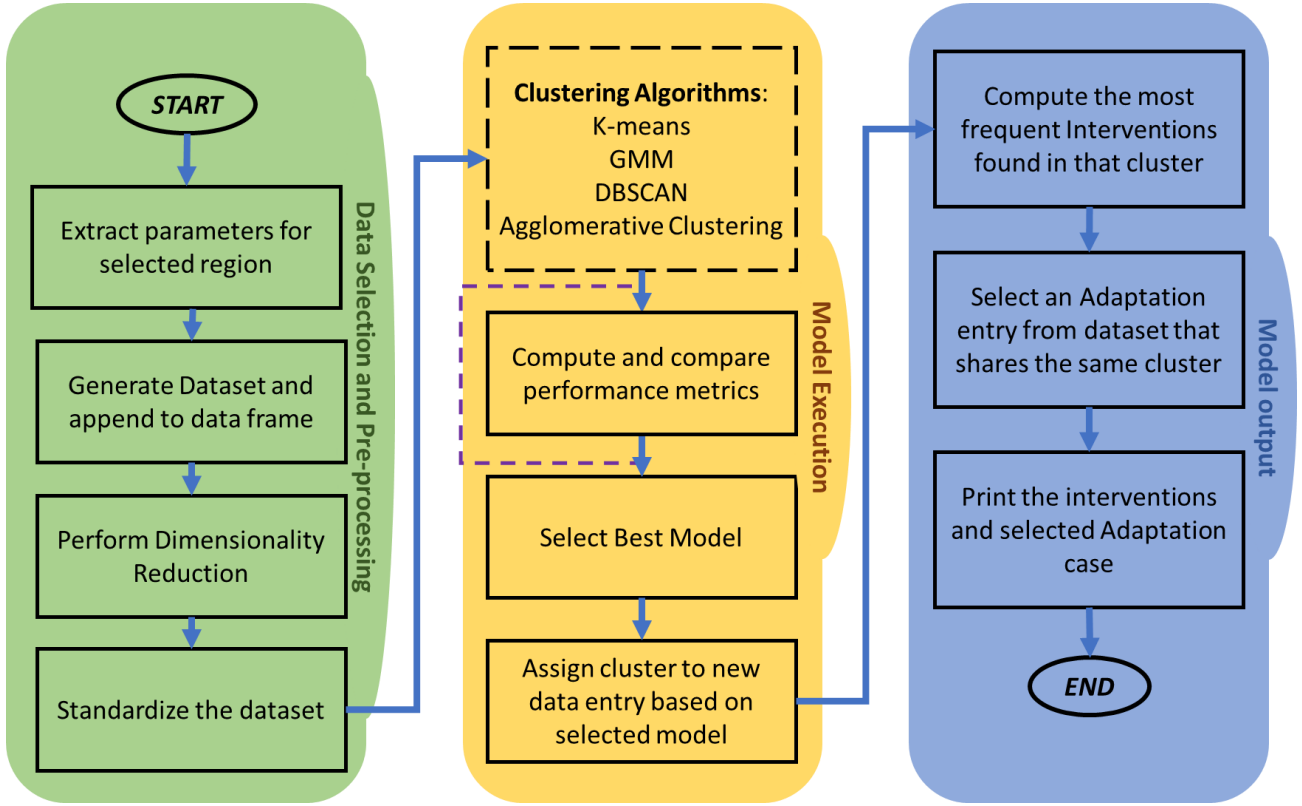
What's next? *AI-Driven Adaptation Solutions*

ClimaWise: AI-Powered Adaptation Planning

Empowering Climate Decision-Makers with AI

A comprehensive tool powered by machine learning and large language models that provides tailored recommendations on adaptation from worldwide case studies based on your area's unique risk profile.

- [Map of Adaptation Solutions Database]
- [Adaptation Recommendations for Mongolia]



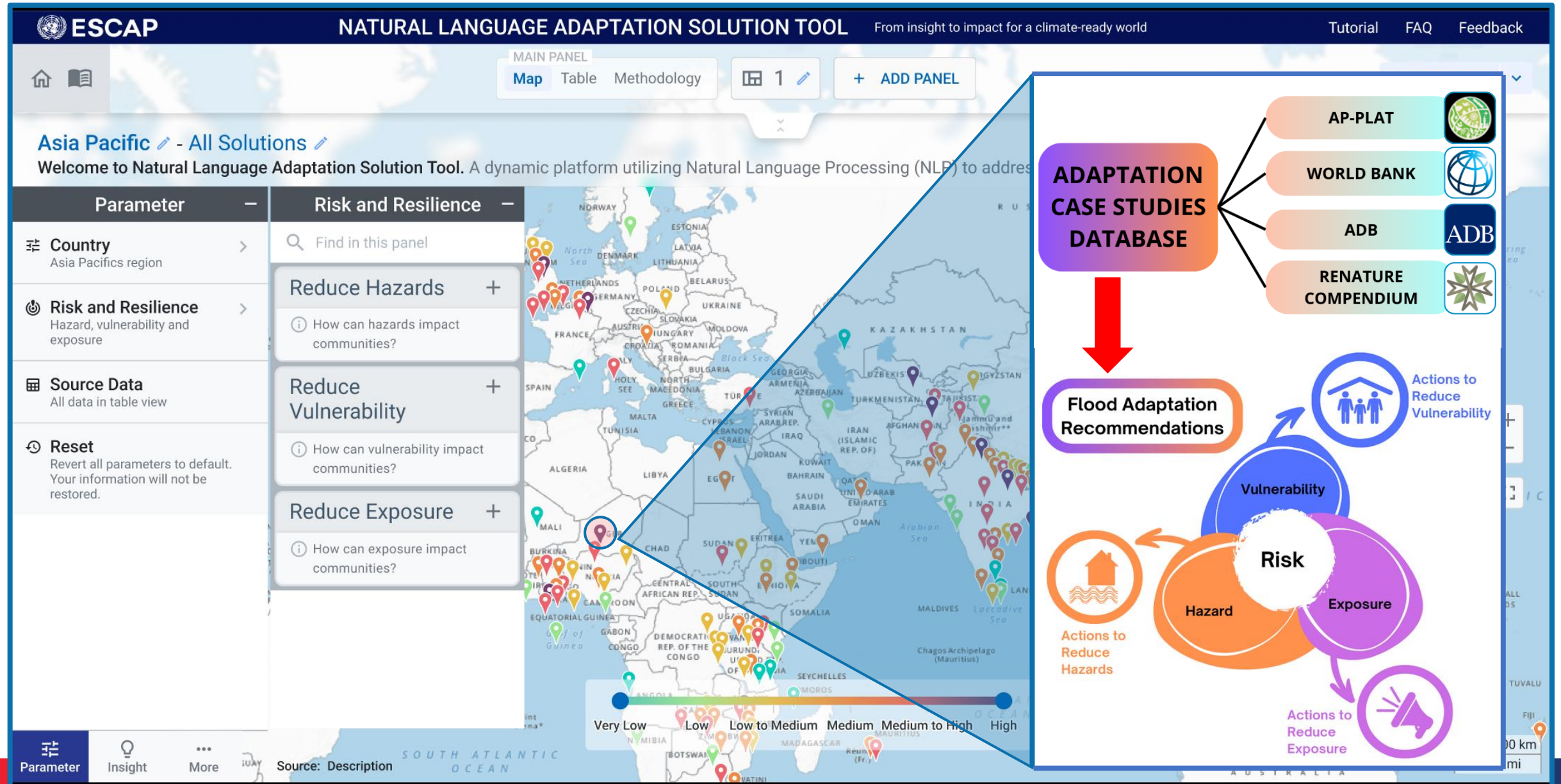
Process Pipeline

Map of Adaptation Solutions Database

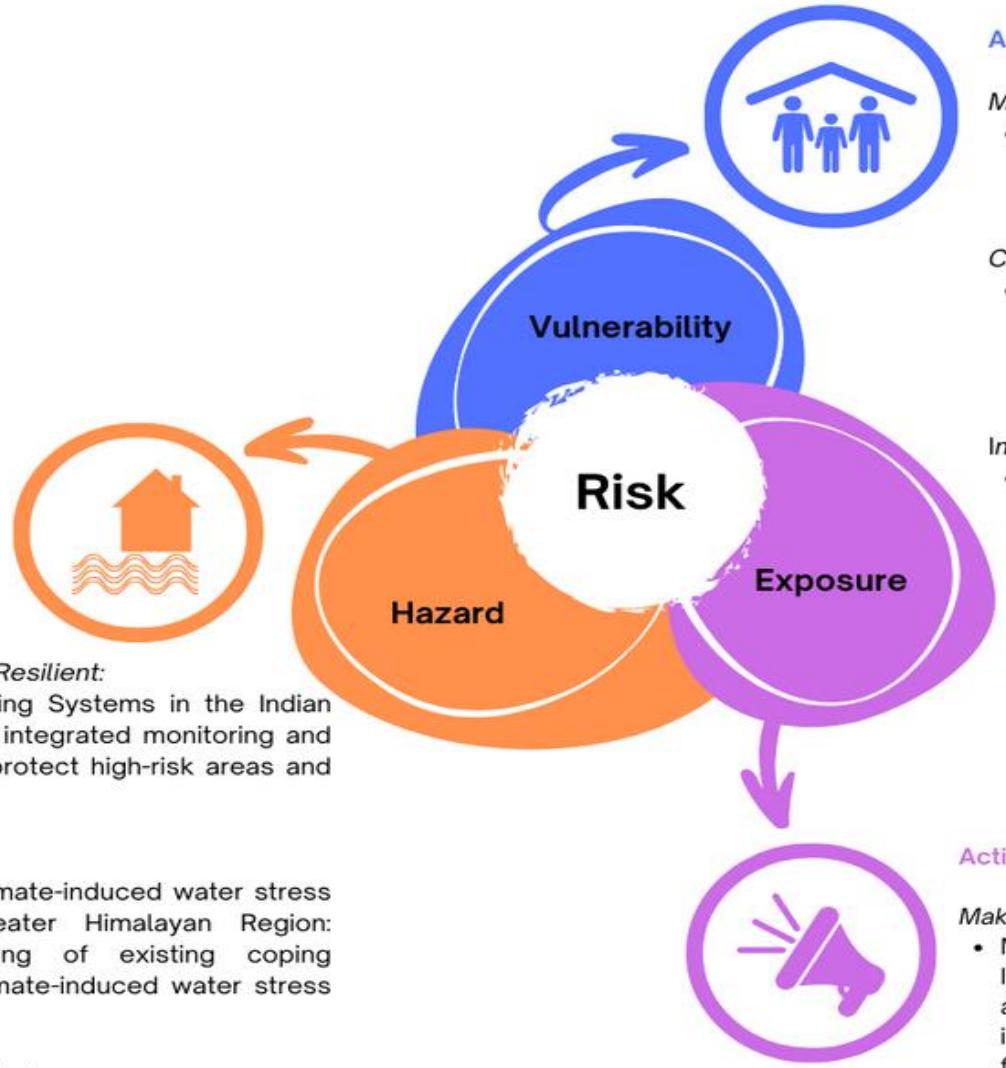
Explore, learn, and adapt from proven adaptation solutions.

ESCAP Economic and Social Commission for Asia and the Pacific | DECADE OF ACTION

RISK AND RESILIENCE PORTAL



Mongolia Case Study for AI driven adaptation recommendations for floods



Actions to Reduce Hazards

Making Water Resources More Resilient:

- Flood Risk and Early Warning Systems in the Indian Himalayas: Development of integrated monitoring and Early Warning Systems to protect high-risk areas and enhance preparedness.

Climate Risk and Resilience:

- Adaptation strategies to climate-induced water stress and hazards in the Greater Himalayan Region: Documentation and sharing of existing coping strategies in relation to climate-induced water stress and risk management.

Making New Infrastructure Resilient:

- Glacier Project in Peru: Early Warning System implementation for glacier lake outburst floods and related risks.

Actions to Reduce Vulnerability

Making Water Resources More Resilient:

- Climate Resilience in Nepal: Improvement of water reliability and accessibility for communities in climate-vulnerable mountain watersheds.

Climate Risk and Resilience:

- An Integrated Response to Climate Change in the Indian Himalayan Region: Ecosystem-based adaptation to enhance community resilience using biodiversity and ecosystem services.

Improving Dryland Agriculture:

- Adaptation al Cambio Climático en comunidades en las Montañas de los Andes de Bolivia: Research and adaptation strategies to address the impact of climate change on community livelihoods and diminish the vulnerability due to declining glacial water storage.

Actions to Reduce Exposure

Making New Infrastructure Resilient:

- Mainstreaming EbA in Nepal: Incorporating ecosystem-based adaptation to manage risks such as increased snow melt, extreme and frequent flash floods, and glacial lake overflows.

THANK YOU

Acknowledgement

Lead team: Madhurima Sarkar-Swaisgood, Rahul Kumar Suman, Prangya Gupta Akash Shrivastav, Shashwat Avi, Soomi Hong, Daisuke Maruichi, Sanjay Srivastava

Developer: Think Blue Data

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