

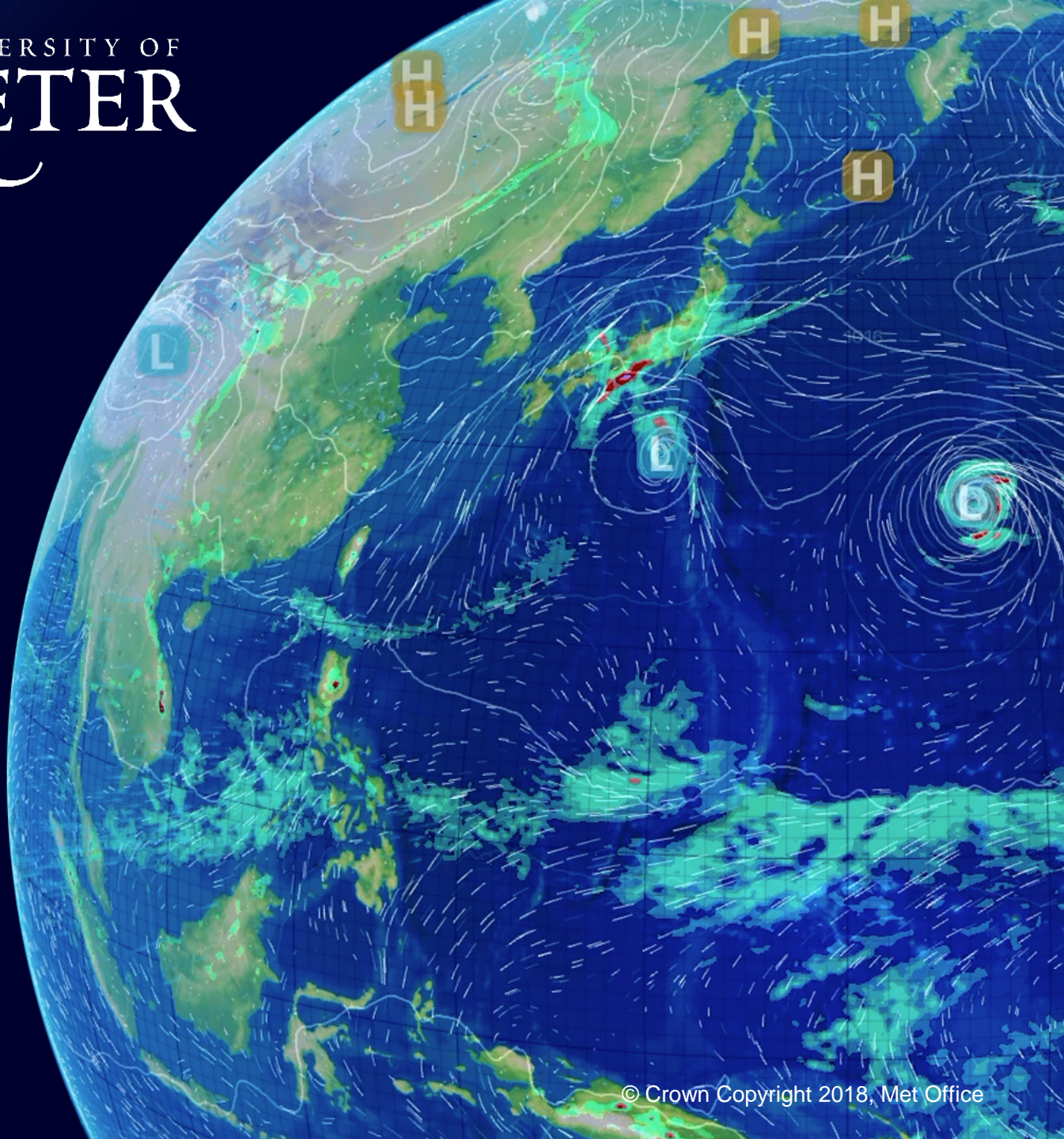
Projected changes in vulnerability to food insecurity at 1.5°C, 2°C and 4°C

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Met Office

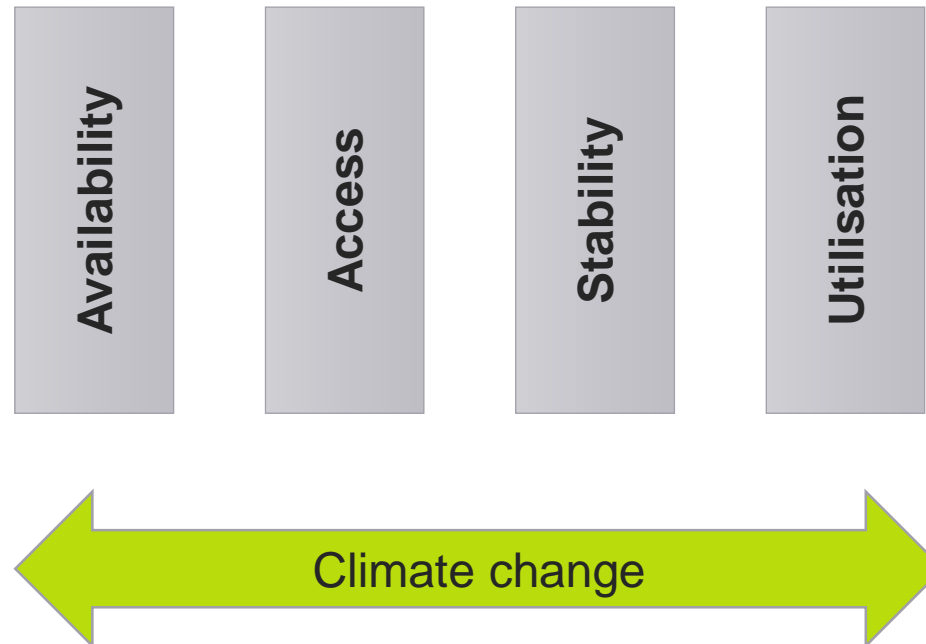
COP24 side event: What if we miss the
target?

12th December 2018



Climate change and food security

Food security analysis

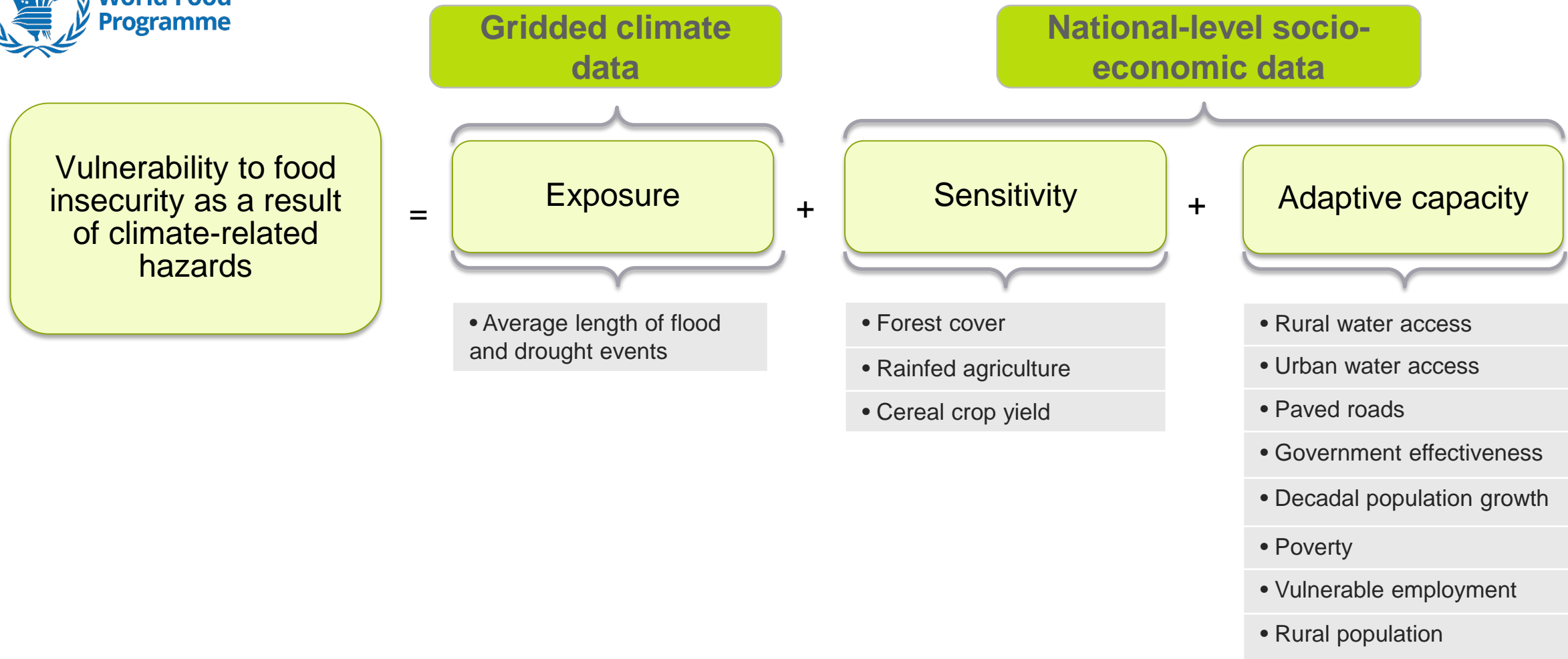


'All aspects of food security are potentially affected by climate change'

IPCC AR5 (Porter *et al.*, 2014)

Hunger and Climate Vulnerability Index (HCVI)

Developed in collaboration with the UN World Food Programme



References:

Krishnamurthy *et al.* (2014)
Richardson *et al.* (2018)

HCVI in the HELIX project



Characterise impacts at
1.5°C, 2°C and 4°C

High resolution climate model
simulations

Vulnerability to food
insecurity

=

Exposure

+

Sensitivity

+

Adaptive capacity

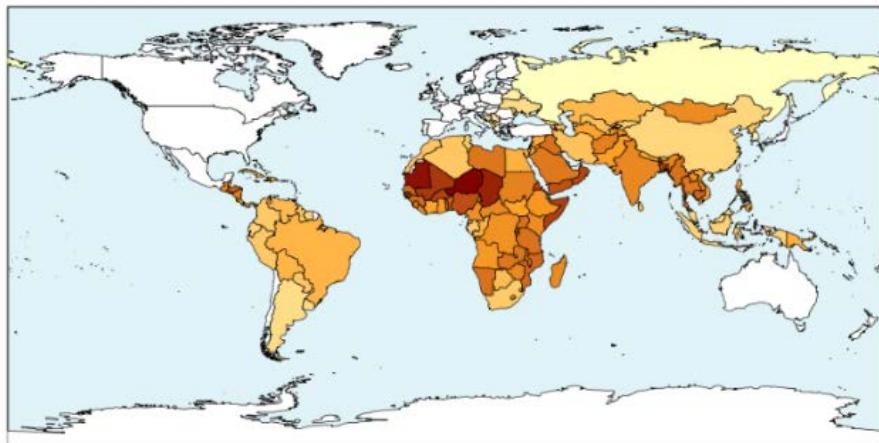
- Flood events
- Drought events

- 4 simulations
- ~60km

- Current climate
- 1.5°C, 2°C, 4°C

HCVI at 1.5°C, 2°C and 4°C

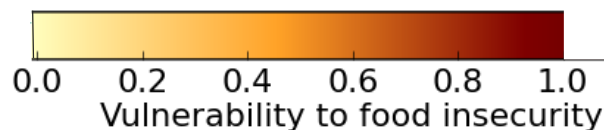
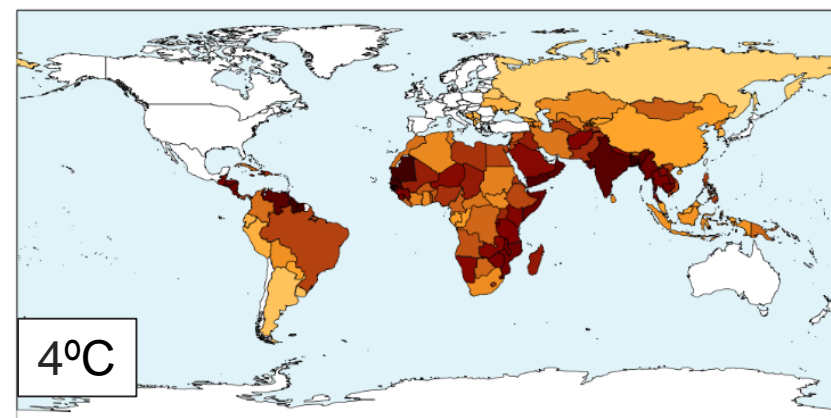
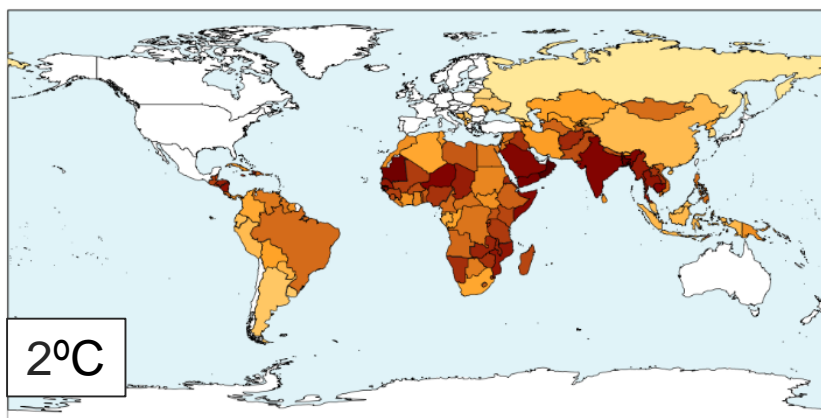
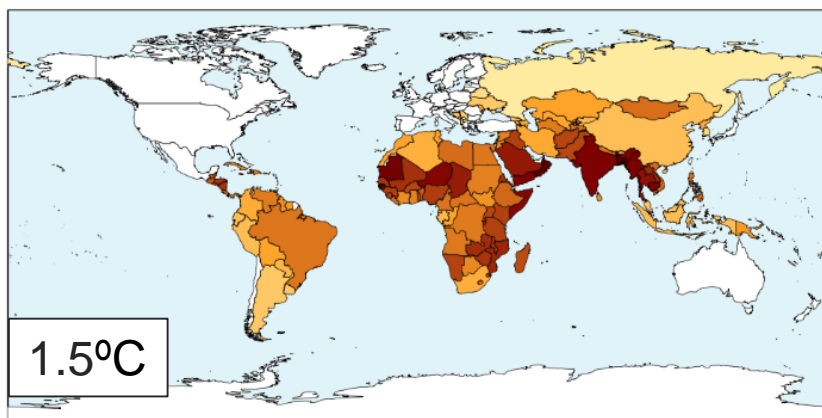
Current climate



Vulnerability to food insecurity increases with global warming

Highest increases are in regions with highest vulnerability in the current climate

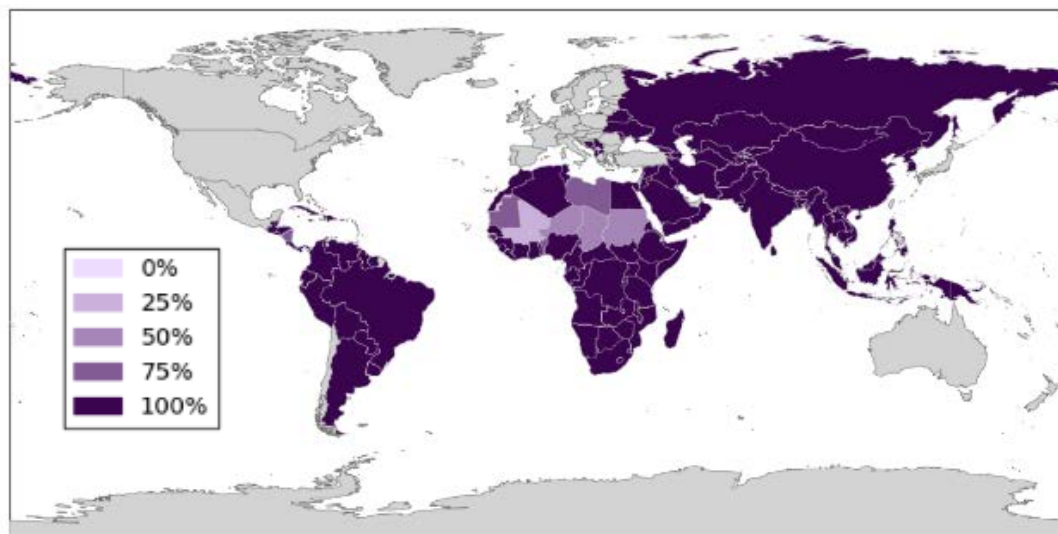
Both adaptation and mitigation are required to improve current levels of food insecurity



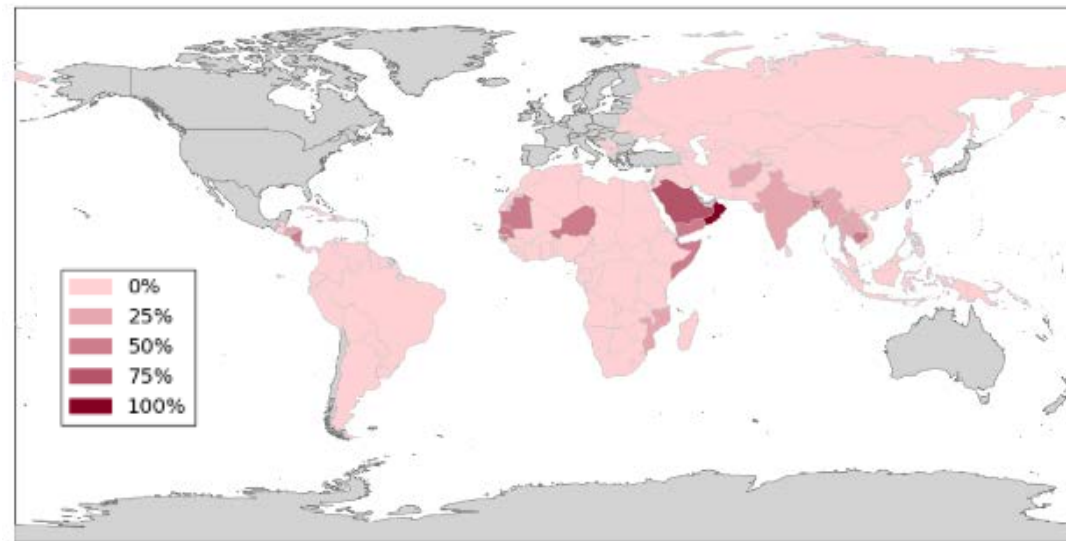
At 2°C of global warming...

Vulnerability to food insecurity increases in most countries compared to the current climate

Vulnerability in some countries reaches unprecedented levels



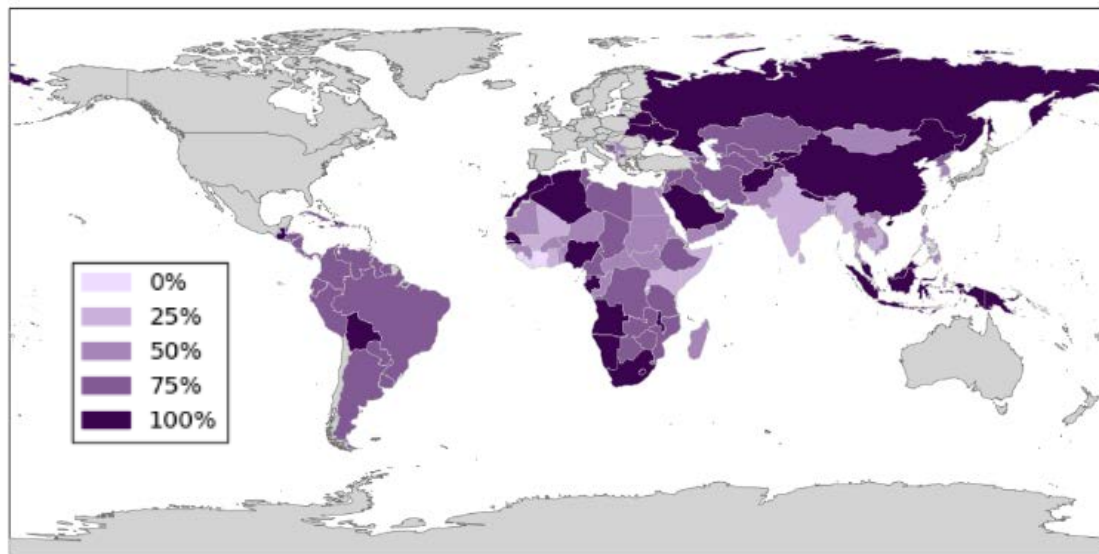
Agreement between simulations on where HCVI is higher at 2°C than the current climate.



Agreement between simulations on where HCVI at 2°C global warming is higher than any current value.

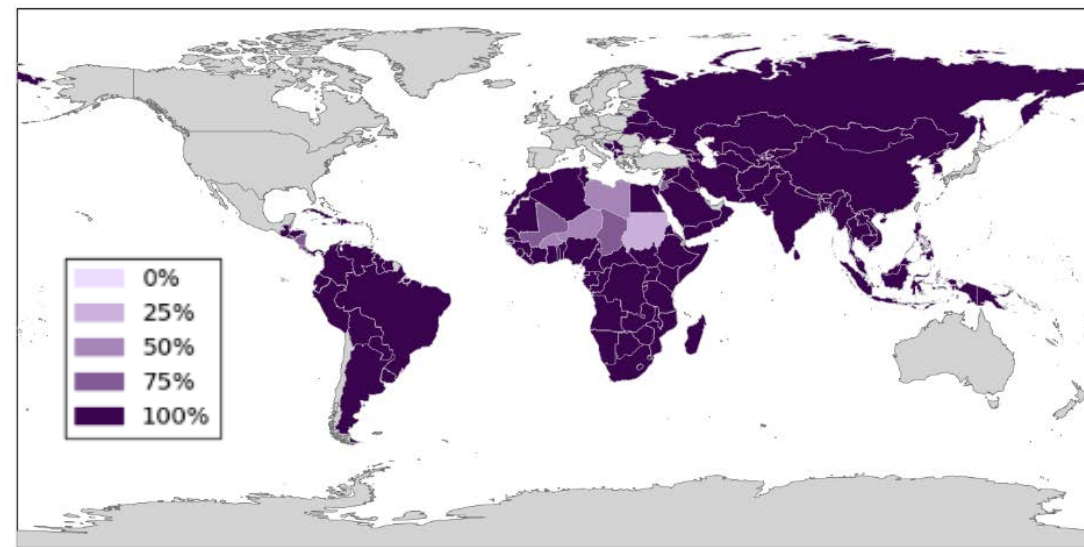
What if we limit global warming to 1.5°C?

Around 2/3rds of countries were calculated as less vulnerable at 1.5°C than 2°C global warming



Agreement between simulations on where HCVI is lower at 1.5°C than 2°C

Most countries are still more vulnerable compared to the current climate

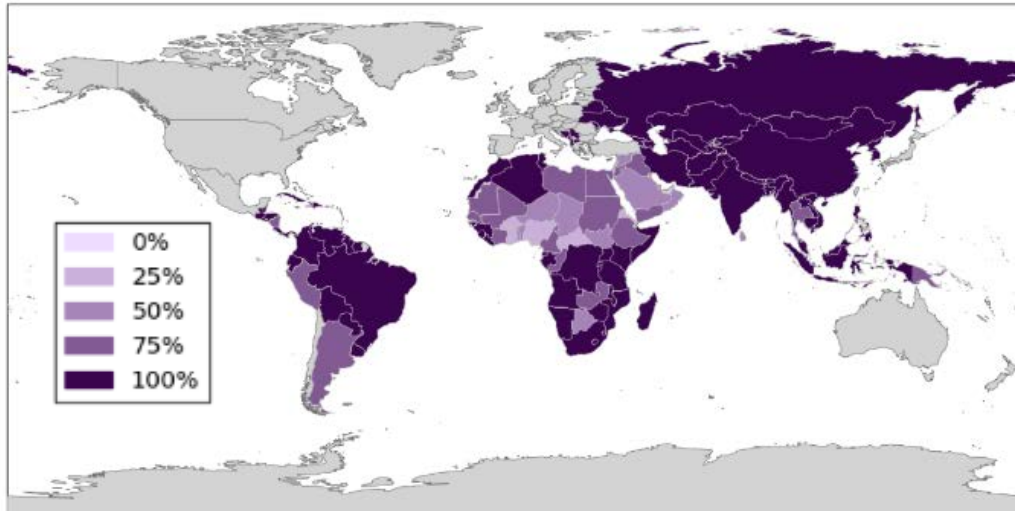


Agreement between simulations on where HCVI is at 1.5°C is greater than in the current climate

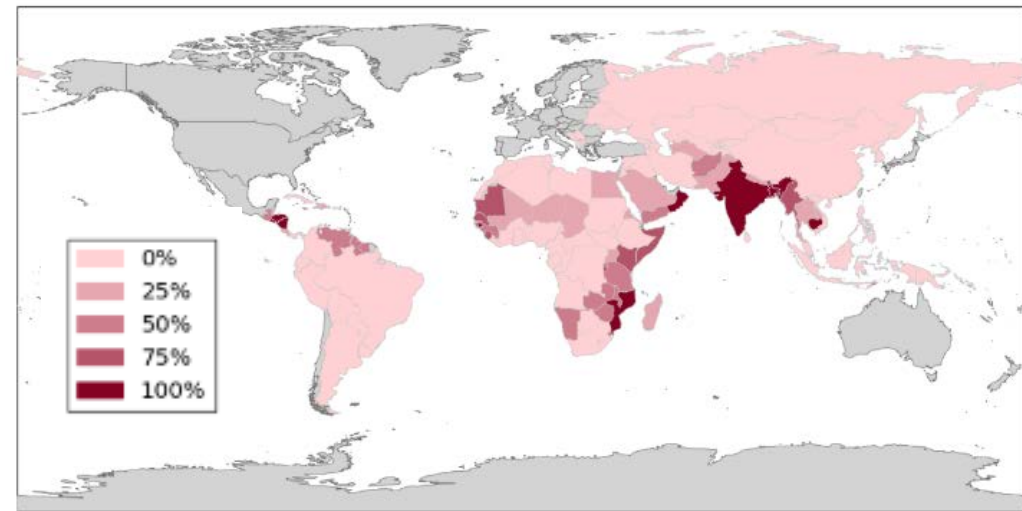
What could happen at 4°C of global warming?

Further increases in vulnerability at 4°C global warming compared to 2°C in most countries.

Unprecedented levels of vulnerability projected in more countries at 4°C global warming



Agreement between simulations on where HCVI is higher at 4°C than 2°C.



Agreement between simulations on where HCVI at 4°C is higher than any country at present day.

Summary

- The HCVI **translates climate model projections into food security outcomes** to inform long-term policy decision-making
- In the absence of adaptation, vulnerability to food insecurity mostly **increases with warming** due to projected changes in flood and drought events
- Some countries are projected to experience **unprecedented levels of vulnerability**
- Increases in vulnerability are **smaller at lower levels of global warming**
- **Both mitigation and adaptation are required** to make gains in tackling food in security