



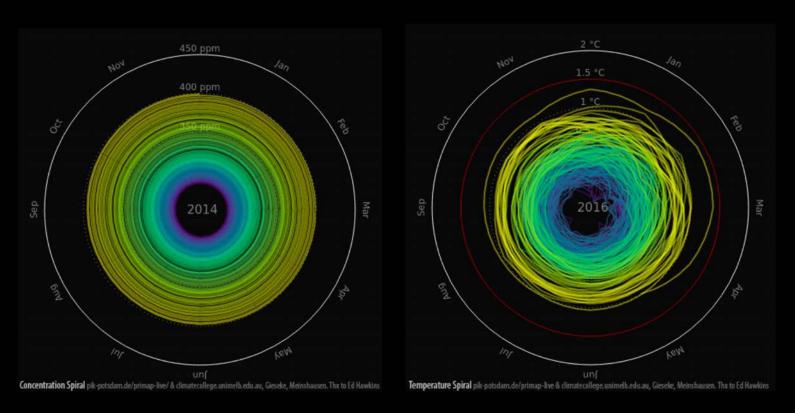
# Impacts, Adaptation and Vulnerability

# ... and the Loss and Damage Issue

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Based on a presentation by the co-Chairs of IPCC Working Group II
Event on Loss and Damage at the Belgian Federal Parliament, Brussels, 24 October 2022
Organised by CNCD-11.11.11, Oxfam, & 11.11.11

## CO<sub>2</sub> Concentration and Temperature spirals



CO<sub>2</sub> Concentration since 1850 and Global Mean Temperature in °C relative to 1850 – 1900 Graph: Ed Hawkins (Climate Lab Book) – Data: HadCRUT4 global temperature dataset Animation available on <a href="http://openclimatedata.net/climate-spirals/concentration-temperature/">http://openclimatedata.net/climate-spirals/concentration-temperature/</a>

Progression of Understanding: Greater and Greater Certainty in **Attribution** 

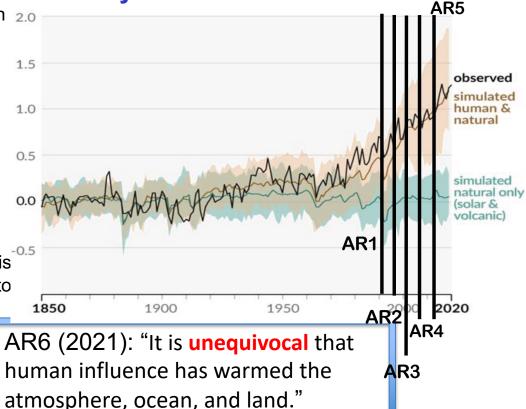
AR1 (1990): "unequivocal detection not likely for a decade"

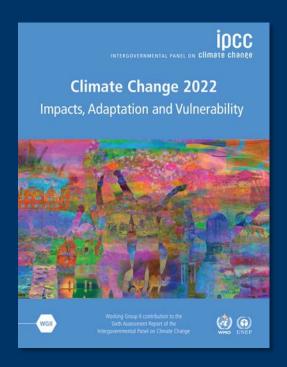
AR2 (1995): "balance of evidence suggests discernible human influence"

AR3 (2001): "most of the warming of the past 50 years is **likely** (odds 2 out of 3) due to human activities"

AR4 (2007): "most of the warming is very likely (odds 9 out of 10) due to greenhouse gases"

AR5 (2013) «It is **extremely likely** (odds 95 out of 100) that human influence has been the dominant cause... »







The scientific evidence is unequivocal: climate change is a threat to human wellbeing and the health of the planet.

> Any further delay in concerted global action will miss the brief, rapidly closing window to secure a liveable future.

> This report offers solutions to the world.







has caused dangerous and widespread disruption in nature...











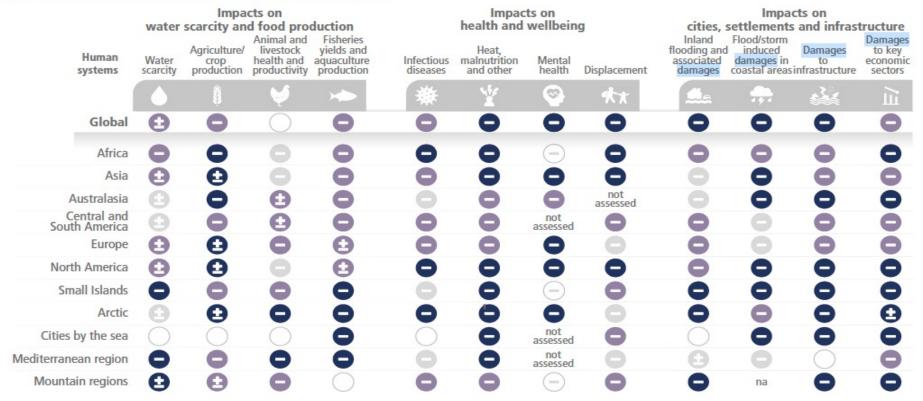
Some development and adaptation efforts have reduced vulnerability.

Across sectors and regions the most vulnerable people and systems are observed to be disproportionately affected.





#### (b) Observed impacts of climate change on human systems







#### Confidence in attribution to climate change

- High or very high
- Medium
- Low
- Evidence limited, insufficient
- na Not applicable

#### Impacts to human systems in panel (b)

- Increasing adverse impacts
- Increasing adverse and positive impacts





# **Future global climate risks**



**Heat stress** 

Exposure to heat waves will continue to increase with additional warming.



**Water scarcity** 

At 2°C, regions relying on snowmelt could experience 20% decline in water availability for agriculture after 2050.



**Food security** 

Climate change will increasingly undermine food security.



Flood risk

About a billion people in low-lying cities by the sea and on Small Islands at risk from sea level rise by midcentury.

# John Holdren, then President of the American Association for the Advancement of Science

- 'We basically have three choices mitigation, adaptation, and suffering.
- We're going to do some of each. The question is what the mix is going to be.
- The more mitigation we do, the less adaptation will be required, and the less suffering there will be.'

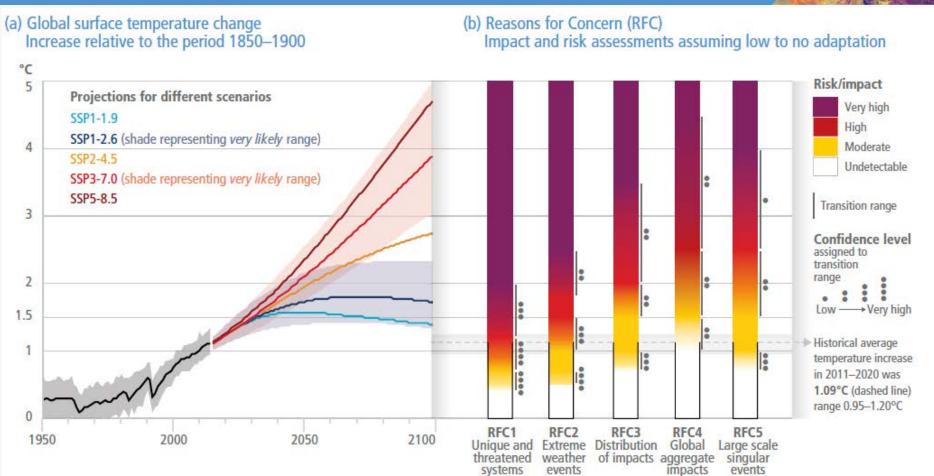
#### **IPCC AR6 WGII Glossary:**

Research has taken Loss and Damage (capitalised letters) to refer to political debate under the United Nations Framework Convention on Climate Change (UNFCCC) following the establishment of the Warsaw Mechanism on Loss and Damage in 2013, which is to 'address loss and damage associated with impacts of climate change, including extreme events and slow onset events, in developing countries that are particularly vulnerable to the adverse effects of climate change.'

Lowercase letters (losses and damages) have been taken to **refer broadly to harm from (observed) impacts and (projected) risks and can be economic or non-economic**.









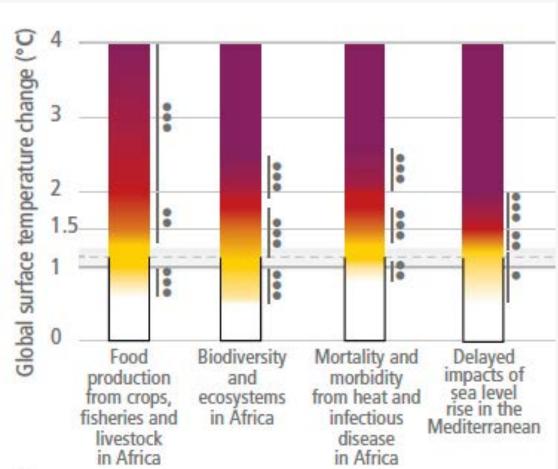


# Risks for Africa (at least medium confidence)(AR6 WG2 SPM):

- Species extinction and reduction or irreversible loss of ecosystems and their services, including freshwater, land and ocean ecosystems
- Risk to food security, risk of malnutrition (micronutrient deficiency), and loss of livelihood due to reduced food production from crops, livestock and fisheries
- Risks to marine ecosystem health and to livelihoods in coastal communities
- Increased human mortality and morbidity due to increased heat and infectious diseases (including vector-borne and diarrhoeal diseases)
- Reduced economic output and growth, and increased inequality and poverty rates
- Increased risk to water and energy security due to drought and heat





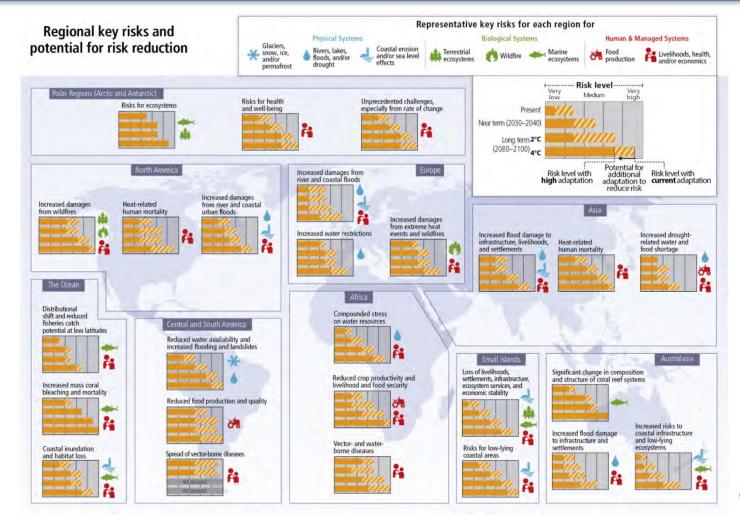






# There are limits to adaptation

- Even effective adaptation cannot prevent all losses and damages
- Above 1.5°C some natural solutions may no longer work.
- Above 1.5°C, lack of fresh water could mean that people living on small islands and those dependent on glaciers and snowmelt can no longer adapt.
- By 2°C it will be challenging to farm multiple staple crops in many current growing areas.

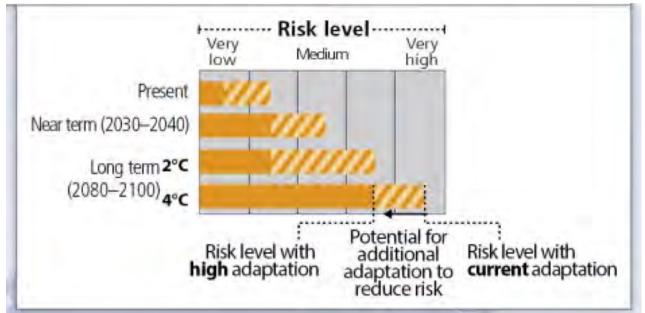




AR5 WG2: Regional key risks and potential for risk reduction

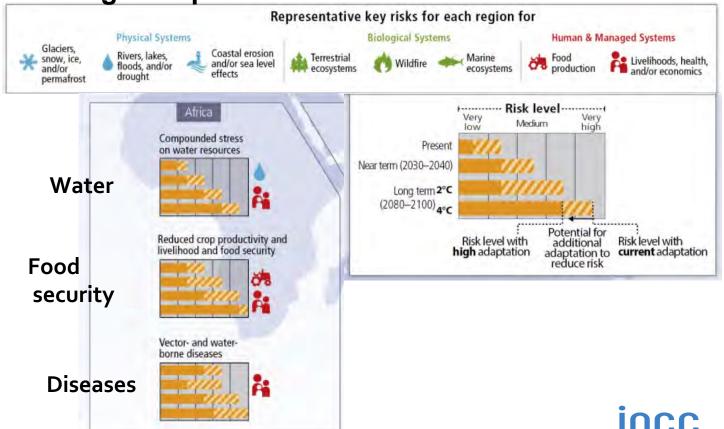
through adaptation







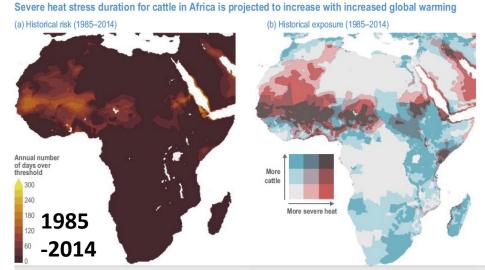
Regional key risks and risk reduction through adaptation: Africa

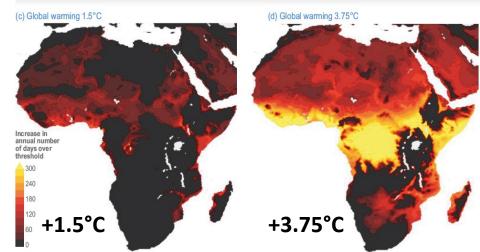






### Duration of heat stress for cattle (days)





AR6 WG2 Fig 9.24 p. 1355







There is evidence that, without strong risk management and adaptation, losses and damages will continue to affect the poorest vulnerable populations, potentially creating poverty traps (high confidence)

Research has started to develop global inventories on losses and damages, including on intangible effects, and engaged with the practice community for data collection. (...) Yet, systematic risk assessments of climate-related losses and damages including adaptation limits have remained scarce (high confidence).

# Cross-Chapter Box on Loss and Damage (AR6 WG2 p. 2563)

Thus, many vulnerable countries lack comprehensive data at scale of risk management including on economic (e.g., loss of livelihood assets and infrastructure) and non-economic losses and damages (e.g., culture, health, biodiversity), thus hampering effective risk management.

While early warning and other risk reduction options as well as risk retention considerations are being discussed, L&D dialogue has strongly focused on risk finance for residual risks, particularly through the donor-supported provision of public insurance systems.

## Cross-Chapter Box on Loss and Damage (AR6 WG2 p. 2563)

Liability and compensation, implying legally defined reimbursement of losses and damages attributable to climate change, remain contentious in L&D dialogue (high confidence). (...)

Studies have laid out responsibility principles, such as historical responsibility based on the polluter pays principle, beneficiary pays and ability to pay.

Discussions on compensation are closely linked to justice and equity scholarship which has studied compensatory, distributive and procedural equity considerations for burden sharing.



# Cross-Chapter Box on Loss and Damage (AR6 WG2 p. 2563)

Litigation and liability are linked, and a growing research body has examined the role of litigation and international law for the L&D context finding that litigation risks for governments and business may increase as the science, particularly on attribution, matures further (high agreement, medium evidence).

# Let us think about the future of these children from Machakos in a warming climate



Photo: @JPvanYpersele, during the #CBA9 conference field trips, Kenya, April 2015

# **Useful links:**

- www.ipcc.ch : IPCC (reports and videos)
- www.climate.be/vanyp : my slides and other documents
- <u>www.skepticalscience.com</u>: excellent responses to contrarians arguments
- On Twitter: @JPvanYpersele and @IPCC\_CH