

# Asian Monsoon: Seasonal Forecast to Impact Outlook for Disaster Resilience in Asia-Pacific

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**Seventh WMO International Workshop on  
Monsoons (IWM)**

*22nd March 2022 (0830-1130 IST)*

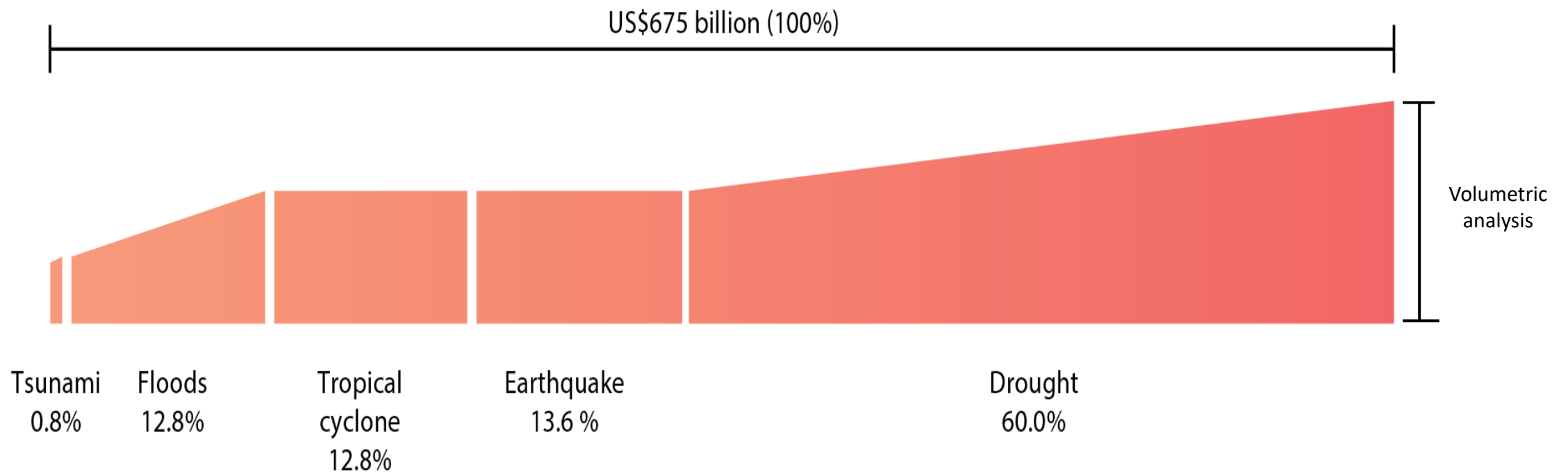
*Organized by India Meteorological Department*

*Ministry of Earth Sciences (MoES)*

*New Delhi, India*

# Asia-Pacific Disaster Riskscape: Annualized economic losses USD 675 billion —around 2.4 per cent of region's GDP

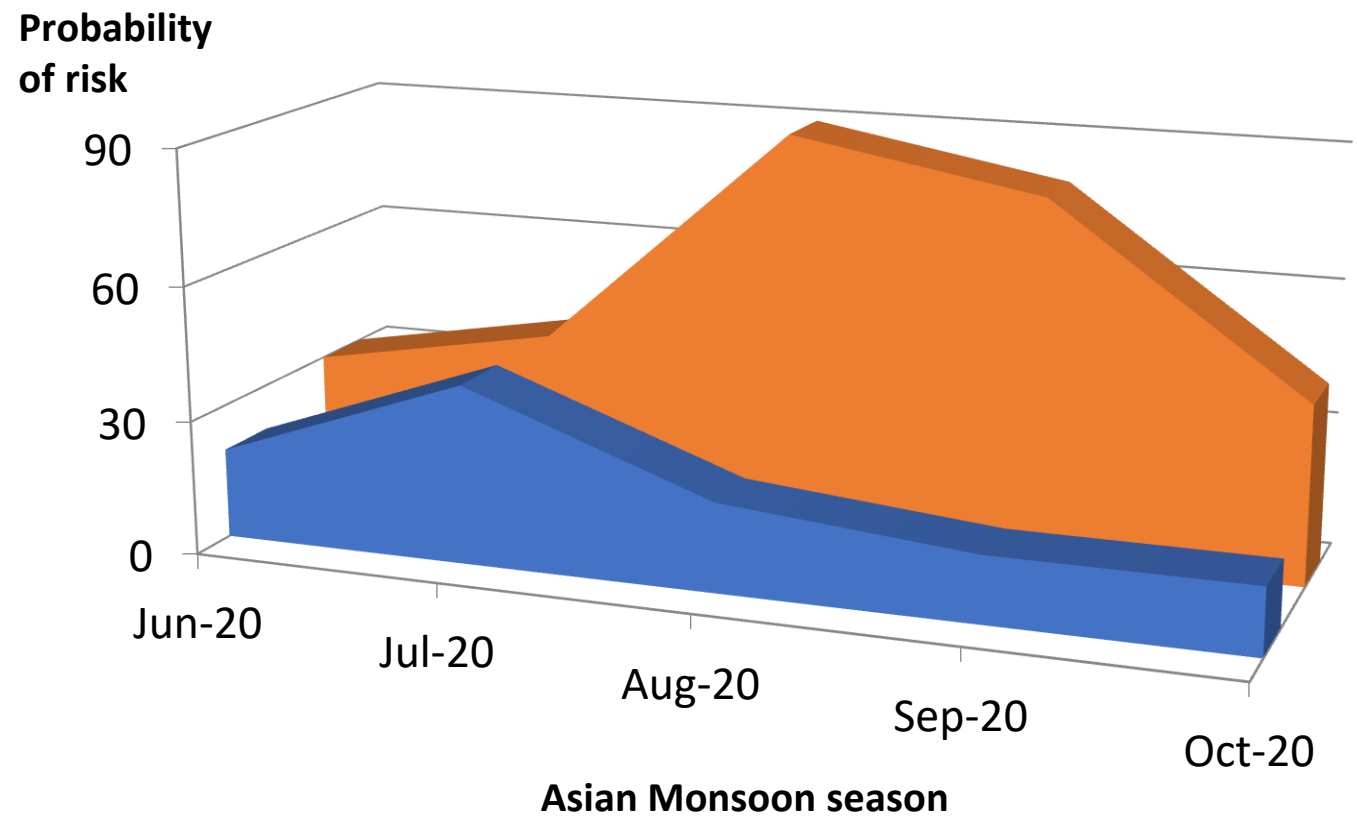
Climate risk accounts for 85 per cent of the regional 'riskscape'



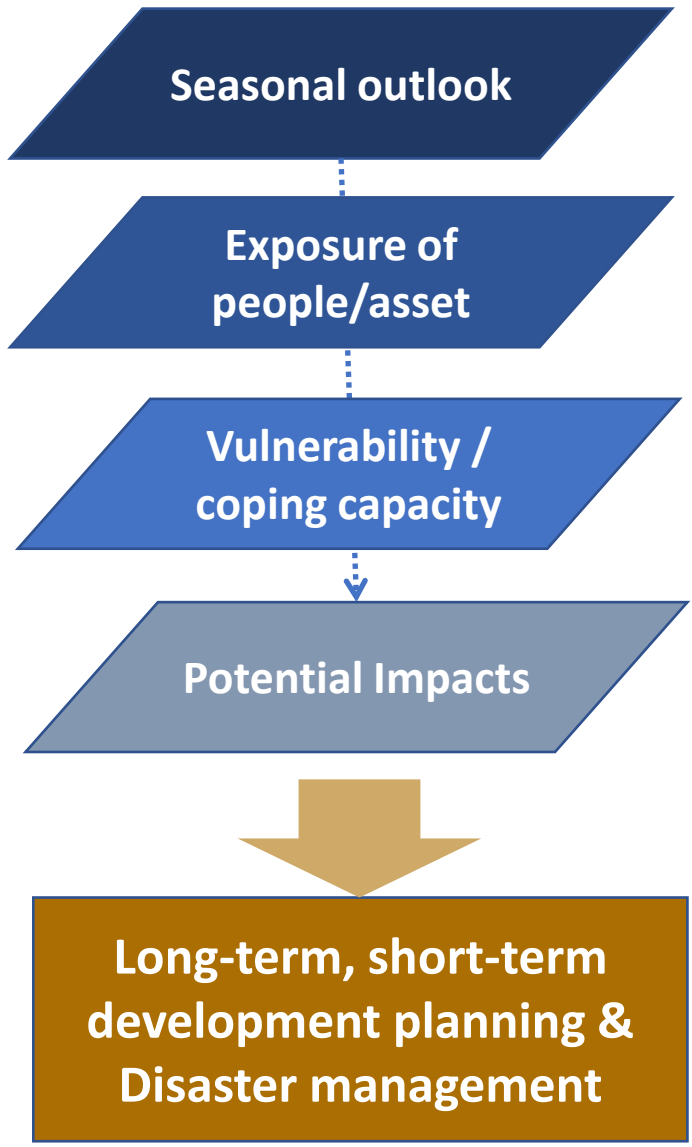
Source: ESCAP, Asia-Pacific Disaster Report 2019, Figure 1-1

# Floods and droughts are primarily driven by the Asian monsoon

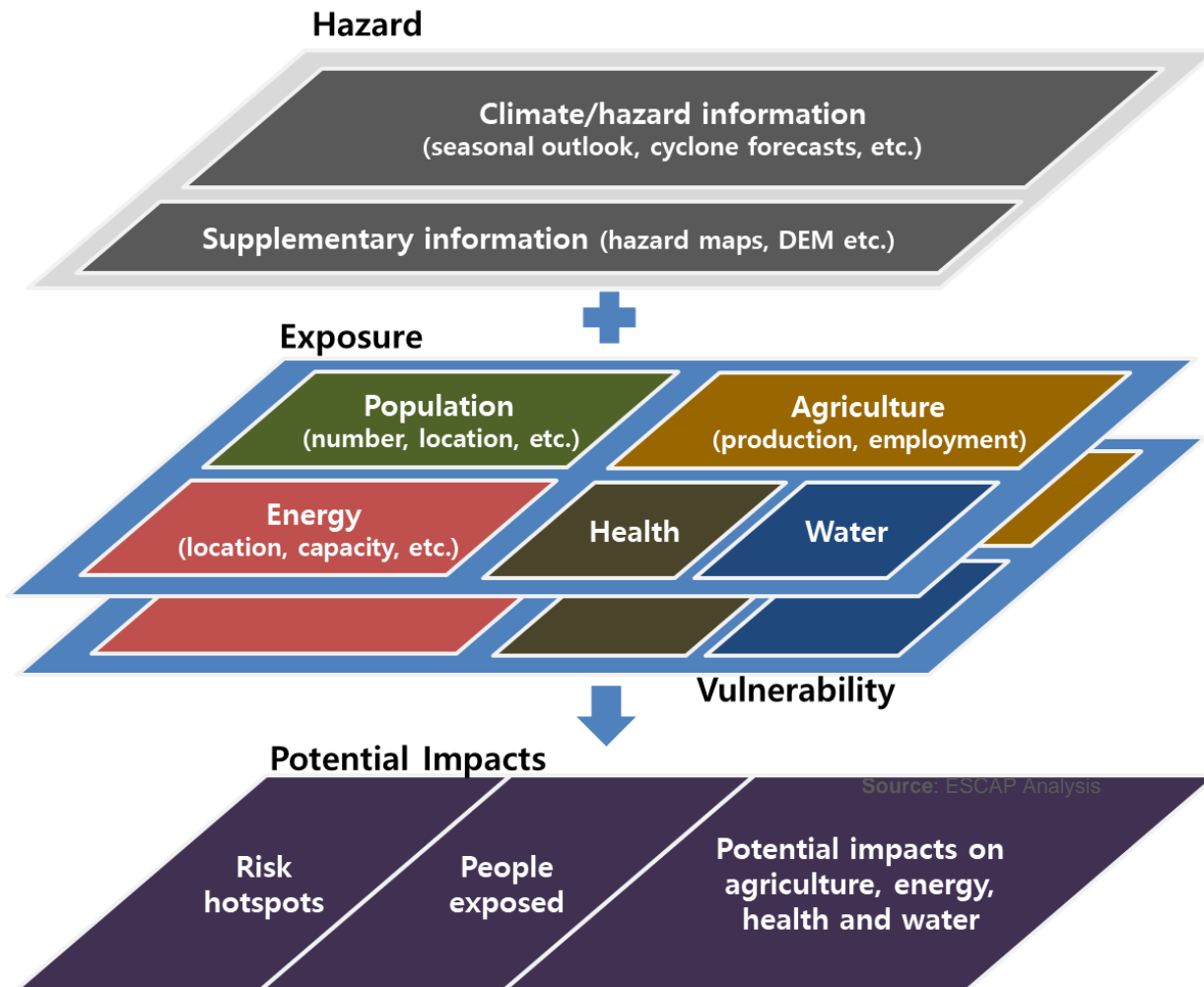
Seasonal forecast capture the temporal risk profile.



Flood  
Drought

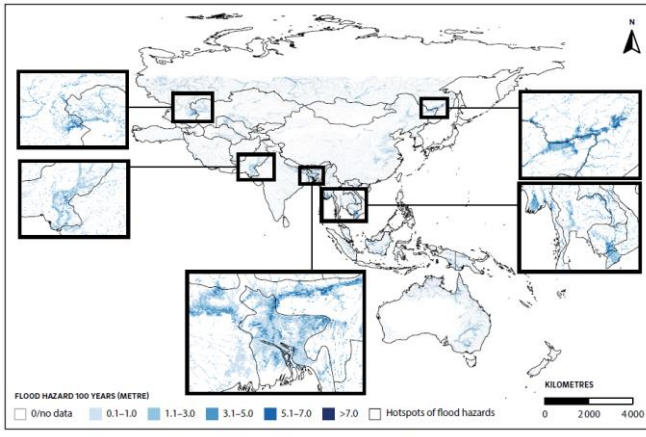


**Reorganizing traditional disaster risk management** – ESCAP has developed **a methodology to operationalize impact forecasting** for extreme events & slow-onset disasters to be scaled up for biological hazards in risk hotspots.

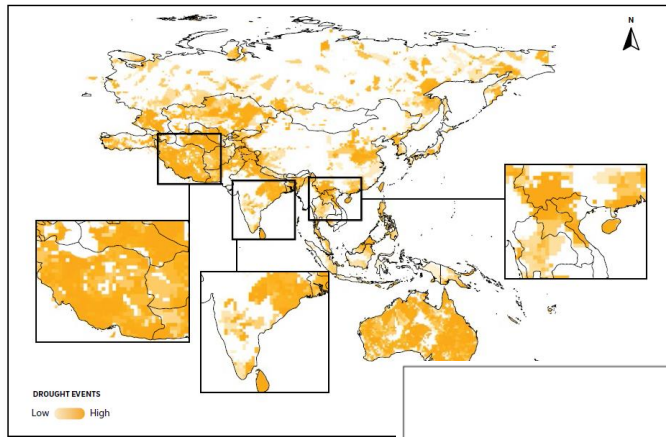


- **IBF based on seasonal forecast products** - Concept and cases were presented to SASCOF, EASCOF and FOCRAII.
- **IBF based on observed and forecast tracks of tropical cyclones (quadrant wind)** - Concept and a case were presented to and discussed at TC and PTC.

[ Methodology to operationalize impact forecasting ]

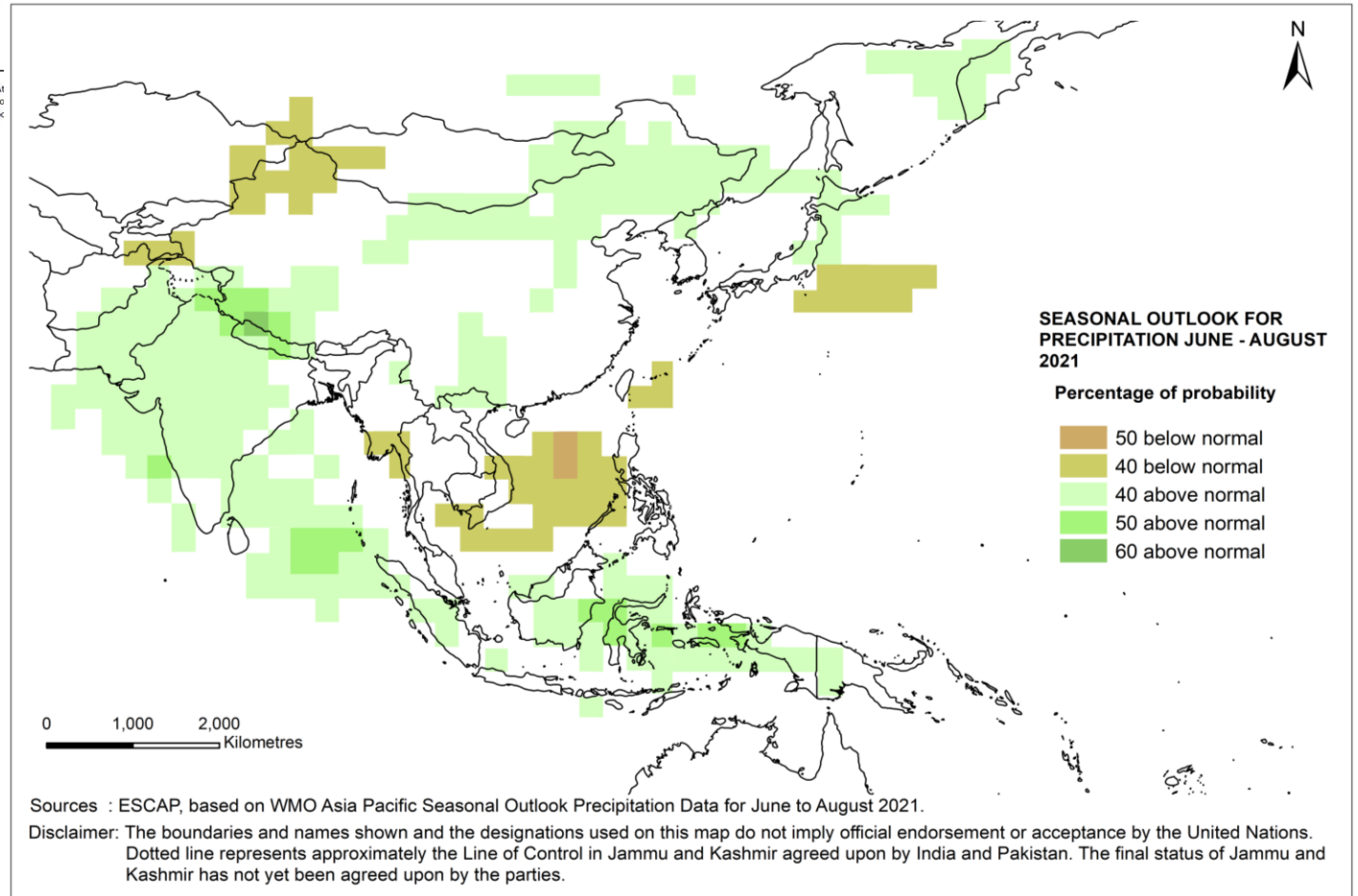


Source: ESCAP, based on Global Assessment Report on Disaster Risk Reduction (GAR) Risk Atlas, 2015.  
 Disclaimer: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations. Dotted line represents approximately the Line 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.



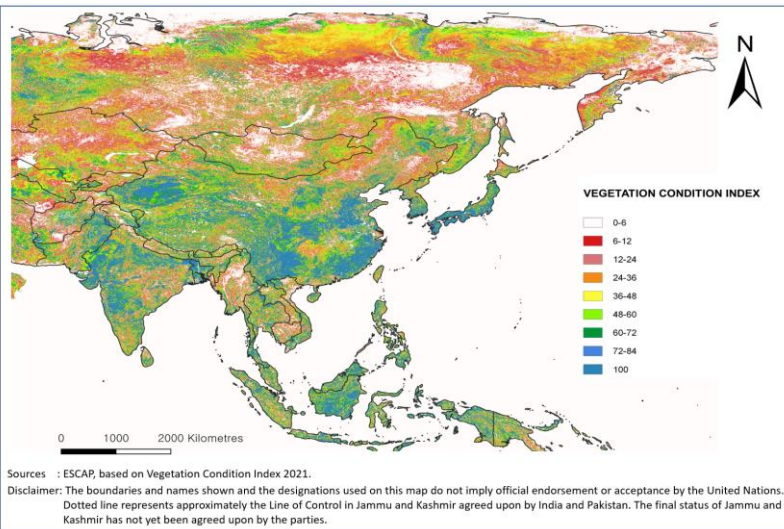
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## WMO Seasonal outlook for precipitation JJA 2021

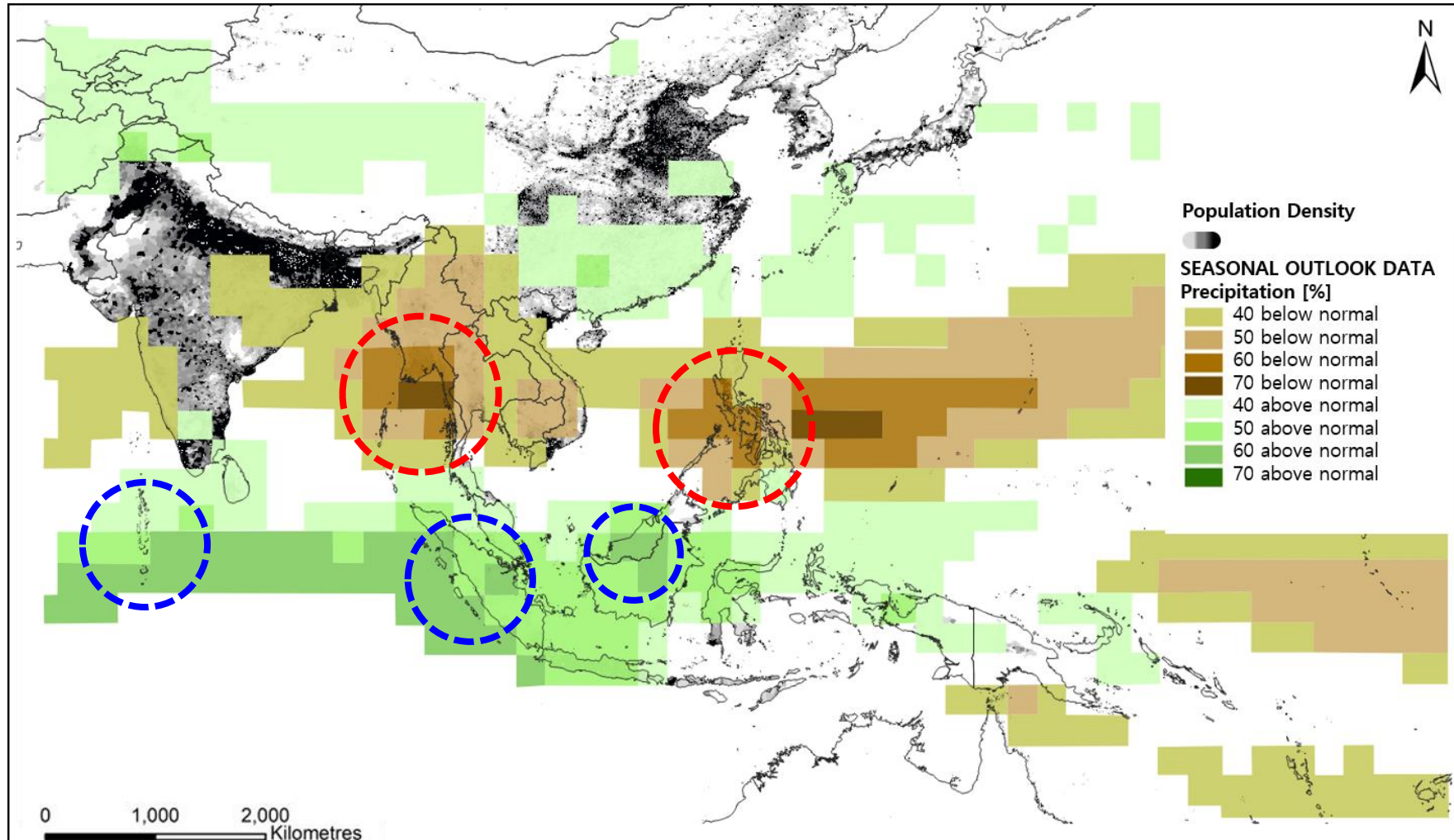


## GAR Hotspots of flood hazard / drought events

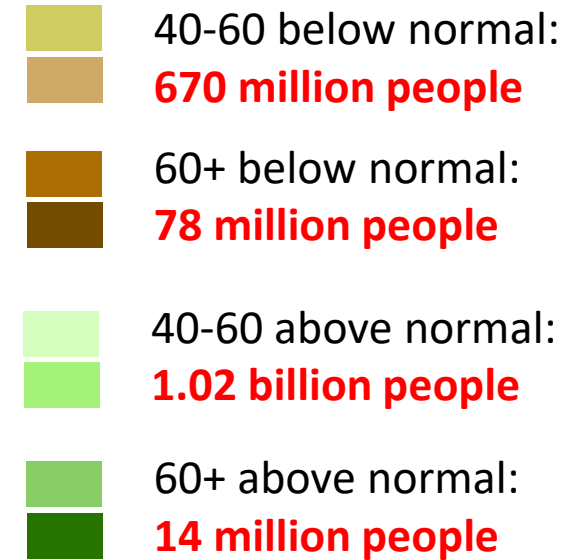
## Vegetation Condition Index on the first week of May 2021



# Population exposed to below/above-normal precipitation.



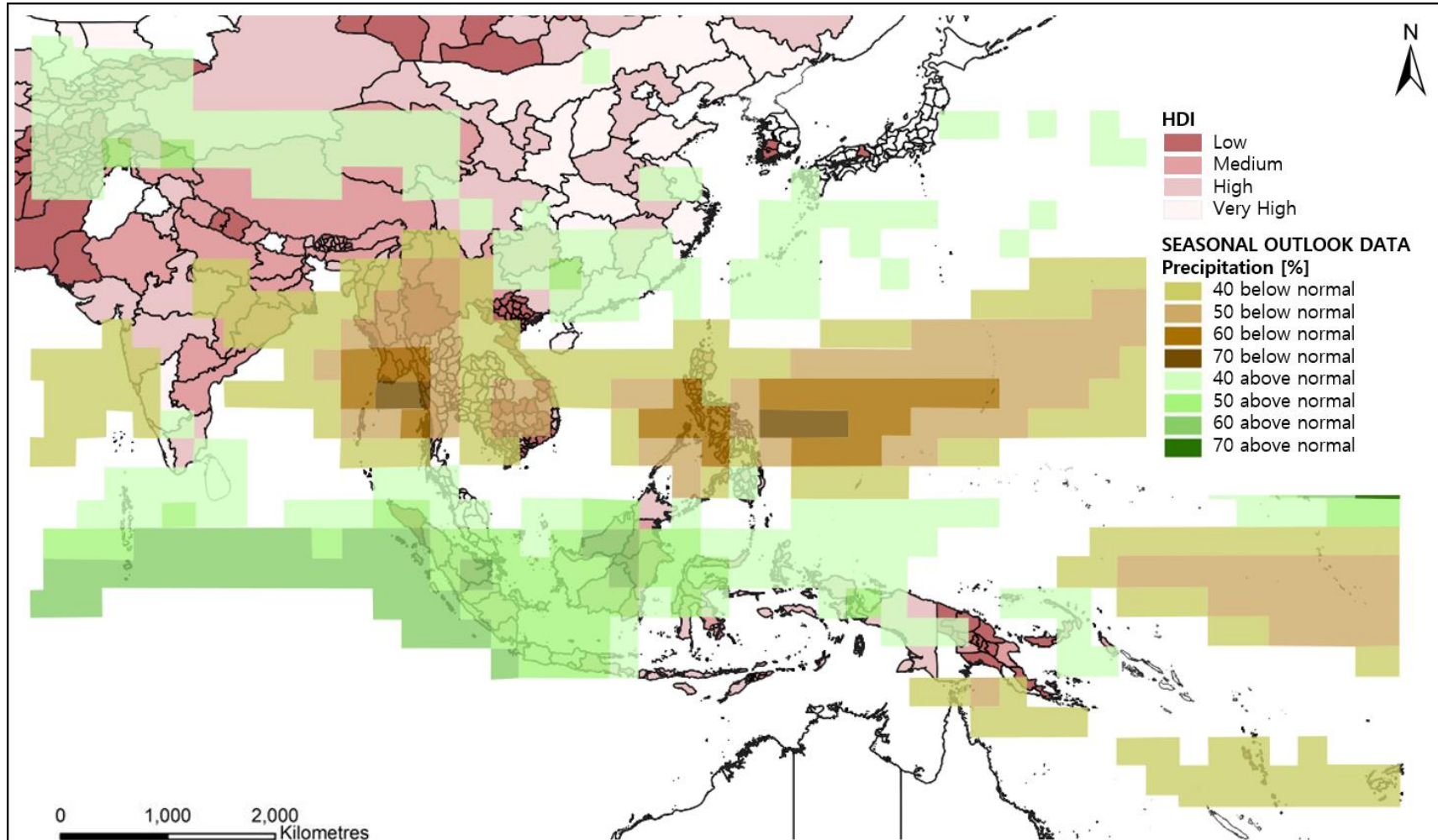
## Number of population exposed



Sources : ESCAP, based on WMO Asia Pacific Seasonal Outlook Precipitation Data, April 2020 and WorldPop, 2019.

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# Identifying populations with multiple layers of vulnerability and hazards



Sources : ESCAP, based on WMO Asia Pacific Seasonal Outlook Precipitation Data, April 2020 and WorldPop, 2019.

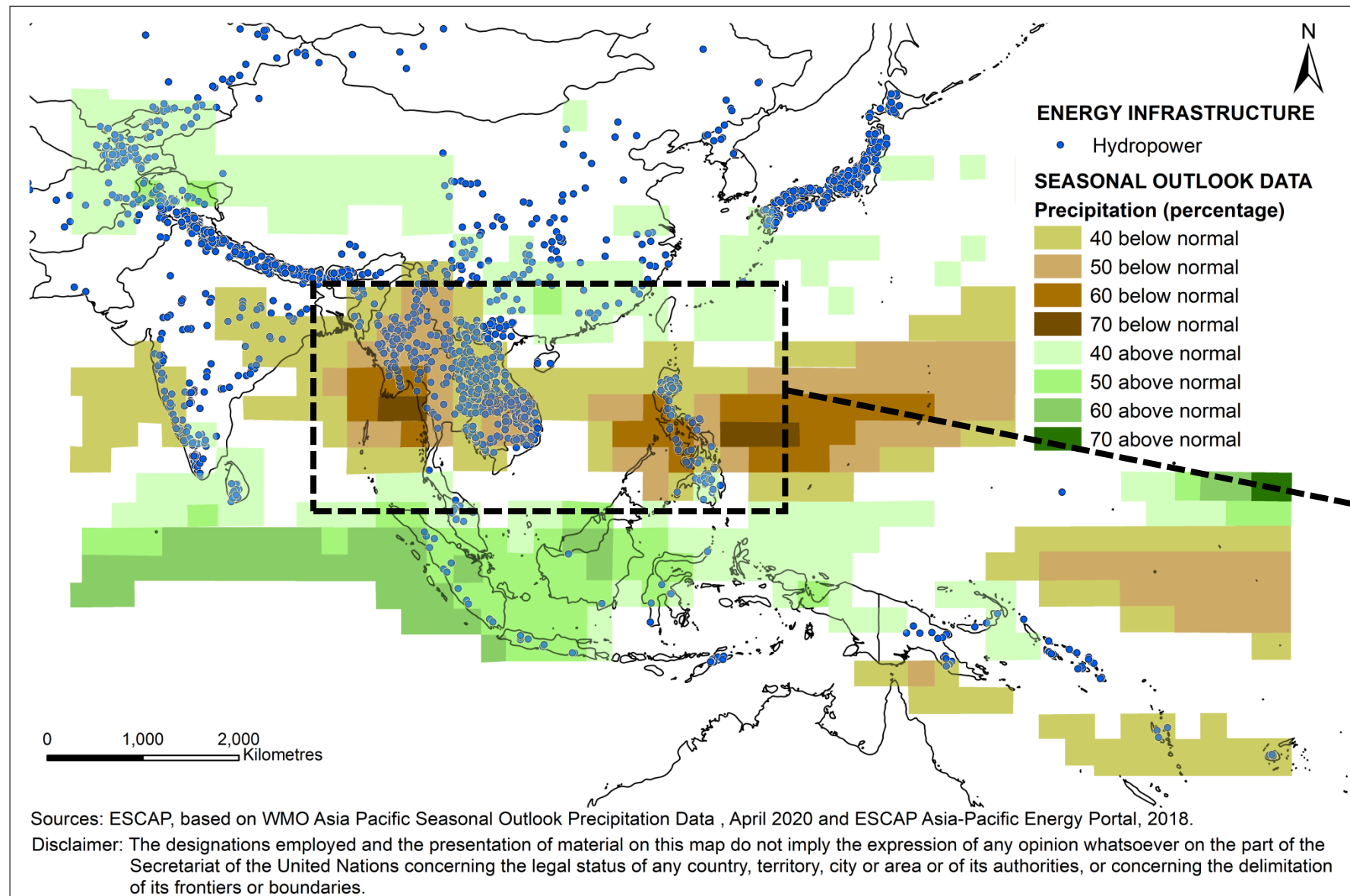
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The **Human Development Index (HDI)** is a statistic composite index of [life expectancy](#), [education](#), and [per capita income](#) indicators, which are used to rank countries into four tiers of [human development](#).

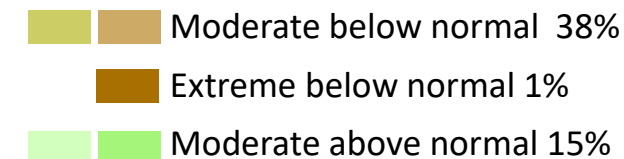
## For development planning

- Short-term: Provide immediate relief to drought-stricken areas with low HDI.
- Long-term: Historical seasonal forecasts can be used to build a disaster-socioeconomic timeline to help policymakers properly budget in the national plans.

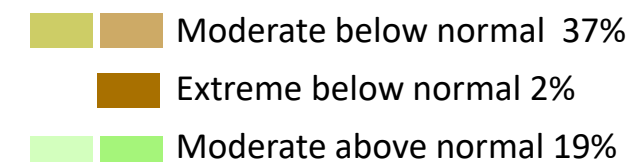
# Hydropower plants exposed to potential drought



## Capacity of exposed power plants



## Number of exposed power plants



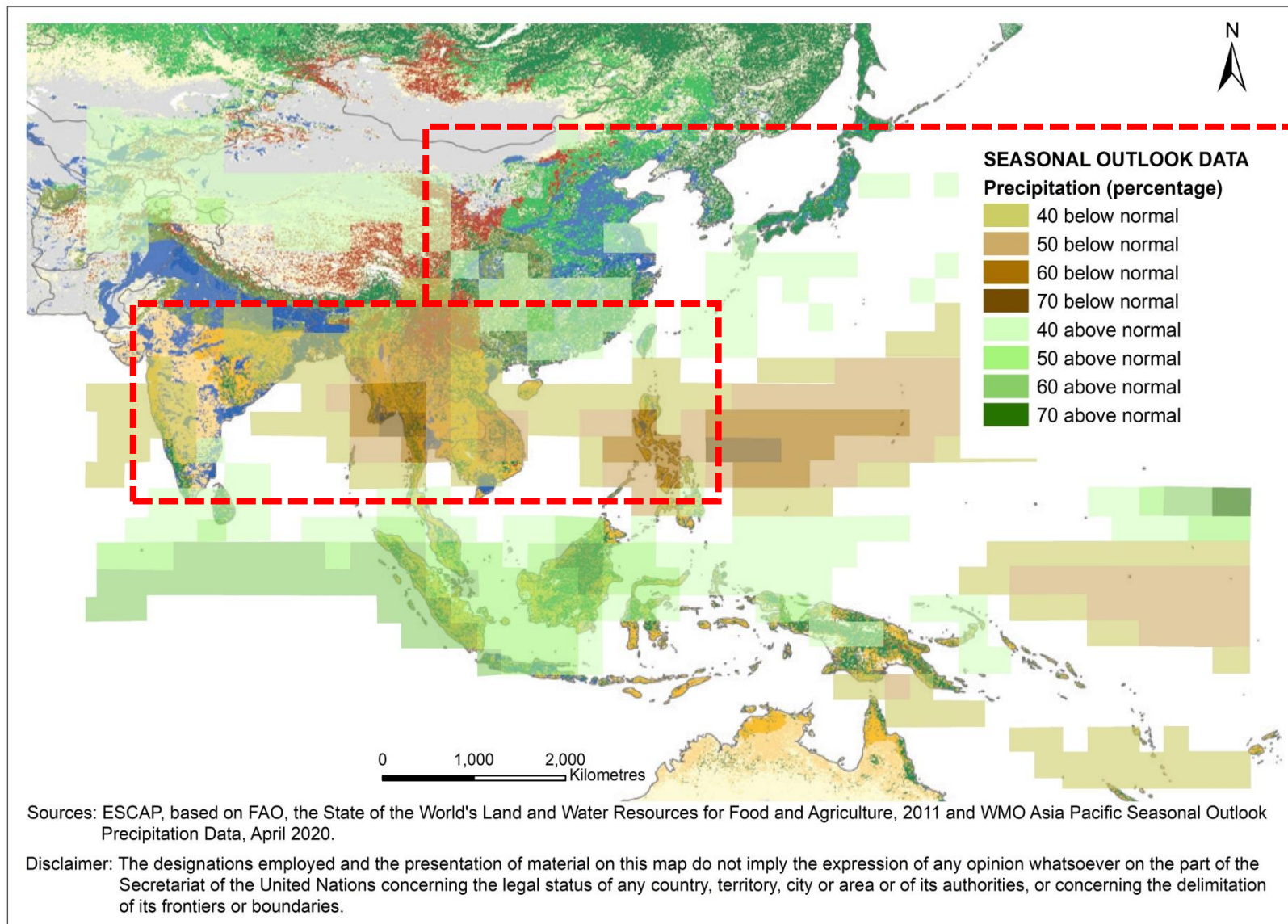
## Hydro % of Electricity Production

Country	Hydro % (2017)
Myanmar	56.1
Viet Nam	44.8
Cambodia	39.1
Philippines	10.2
Thailand	5.11
Lao PDR	N/A

Source: ESCAP Asia-Pacific Energy Portal



# Understanding potential impacts on region's agricultural system



Major agriculture systems in Asia-Pacific exposed to below normal precipitation.

	Rice export value (2019)	share of the global total export
India	\$7.1billion	33%
Thailand	\$4.2billion	19%
Viet Nam	\$2.6billion	12%

• 2018 data for Viet Nam  
Data source: ITC Trade map (accessed on 6 May 2020)

# Multi-stakeholders dialogue and cooperation for climate resilience

Enhancing the capacity of hydro-meteorological organizations to develop dynamic risk information, from global/regional resources, for managing drought.

## Selected resources/tools at:

Regional Climate Outlook Forums

<https://public.wmo.int/en/our-mandate/climate/regional-climate-outlook-products>

Monsoon Forums

<http://www.rimes.int/soc-monsoon>

Climate adaptation tool kits

[https://www.unescap.org/sites/default/files/publication\\_WEBdrr01\\_Agri.pdf](https://www.unescap.org/sites/default/files/publication_WEBdrr01_Agri.pdf)



### Review of seasonal outlook

- discuss likely conditions for upcoming season (monsoon) based on historical data, currently observed conditions, and forecast

### Impact scenarios

- prepare potential impact scenarios by sector

### Preparedness Plans

- develop strategies & plans for addressing potential impacts
- discuss other relevant issues and concerns related to preparedness

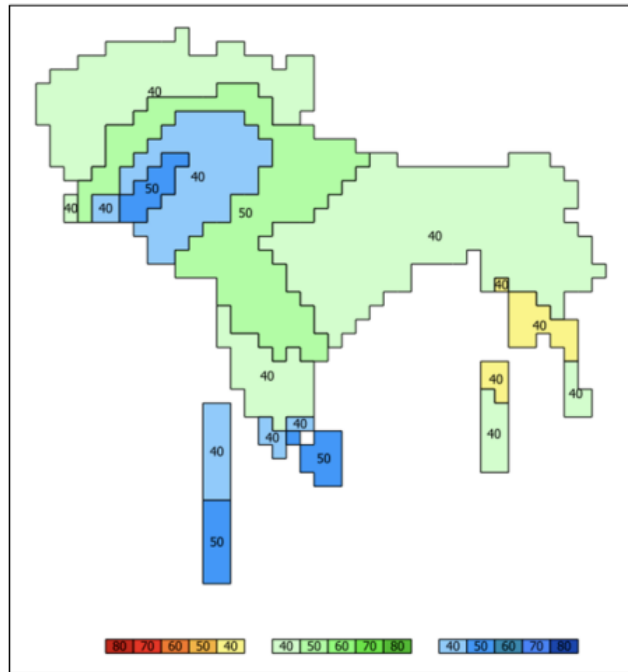
### Monitoring

- track actions taken during the season, including uptake of seasonal outlooks and constraints in applying them

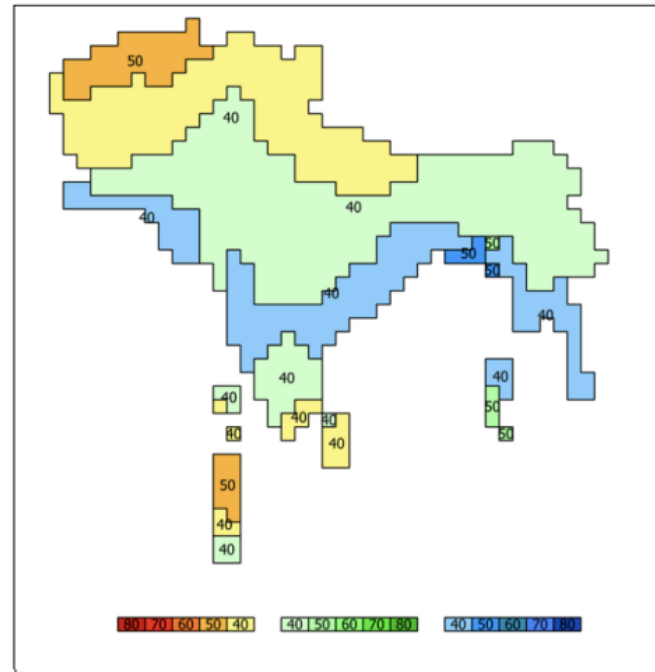
# South Asia Seasonal Climate Outlook to Socio-Economic Impact-Based Forecasting

Based on SASCOF seasonal forecast...

(June to September)



(October to December)



Source: <http://rcc.imdpune.gov.in/SASCOF17/concensus.html> (left), received from RCC of IMD in Pune, India (right)

UNITED NATIONS  
**ESCAP**  
Economic and Social Commission for Asia and the Pacific

December 2020    ICT and Disaster Risk Reduction Division    Asia-Pacific Disaster Report 2021, Working Paper 02

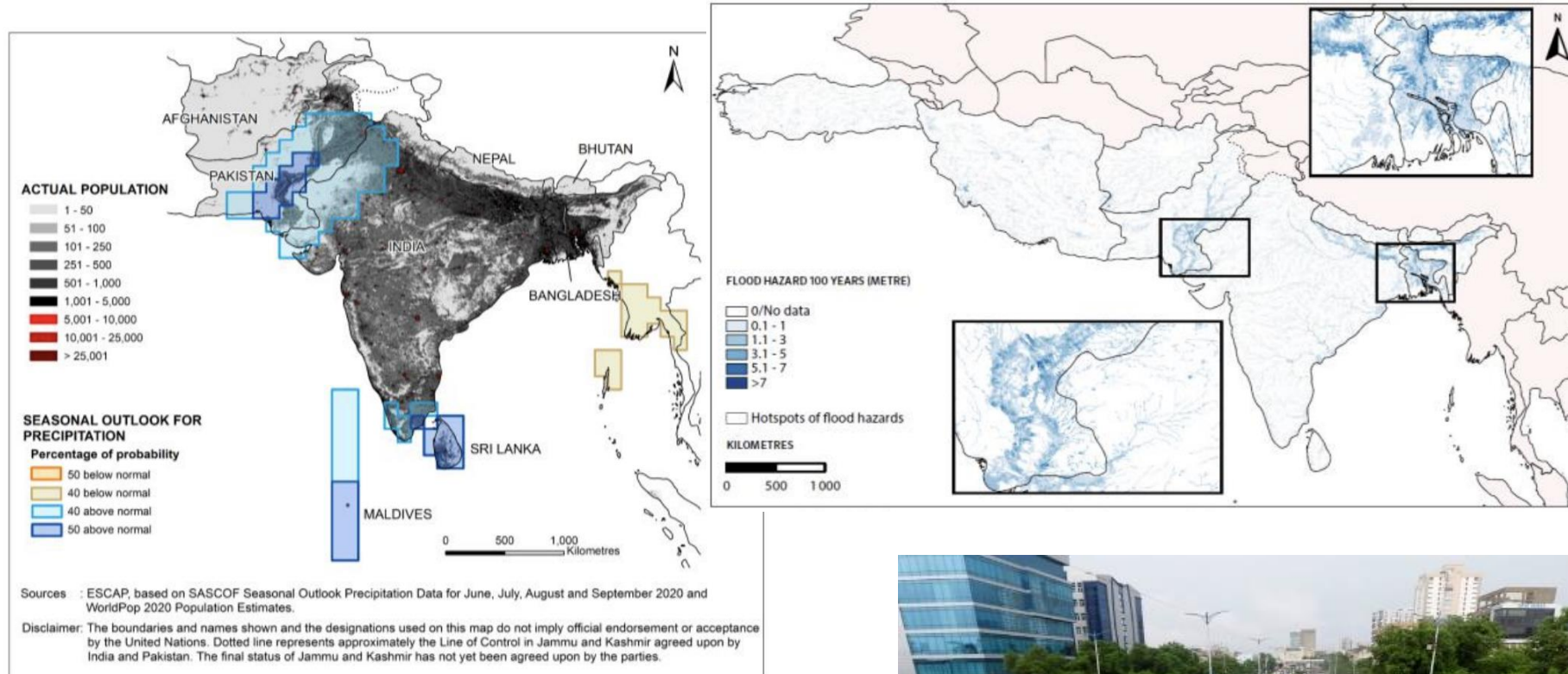
**SEASONAL OUTLOOK TO SOCIO-ECONOMIC IMPACT BASED FORECASTING:**  
Proposed Methodology and Key Results — Building on the Seasonal Forecasts of South Asia Climate Outlook Forums 2020

**Asia Pacific Disaster Risk Network**

- 1 Regional Platform for Multi-hazard Early Warning System
- 2 Knowledge for Policy — Asia-Pacific Disaster Report, Policy Research
- 3 Technology Innovations and Application
- 4 Data and Statistics — Multi-hazard Risk Hotspot Analysis
- 5 Disaster-Climate-Health Nexus — Cascading Impacts and Systemic Risks

For more information, please contact: ICT and Disaster Risk Reduction Division, Economic and Social Commission for Asia and the Pacific (ESCAP) United Nations Building, Rajadamnern Nok Avenue, Bangkok 10200, Thailand  
Email: [escap-idd@un.org](mailto:escap-idd@un.org)

## Identified potential flood risk hotspots for targeted policy actions



In August/September, Pakistan was severely hit by heavy rains and experienced urban flooding with over 400 lives lost and around 305,000 homes partially destroyed. Floods also affected agricultural sector destroying main crops (Relief web)



**Bridging the  
science policy gap  
for informed  
action**

## RISK AND RESILIENCE PORTAL

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All hazard approaches



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