Climate Risk and Resilience Analytics in Asia Pacific

Digital tools for sector resilience

ESCAP Asia Pacific Risk and Resilience Portal

Madhurima Sarkar-Swaisgood, PhD
Economic Affairs Officer, Disaster Risk Reduction, UNESCAP

Motivation behind the Risk and Resilience Portal

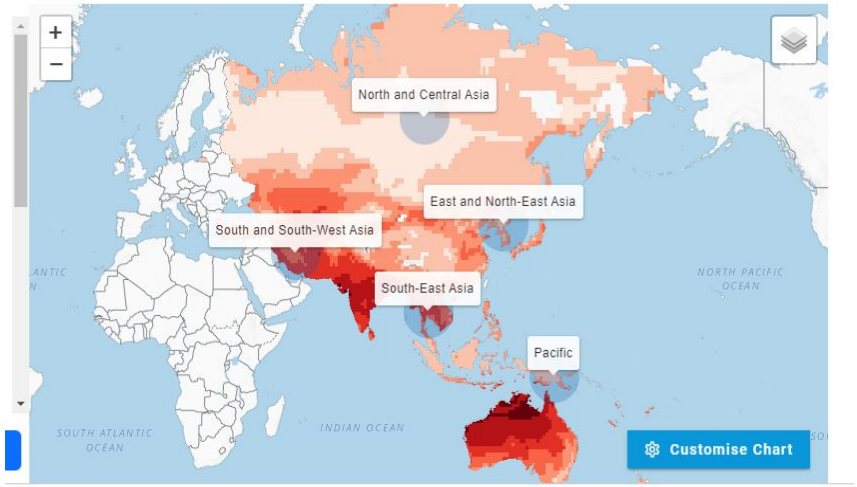
ESCAP
Economic and Social Commission for Asia and the Pacific

Global climate and weather scenarios

	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 %

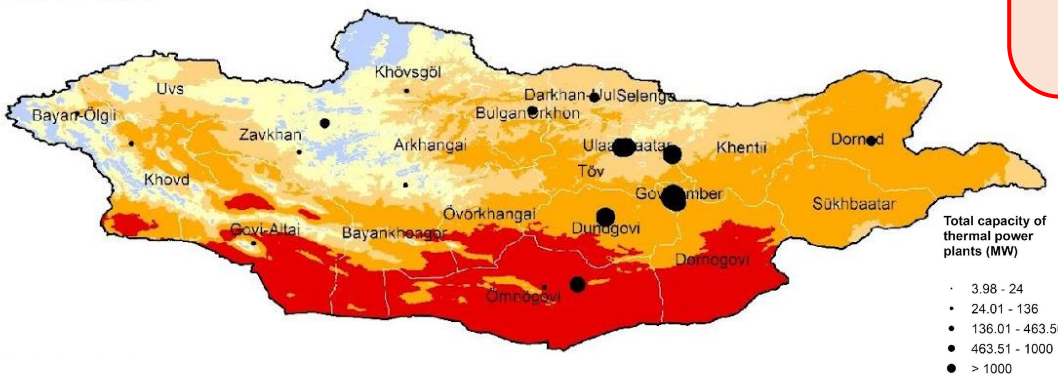
Based on IPCC's Sixth Assessment Report, Working Group I. © FMI and Ministry of the Environment, 2021. Climateguide.fi

Asia Pacific region

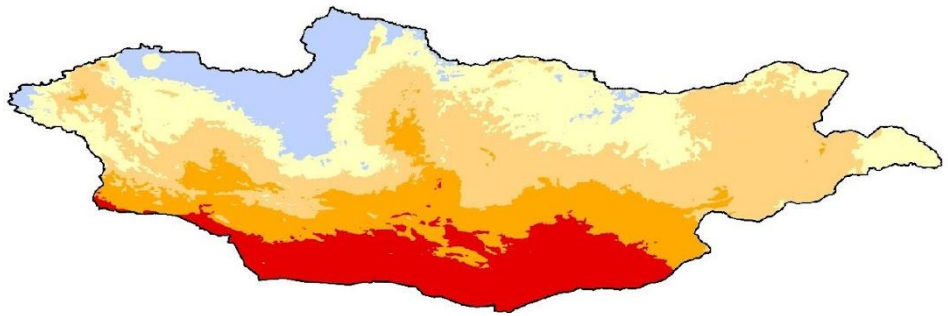


Translating global climate and hazard risks to the region, countries, and sectors

Baseline 1970-2000



Baseline 1970-2000



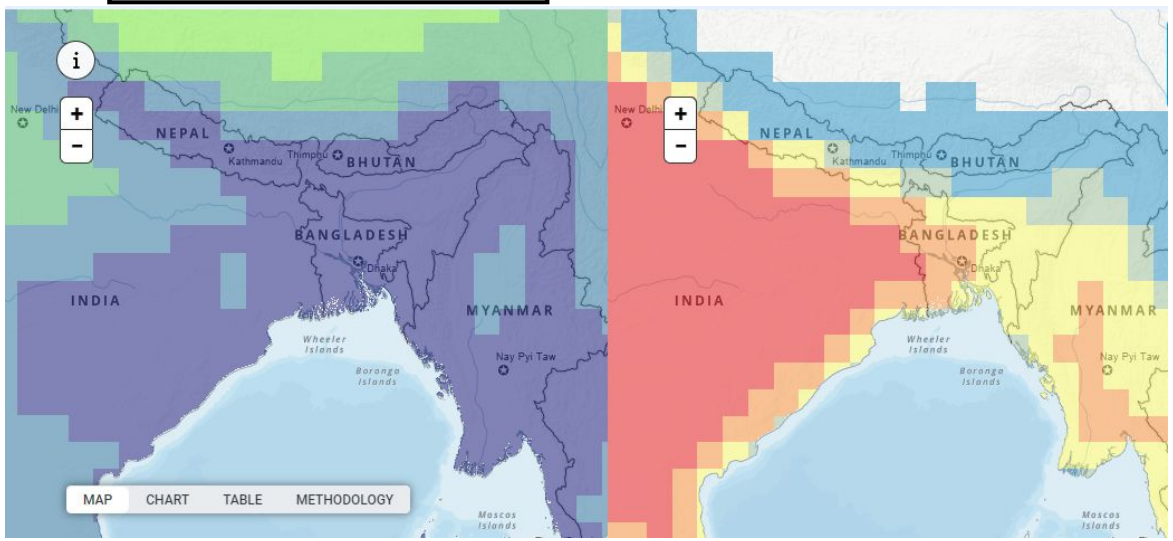
Sectoral insight for climate and weather

Downscaling at country level

Building Disaster and climate resilience in Energy sector

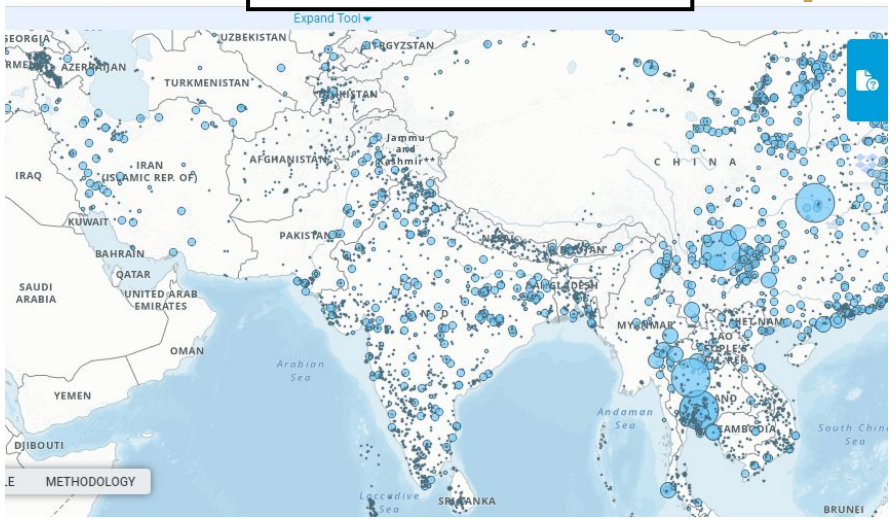
ESCAP
Economic and Social Commission for Asia and the Pacific

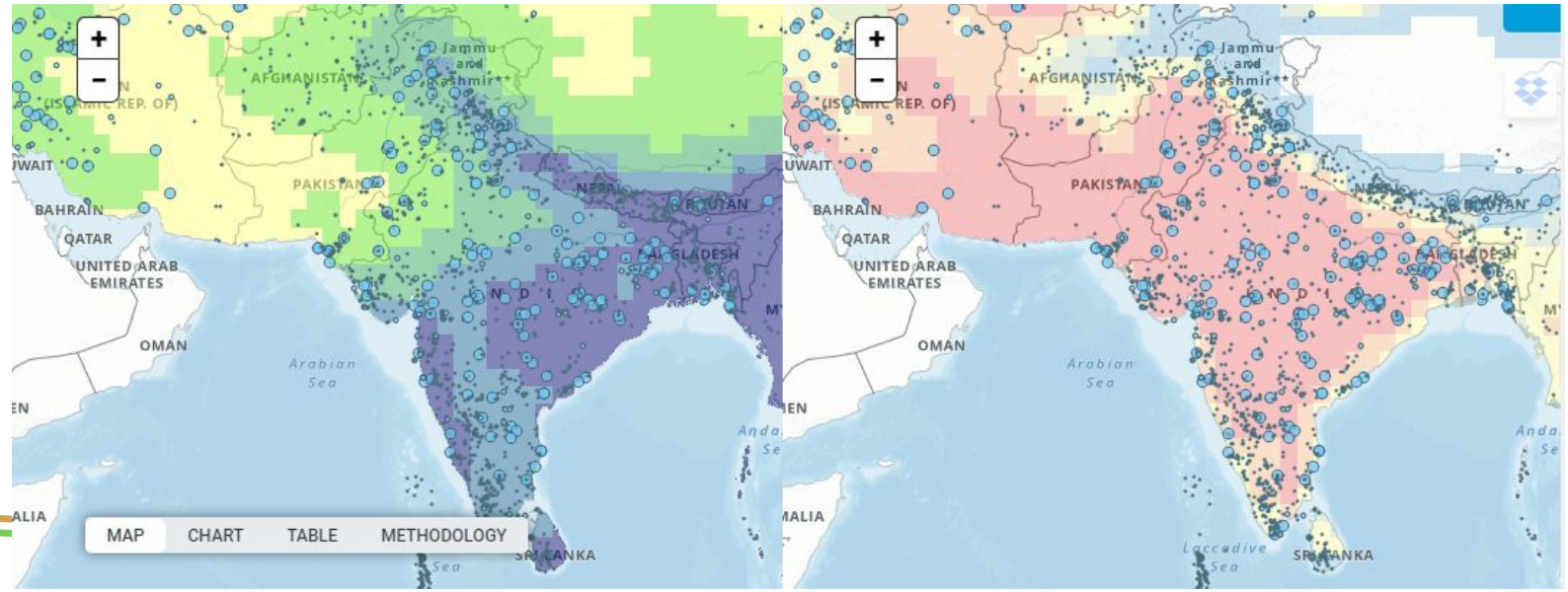
Flood 2°C SSP3



Heatwave 2°C SSP3

Powerplants



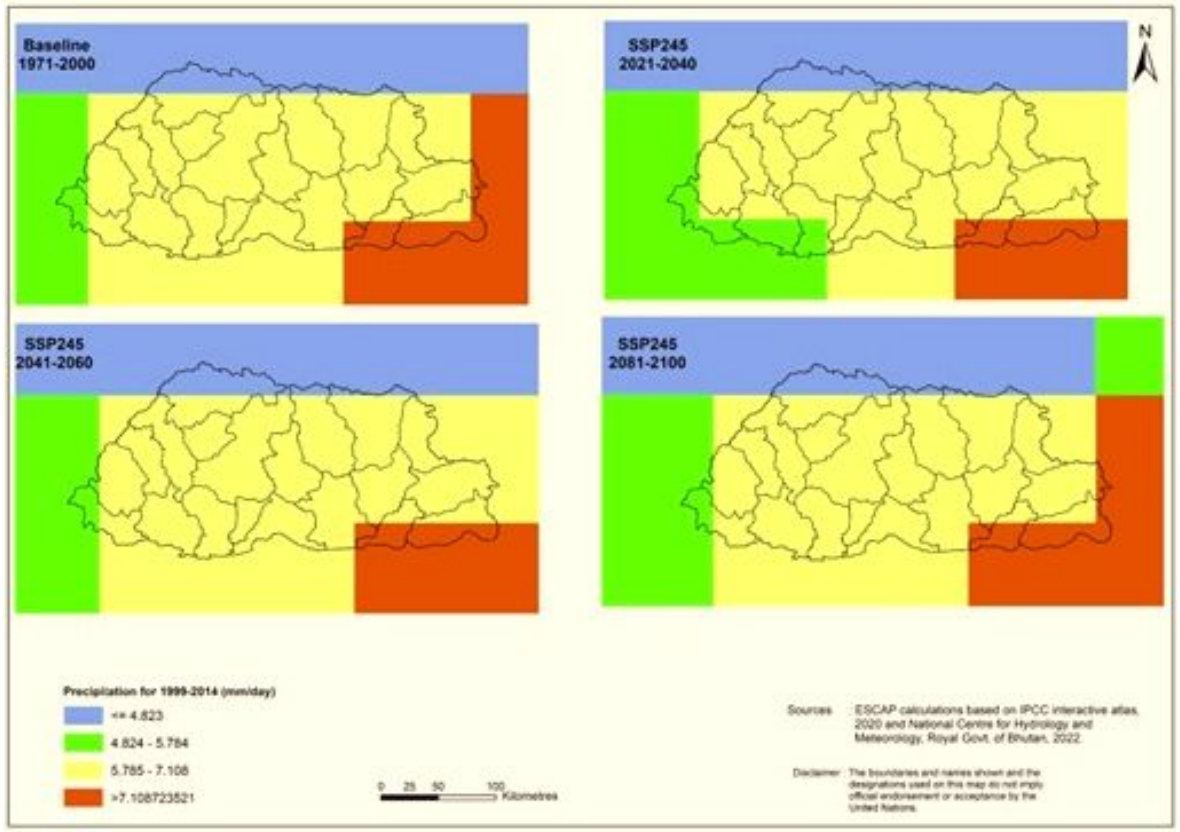


Understanding where future power plants should be built and where infrastructure needs to be resilient to multiple hazards under 2°C warming

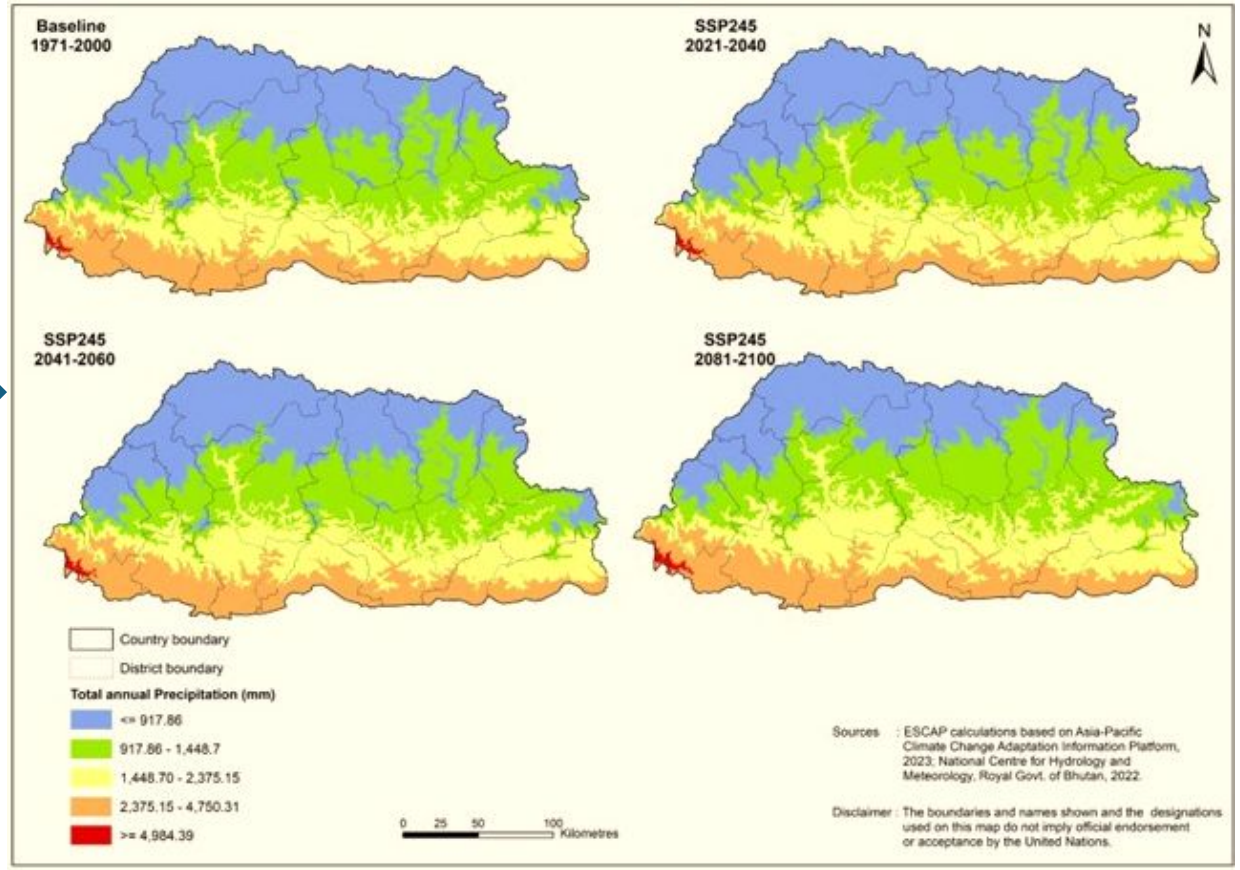
Customized downscaling of climate data for sector analysis

(Bhutan example: downscaling climate projections to 1x1 km grid)

100km x 100km (CMIP6 model)



1km x 1km (CMIP6 model)



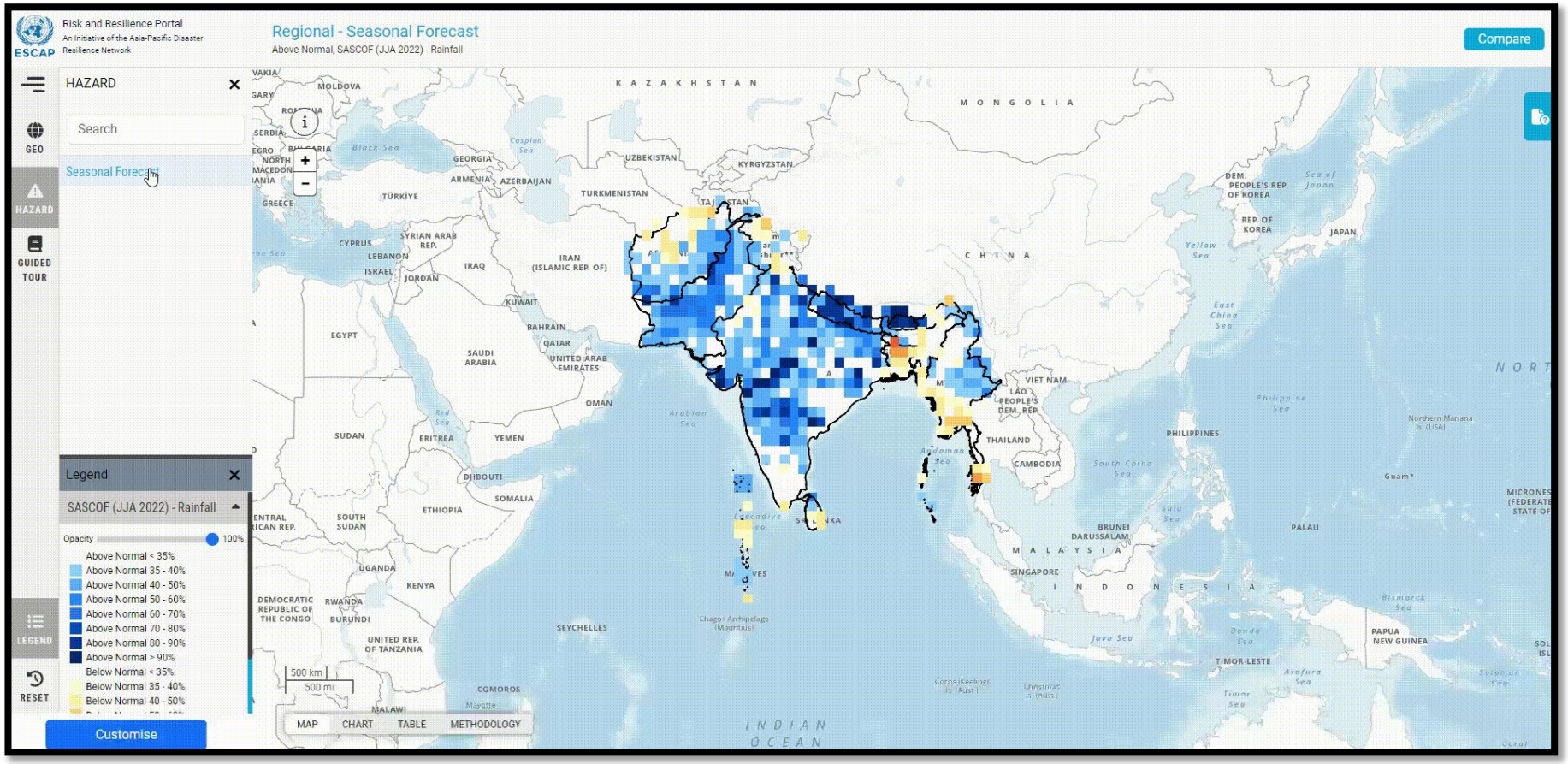
Customized downscaling of climate data for sector analysis (Maldives)

Baseline Sea level rise (1971-2000)

Sea level rise (2041-2060)- SSP3

Automated Impact Based Forecasting with Machine Learning

Not what the weather will be but what the weather will do

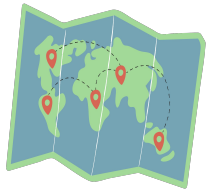


INPUT*

Seasonal Data (Above and below normal precipitation and temperature)

Socioeconomic data

- Population data
- Infrastructure data

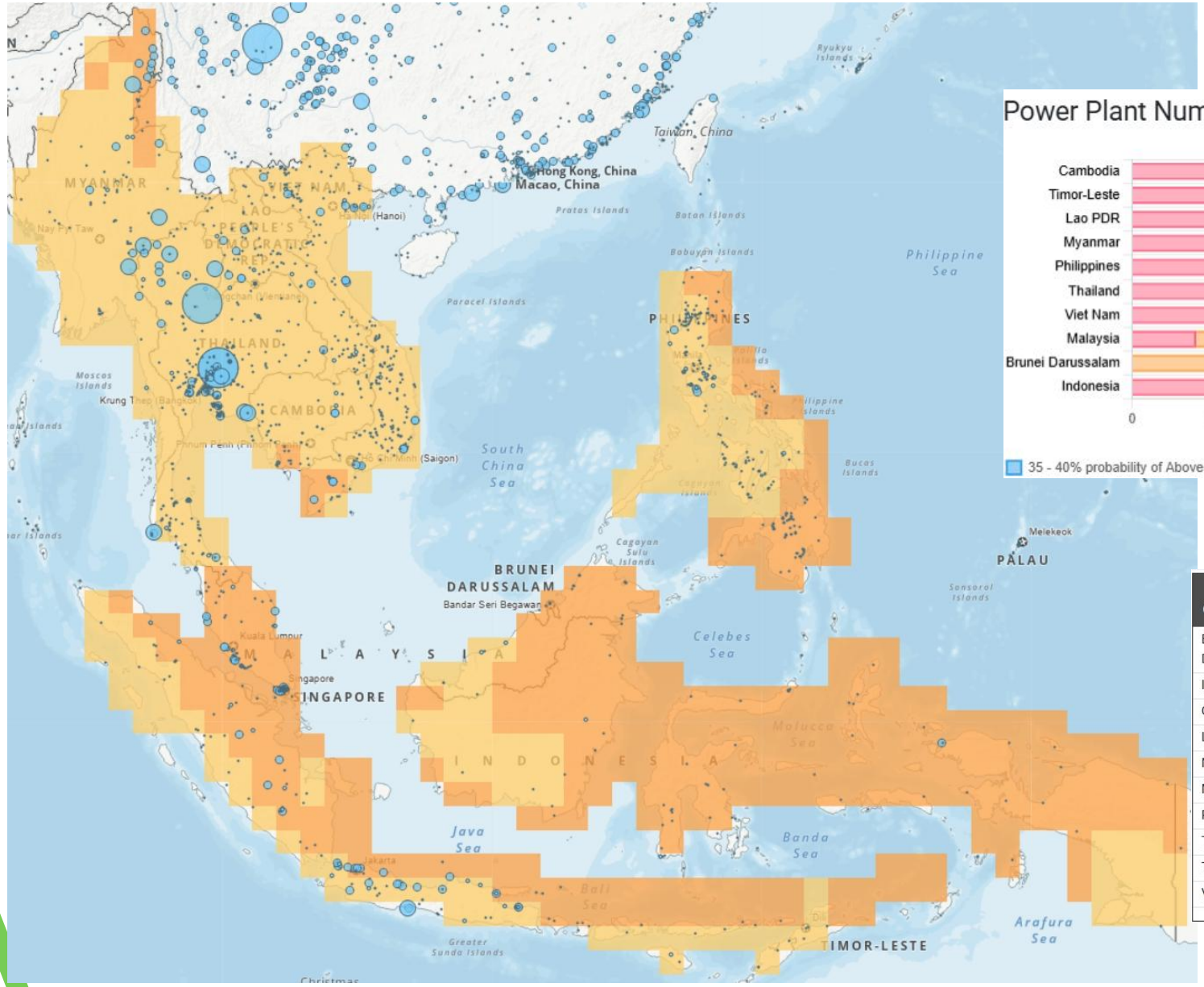


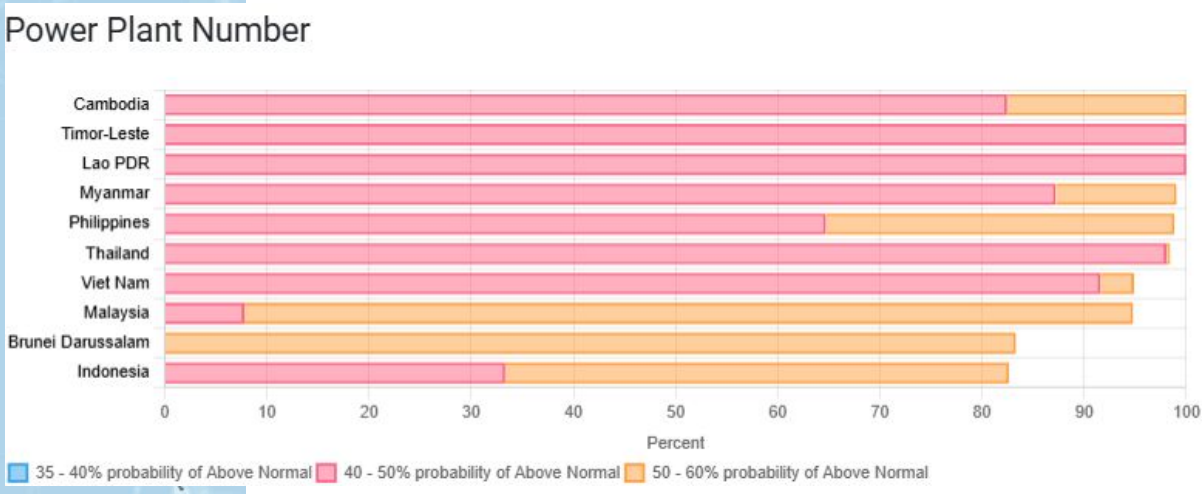
OUTPUT

Exposure and intensity zone of hazards for sectors

Automated Impact Based Forecasting with Machine Learning

Not what the weather will be but what the weather will do





Country	Region	35 - 40% probability of Above Normal	40 - 50% probability of Above Normal	50 - 60% probability of Above Normal
Brunei Darussalam	South-East Asia	0.00	0.00	83.33
Indonesia	South-East Asia	0.00	33.33	49.30
Cambodia	South-East Asia	0.00	82.46	17.54
Lao PDR	South-East Asia	0.00	100.00	0.00
Myanmar	South-East Asia	0.00	87.20	11.85
Malaysia	South-East Asia	0.00	7.79	87.01
Philippines	South-East Asia	0.00	64.73	34.11
Thailand	South-East Asia	0.00	98.05	0.39
Timor-Leste	South-East Asia	0.00	100.00	0.00
Viet Nam	South-East Asia	0.00	91.58	3.30

For more information:

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

Developer: Think Blue Data

THINK BLUE DATA

Contact:

Sarkar-swaisgood@un.org

rrp.unescap.org

ESCAP
Economic and Social Commission for Asia and the Pacific