

Impact of climate change on agriculture in Asia-Pacific: Convergence of food systems transformation and climate action:

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FOOD SYSTEMS TRANSFORMATION PROGRESS REVIEW

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Outline of presentation

Impact of climate change on agriculture

01

An era of climate emergency

Intersection of climate extreme and SDGs on ground?

Intensifying and expanding multi-hazard risk hotspots affecting food systems

02

Exposure of agriculture value under climate scenarios

Food system resilience in climate emergency

03

Seamless integration of weather and climate information

ESCAP Risk and Resilience Data platform to fill in gaps in information and knowledge

04

Key takeaways



1 An era of climate emergency

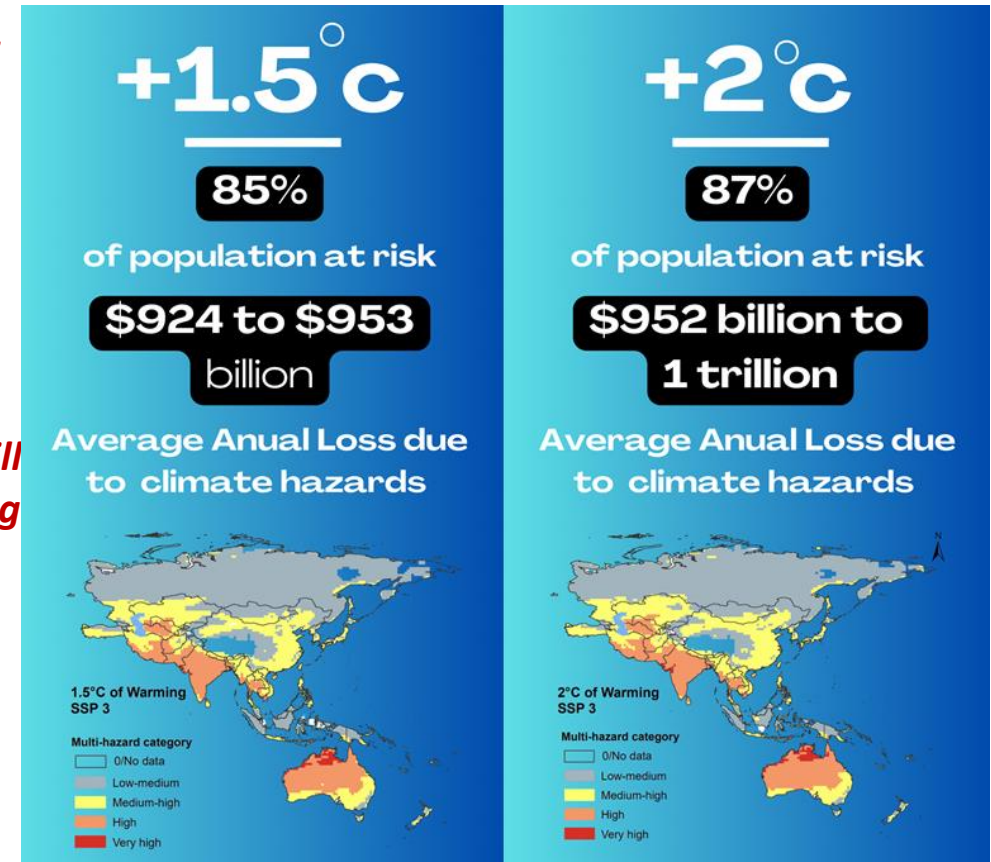
Asia-Pacific remains the most disaster impacted region.

Climate change impacts and risks are becoming increasingly complex and more difficult to manage.

Multiple climate hazards will occur simultaneously.

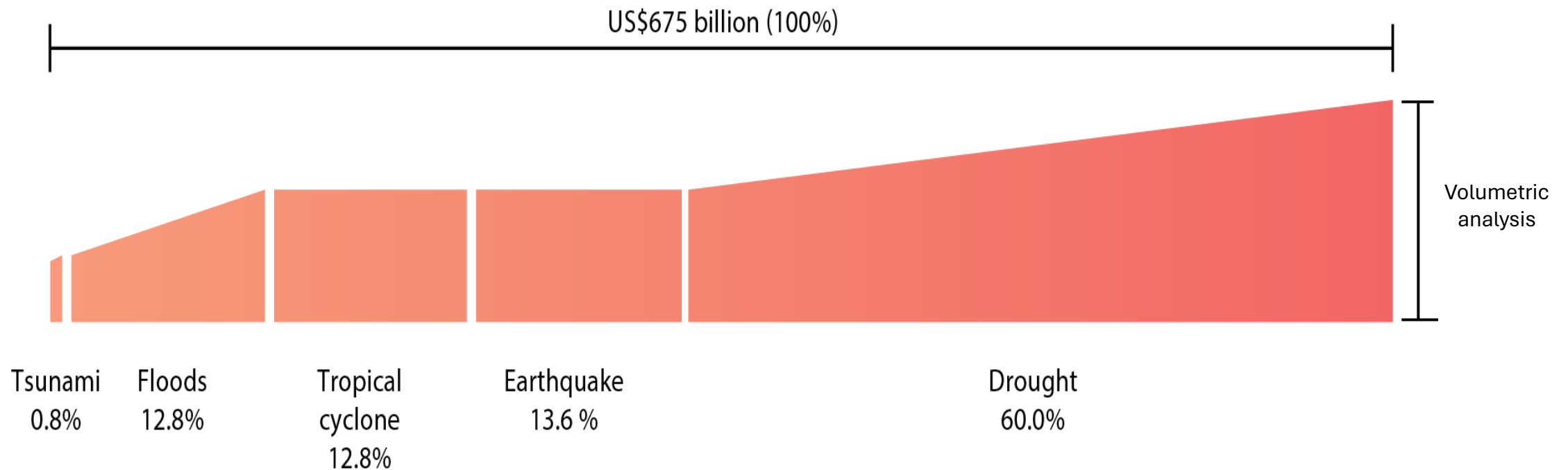
Climatic and non-climatic risks will interact, resulting in compounding overall risk and risks cascading across sectors and regions. (IPCC AR 6)

**A Riskscape@1.5 and 2.0 warming:
Intensifying and emerging hotspots**



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

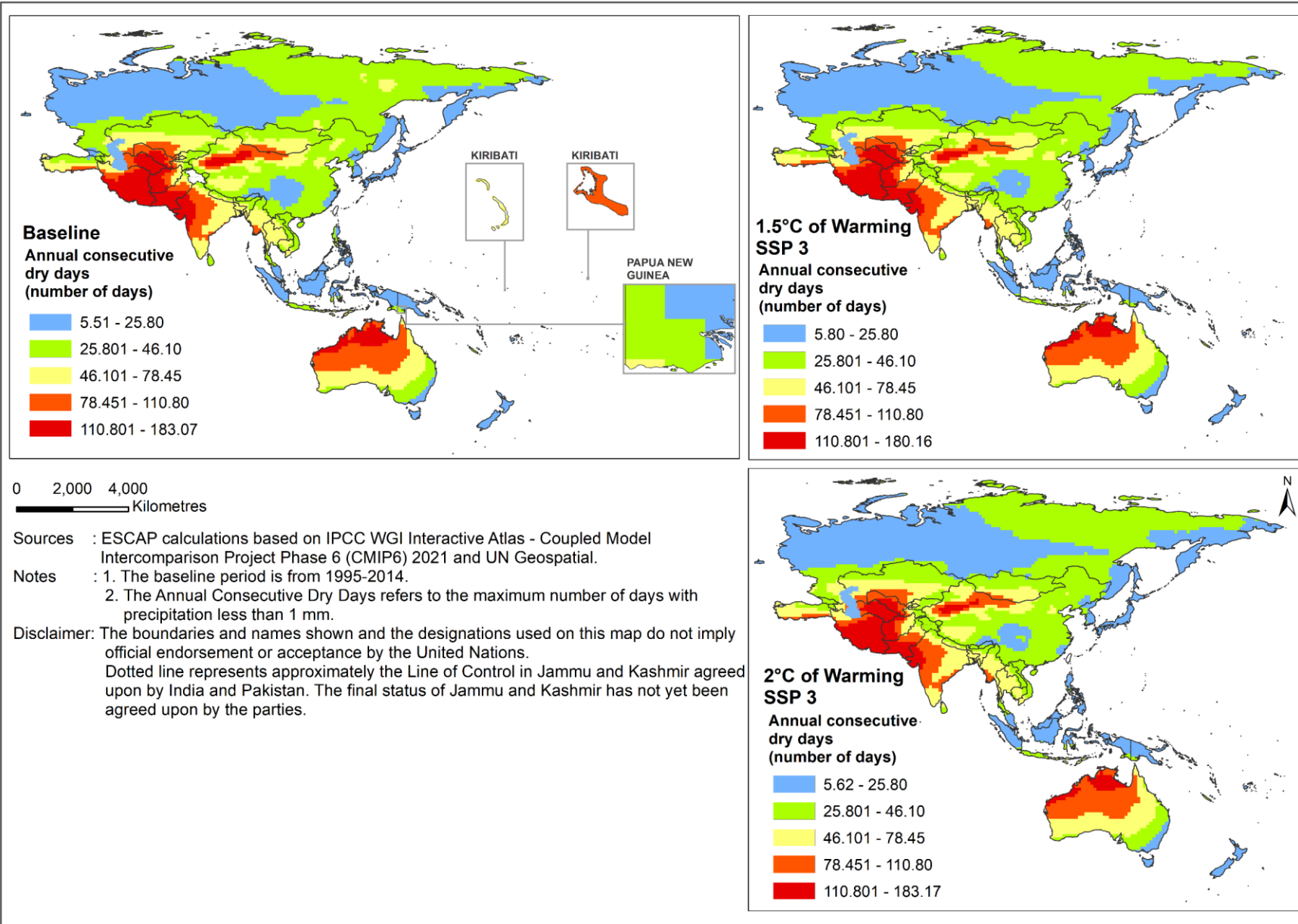
Climate risk accounts for 85 per cent of the regional 'riskscape'



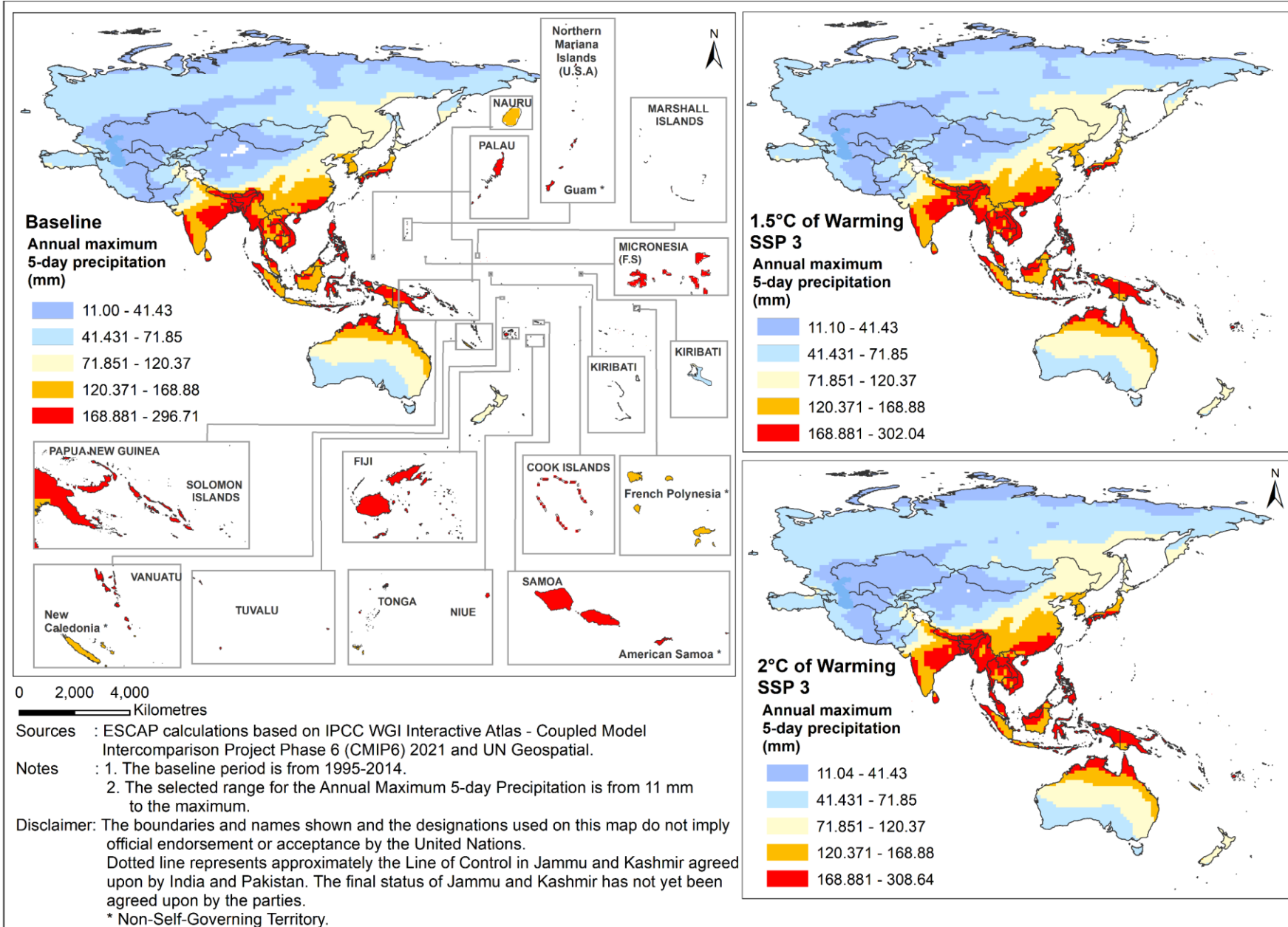
Source: ESCAP, Asia-Pacific Disaster Report 2019, Figure 1-1

Agriculture bears the brunt of climate related risk, Drought impacts, more than 80%, to agriculture/livestock

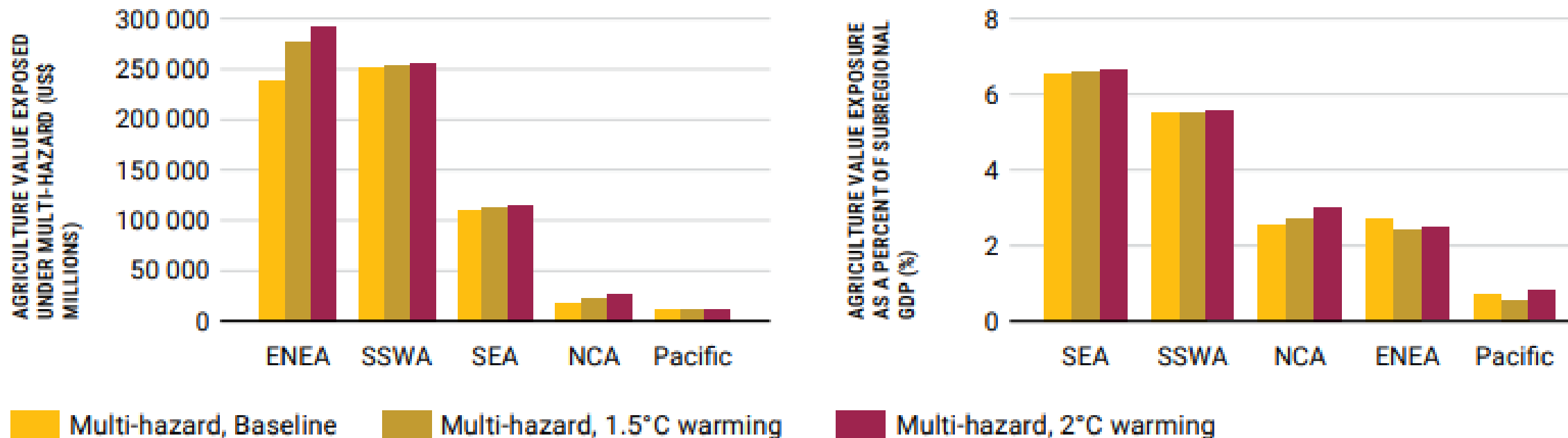
Hotspots of existing, intensifying and emerging drought risk under baseline and climate change scenarios (1.5- and 2-Degree warming)



Hotspots of intensifying and emerging flood risk under scenarios (1.5- and 2-Degree warming)



2.0 Exposure of agriculture value under climate scenarios



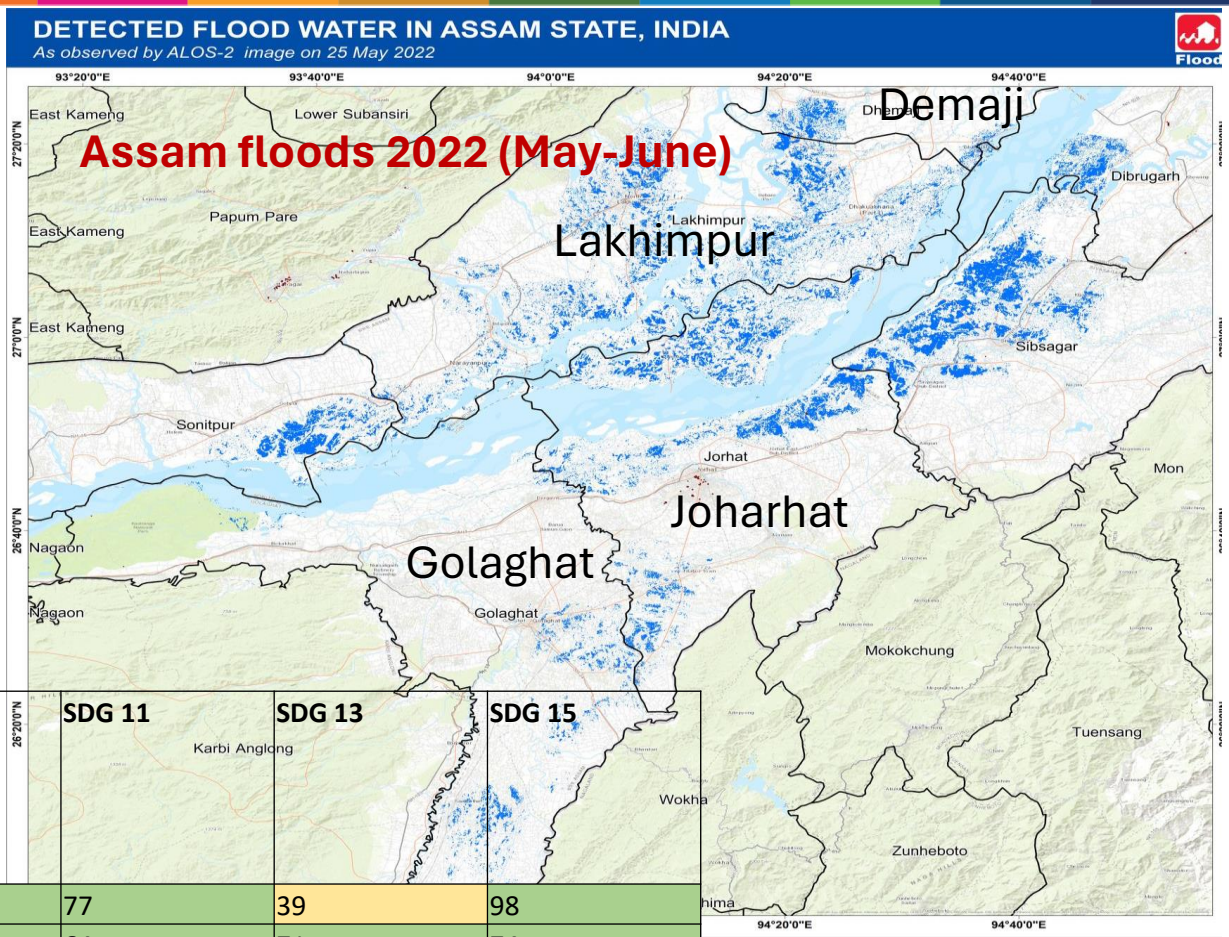
Under different warming scenarios, East and North-East Asia face the highest absolute value of potential agriculture loss, with over \$250 million at stake in all scenarios. South-East Asia is projected to suffer the most in terms of GDP loss, with potential agriculture losses amounting to 6 per cent of GDP. North and Central Asia and the Pacific also show increasing potential GDP losses.

When Assam (India) floods intersected with SDGs on ground?

Assam records one of the highest number of flood events across India (1969-2019): SDG localization reveals flood impacted districts have lowest SDGs (2, 13)

2022 Assam floods impact severely SDGs
SDGs (2/13) already low in Golaghat, Demaji, Lakhimpur, Jorhat..
Floods impacts on agriculture will affect the progress

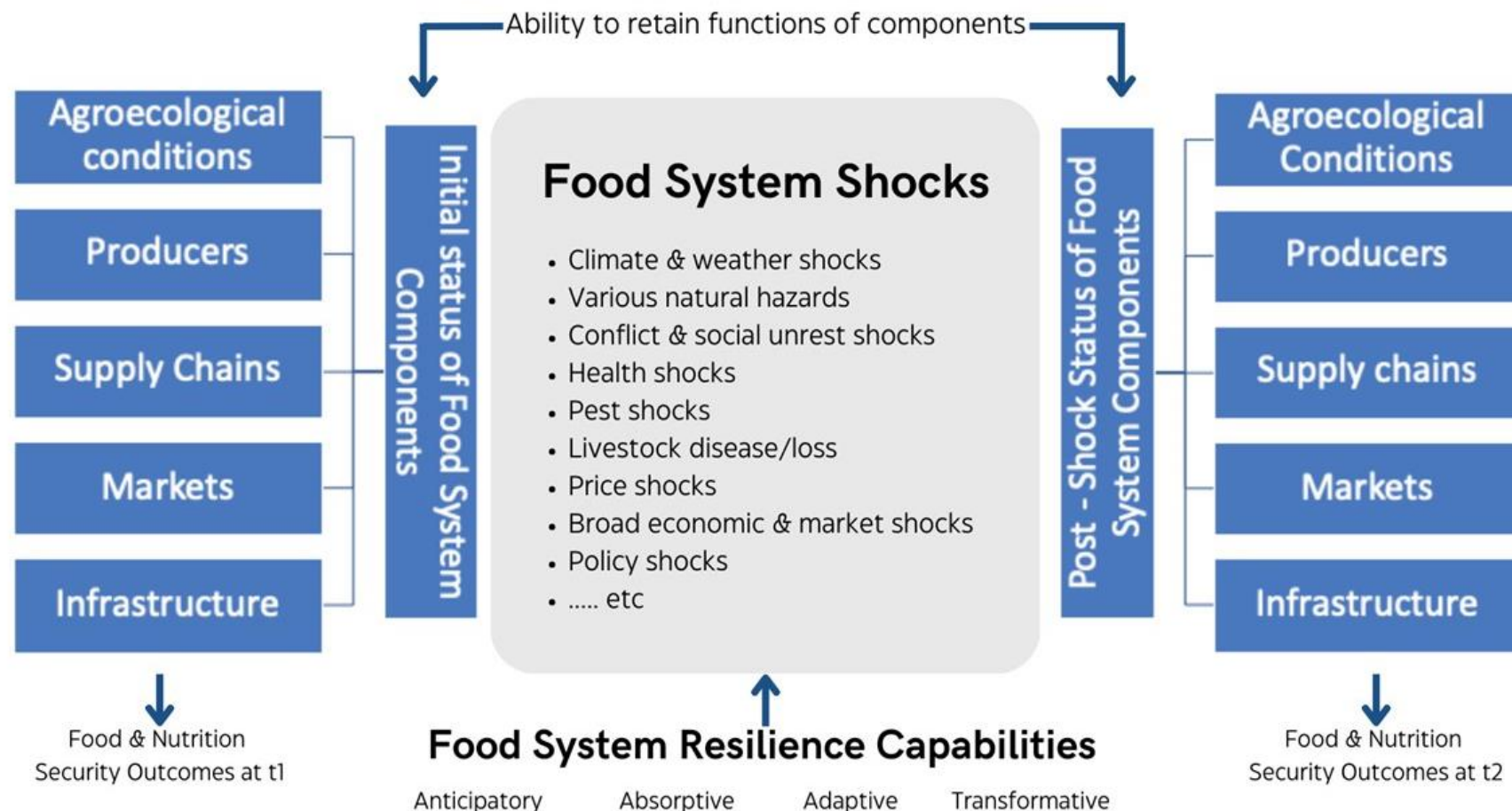
Small and marginal farmers bear the brunt



Districts	Composite SDG Score	SDG 1	SDG 2	SDG 3	SDG 9	SDG 11	SDG 13	SDG 15
Cachar	68	56	49	60	94	77	39	98
Dhemaji	66	64	42	61	94	64	71	74
Dibrugarh	68	64	55	59	95	71	38	87
Golaghat	67	65	48	58	94	70	70	71
Hailakandi	67	52	45	59	96	71	72	93
Jorhat	70	65	47	57	96	73	75	83
Karbi Anglong	64	50	48	61	78	67	35	81
Karimganj	69	56	50	61	93	73	76	98
Lakhimpur	69	68	42	63	90	76	74	77
Nagaon	67	61	48	61	96	70	73	80
Sibsagar	68	61	54	62	92	69	77	90
Sonitpur	69	65	51	59	94	75	74	78

Many countries across the region are regressing on SDG 2- and climate hazards lead directly to the regression

Food system resilience in the era of climate emergency



Build on climate risk information

[FAO 2021]

Seamless integration of weather and climate information: Towards building food system resilience capacities

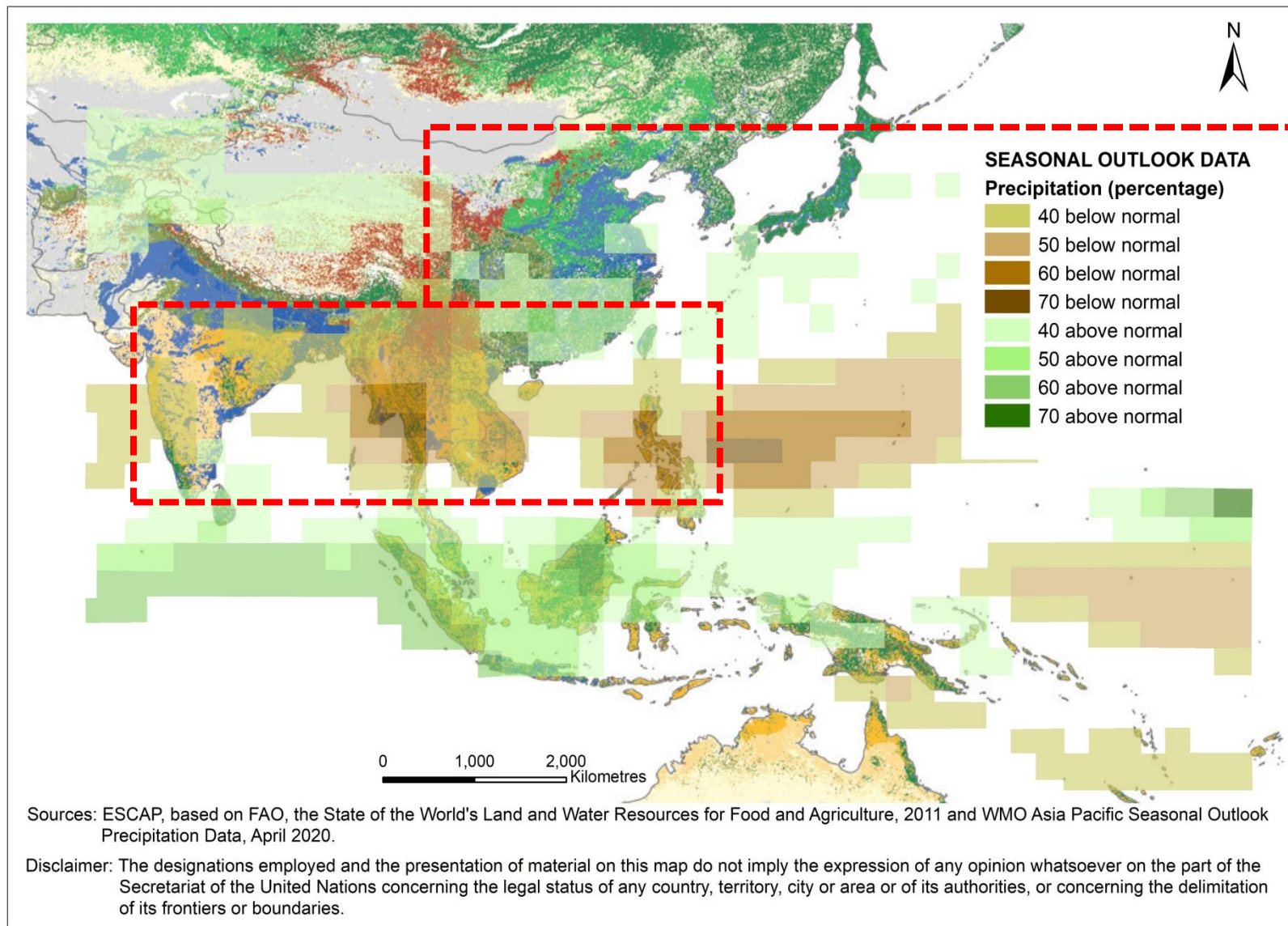


Bridging the gaps in information value chain for food system resilience: seasonal impact forecasting, climate scenarios



The **Risk and Resilience Portal**, an initiative of the Asia Pacific Disaster Resilient Network (APDRN) brings together **risk analytics and policy analysis under one platform** to strengthen capacity of all stakeholders for risk informed planning and budgeting

Translating seasonal outlook to impact forecasting of agri-food 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%

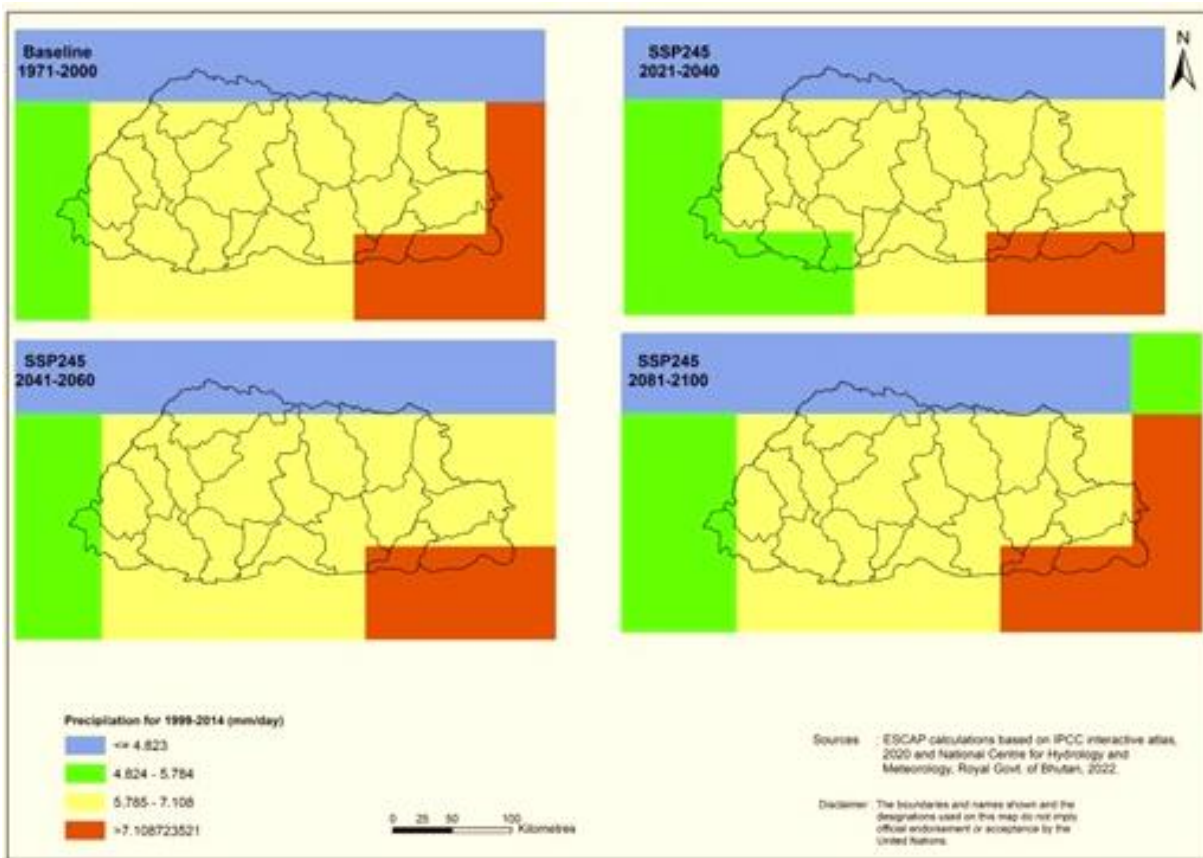
• 2018 data for Viet Nam
Data source: ITC Trade map (accessed on 6 May 2020)

Bhutan

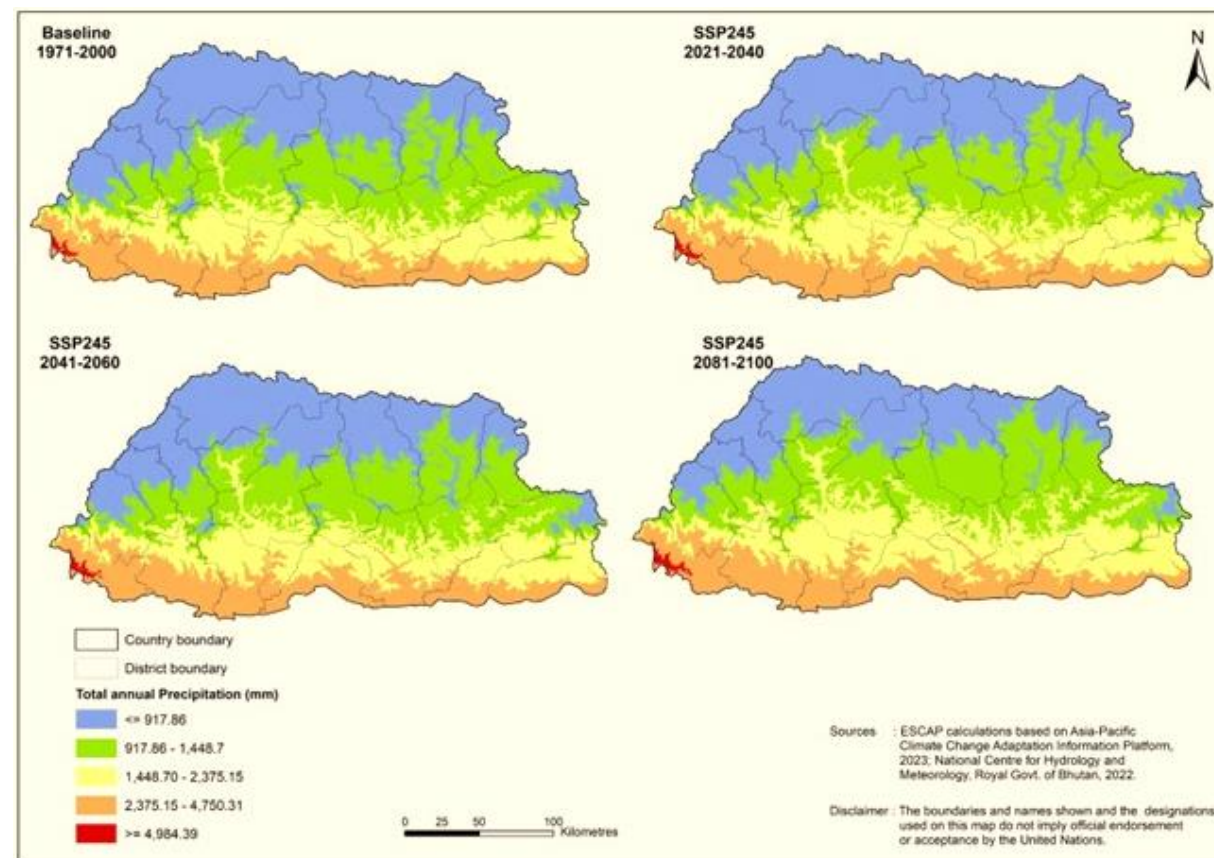
Downscaling risk scenario for climate resilient food system

Upon request, downscale the climate data for a more granular analysis (1km resolution in Bhutan)

100km x 100km

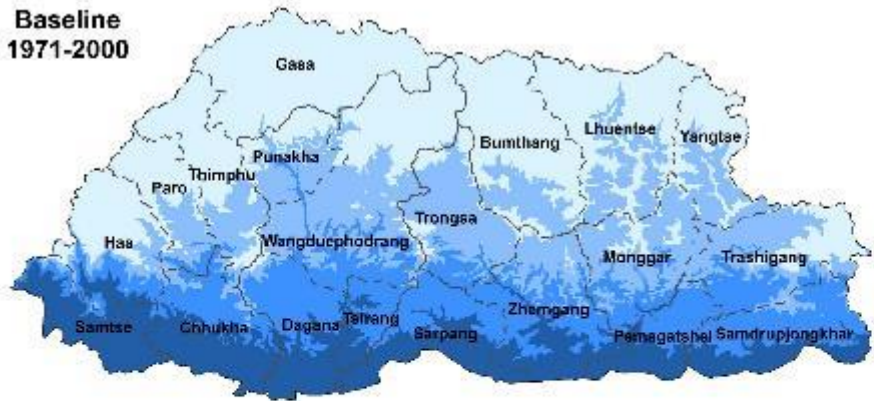


1km x 1km



Bhutan: Change in total monsoon precipitation from baseline by 2040

**Baseline
1971-2000**



**SSP370
2021-2040**



**SSP126
2021-2040**

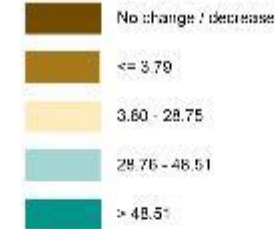
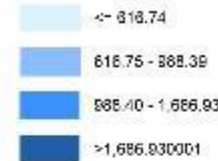


**SSP245
2021-2040**



Increase in monsoon precipitation from baseline (mm)

Total monsoon precipitation (mm)



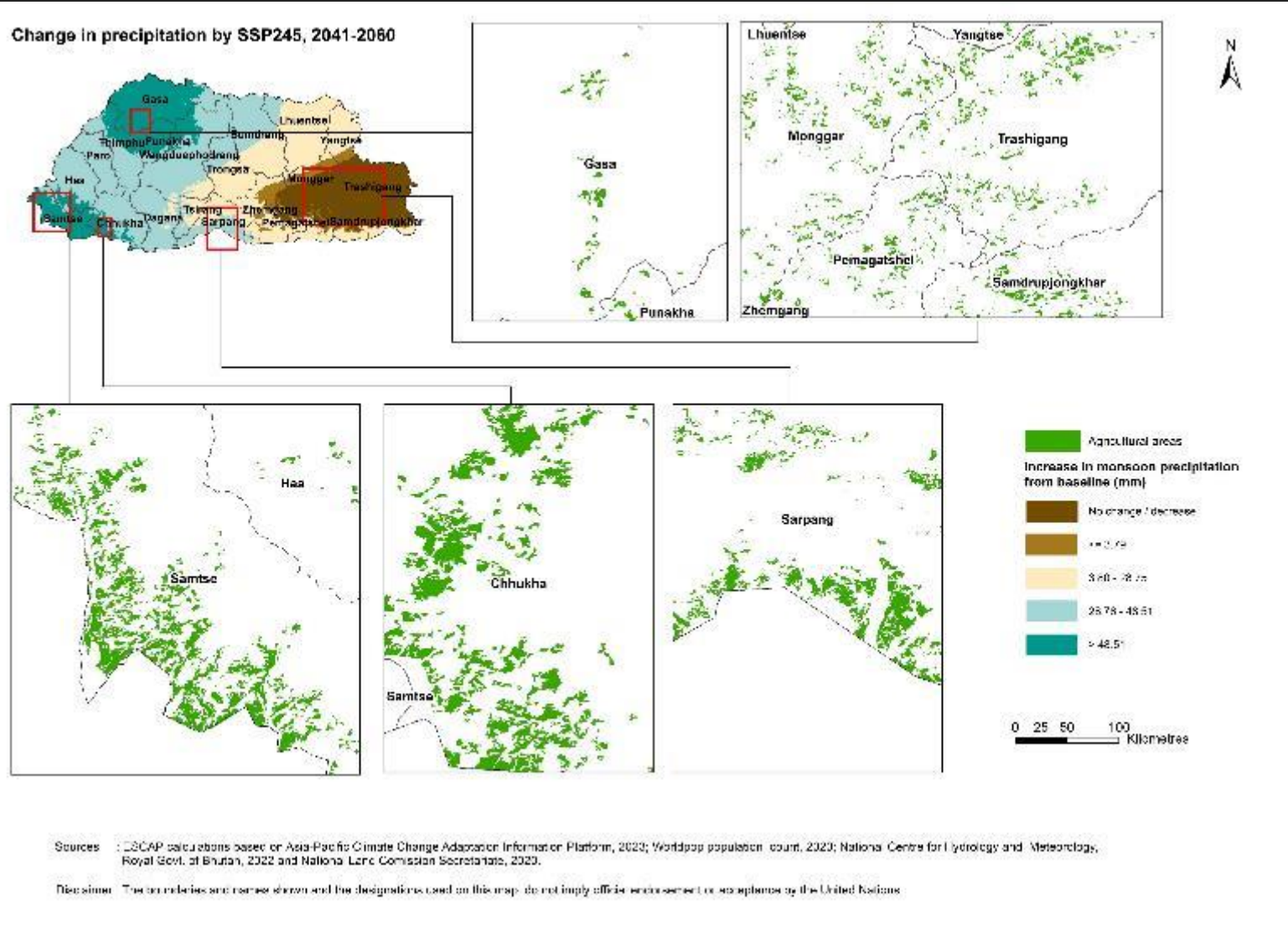
0 25 50 100 Kilometres

Sources : ESCAP calculations based on Asia-Pacific Climate Change Adaptation Information Platform, 2023 and National Centre for Hydrology and Meteorology, Royal Govt. of Bhutan, 2022.

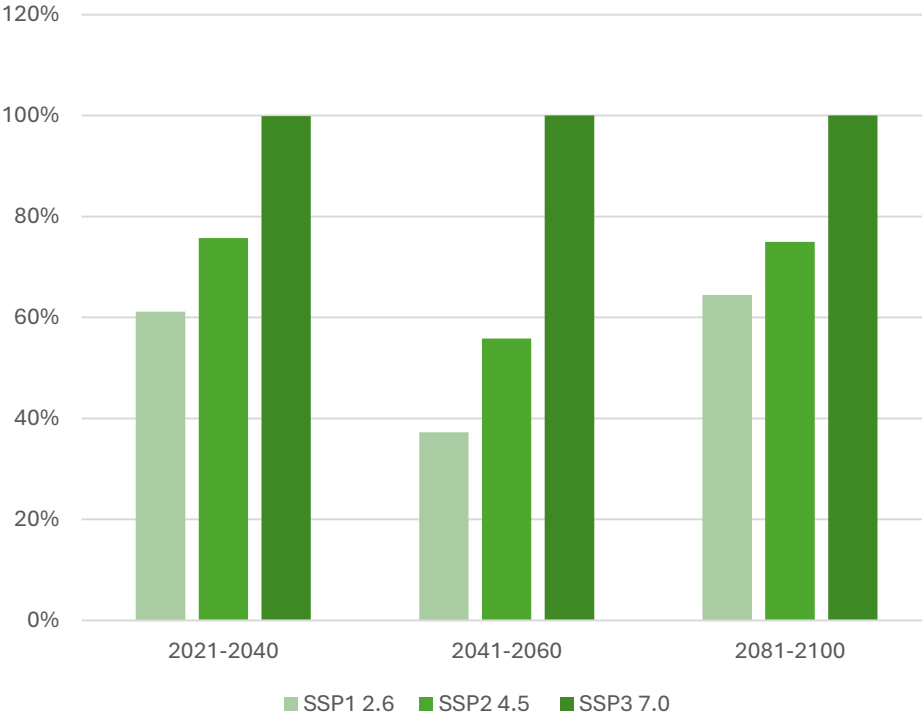
Disclaimer : The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

- The eastern most districts are likely to face slight decrease in monsoon precipitation
- Monsoon precipitation is likely to increase in rest of the districts by up to 100mm by 2040 under worst case scenario.
- The highest increase is likely in the central and south-western districts.
- The southern districts which receives highest rainfall in Bhutan are already flood prone.

Bhutan: Exposure of agricultural areas to change in monsoon precipitation under SSP3, 2041-2060



- Exposure of agricultural lands to high to very high increase in monsoon precipitation increases from 2021 to 2100 across all the scenario.
- **Around 54% and 66% of the total agricultural areas are exposed to high increase in monsoon precipitation by 2040 and 2060 respectively under SSP3 scenario**

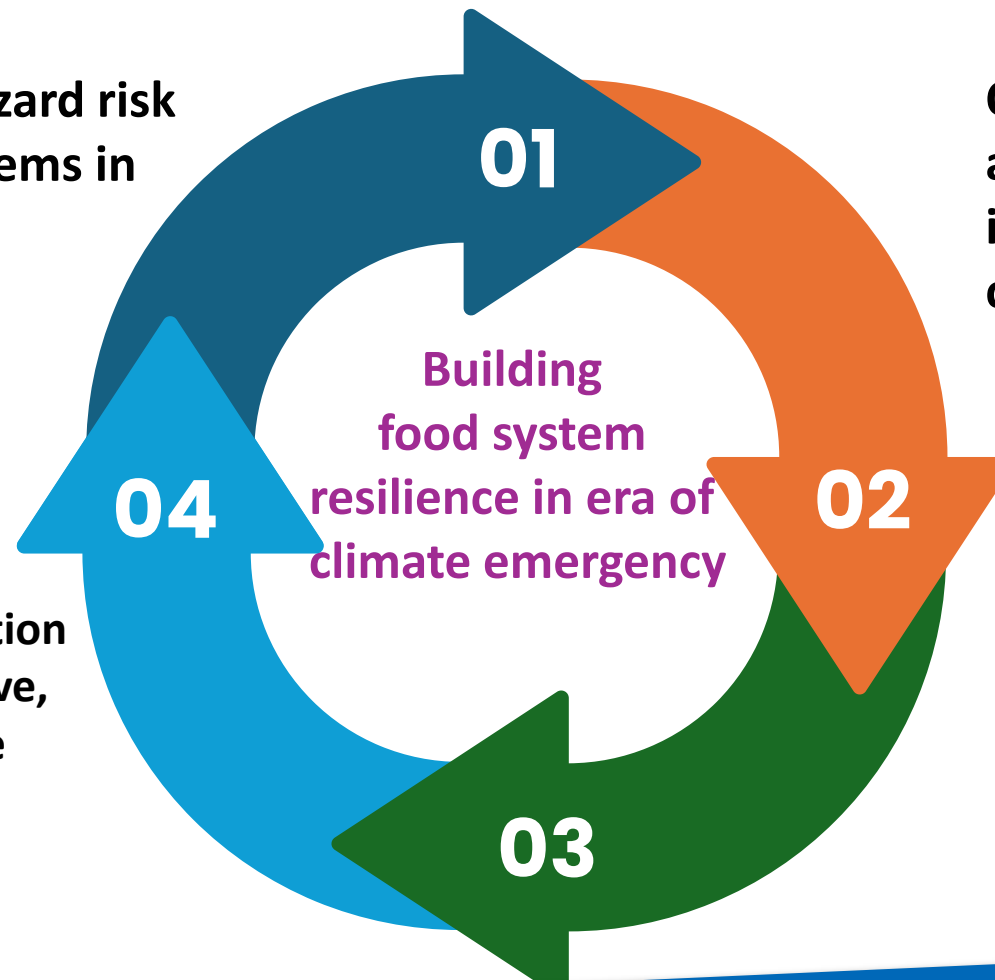


Key takeaways

#4 strategic actions

Understand the multi-hazard risk hotspots of agrifood systems in diverse ecosystems

Capitalize on advances in climate and data science for seamless integration of weather and climate information



Integrate climate risk information to build anticipatory, absorptive, adaptive and transformative capacities

Managing climate risk key to SDG 2/SDG 13 acceleration

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