

SIXTH ASSESSMENT REPORT

Working Group II – Impacts, Adaptation and Vulnerability
Working Group II – Impacts, Adaptation and Vulnerability

ipcc
INTERGOVERNMENTAL PANEL ON climate change



INTERGOVERNMENTAL PANEL ON climate change



Scene Setting: Context

Reinhard Mechler (Lead author Chapter 17/SPM, IIASA)

Glasgow Dialogue at SBI 56

Bonn June 7, 2022



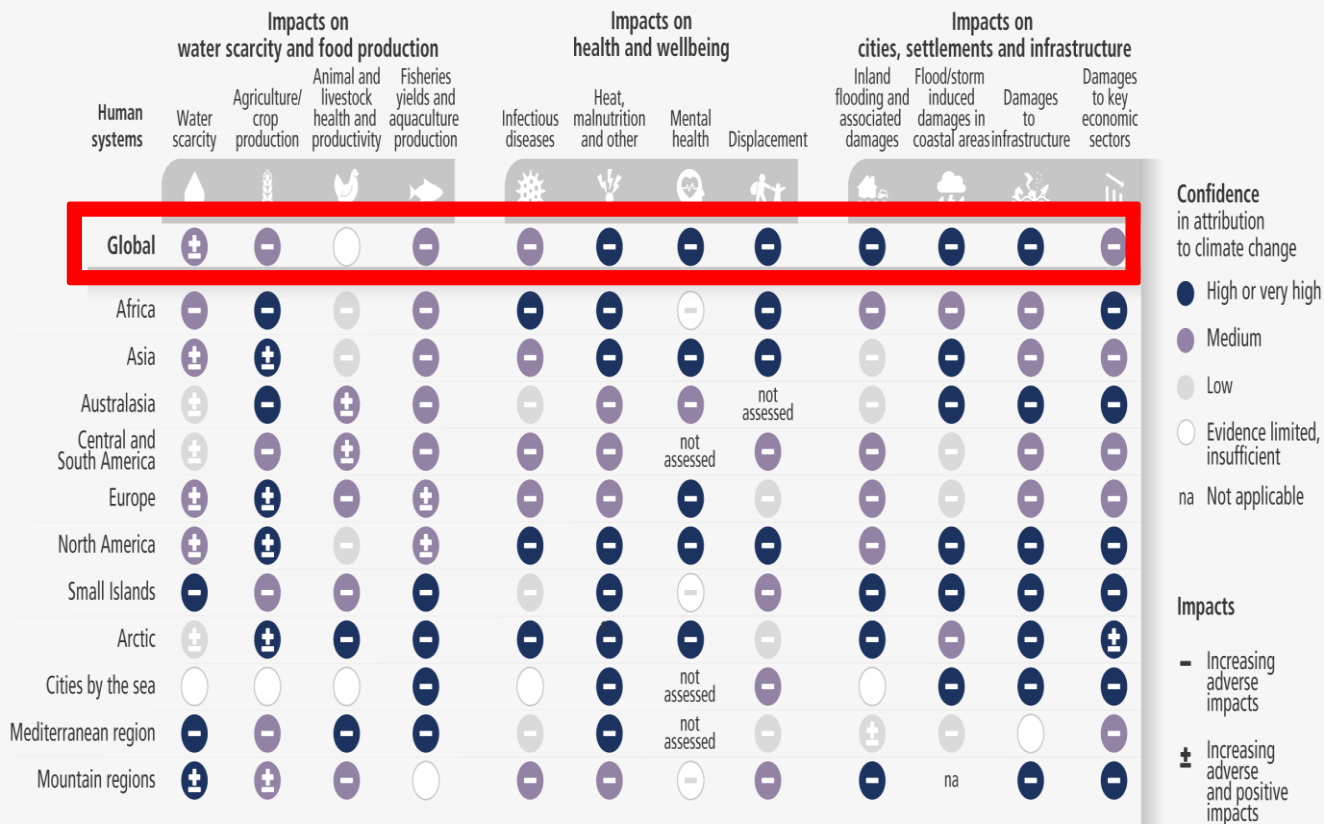
Losses and damages: today

Global warming of 1.1°C has already caused dangerous and widespread losses and damages, led to disruptions in nature as well as affected the lives of billions of people, despite efforts to adapt

- **Roughly half the world's population** currently experiences severe water scarcity at some point each year, partly due to climate change.
- **3.3-3.6 billion people** across West-, Central- and East Africa, South Asia, Central and South America, Small Islands Developing States and the Arctic are considered highly vulnerable to climate change.
- People in **informal settlements** and in rapidly growing smaller communities the **most vulnerable**.



Observed impacts of climate change on human systems



Confidence
in attribution to climate change

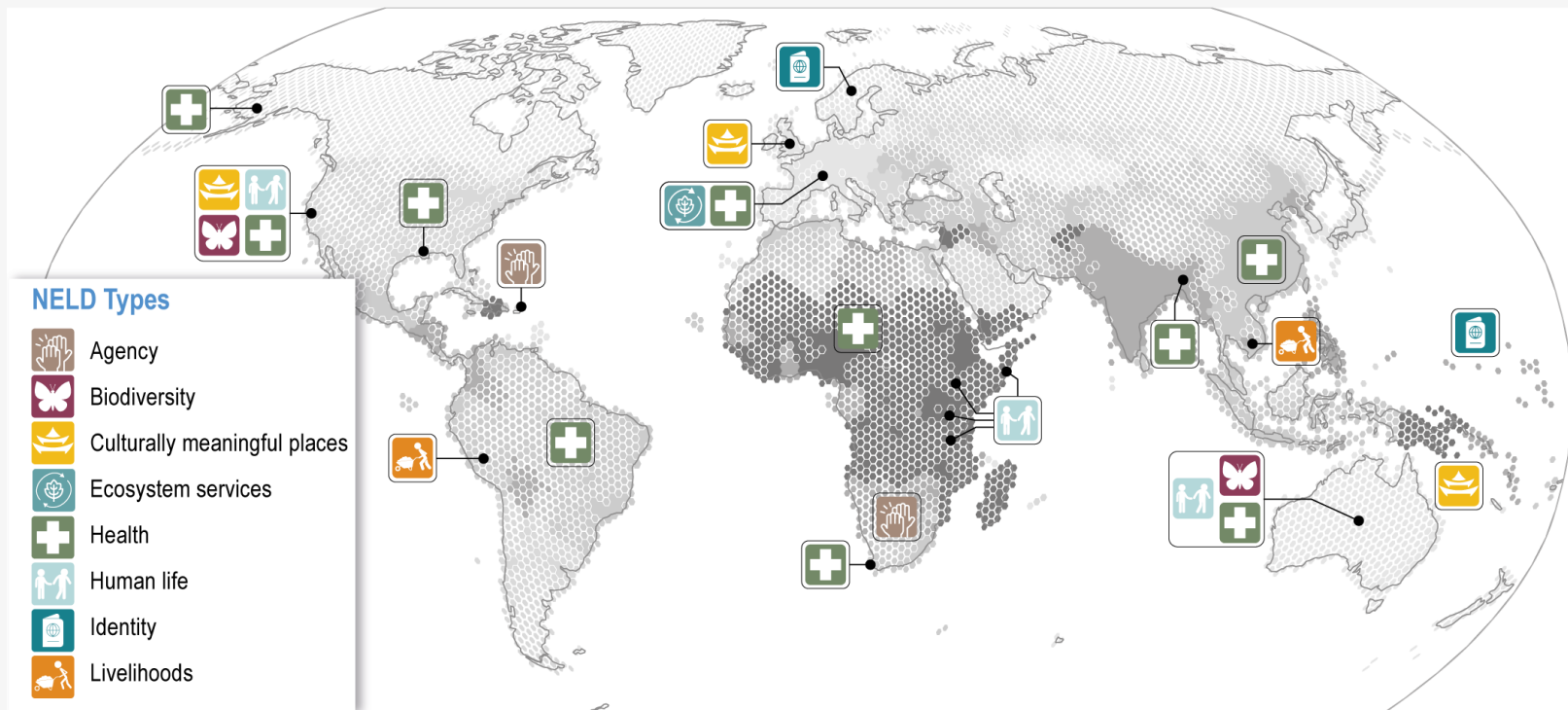
- High or very high
- Medium
- Low
- Evidence limited, insufficient
- na Not applicable

Impacts

- Increasing adverse impacts
- ± Increasing adverse and positive impacts



Non-economic loss and damage (NELD) associated with climate hazards attributed to climate change with background on the global vulnerability



Future losses and damages are projected to increase with increased warming

Future projected losses and damages in the near-term as well as unavoidable increases in multiple climate hazards will present multiple risks to ecosystems and humans

- Risks are highest for **nature and people** in regions experiencing the **highest temperatures**, those **living along coastlines**, in the **frozen parts of the world**, along **rivers** and **where other threats exist**.
- **Sea level rise** will put people living in coastal cities and settlements at greater flood risk and low-lying coastal ecosystems, such as mangroves, will be submerged and lost.
- The number of people at risk from **climate change** and **associated loss of biodiversity** will progressively increase.
- Reducing GHG emissions to limit global warming to 1.5°C would substantially reduce climate-related losses, **but they cannot be eliminated completely**.



Report delineates risk escalation at various warming levels: 1.1°C, 1.5°C, 2°C, 3°C, 4°C

Adaptation/Risk Management

- Despite progress, **adaptation gaps** exist between current levels of adaptation and levels needed to respond to impacts and reduce climate risks.
- Most observed adaptation is **fragmented**, small in scale, incremental, sector-specific, designed to respond to current impacts or near-term risks, and focused more on planning rather than implementation.
- Adaptation **does not prevent** all losses and damages: Risks **unavoided** and linked to **unavoidable increases in hazards** (e.g., sea level rise)
- **Limits**: Adaptation effectiveness declines with increased warming and limits also driven by financial, governance, institutional and policy constraints
 - **Soft limits** already reached (e.g. by individuals and households in low-lying coastal areas and by smallholder farmers)
 - **Many natural systems** already near the **hard** limits: Warm water coral reefs, some coastal wetlands, some rainforests, and some polar and mountain ecosystems
 - **Above 1.5 °C limited freshwater resources** pose potential hard limits for **Small Islands and for regions dependent on glacier and snow-melt**
 - **By 2 °C** global warming level, soft limits are projected for **multiple staple crops** in many growing areas, particularly in tropical regions

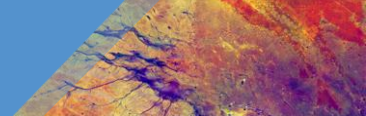
Adaptation limits

- **Hard adaptation limit:**

No adaptive actions are possible to avoid intolerable risks.

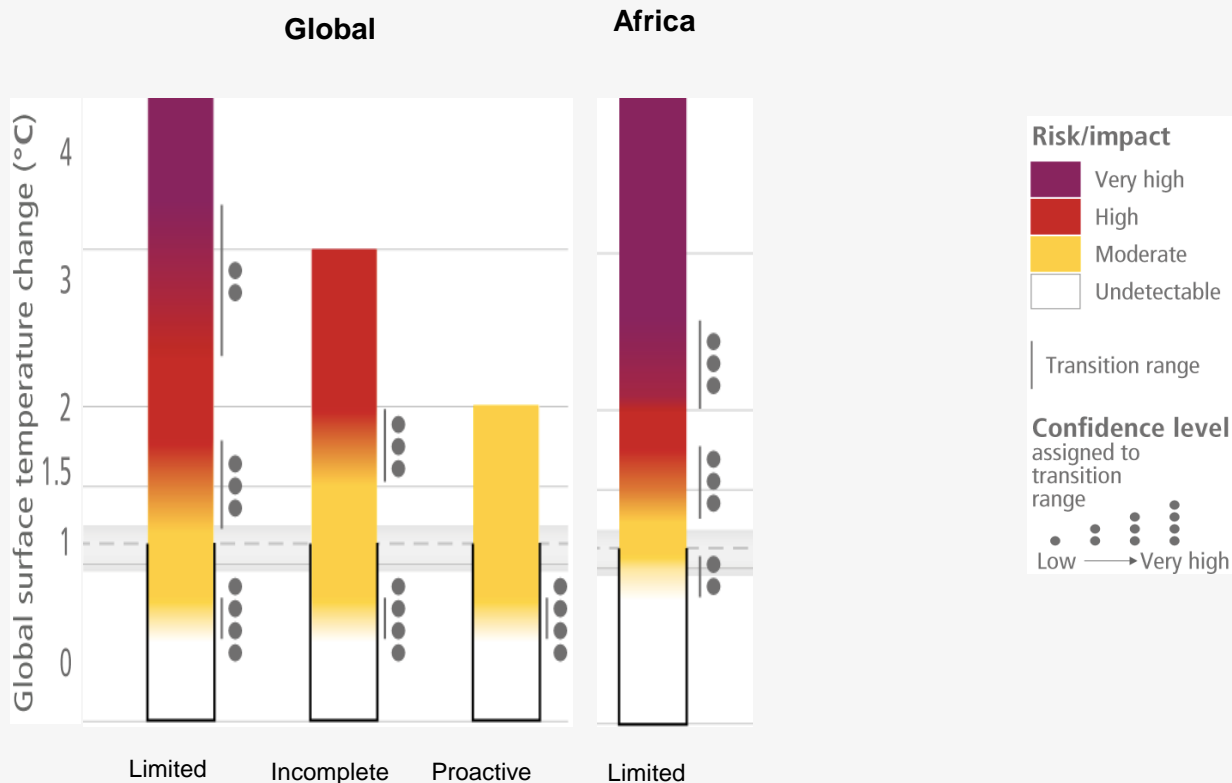
- **Soft adaptation limit:**

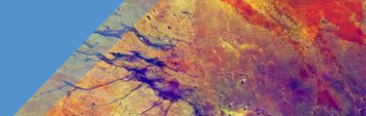
Options are currently not available to avoid intolerable risks through adaptive action.



Example: Heat-related mortality and morbidity

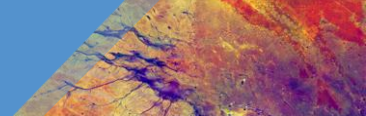
Excess death rates from non-optimal temperature in sub-Saharan Africa are estimated to be nearly double the global average





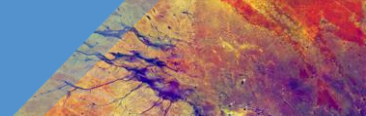
Risk layering for coordinating action and support





Risk layering for coordinating action and support

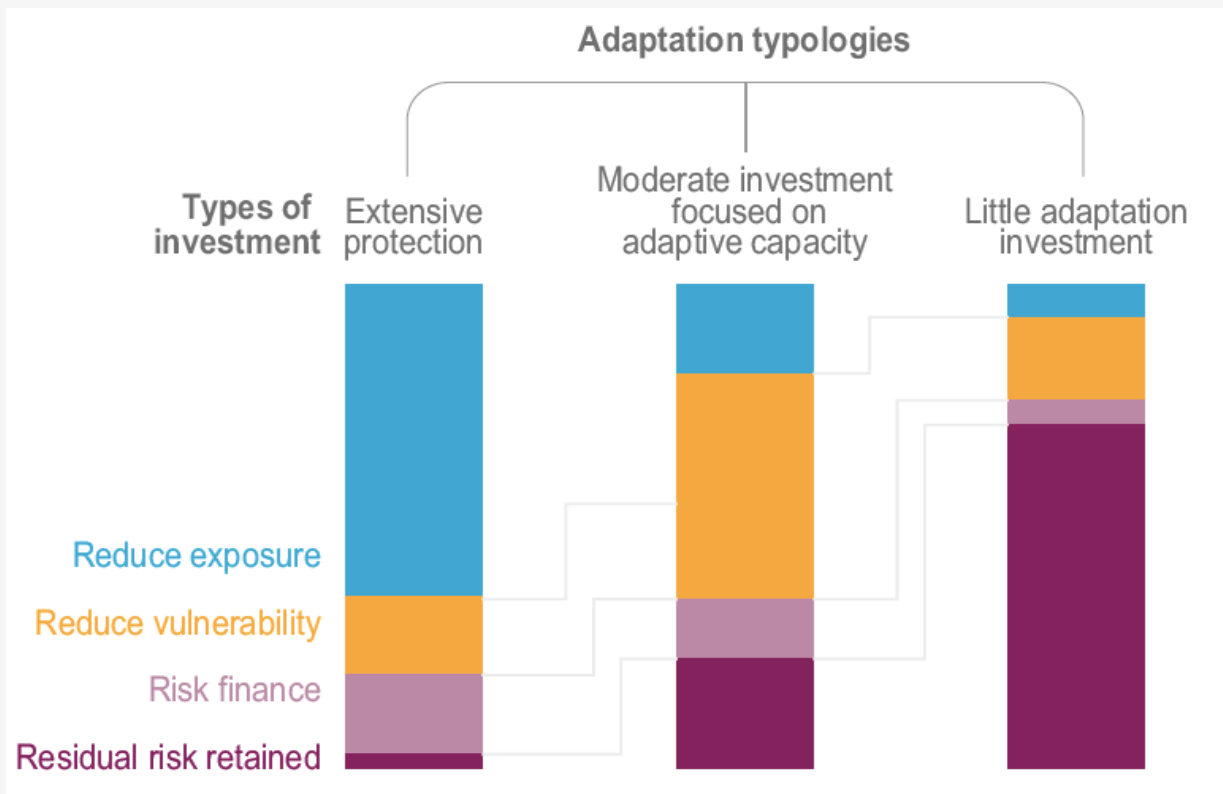




Risk layering for coordinating action and support



Adaptation and residual risk



Summary

- **Global warming of 1.1°C** has already caused **dangerous** and **widespread losses and damages** on people and nature
- **With increasing global warming, losses and damages increase** and become increasingly difficult to avoid, while **strongly concentrated among the poorest vulnerable groups**
- **Adaptation gap: Ambitious adaptation** critical to upgrade small scale, fragmented and reactive efforts, but will **not prevent (avert&minimize)** all losses and damages
- **Risk retention gap: Further addressing residual risks** critical where risk retention capacity limited
- **Towards solutions:** involves financing, capacity building, improving equity and justice, conserving and restoring biodiversity, systematically improving the resilience of urban areas, informal settlements and the rural space can aid in addressing losses and damages

