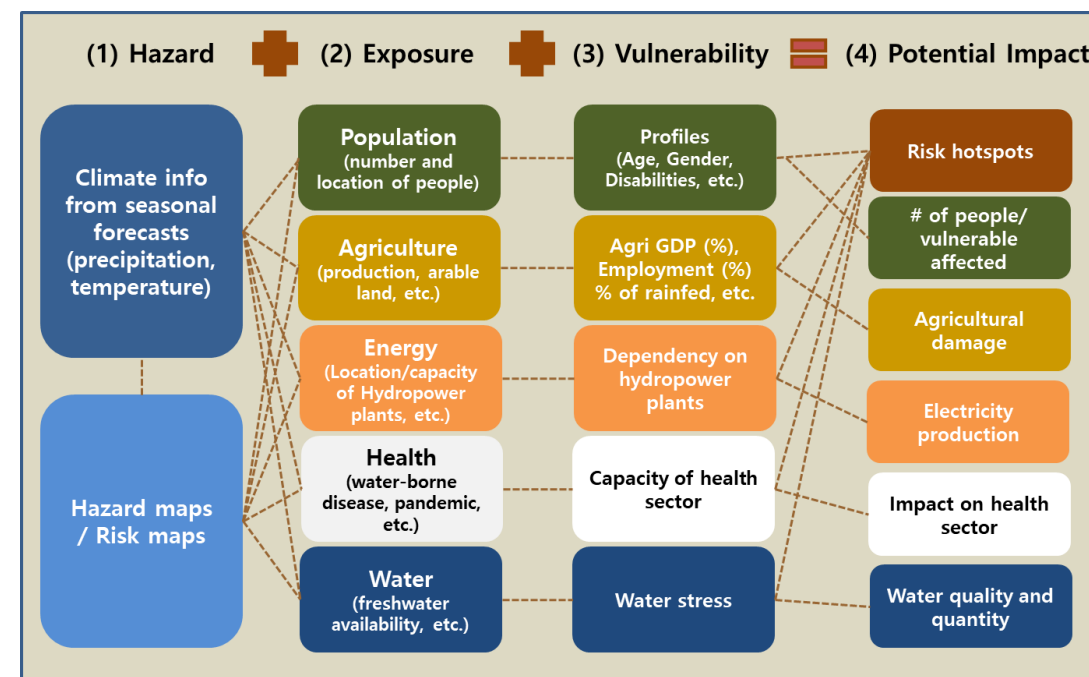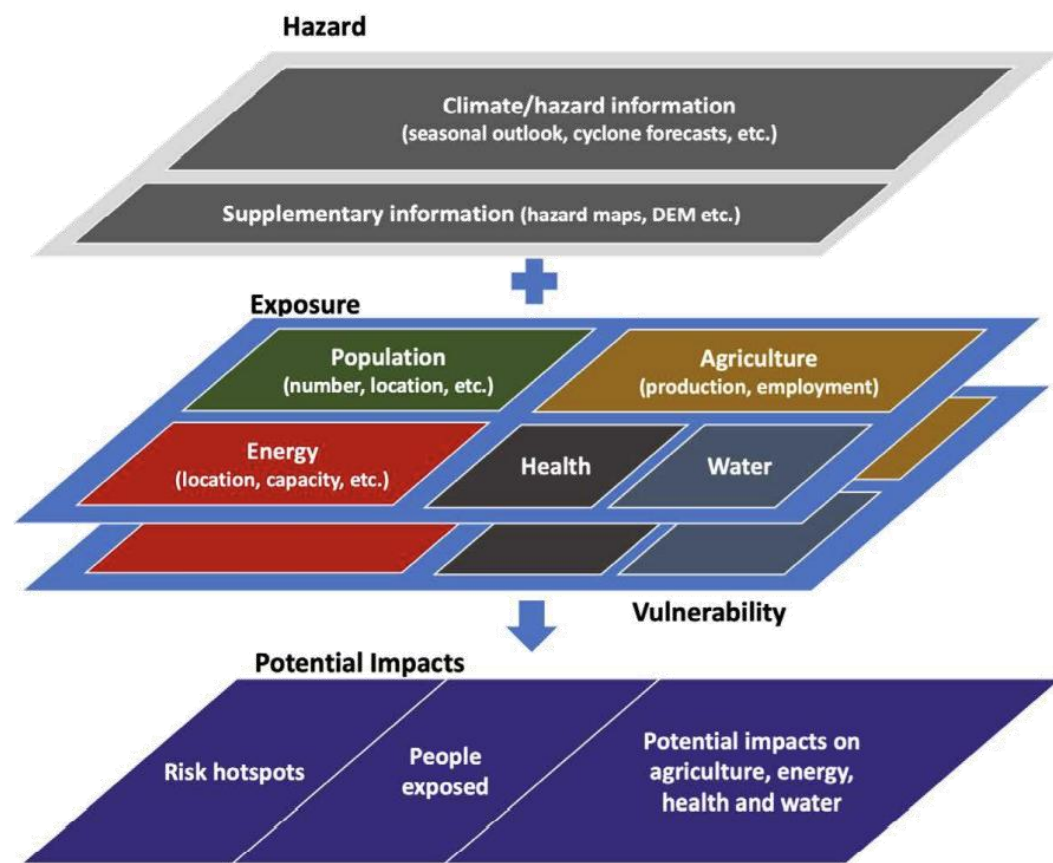# TPCF-2

Impact outlook for Third Pole region
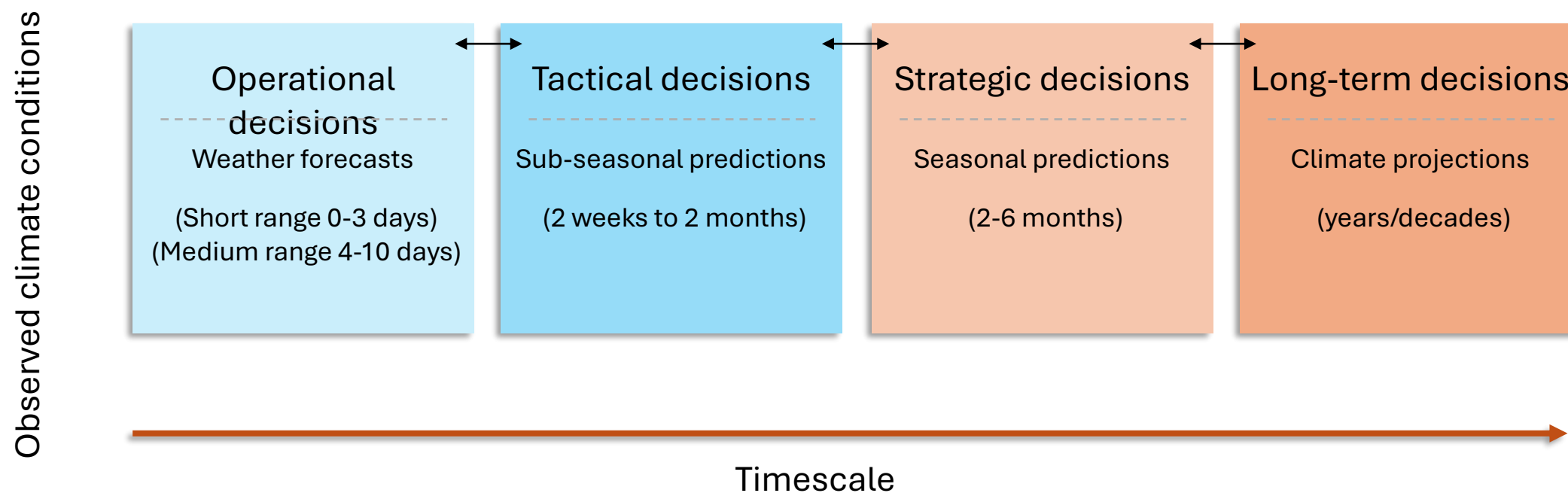
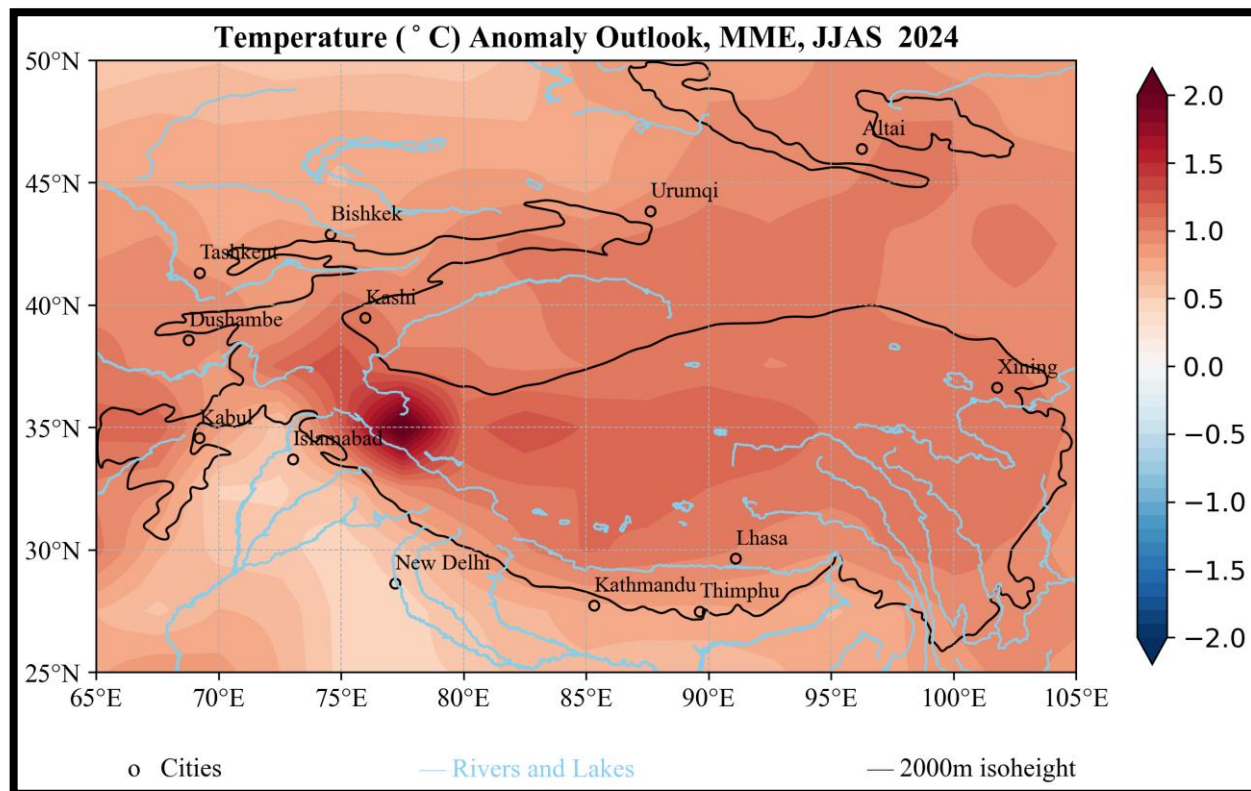**UN ESCAP**

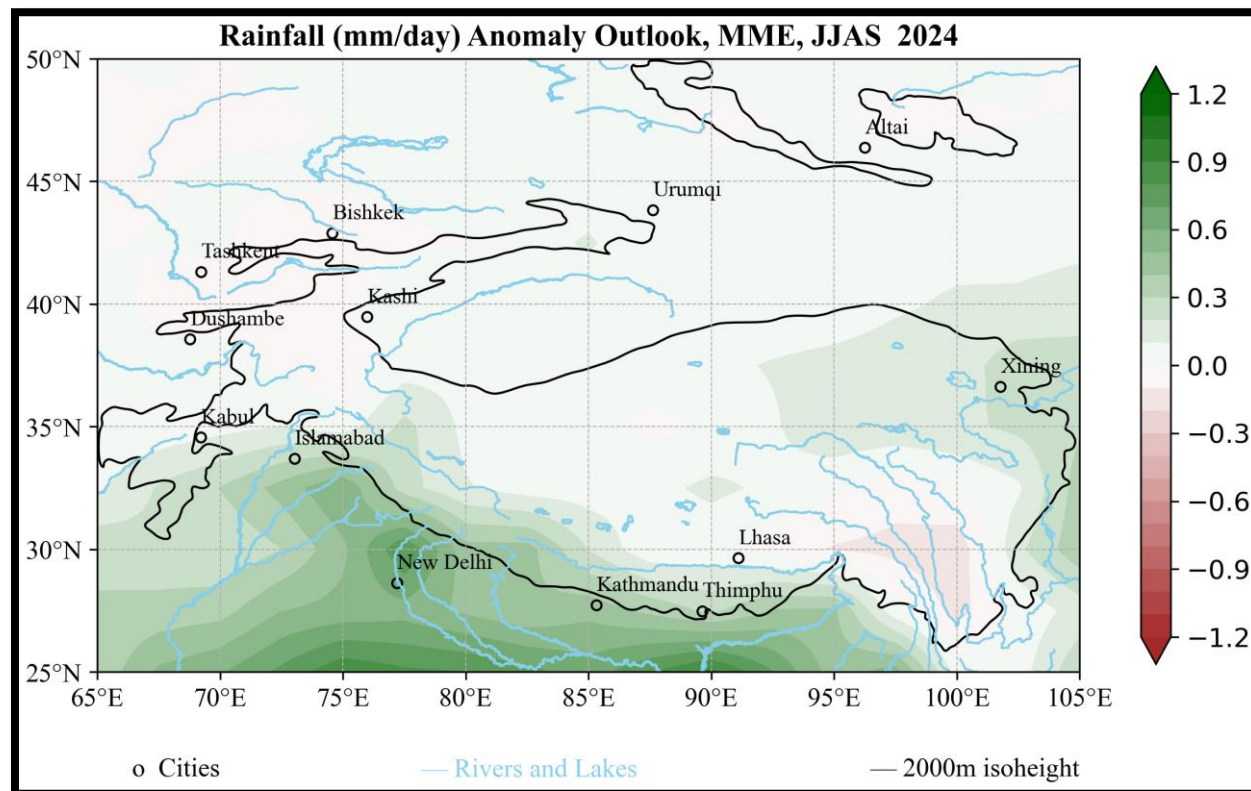*IDD Disaster Risk Reduction Section*

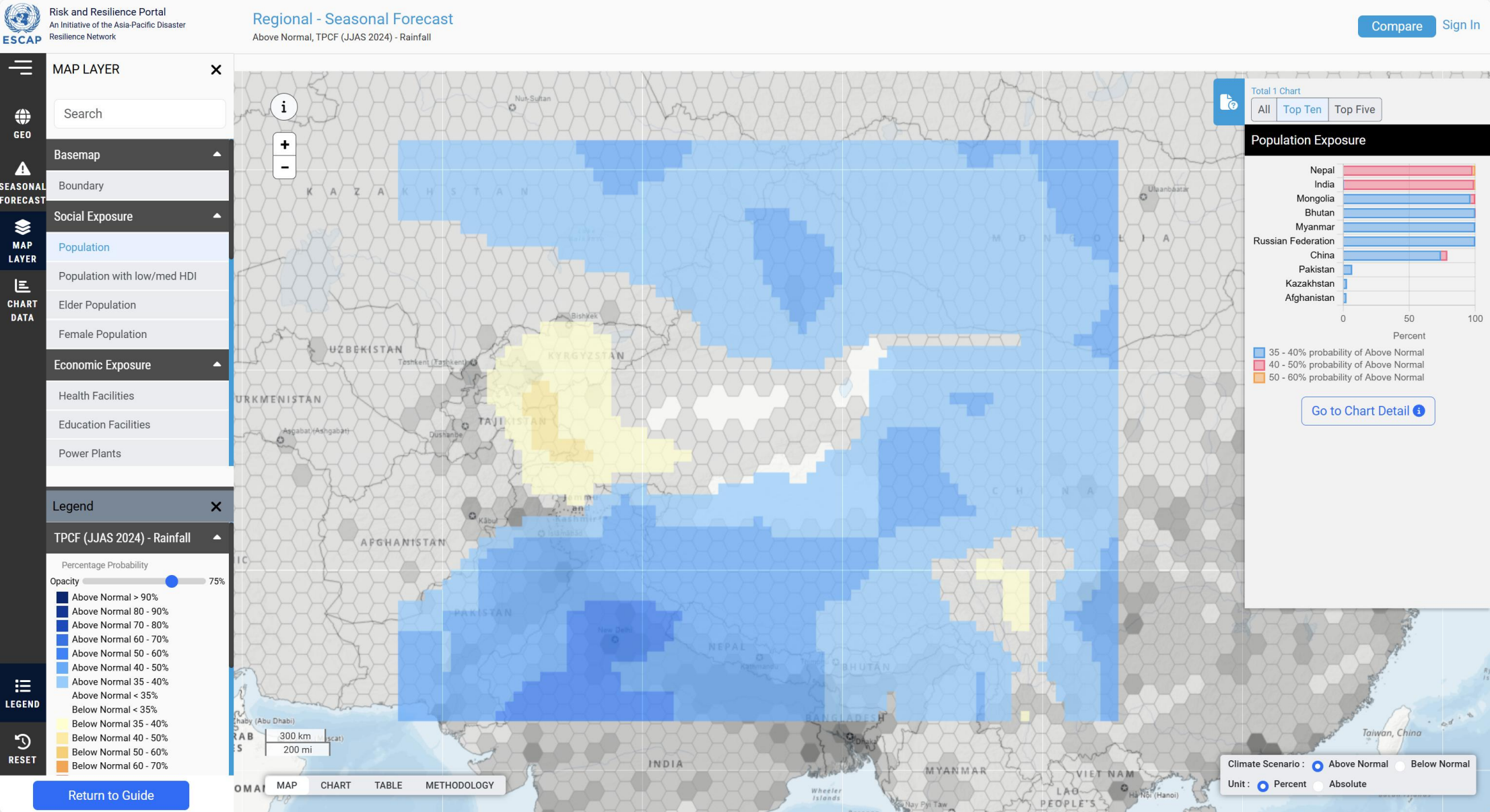# Impact-based forecasting approach

Facilitate decision-making at different time scale

Operational decisions	Tactical decisions	Strategic decisions	Long-term decisions
Weather forecasts	Sub-seasonal predictions	Seasonal predictions	Climate projections
(Short range 0-3 days) (Medium range 4-10 days)	(2 weeks to 2 months)	(2-6 months)	(years/decades)

Observed climate conditions

Timescale

Rainfall (mm/day) Anomaly Outlook, MME, JJAS 2024 / Temperature (°C) Anomaly Outlook, MME, JJAS 2024
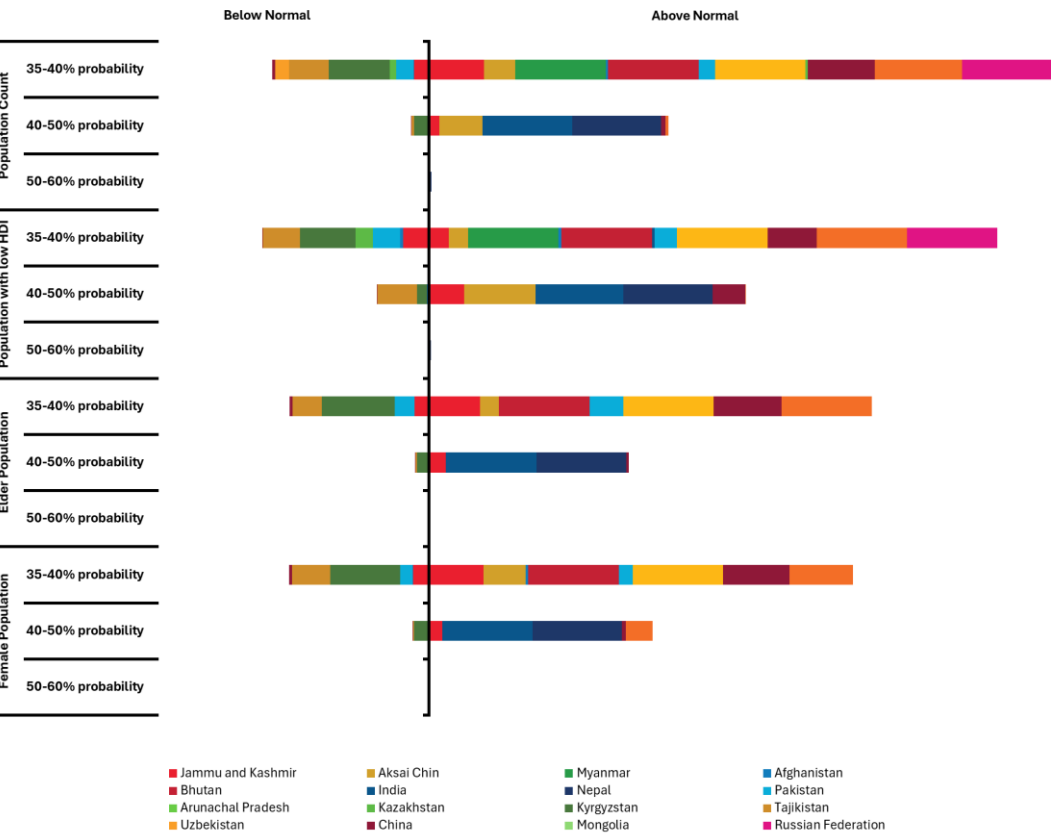
Impact outlook for Third Pole region - JJAS 2024
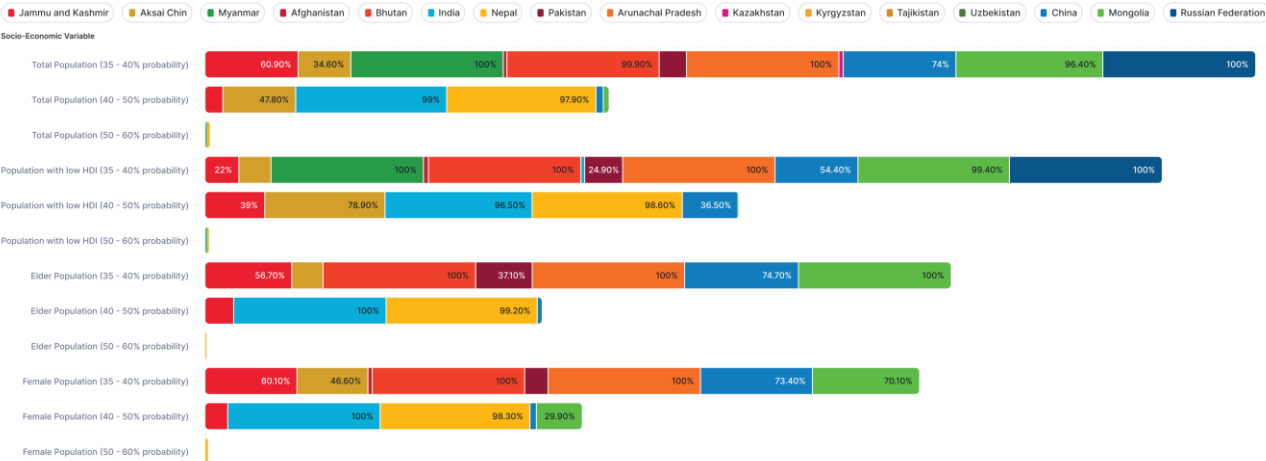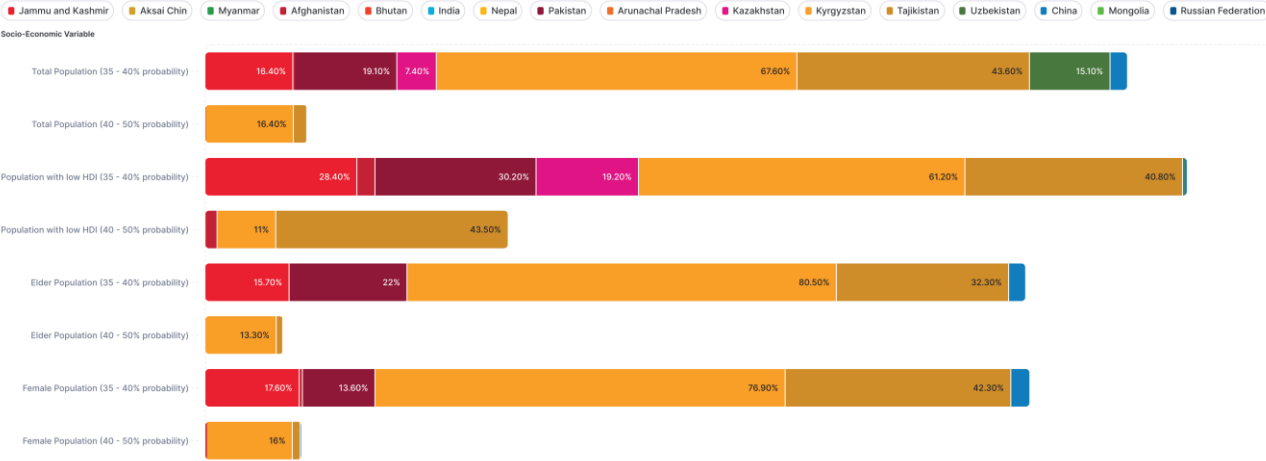
Social Vulnerability

Social Vulnerability

Impact Outlook : Social Vulnerability (Seasonal Rainfall - JJAS 2024)

Social Vulnerability
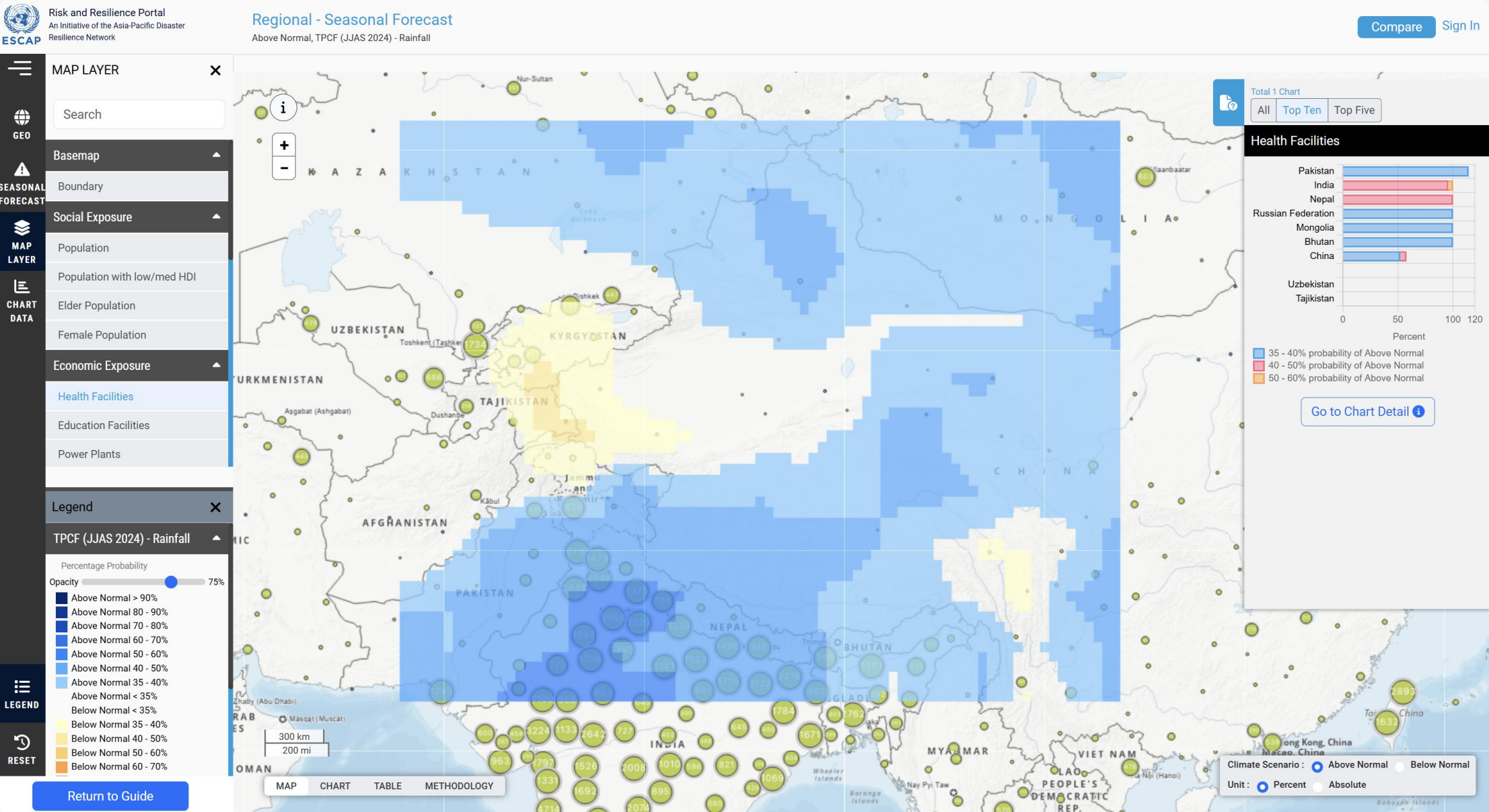**Above Normal Precipitation (JJAS 2024)**

Legend: Jammu and Kashmir, Aksai Chin, Myanmar, Afghanistan, Bhutan, India, Nepal, Pakistan, Arunachal Pradesh, Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan, China, Mongolia, Russian Federation

Socio-Economic Variable

Socio-Economic Variable	Values
Total Population (35 - 40% probability)	60.90%, 34.60%, 100%, 99.90%, 100%, 74%, 96.40%, 100%
Total Population (40 - 50% probability)	47.80%, 99%, 97.90%
Total Population (50 - 60% probability)	
Population with low HDI (35 - 40% probability)	22%, 100%, 100%, 24.90%, 100%, 54.40%, 99.40%, 100%
Population with low HDI (40 - 50% probability)	39%, 78.90%, 96.50%, 98.60%, 36.50%
Population with low HDI (50 - 60% probability)	
Elder Population (35 - 40% probability)	56.70%, 100%, 37.10%, 100%, 74.70%, 100%
Elder Population (40 - 50% probability)	100%, 99.20%
Elder Population (50 - 60% probability)	
Female Population (35 - 40% probability)	60.10%, 46.60%, 100%, 100%, 73.40%, 70.10%
Female Population (40 - 50% probability)	100%, 98.30%, 29.90%
Female Population (50 - 60% probability)	

Social Vulnerability
Below Normal Precipitation (JJAS 2024)

Legend: Jammu and Kashmir, Aksai Chin, Myanmar, Afghanistan, Bhutan, India, Nepal, Pakistan, Arunachal Pradesh, Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan, China, Mongolia, Russian Federation

Socio-Economic Variable

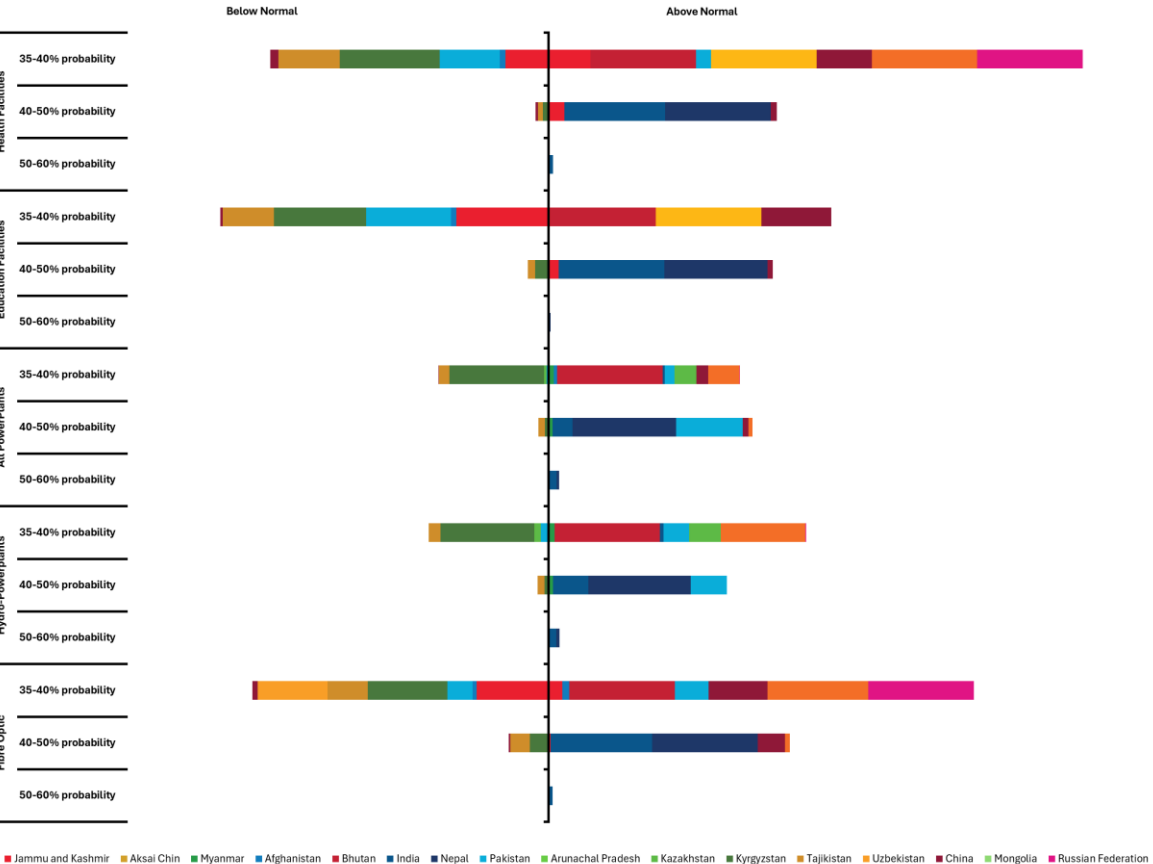| Socio-Economic Variable	Values
Total Population (35 - 40% probability)	16.40%, 19.10%, 7.40%, 67.60%, 43.60%, 15.10%
Total Population (40 - 50% probability)	16.40%
Population with low HDI (35 - 40% probability)	28.40%, 30.20%, 19.20%, 61.20%, 40.80%
Population with low HDI (40 - 50% probability)	11%, 43.50%
Elder Population (35 - 40% probability)	15.70%, 22%, 80.50%, 32.30%
Elder Population (40 - 50% probability)	13.30%
Female Population (35 - 40% probability)	17.60%, 13.60%, 76.90%, 42.30%
Female Population (40 - 50% probability)	16%

Note: The percentages reflect exposure related to the specific sections within the Third Pole region, not the entire nation. Thus , 100% means full coverage of the region involved, not the entire country.
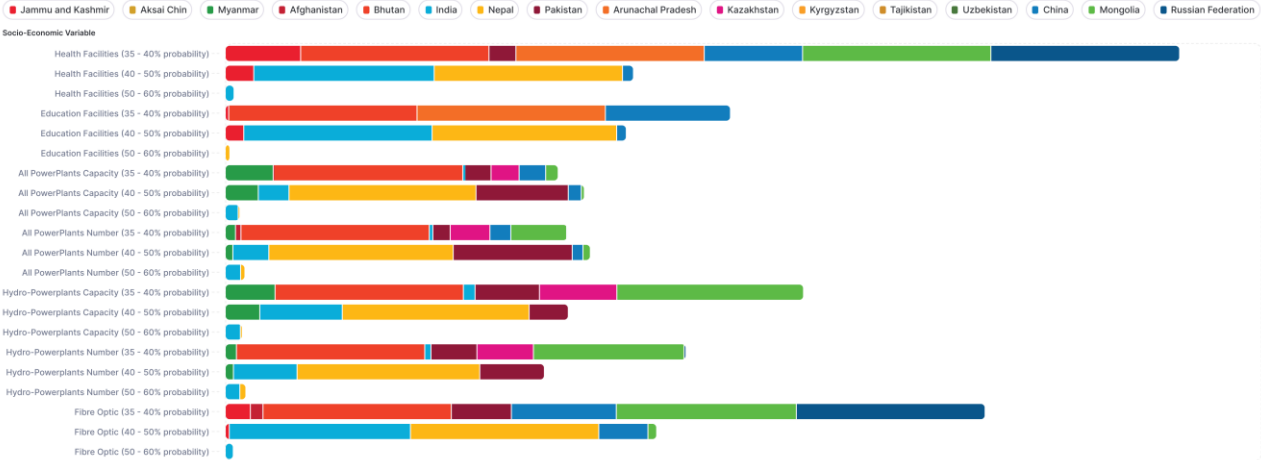
Critical Infrastructure Exposure
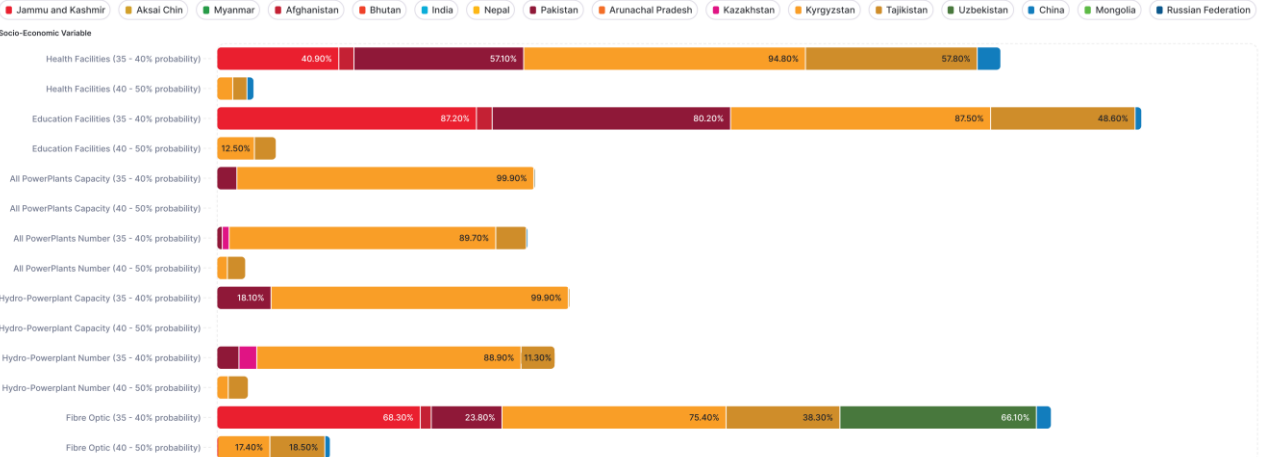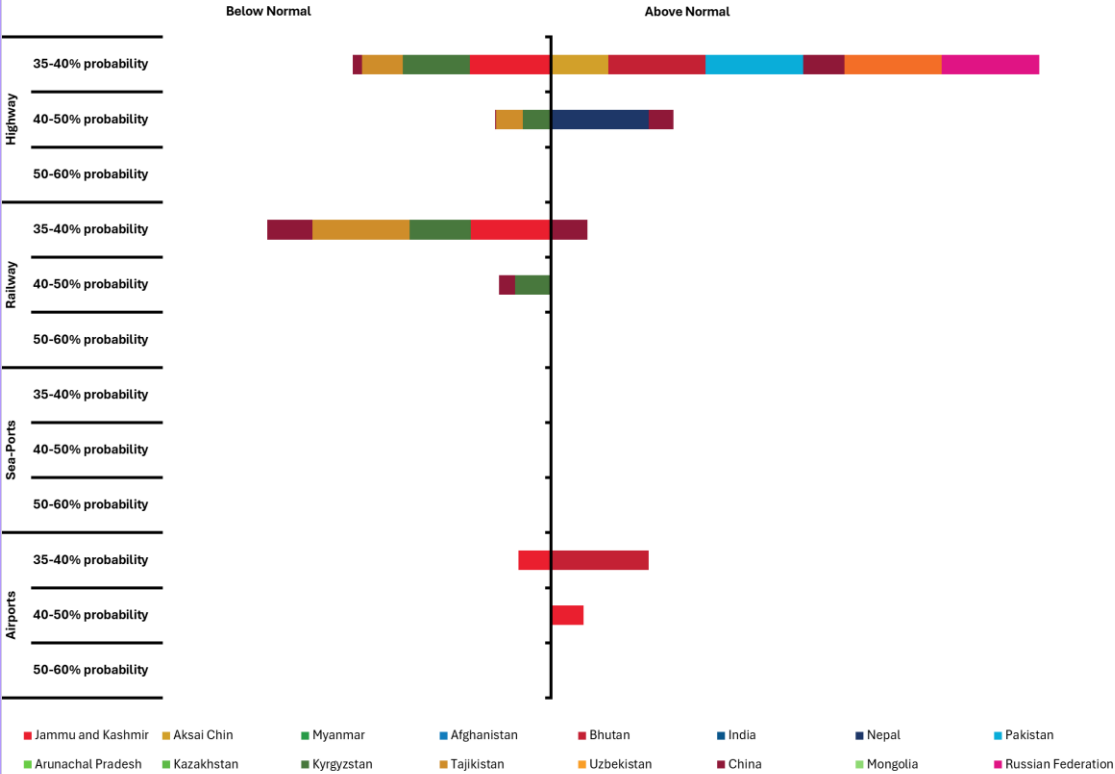
Critical Infrastructure Exposure

Note: The percentages reflect exposure related to the specific sections within the Third Pole region, not the entire nation. Thus, 100% means full coverage of the region involved, not the entire country.
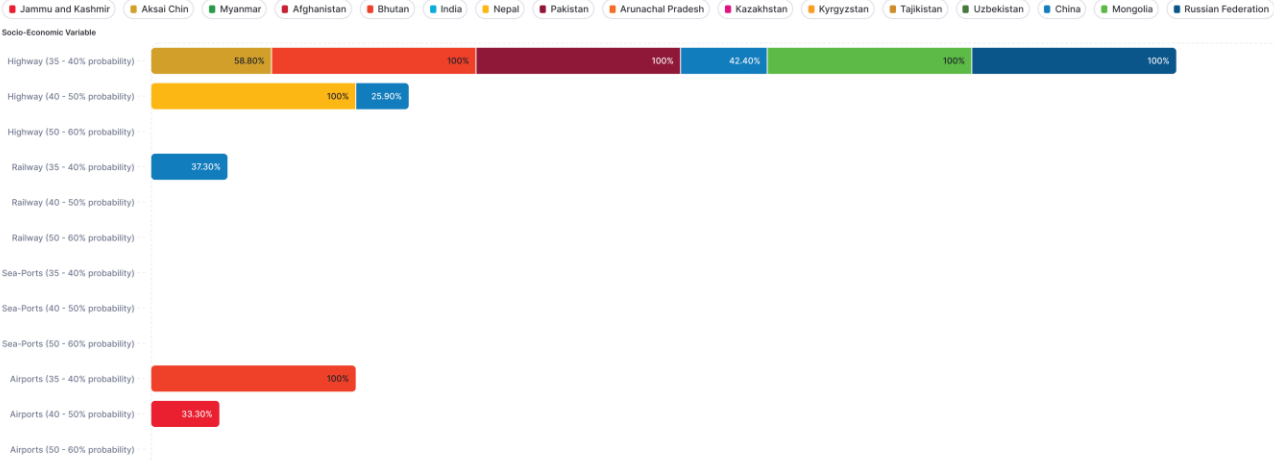
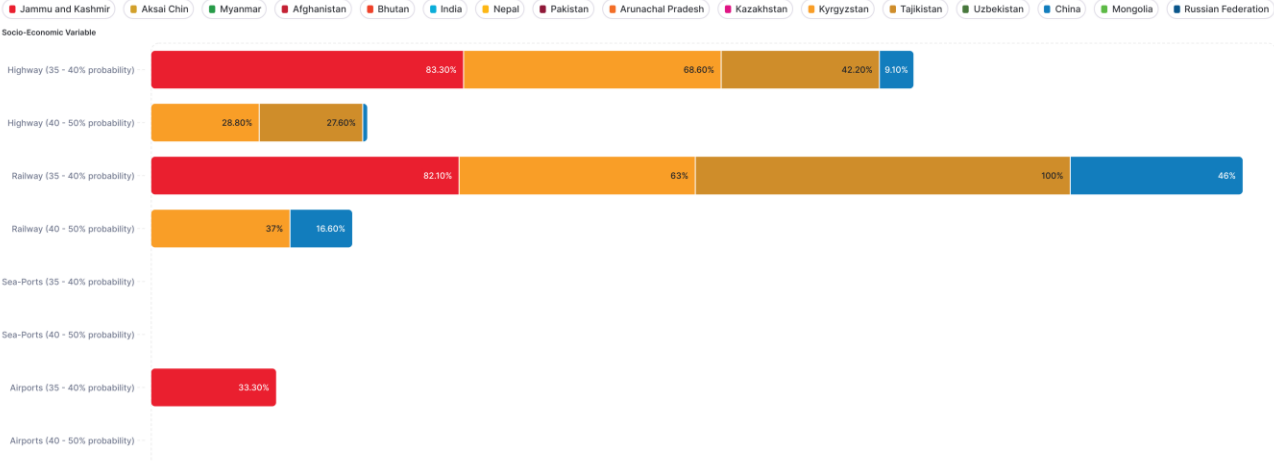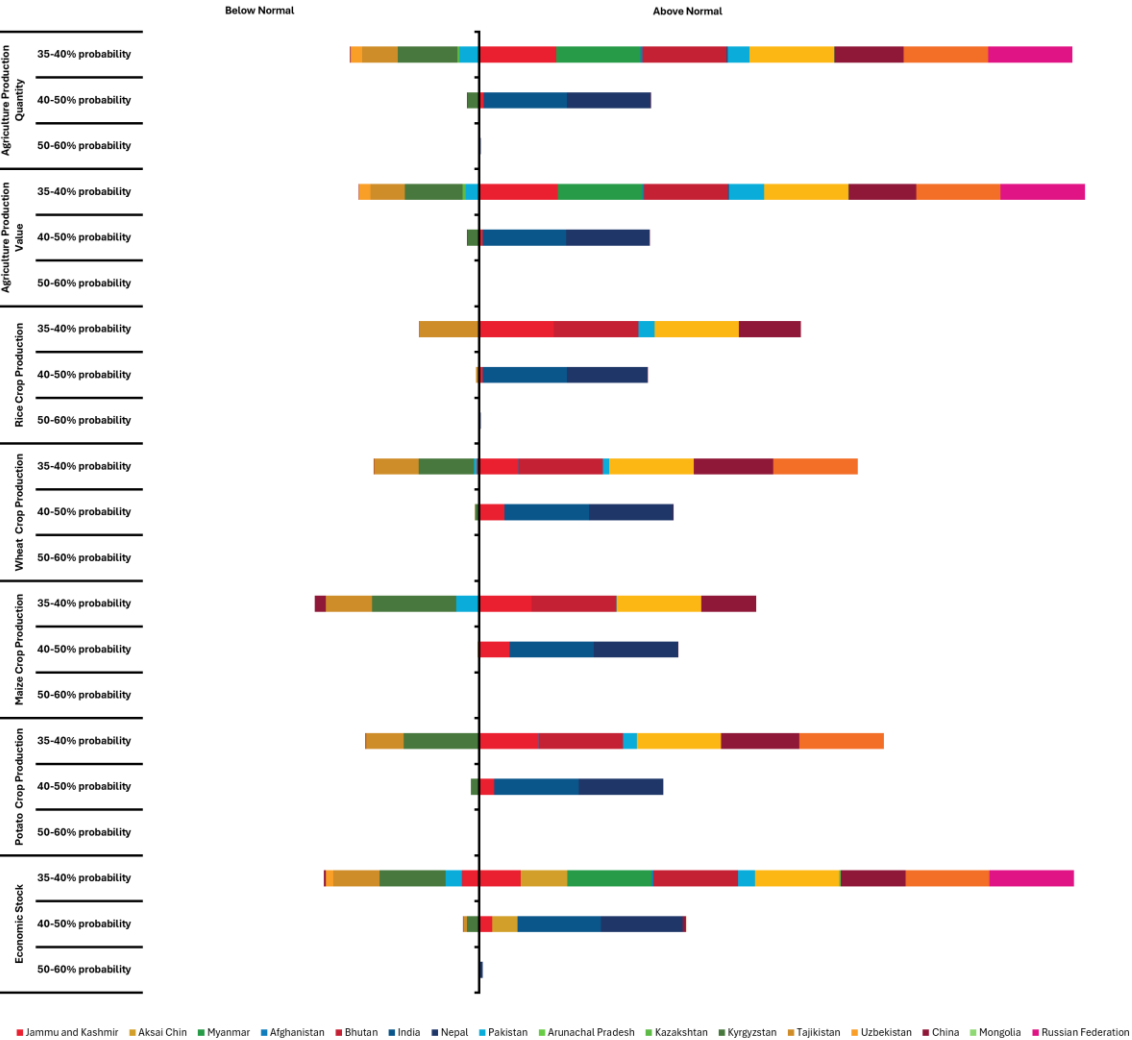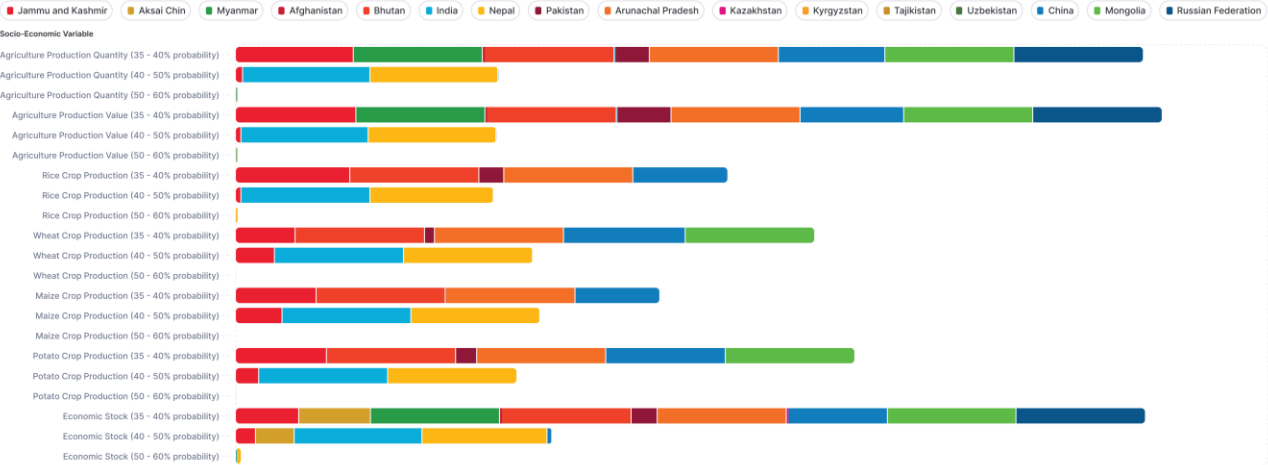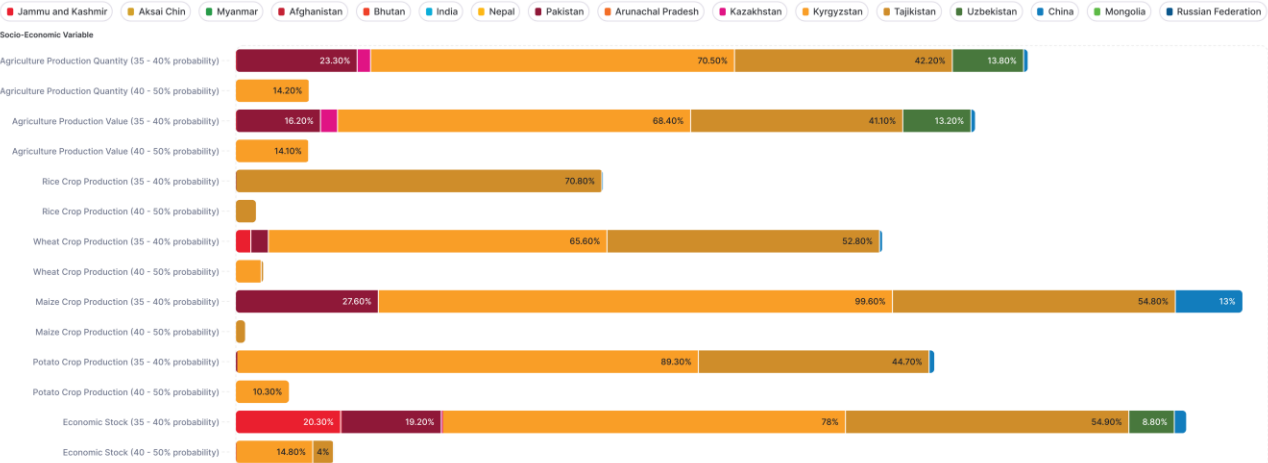# Transport Sector Exposure

Transport Sector Exposure

Note: The percentages reflect exposure related to the specific sections within the Third Pole region, not the entire nation. Thus, 100% means full coverage of the region involved, not the entire country.

Agriculture Sector Exposure

Agriculture Sector Exposure

Note: The percentages reflect exposure related to the specific sections within the Third Pole region, not the entire nation. Thus, 100% means full coverage of the region involved, not the entire country.

Verification of the IBF percent exposure from automation tool with the manual calculations on QGIS

Population exposure obtained from manual calculation and automation tool
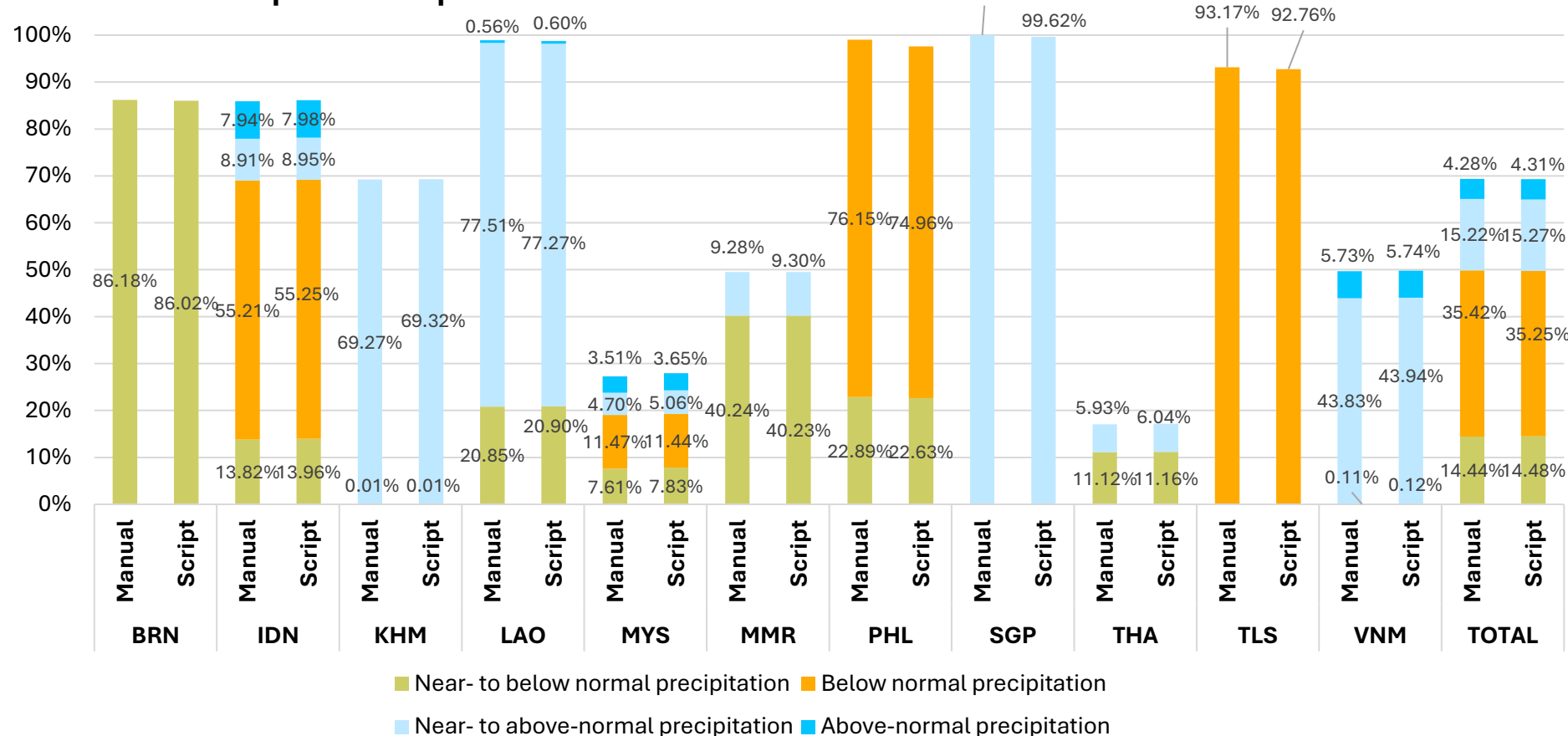
Percent difference of population exposure obtained from automation tool and manual calculations for each precipitation category in each country,

- ranges from **-1.45% to 0.18%** for the **below-normal precipitation**.

- ranges from **0.38% to 0.5%** in each country for the **above-normal precipitation**.

Result Verification with On-Ground Results

Source: OCHA
Link: Myanmar: Flood Situation Report, 16 September 2024 | OCHA

Source: WHO
Link: September 2024 Floods and Landslides

Source: KUENSEL
Link: Bhutan faces unprecedented rise in extreme weather events | Kuensel Online
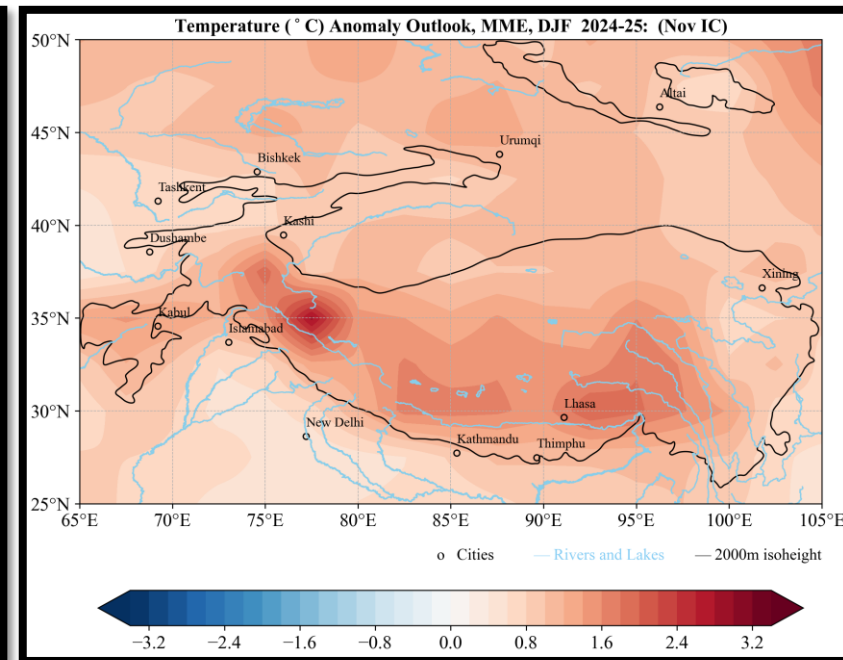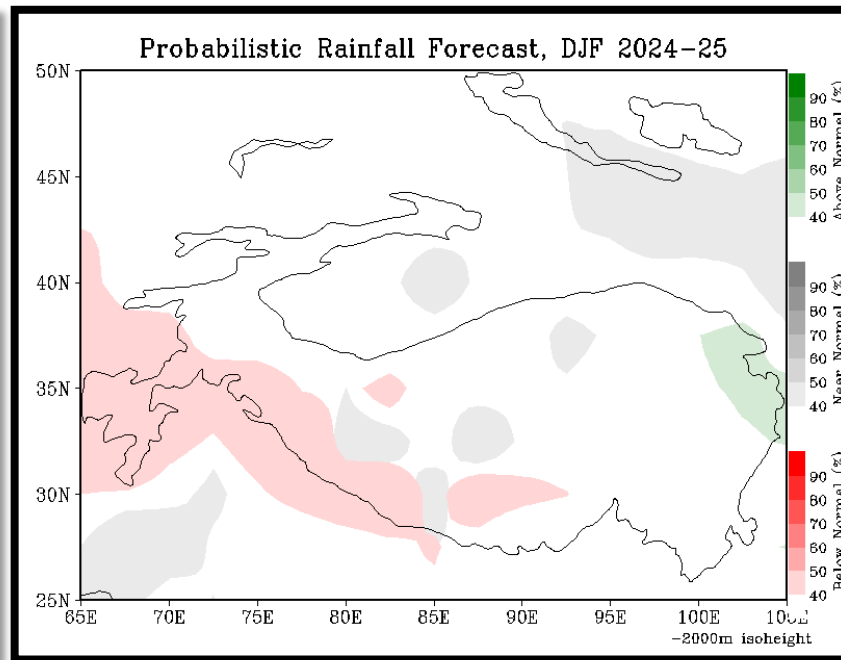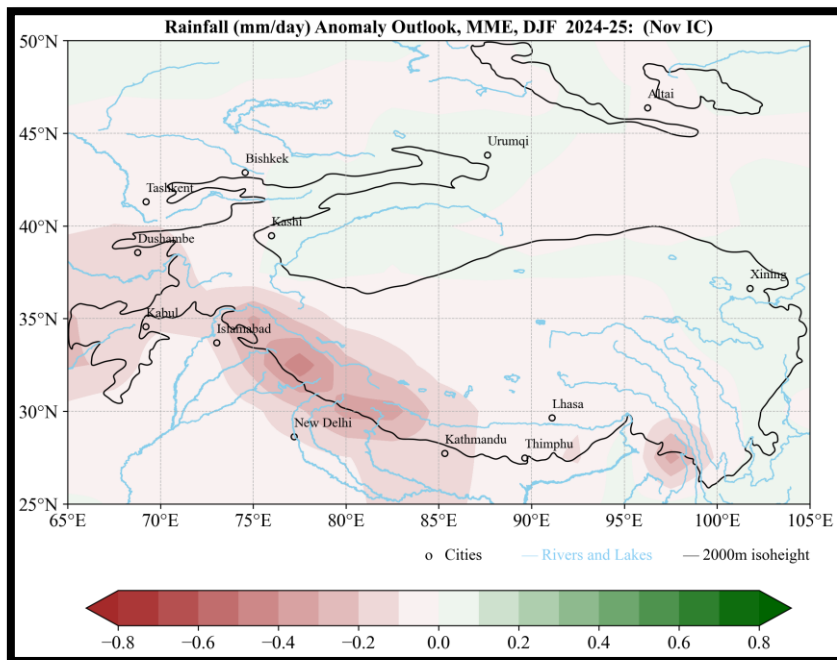
Impact outlook for Third Pole region - DJF 2024-25

Social Vulnerability

Social Vulnerability

Note: The percentages reflect exposure related to the specific sections within the Third Pole region, not the entire nation. Thus, 100% means full coverage of the region involved, not the entire country.

Critical Infrastructure Exposure

Critical Infrastructure Exposure

Note: The percentages reflect exposure related to the specific sections within the Third Pole region, not the entire nation. Thus, 100% means full coverage of the region involved, not the entire country.

Transport Sector Exposure

Transport Sector Exposure

Transport Sector Exposure
Above Normal Temperature (DJF 2025)

Transport Sector Exposure
Above Normal Rainfall (DJF 2025)
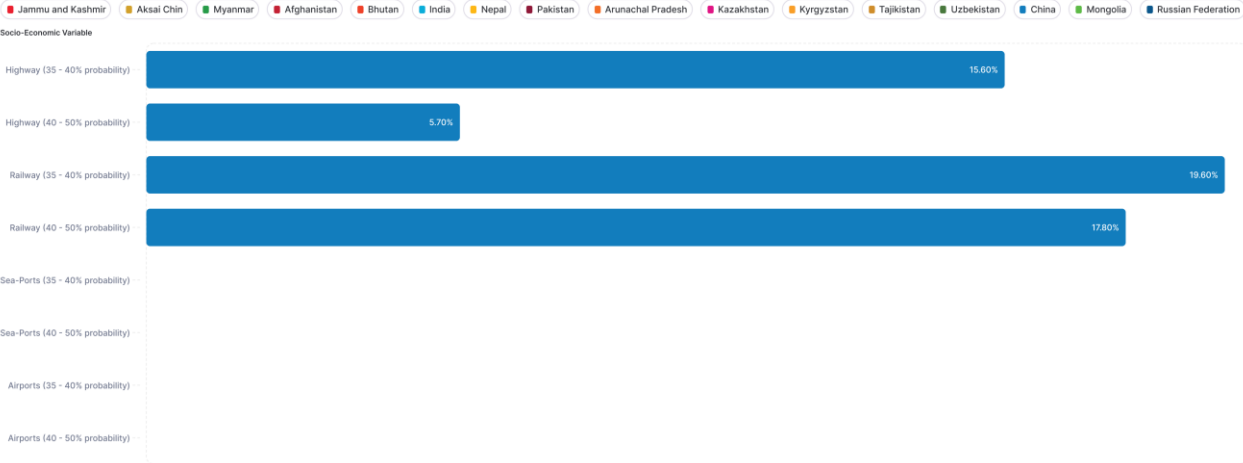
Transport Sector Exposure
Below Normal Rainfall (DJF 2025)
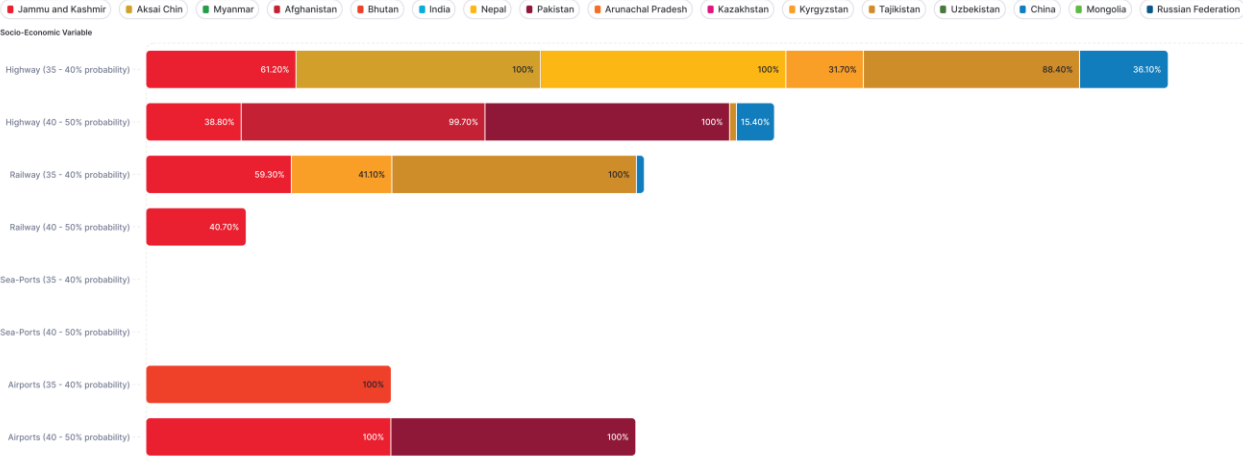
Note: The percentages reflect exposure related to the specific sections within the Third Pole region, not the entire nation. Thus, 100% means full coverage of the region involved, not the entire country.

Agriculture Sector Exposure

Agriculture Sector Exposure

Agriculture Sector Exposure
Above Normal Temperature (DJF 2025)

Agriculture Sector Exposure
Above Normal Rainfall (DJF 2025)

Legend: Jammu and Kashmir | Aksai Chin | Myanmar | Afghanistan | Bhutan | India | Nepal | Pakistan | Arunachal Pradesh | Kazakhstan | Kyrgyzstan | Tajikistan | Uzbekistan | China | Mongolia | Russian Federation
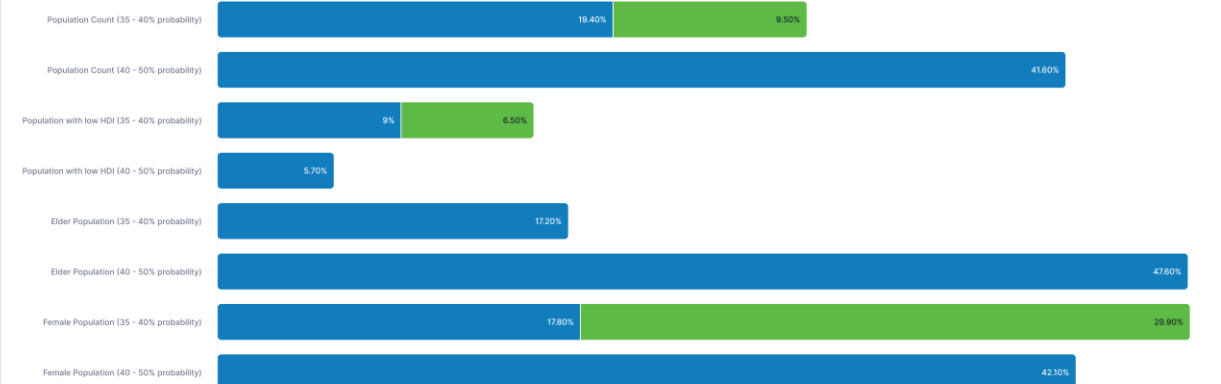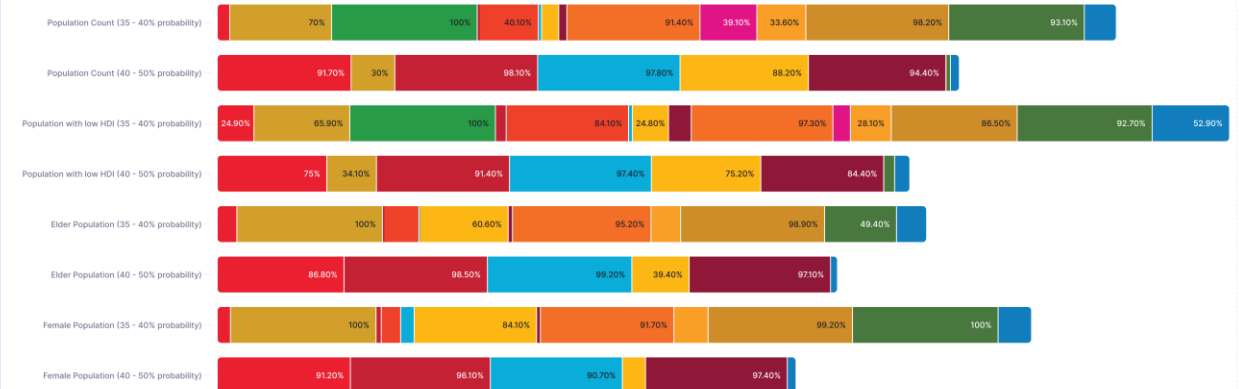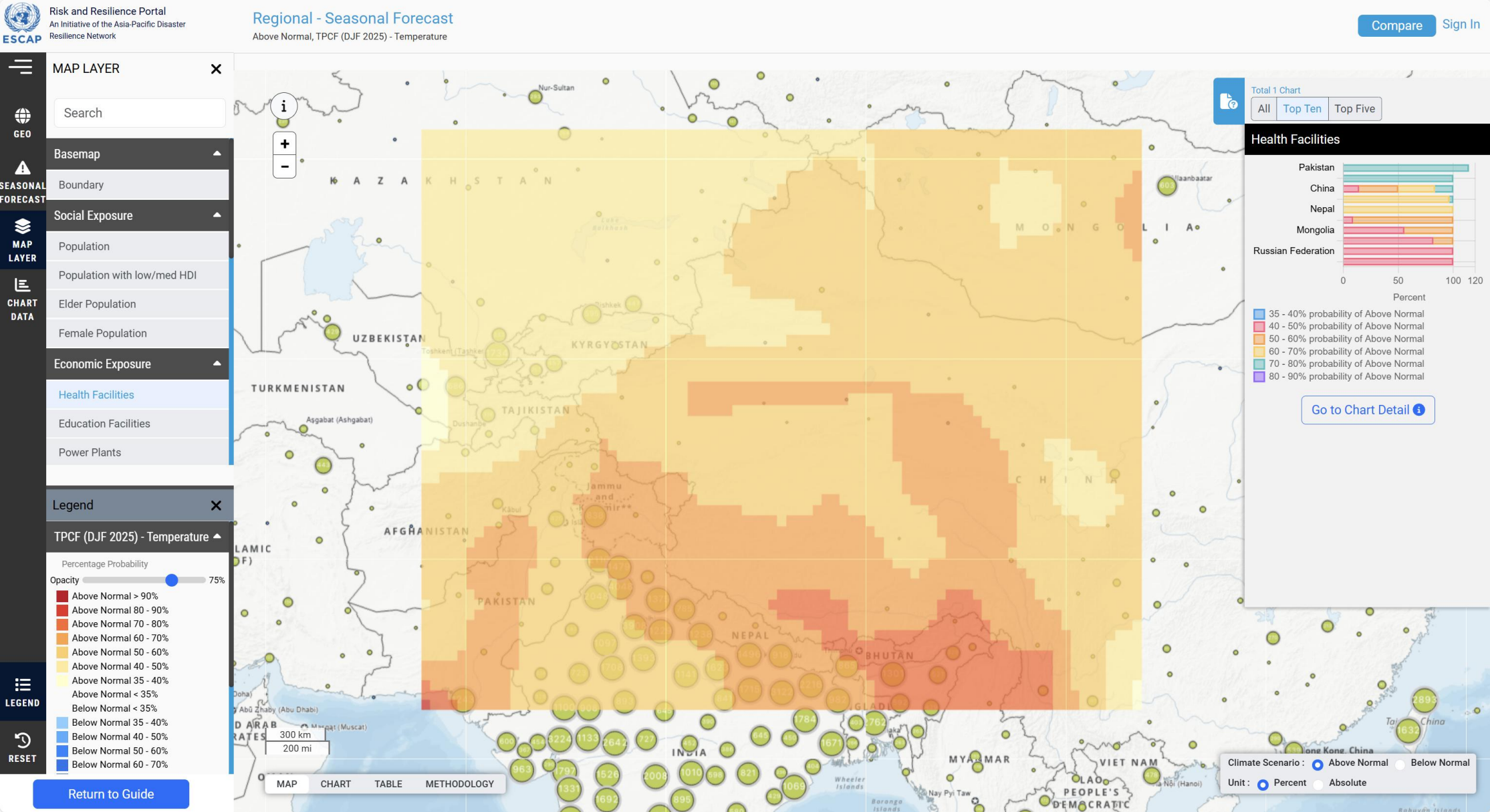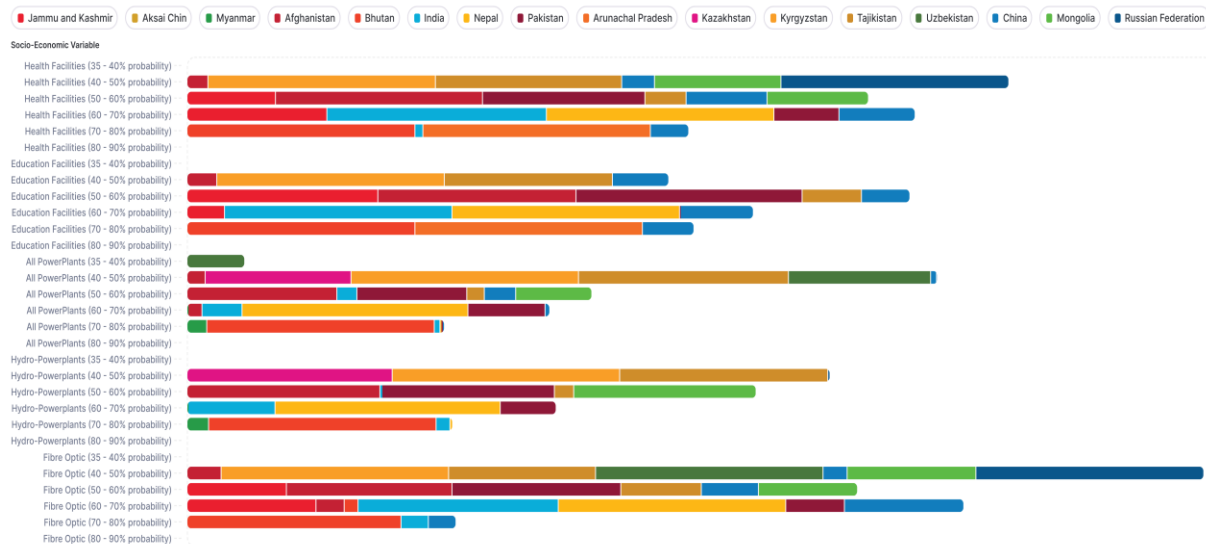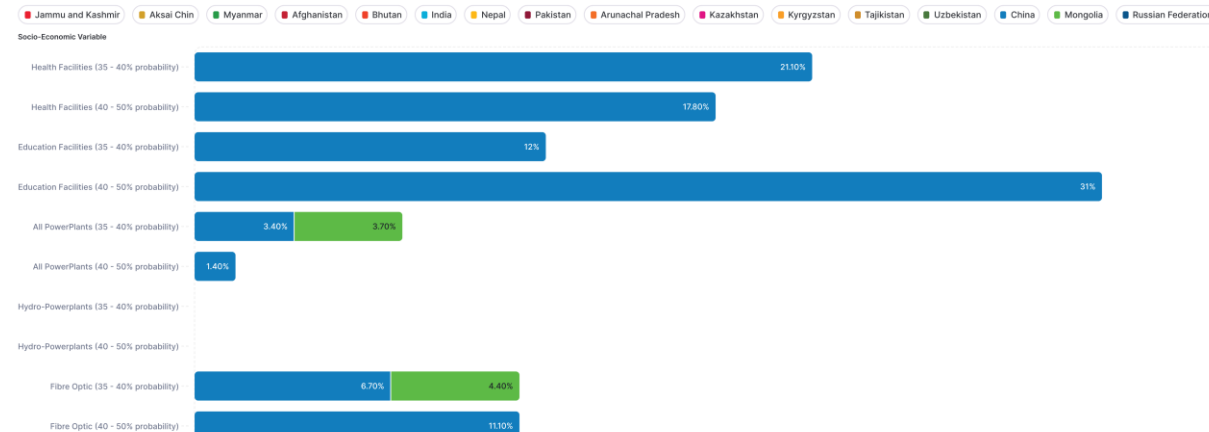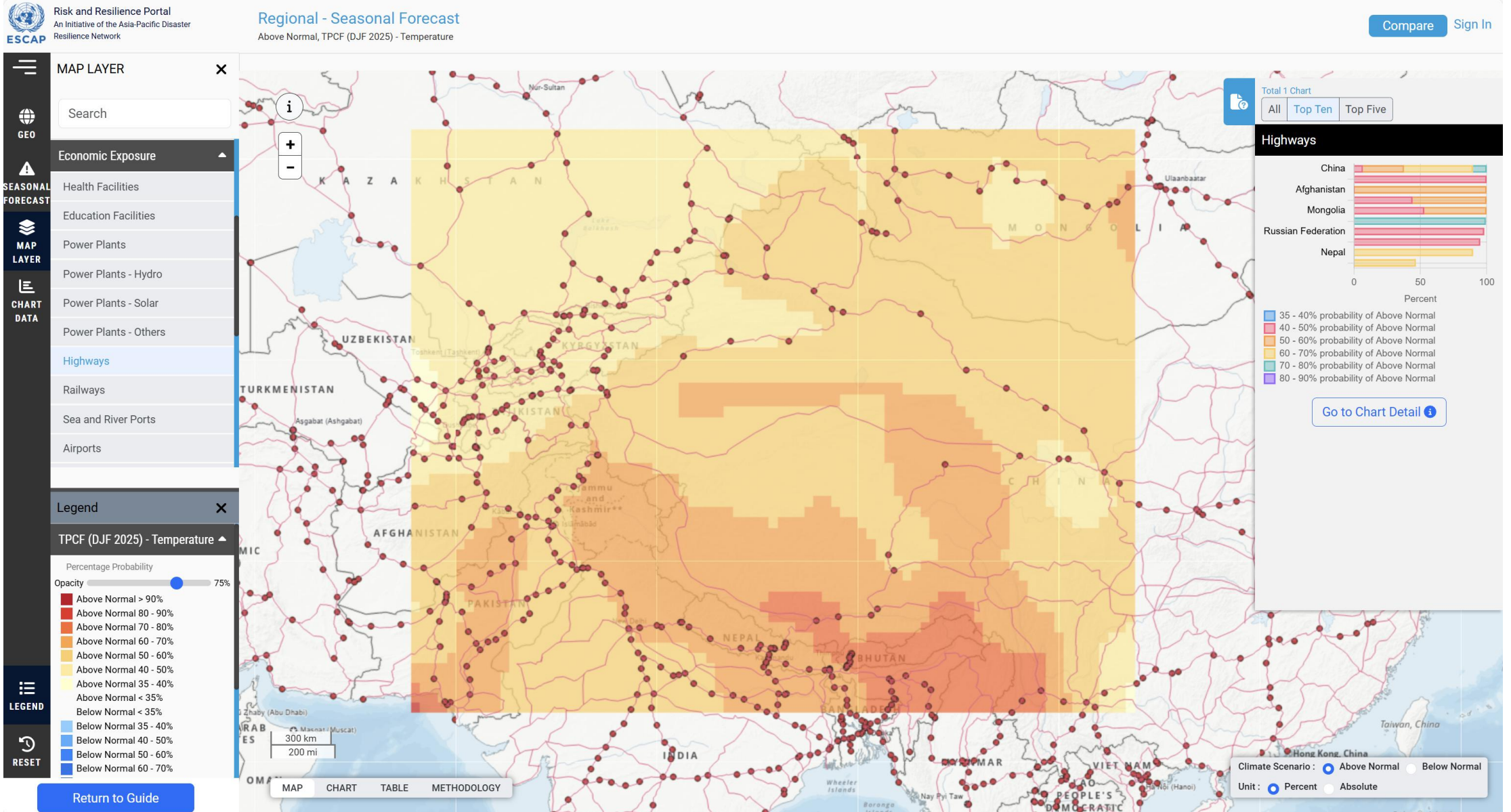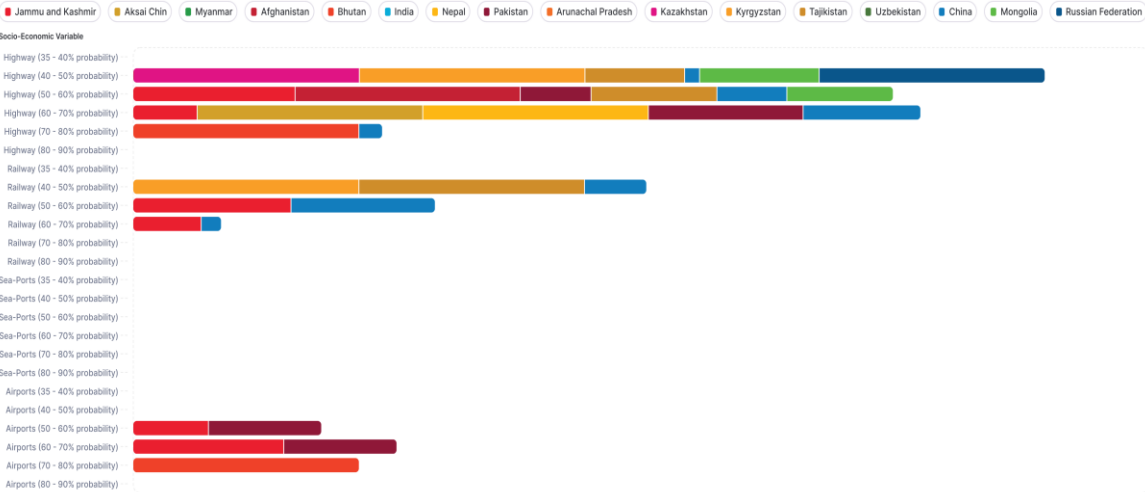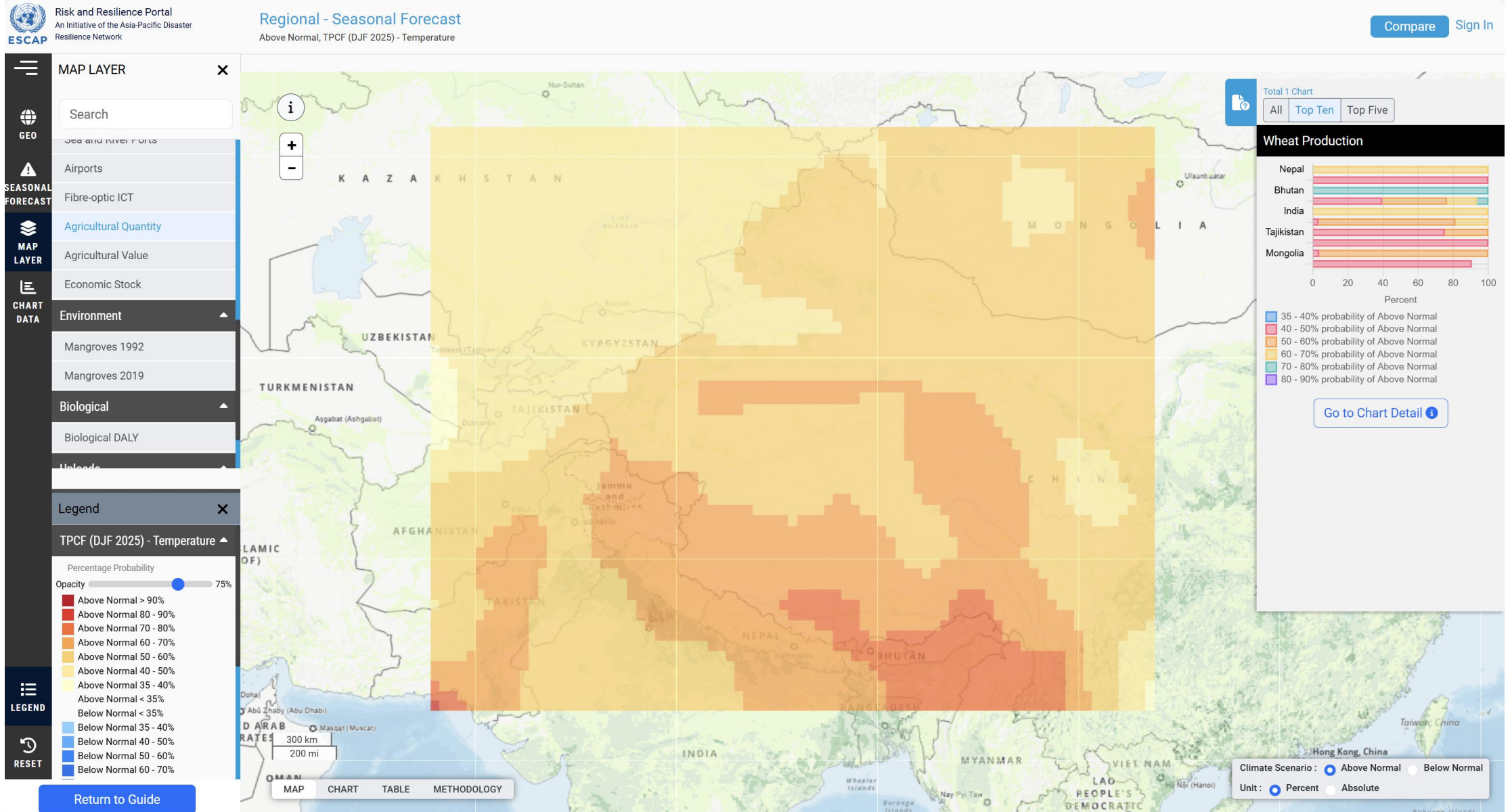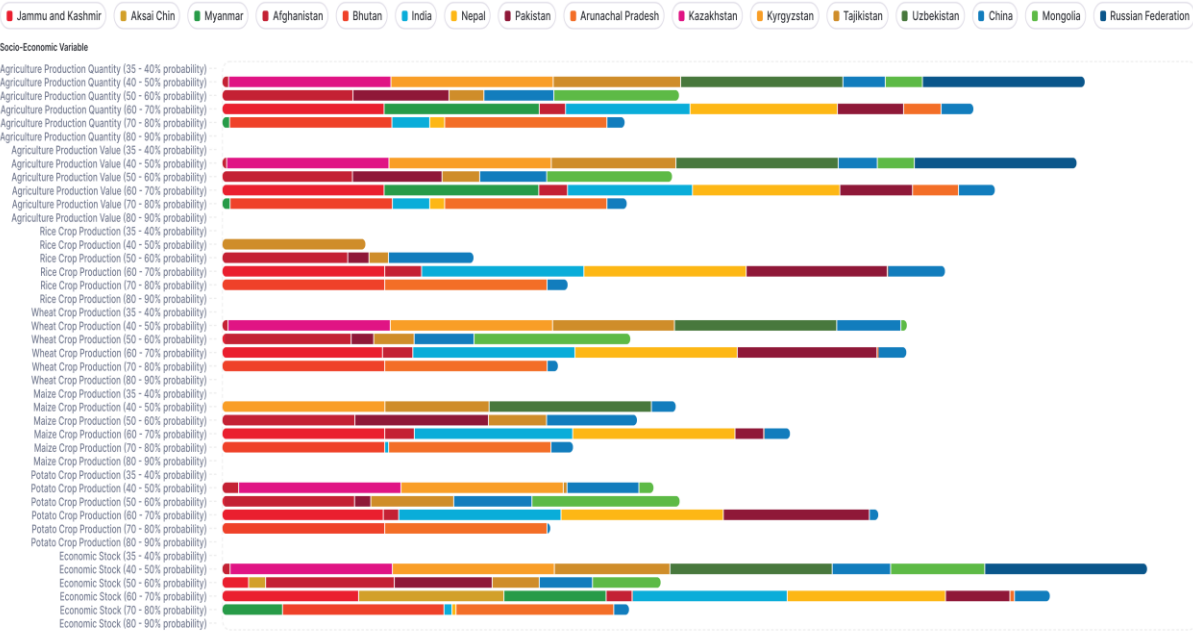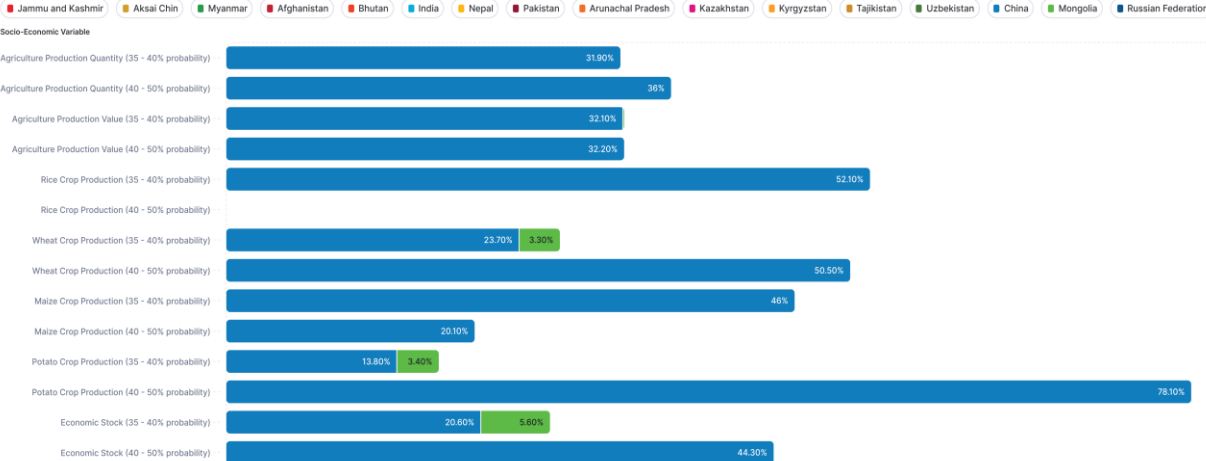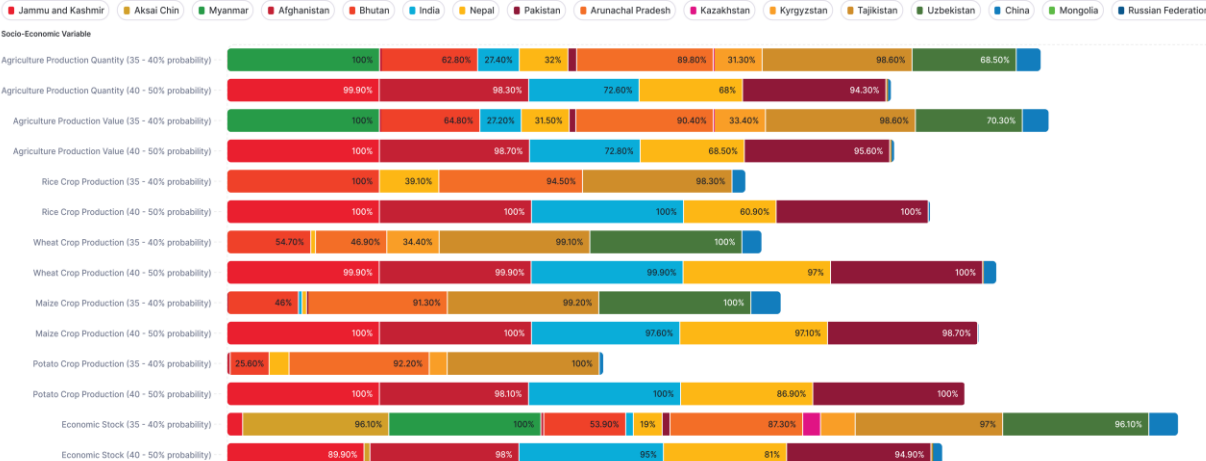
Socio-Economic Variable

Socio-Economic Variable	Value
Agriculture Production Quantity (35 - 40% probability)	31.90%
Agriculture Production Quantity (40 - 50% probability)	36%
Agriculture Production Value (35 - 40% probability)	32.10%
Agriculture Production Value (40 - 50% probability)	32.20%
Rice Crop Production (35 - 40% probability)	52.10%
Rice Crop Production (40 - 50% probability)	
Wheat Crop Production (35 - 40% probability)	23.70% 3.30%
Wheat Crop Production (40 - 50% probability)	50.50%
Maize Crop Production (35 - 40% probability)	46%
Maize Crop Production (40 - 50% probability)	20.10%
Potato Crop Production (35 - 40% probability)	13.80% 3.40%
Potato Crop Production (40 - 50% probability)	78.10%
Economic Stock (35 - 40% probability)	20.60% 5.60%
Economic Stock (40 - 50% probability)	44.30%

Agriculture Sector Exposure
Below Normal Rainfall (DJF 2025)

Socio-Economic Variable	Values
Agriculture Production Quantity (35 - 40% probability)	100% 62.80% 27.40% 32% 89.80% 31.30% 98.60% 68.50%
Agriculture Production Quantity (40 - 50% probability)	99.90% 98.30% 72.60% 68% 94.30%
Agriculture Production Value (35 - 40% probability)	100% 64.80% 27.20% 31.50% 90.40% 33.40% 98.60% 70.30%
Agriculture Production Value (40 - 50% probability)	100% 98.70% 72.80% 68.50% 95.60%
Rice Crop Production (35 - 40% probability)	100% 39.10% 94.50% 98.30%
Rice Crop Production (40 - 50% probability)	100% 100% 100% 60.90% 100%
Wheat Crop Production (35 - 40% probability)	54.70% 46.90% 34.40% 99.10% 100%
Wheat Crop Production (40 - 50% probability)	99.90% 99.90% 99.90% 97% 100%
Maize Crop Production (35 - 40% probability)	46% 91.30% 99.20% 100%
Maize Crop Production (40 - 50% probability)	100% 100% 97.60% 97.10% 98.70%
Potato Crop Production (35 - 40% probability)	25.60% 92.20% 100%
Potato Crop Production (40 - 50% probability)	100% 98.10% 100% 86.90% 100%
Economic Stock (35 - 40% probability)	96.10% 100% 53.90% 19% 87.30% 97% 96.10%
Economic Stock (40 - 50% probability)	89.90% 98% 95% 81% 94.90%

Note: The percentages reflect exposure related to the specific sections within the Third Pole region, not the entire nation. Thus, 100% means full coverage of the region involved, not the entire country.
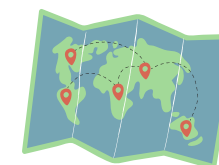
IBF automation tool on ESCAP RRP

INPUT*

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

OUTPUT

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

GEOSPATIAL PYTHON AUTOMATION SCRIPT

GEOSPATIAL PRE-PROCESSING

- Setting CRS
- Setting resolution
- Classifying hazard (based on intensities, create different hazard intensity zones)

PROCESS IDENTIFICATION

- Auto recognize type of infrastructure / population data

GEOSPATIAL EXPOSURE ANALYSIS

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

Georeferenced raster data

IBF E-learning training module on ESCAP RRP

THANK YOU

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