

# Consequences for Sustainable Economic Development



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**ipcc**

INTERGOVERNMENTAL PANEL ON climate change



# Uneven Development and Multidimensional Inequalities



Differences in vulnerability and exposure arise from non-climatic factors and from multidimensional inequalities often produced by uneven development processes.

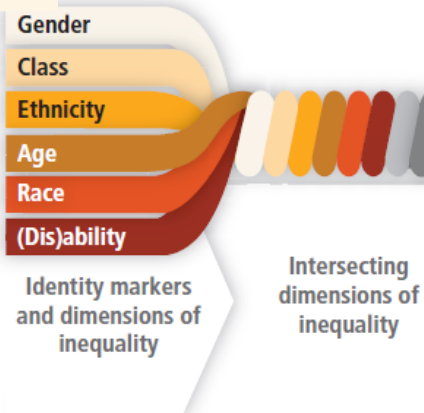
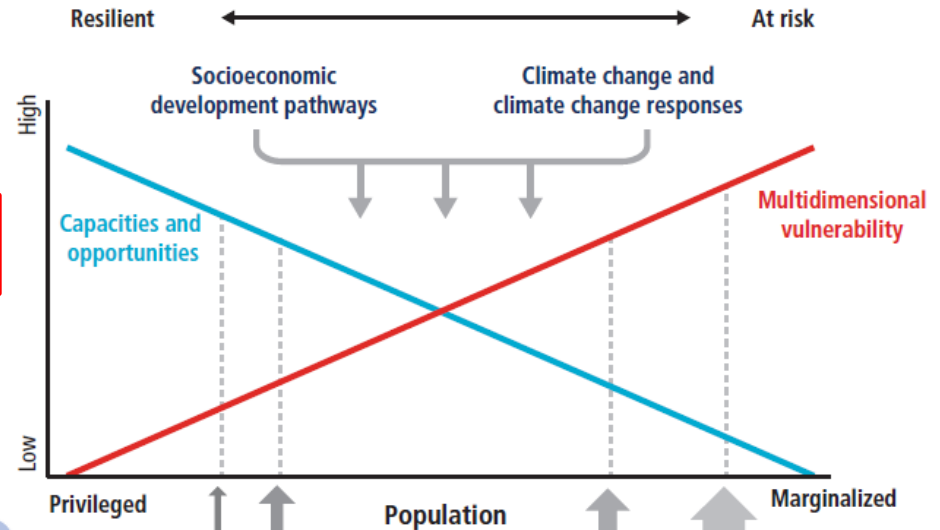
These differences shape differential risks from climate change.

People who are socially, economically, culturally, politically, institutionally or otherwise marginalized are especially vulnerable to climate change and also to some adaptation & mitigation responses.

# Inequalities

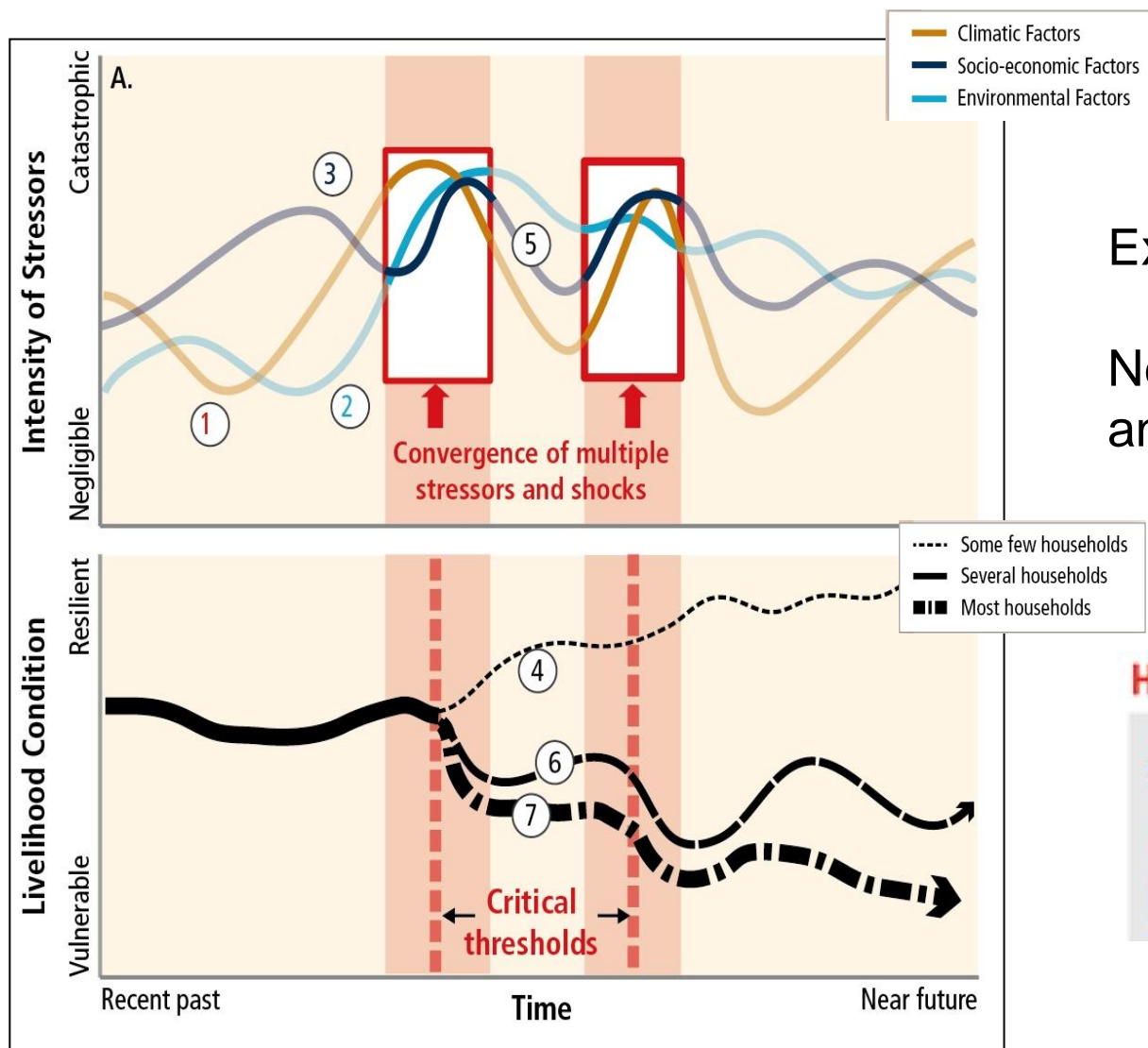


Inequalities



- Multidimensional vulnerability**
- Producing some privileged and resilient people with very little or no multidimensional vulnerability
  - Producing many marginalized and at risk people, with fewer capacities and opportunities, and higher multidimensional vulnerability
  - Many people in between

# Impacts of Climate-Related Hazards



Exacerbate other stressors

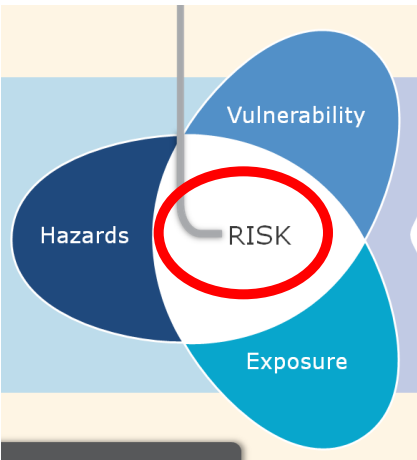
Negative impacts for people and livelihoods

Human and managed systems



WGII, Fig 13.3

# Future Risks



Climate change will amplify existing risks and create new risks for natural and human systems.

Risks are unevenly distributed and are generally greater for disadvantaged people and communities in countries at all levels of development.

Increasing magnitudes of warming increase the likelihood of severe, pervasive, and irreversible impacts for people, species and ecosystems.

# Representative key risks for each region for

**Physical Systems**

- Glaciers, snow, ice, and/or permafrost
- Rivers, lakes, floods, and/or drought
- Coastal erosion and/or sea level effects

**Biological Systems**

- Terrestrial ecosystems
- Wildfire
- Marine ecosystems

**Human & Managed Systems**

- Food production
- Livelihoods, health, and/or economics

## Polar Regions (Arctic and Antarctic)

Risks for health and well-being

## North America

Heat-related human mortality

## Europe

Increased damages from extreme heat events and wildfires

## Asia

Increased flood damage to infrastructure, livelihoods, and settlements

## Small islands

Loss of livelihoods, settlements, infrastructure, ecosystem services, and economic stability

## Africa

Reduced crop productivity and livelihood and food security

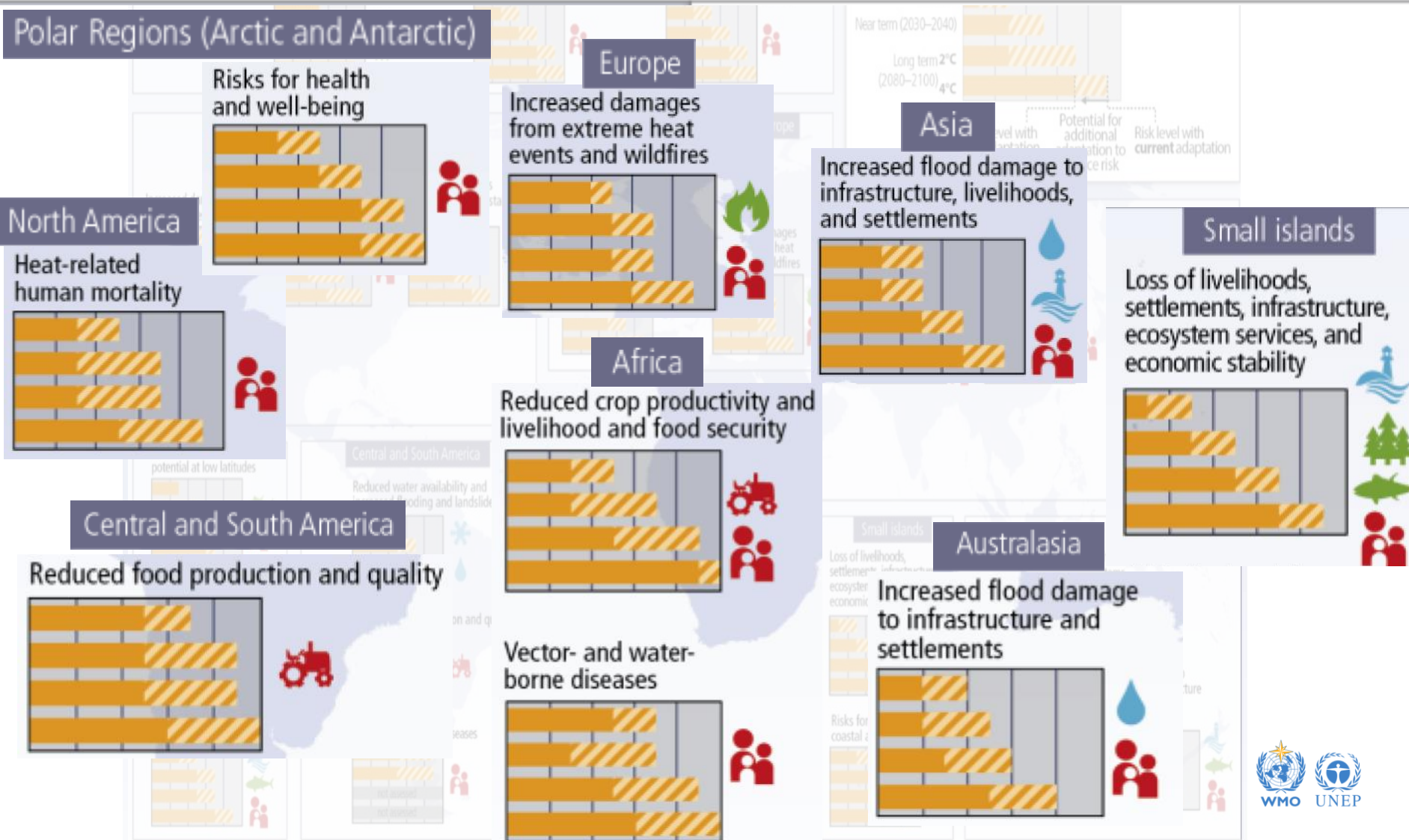
## Australasia

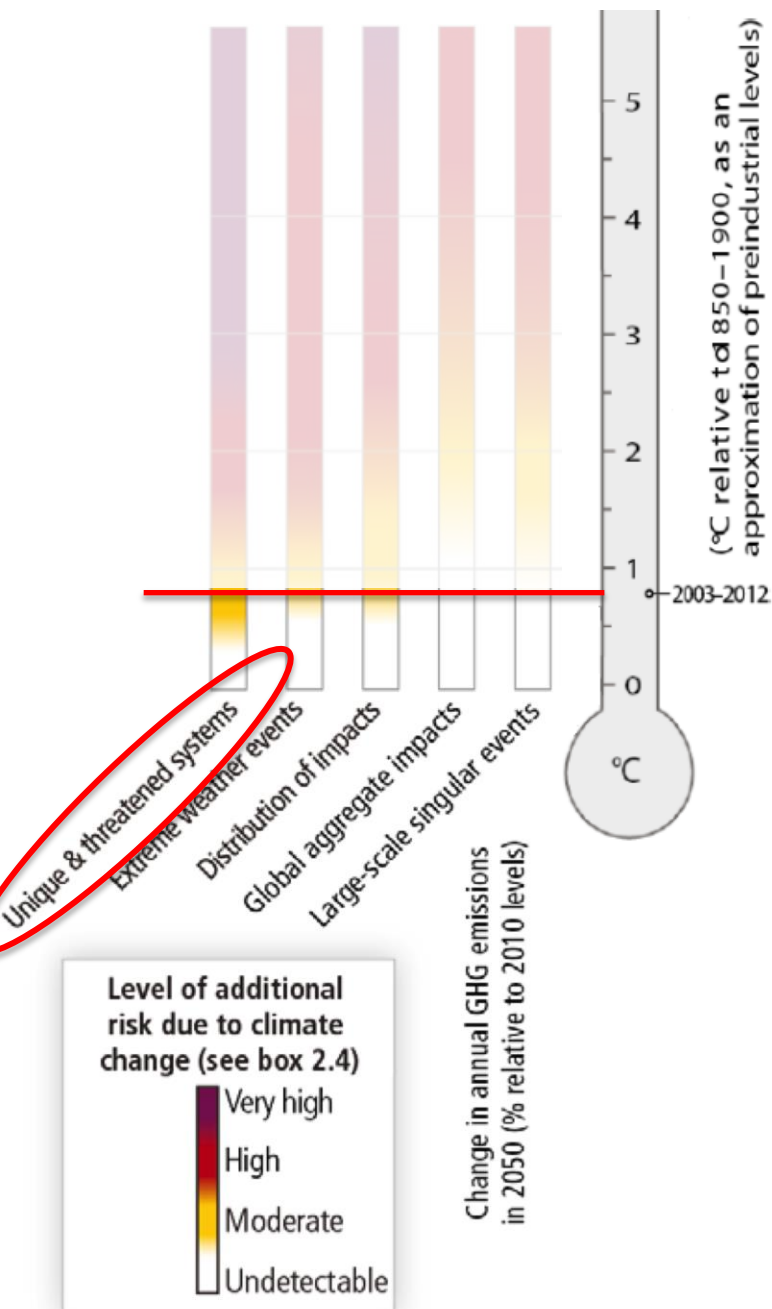
Increased flood damage to infrastructure and settlements

## Central and South America

Reduced food production and quality

Vector- and water-borne diseases





# Reasons for Concern

Indigenous and other unique communities/social systems:

Arctic communities + N Europe:

Livelihoods of indigenous peoples (e.g Inuit, Sámi)

Increased shipping traffic (Bering Street)

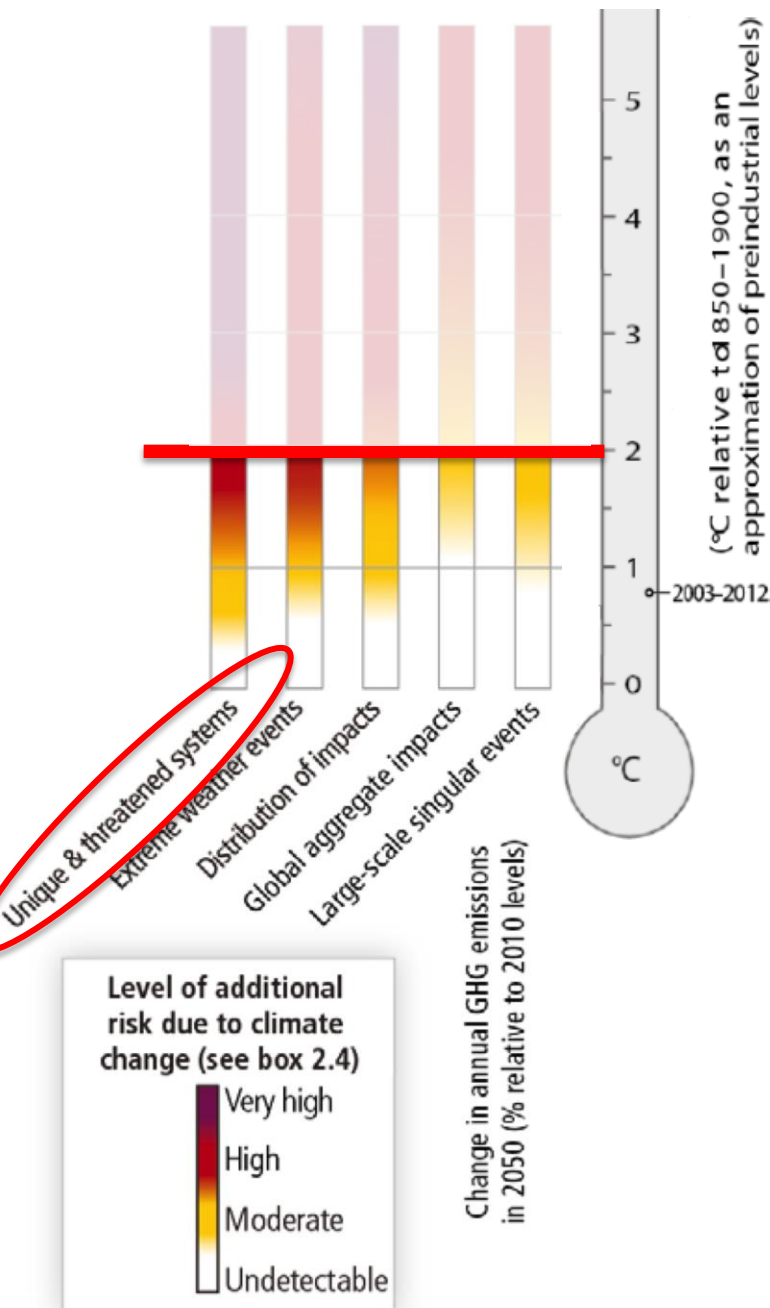
High mountain communities:

Declining livelihood trajectories (Aymara)

# Reasons for Concern

## Indigenous and other unique communities/social systems:

Loss of land, cultural and natural heritage disrupting cultural practices embedded in livelihoods

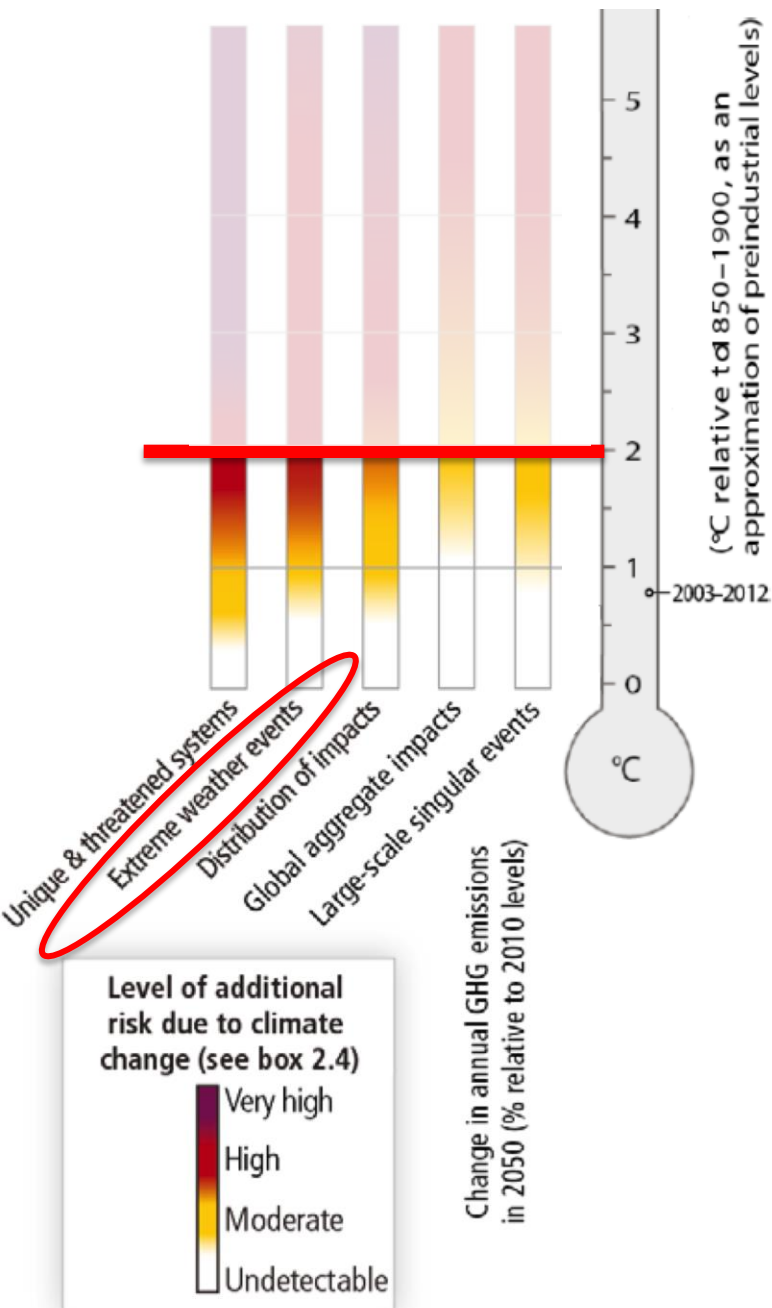


	Very low	Medium	Very high
Present	[Bar chart showing risk level for Present]		
Near term (2030 – 2040)	[Bar chart showing risk level for Near term]		
Long term 2°C (2080 – 2100)	[Bar chart showing risk level for Long term 2°C]		
	[Bar chart showing risk level for Long term 4°C]		

WGII, Fig 12.1



# Reasons for Concern



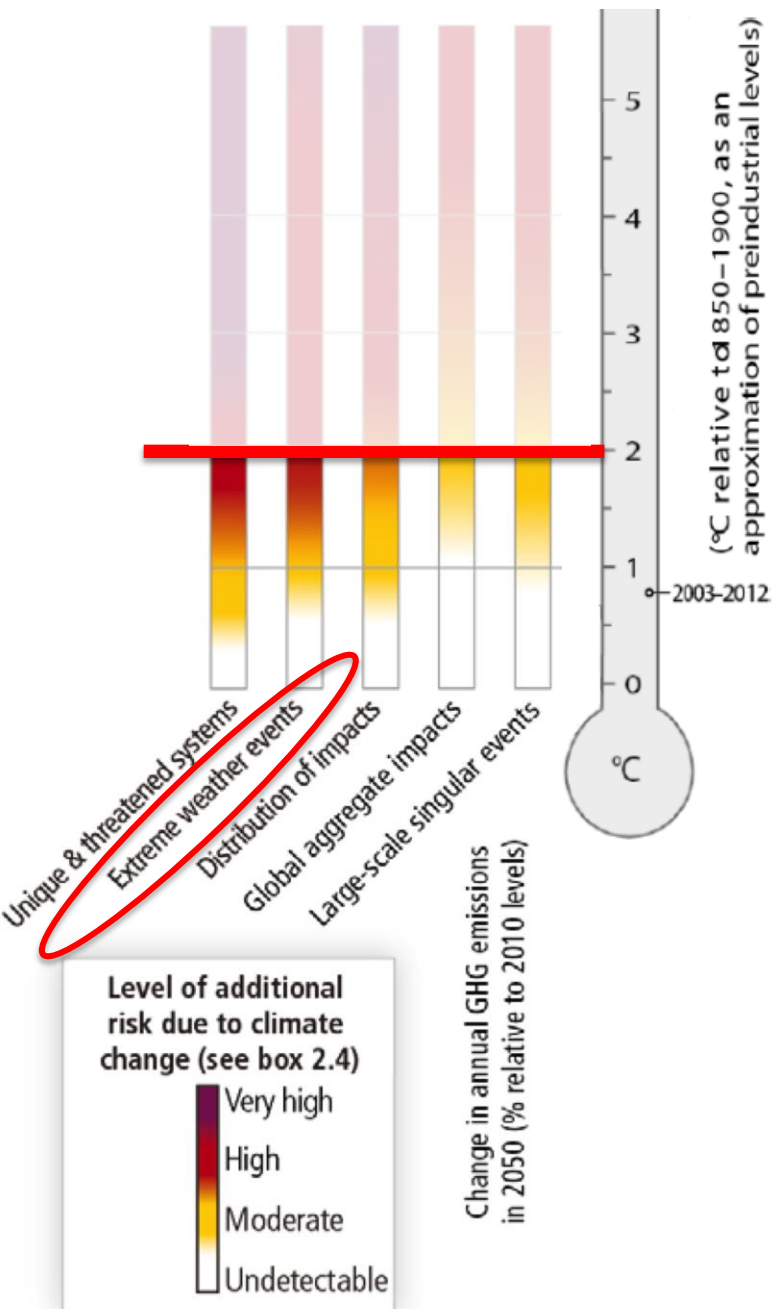
Megacities – urban heat island effect, air pollution, and differential vulnerabilities

Urban housing and human health

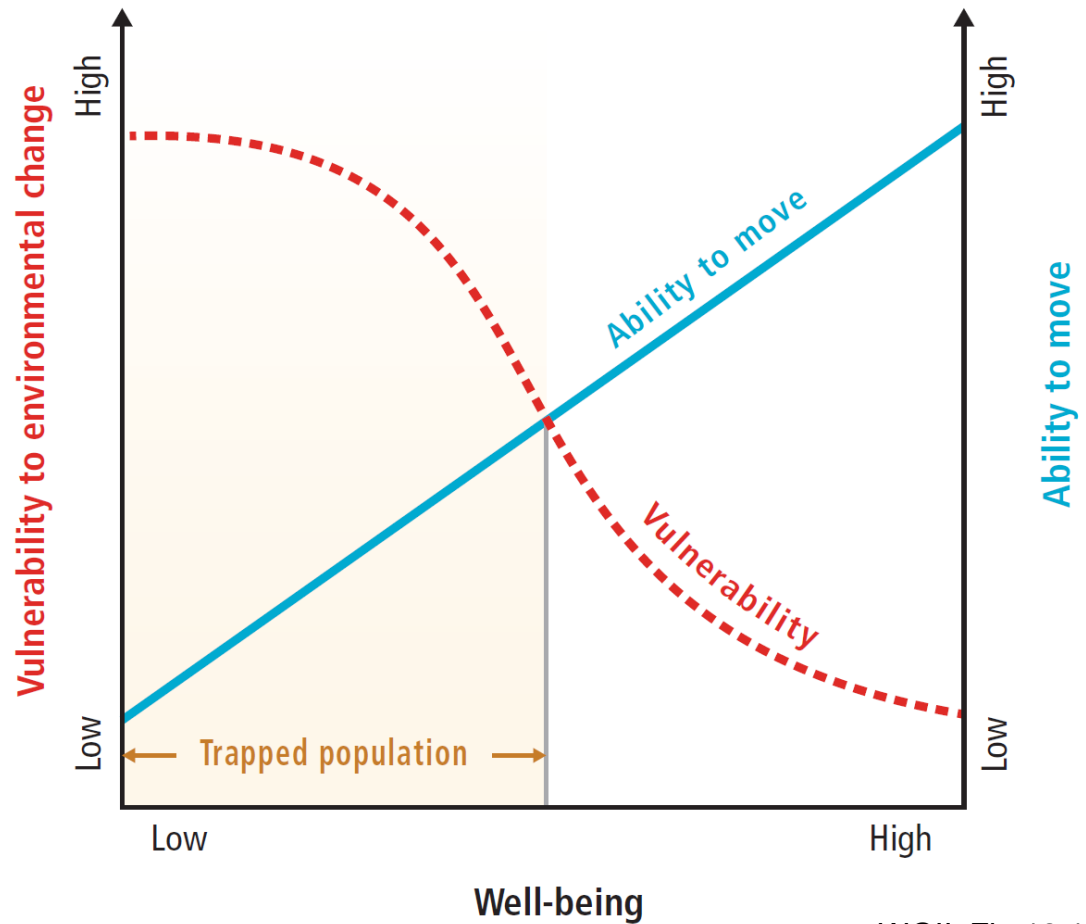
Displacement and permanent migration

Livelihood struggles and conflict in resource-dependent livelihoods (agriculture, pastoralism)

High livelihood vs monetary damage

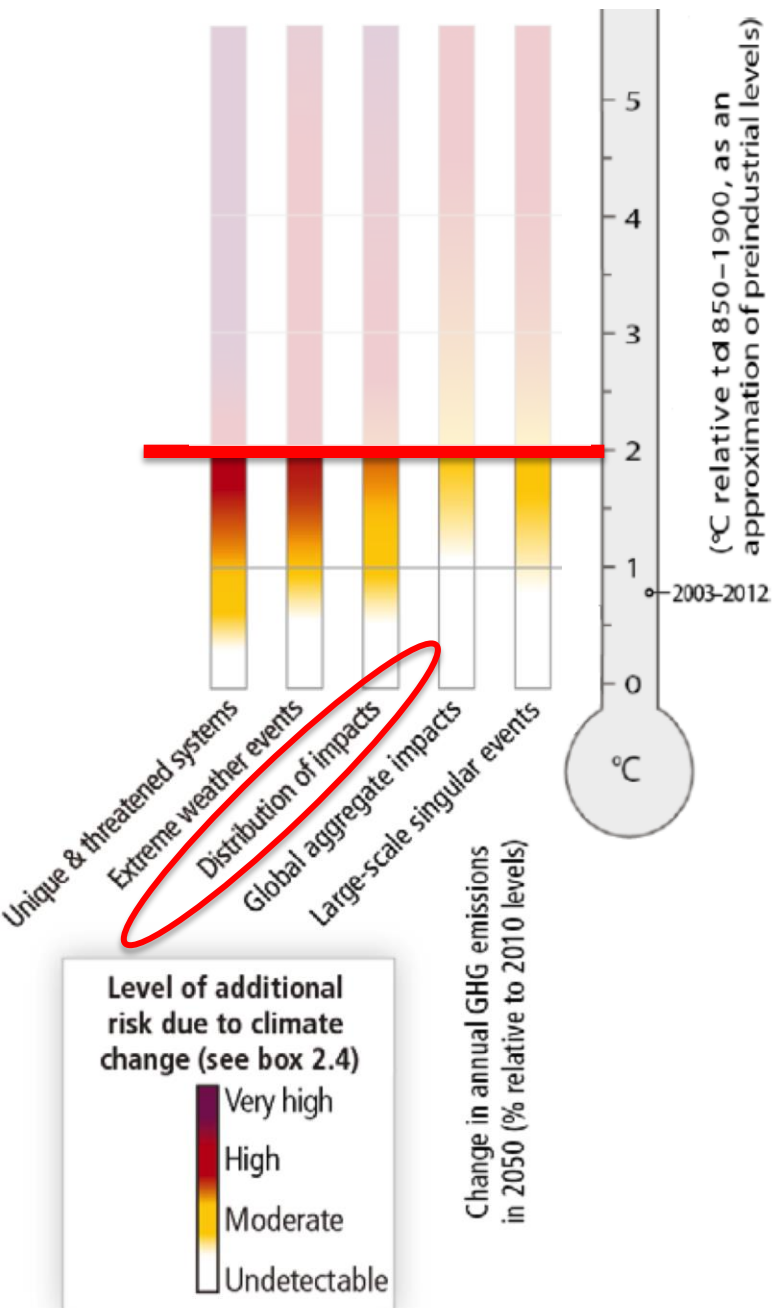


# Reasons for Concern



WGII, Fig 12.1

# Reasons for Concern



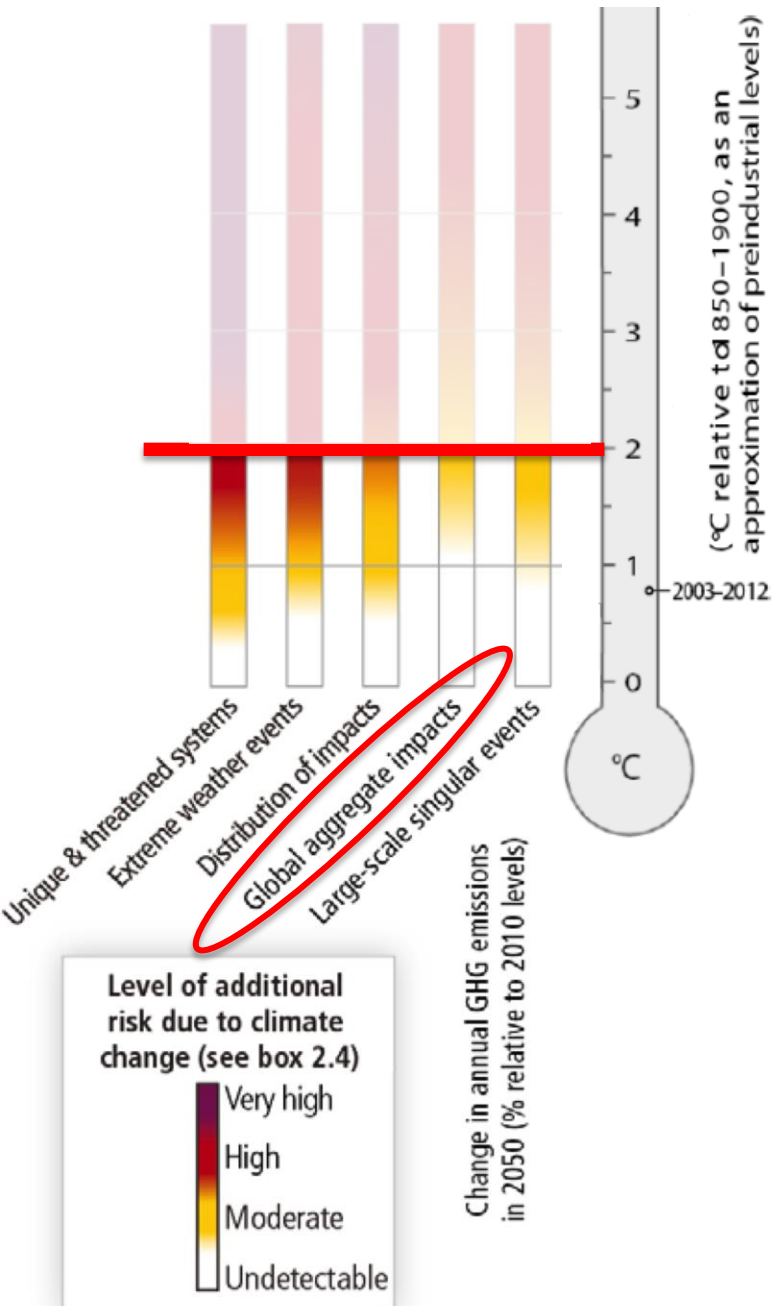
Increasingly unevenly distributed risks

- low-latitudes, low-income countries
- crop yields, water availability
- inequalities

Shifts from transient to chronic poverty (social marginalization & food insecurity)

Elderly, children, the socially marginalized, and outdoor workers disproportionately at risk from heat stress

# Reasons for Concern



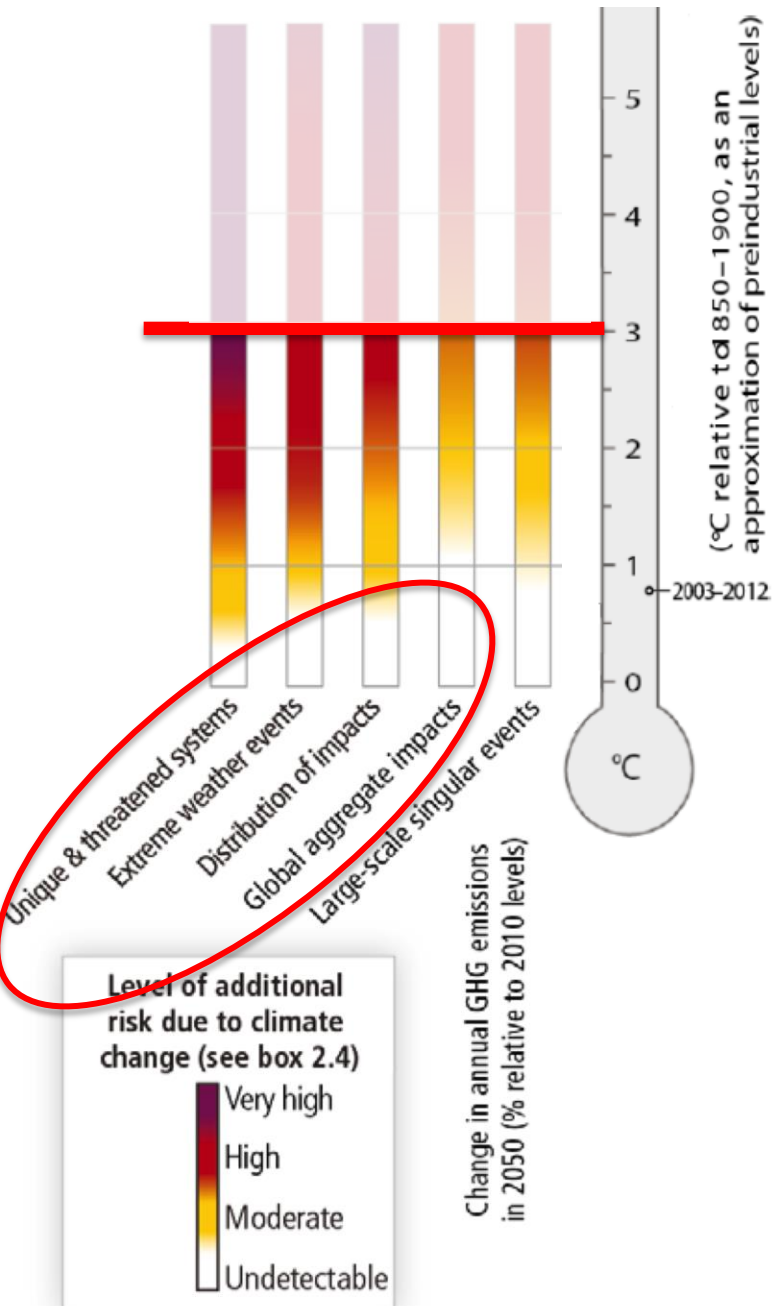
Aggregate economic damages moderate up to 2-2.5°C warming (~0.2-2% of income), but accelerate with increasing temperature

Aggregate economic damages (esp. GDP) mask impacts across sectors, regions, poor

Asset losses can tip livelihoods of the poor

Current evaluations incomplete

# Reasons for Concern

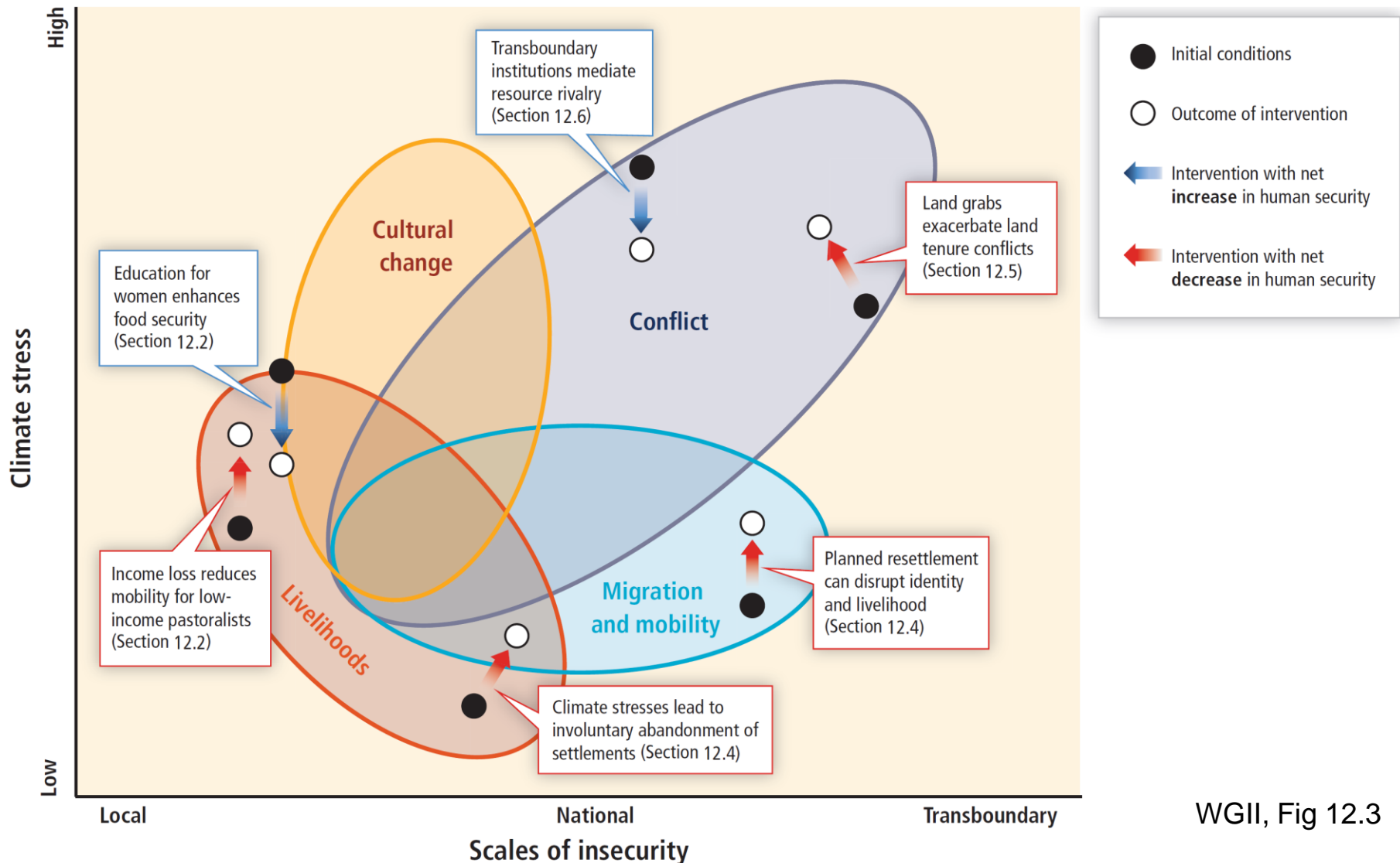


Limits to adaptation for urban water supply systems, heat-sensitive people, productivity, food security, and cultural identity (loss)

Declining adaption potential for conflict over land acquisition (M) and displacement

Few estimates of economic costs of  $\geq 3^{\circ}\text{C}$

# Interactions at Multiple Levels



WGII, Fig 12.3

# The Long-Term Goal and Sustainable Development

- Climate change is a threat to equitable and sustainable development
- Averages and aggregates mask disproportional impacts and risks
- Critical thresholds for communities and society NOT from a global average
- Critical thresholds of climate stressors in combination with other stressors – exacerbate livelihood struggles, especially among disadvantaged people
- Yardstick: transition from acceptable to unacceptable at the local level
- Limiting the effects of climate change is necessary to achieve sustainable development and equity, including eradication of poverty

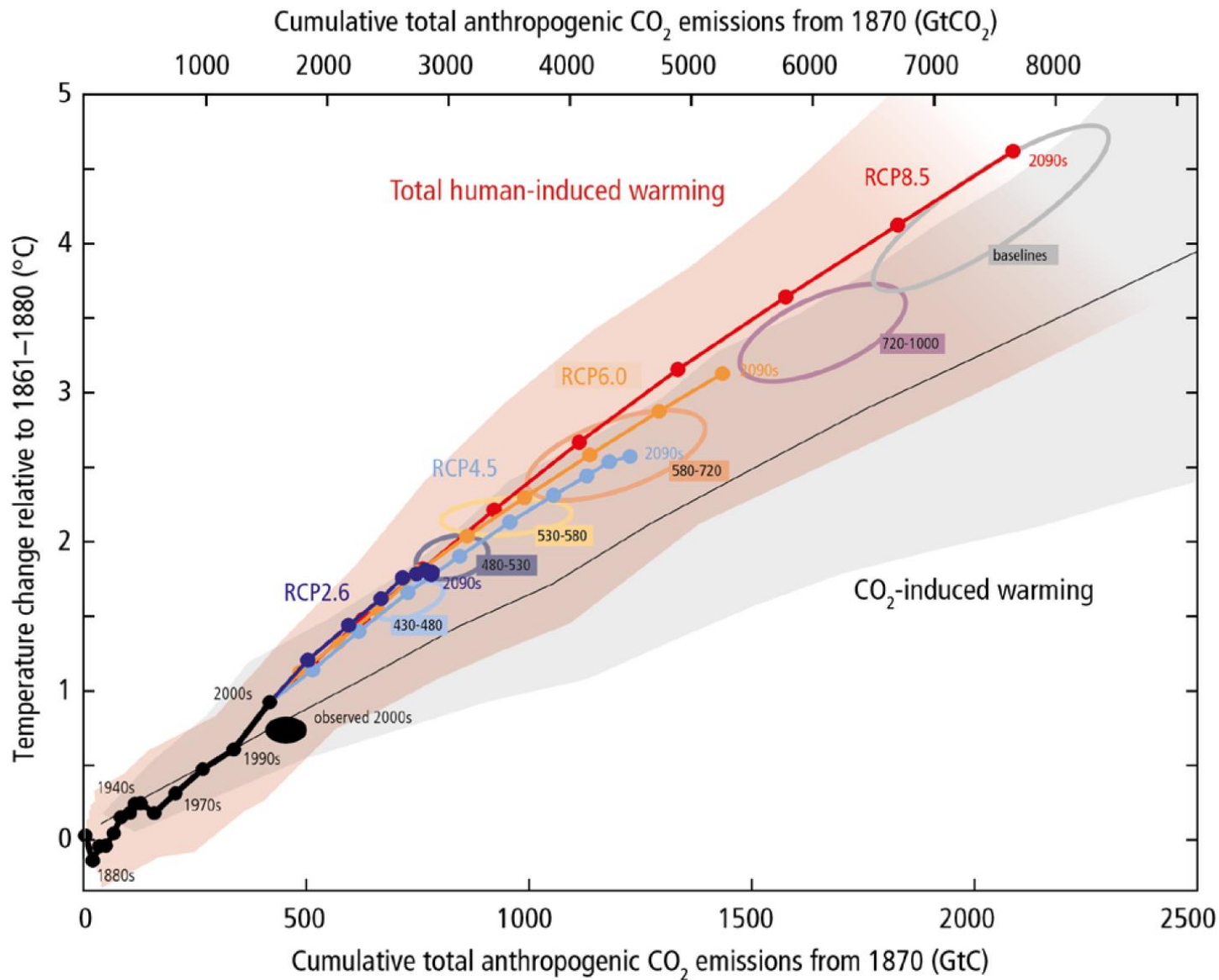
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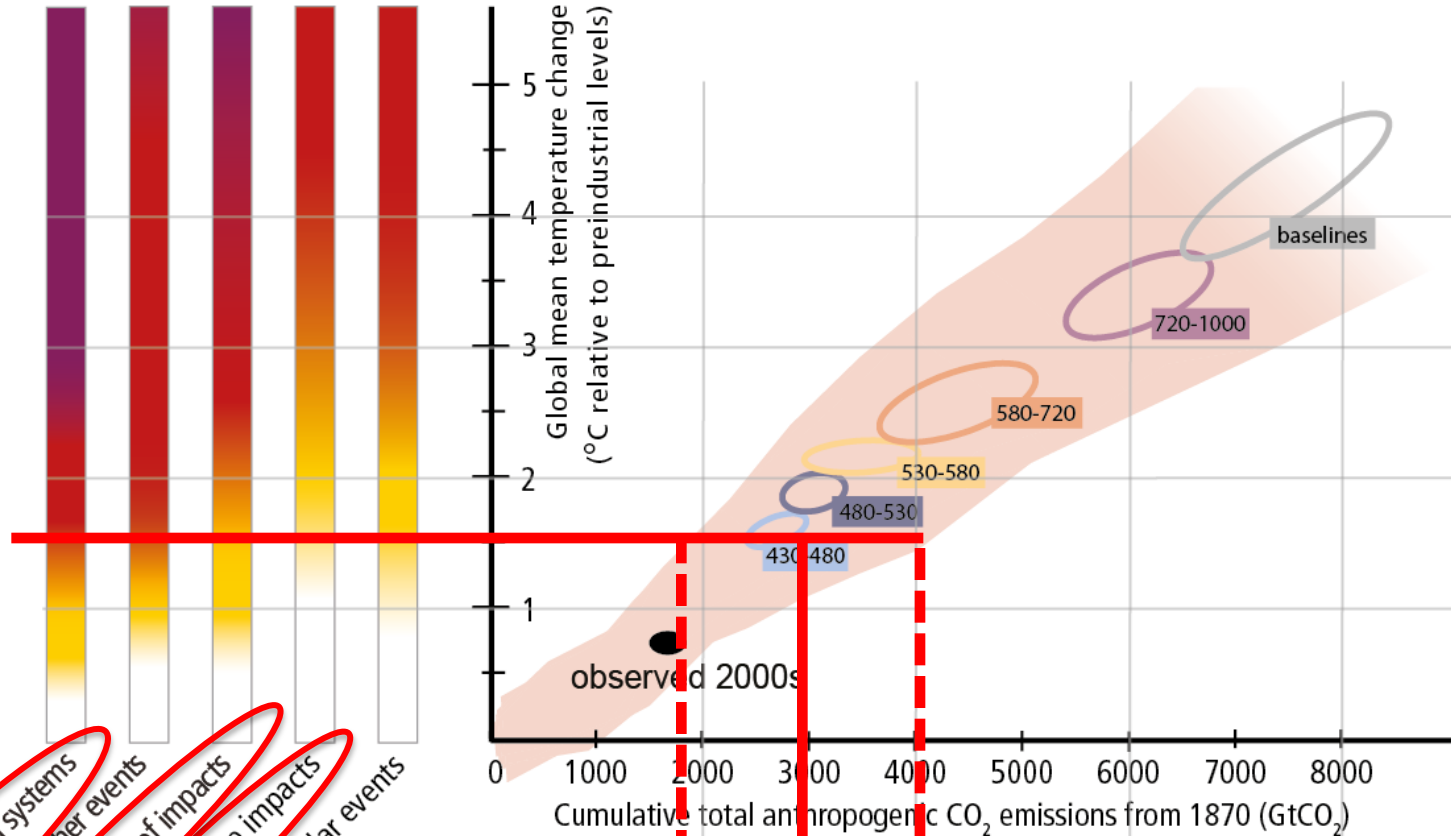
# Climate-Resilient Development Pathways

- Current global development pathways contribute to climate risk/vulnerability
- Reducing vulnerability = prerequisite for adaptation, sustainable development
- Adaptation and mitigation while improving livelihoods, well-being, and equity
- Consideration of co-benefits, adverse side-effects, and risks from mitigation and adaptation options, even if difficult to quantify (no “silver bullet”)
- Countries’ visions for transformation and sustainable development
- Sustainable development and equity – basis for climate policies.



**Global mean surface temperature increase, RCPs and total anthropogenic warming, by 2100**

# Development, RCPs and global mean temperature (2100), and emission reductions (2050)



Unique & threatened systems  
 Extreme weather events  
 Distribution of impacts  
 Global aggregate impacts  
 Large-scale singular events

