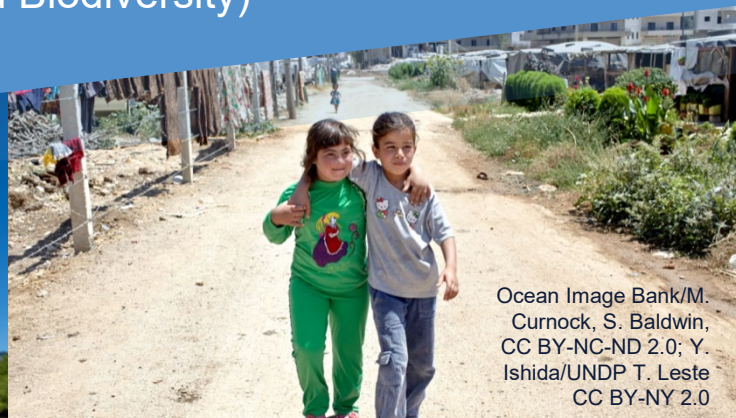
ipcc

Climate change 2022:
Impacts, adaptation and vulnerability

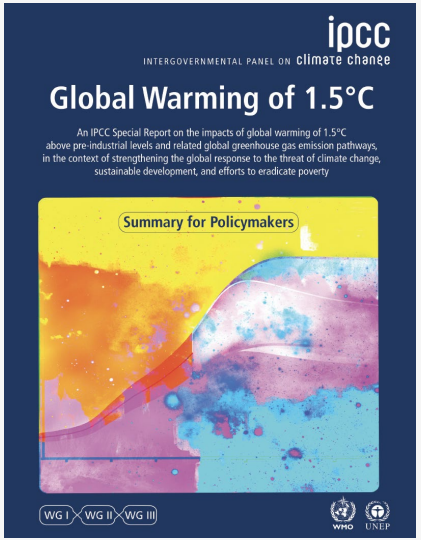
Towards Climate Resilient Development

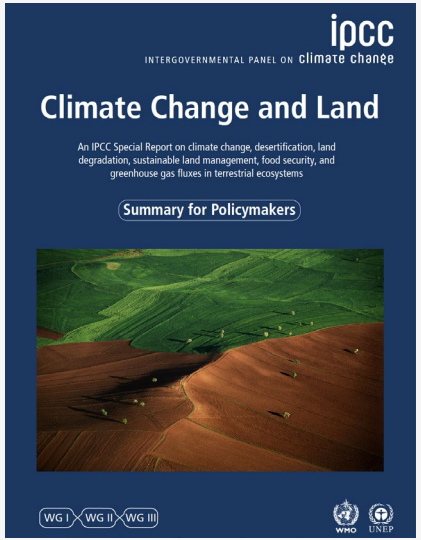
H.O. Pörtner, Co-Chair IPCC WGII, and WGII Author Team,
(Co-Chair of IPCC-IPBES workshop report on Climate and Biodiversity)

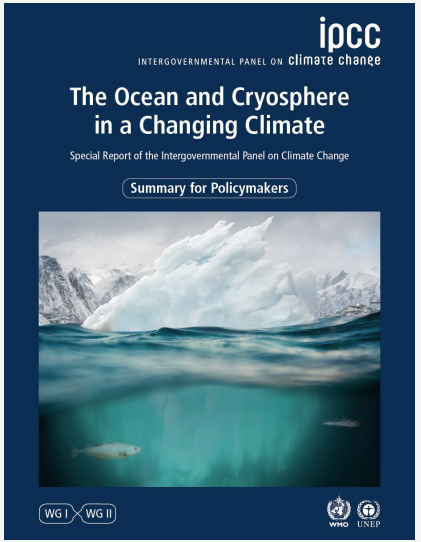


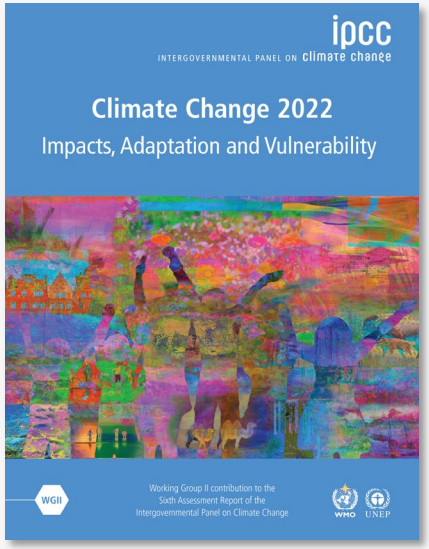
SIXTH ASSESSMENT REPORT

Working Group II – Impacts, Adaptation and Vulnerability









WGII: Guiding AMBITION in Mitigation and Adaptation, setting LONG TERM GLOBAL GOALS … for protecting biodiversity and human society

IPCC 6th Assessment Cycle: 3 Special Reports, WGI + II + III AR6 released between October 2018 and March 2022

What is already happening …

Human pressure on biodiversity is increasing constantly. At the same time conservation efforts have not been sufficient to stem the loss of biodiversity on a global scale.

Human caused climate change is increasingly threatening nature and its contributions to people, causing:


Losses in …Overfished Stocks


…Excessive Drought


…Heatwaves

…Excessive Wildfires

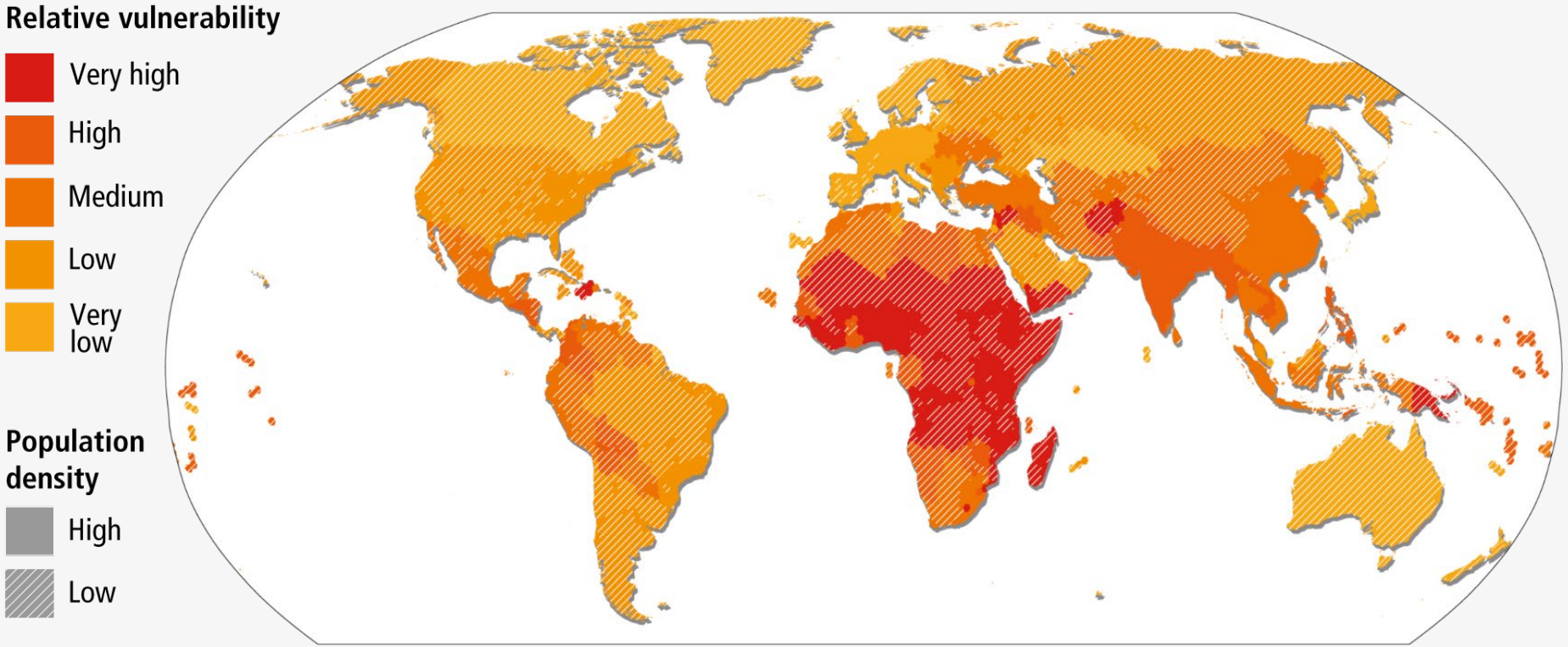
Pörtner et al., 2021

[Unsplash.com, Facebook/ Help Save the Wildlife and Bushlands in Campbelltown, Madeleine Nicolas / imaggeo.egu.eu]

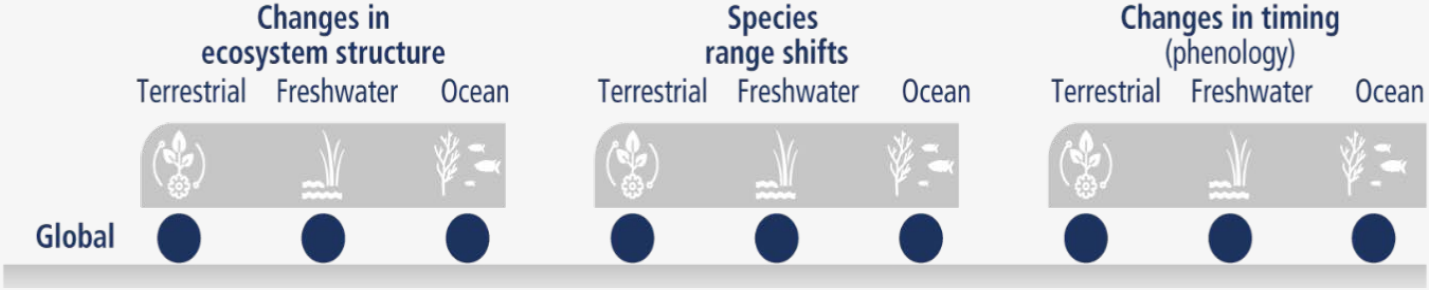
Climate change is affecting the lives of billions of people, despite efforts to adapt

... for example, through high intensity cyclones, sea level rise, heavy rainfall, drought

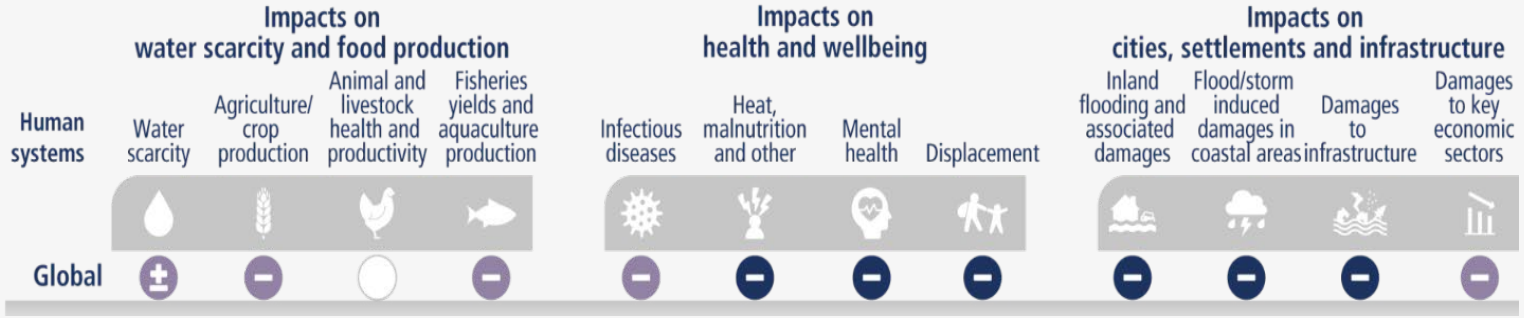
3.3 – 3.6 billion people live in hotspots of high vulnerability to climate change impacts



Observed impacts of climate change on ecosystems



Observed impacts on human systems



± Increasing adverse and positive impacts

− Increasing adverse impacts

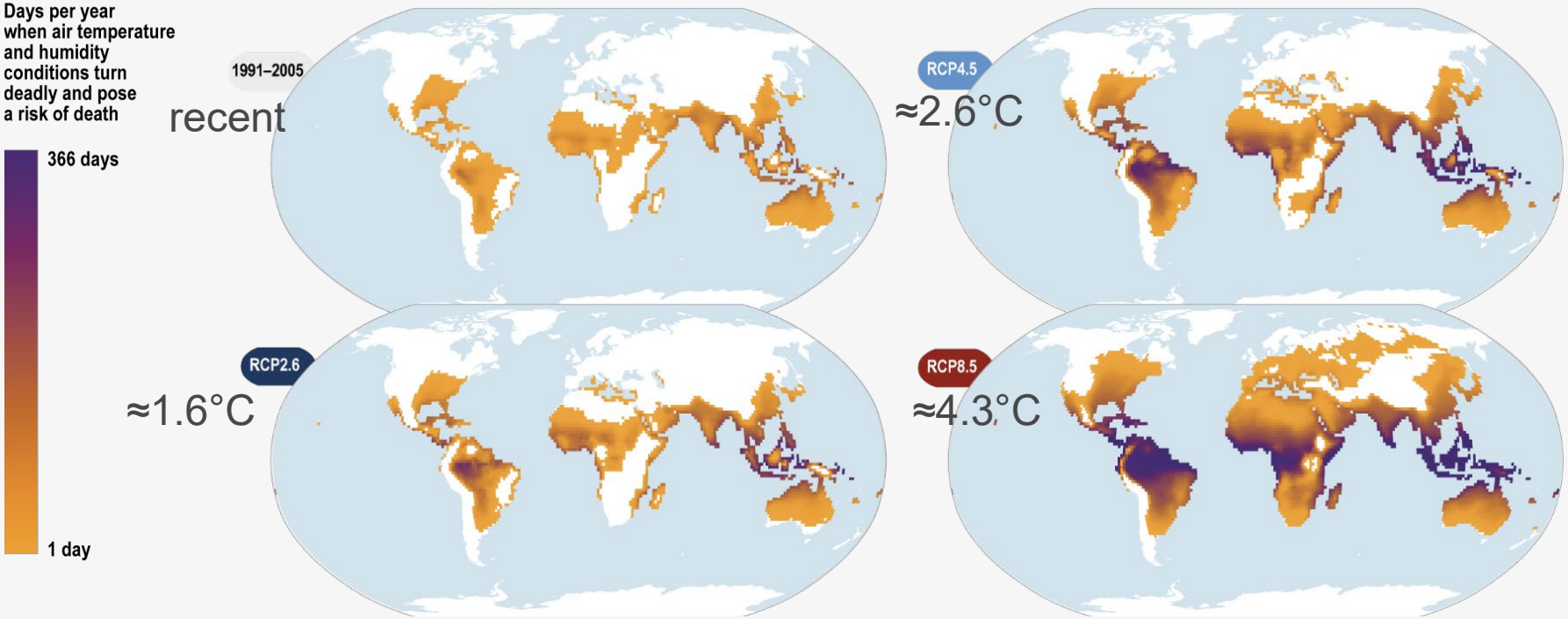
Confidence in attribution to climate change

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

Source: IPCC WGII AR6 SPM Figure 2

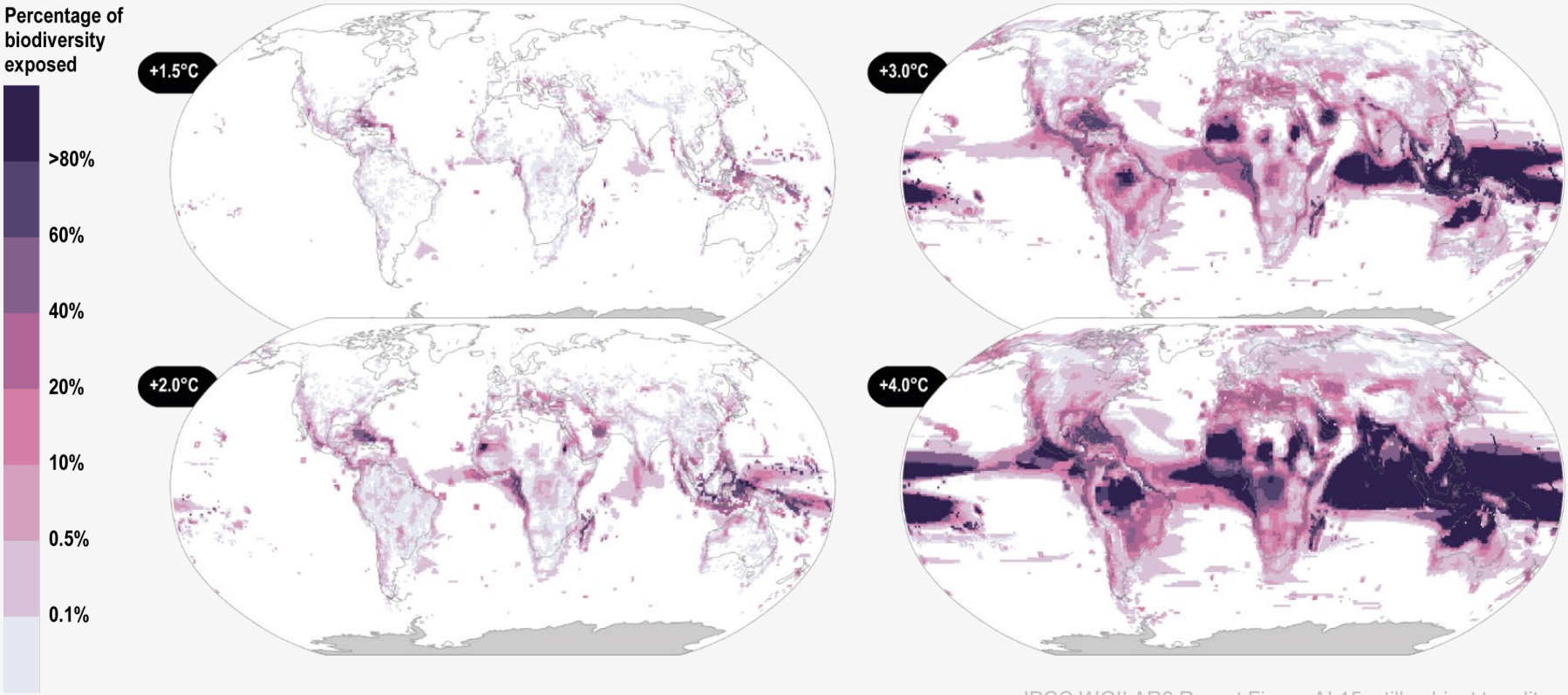
The Future: e.g., Loss of Human (and Livestock) Habitat

Global distribution of population exposed to hyperthermia from extreme heat and humidity (concerning half to three-quarters of the population periodically by 2100).



IPCC WGII AR6 Report Figure AI.29, still subject to edits

The Future: e.g., Loss of Species Habitat and Biodiversity



IPCC WGII AR6 Report Figure AI.15, still subject to edits

Nature's crucial services at risk in a warming world

Pollination

Coastal protection

Tourism / recreation

Food source

Health

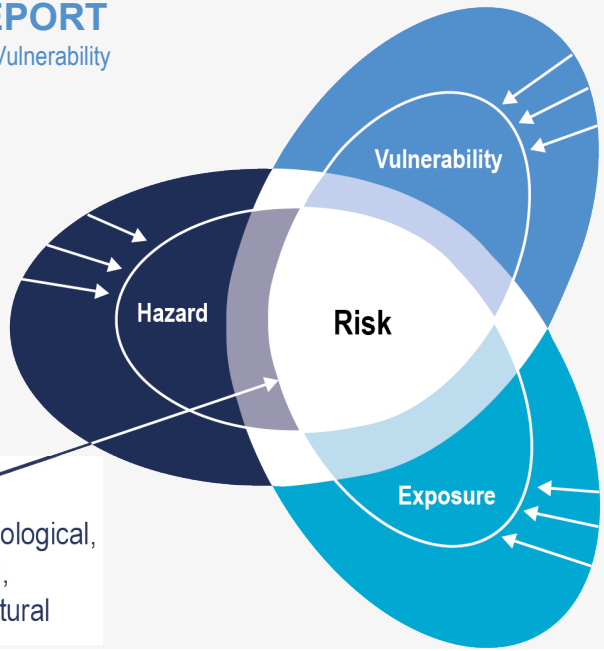
Water filtration

Clean air / water

Climate regulation

[Ocean Image Bank/ Shaun Wolfe, Dimitris Poursanidis; FAO/Kurt Arrigo, Unsplash, Axel Fassio/CIFOR CC BY-NC-ND

Evaluating risks



Limits to Adaptation

- E.g. physical, ecological, technological, economic, political, institutional, psychological, and/or socio-cultural

The IPCC concept of risk

Climate action entails risk reduction by adaptation and mitigation …. considering limits to adaptation

Level of added impacts/risks

- **Very high** — **Purple:** Very high probability of severe impacts/ risks and the presence of significant irreversibility or the persistence of climate-related hazards, combined with persistence of climate-related hazards, combined with limited ability to adapt due to the nature of the hazard or impacts/risks.
- **High** — **Red:** Significant and widespread impacts/risks.
- **Moderate** — **Yellow:** Impacts/risks are detectable and attributable to climate change with at least medium confidence.
- **Undetectable** — **White:** Impacts/risks are undetectable.

Confidence level for transition

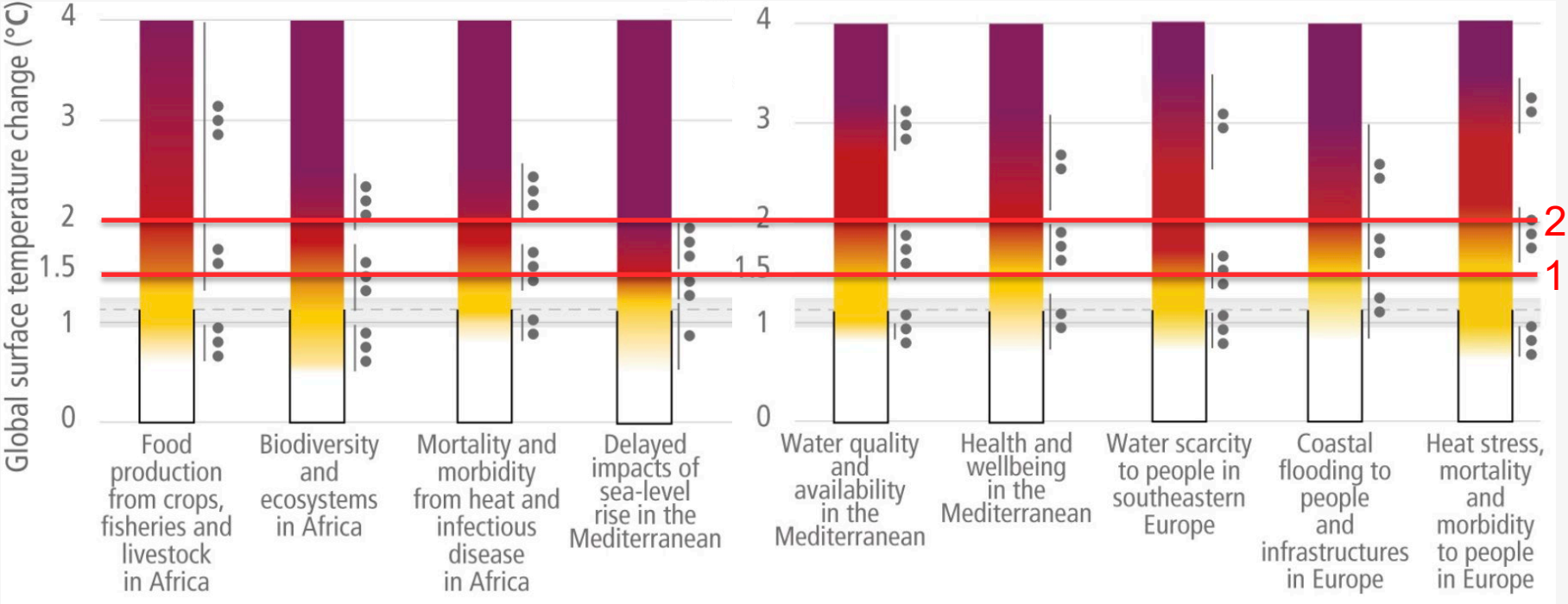
●●●● = Very high
●●● = High
●● = Medium
● = Low
| = Transition range

**see figure caption for definition

[IPCC SROCC, WGII AR6]

Global and regional risk provide orientation for action (adaptation and mitigation)

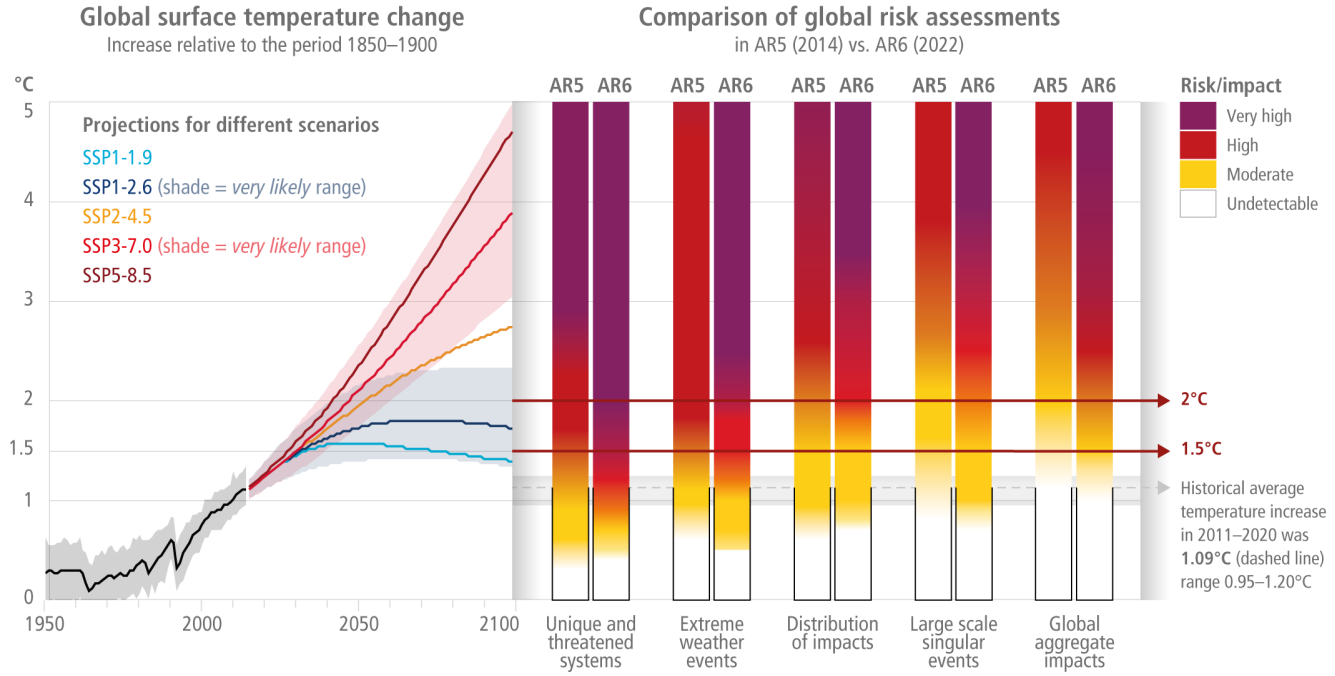
… minimizing risk by keeping global warming below 1.5°C



Africa **Mediterranean** **Europe**

AR6 insight: Risks are developing sooner than assessed in AR5

… emphasizing the ambitious side of the Paris Agreement (GWL ≤ 1.5°C)



IPCC WGII AR6 SPM Figure 3 and AR5 Assessment Box SPM.1 Figure 1

Vulnerable population groups have the most urgent need for adaptation … but:

There are increasing gaps between adaptation action taken and what's needed

Towards Transformation: Five System Transitions

Land, ocean, coastal and freshwater ecosystems

Urban, rural and infrastructure

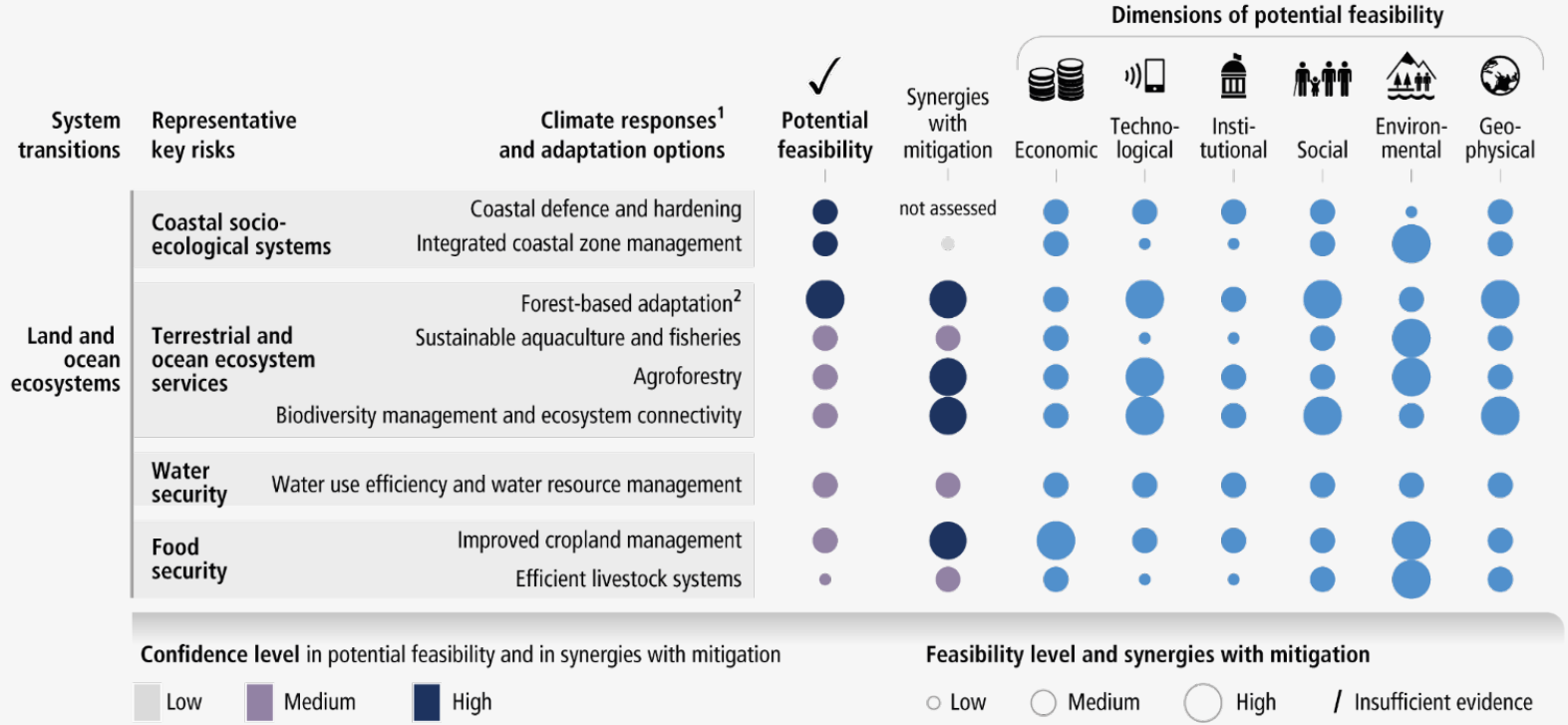
Energy

Industry

Society

- Make possible the adaptation required for human health and well being; economic and social resilience; ecosystem health and planetary health.
- Have co-benefits with mitigation and are important for achieving the low global warming levels that would avoid many limits to adaptation.

The Feasibility of Adaptation measures: e.g. Land and ocean ecosystems



Footnotes:

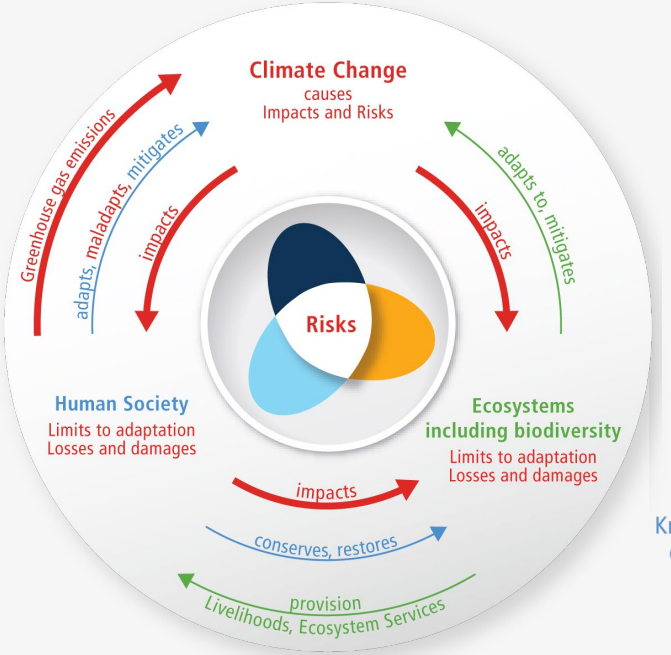
[1] The term response is used here instead of adaptation because some responses, such as retreat, may or may not be considered to be adaptation.

[2] Including sustainable forest management, forest conservation and restoration, reforestation and afforestation.

IPCC WGII AR6 SPM Figure 4a

ipcc

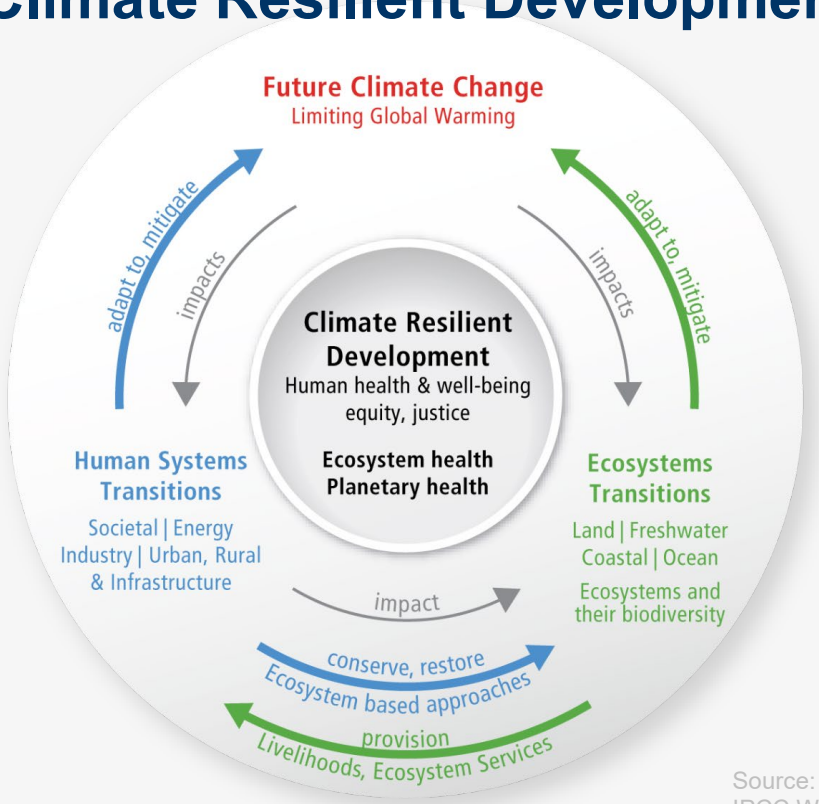
Current imbalance …



From urgent to timely action

Governance
Finance
Knowledge and capacity
Catalysing conditions
Technologies

towards a sustainable future = Climate Resilient Development…



The risk propeller shows that risk emerges from the overlap of:

Climate hazard(s) Vulnerability Exposure

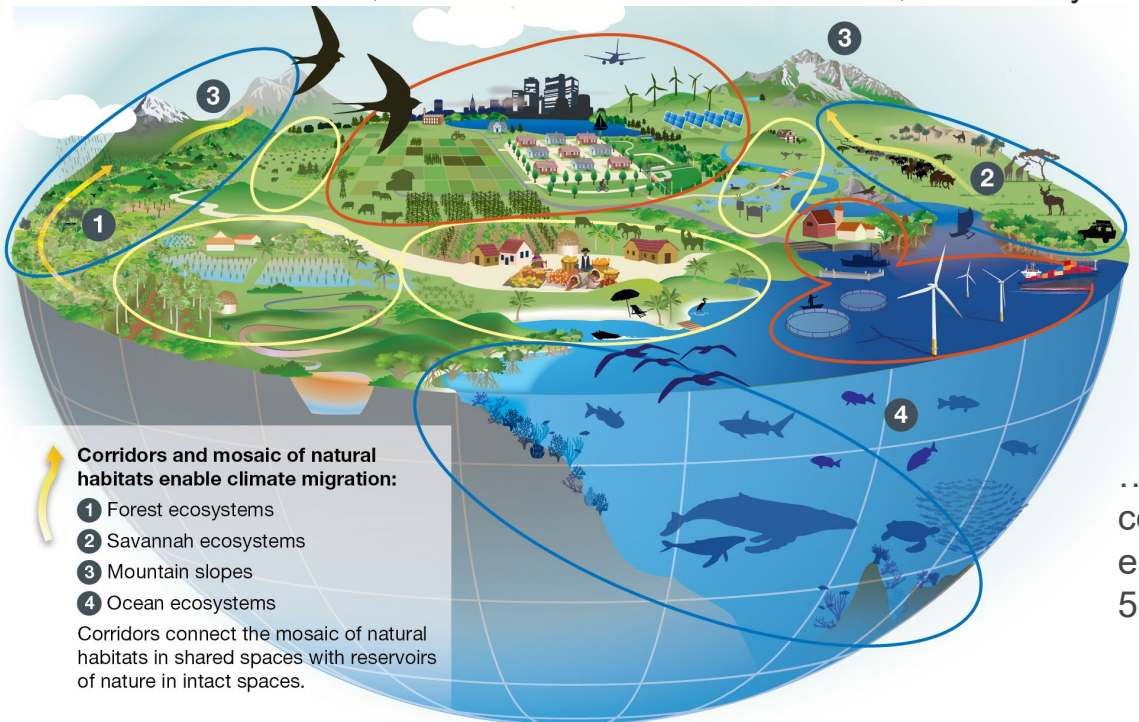
…of human systems, ecosystems and their biodiversity

Source:
IPCC WGII AR6
SPM Figure 1

Integrating conservation, climate and societal actions: spatial planning

Treating climate, biodiversity, and human society as coupled systems is key to successful outcomes.

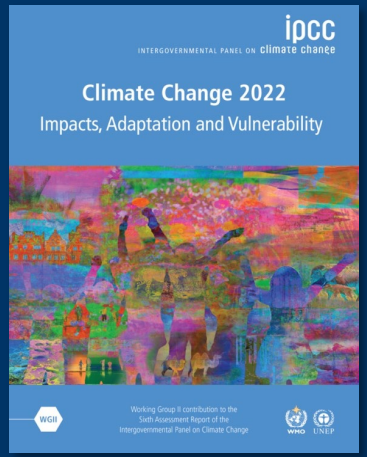
To be successful, conservation and climate actions would go hand in hand across landscapes, in cities and rural areas, taking people's needs into consideration, for maximized benefits for climate, biodiversity and humans.

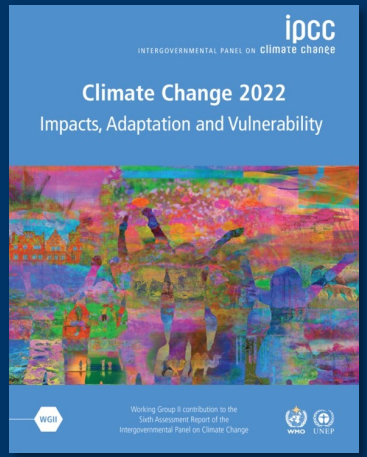


…effectively conserving ecosystems on 30 to 50% of land and ocean

Some high level conclusions from the WGII report(s):

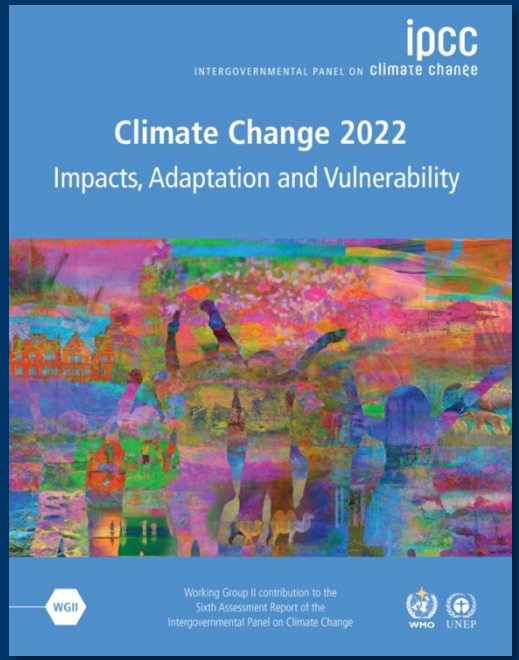
- **Meeting the ambitious side of the Paris agreement has no acceptable alternative**.
- A holistic concept (CRD) integrates mitigation, adaptation, development, and also covers **loss and damage**.
- Justice and equity demand **shared responsibility** for the present and the future. (A dynamic basis for everybody's regular financial contributions would be the **cumulative emissions per country**, past and present.)





Some high level conclusions from the WGII report(s):

- Solutions of the **climate and the biodiversity** crises depend on each other.
- **Global Goals:** As much as limiting warming to 1.5° would be a **GG for Mitigation**, limiting risk to medium levels could be a **GG for Adaptation**. According to WGII both GGs would nicely match.
- CRD and the closing time window call for tieing **development to using renewable energies only**.
- **Climate action** for mitigation and adaptation has no alternative and is an **existential necessity**.



“ The science is clear.

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

IPCC AR6 reports offer solutions to the world.

However, it is getting late!

ipcc
INTERGOVERNMENTAL PANEL ON climate change
WMO UNEP

Thank you!

IPCC Working Group II Author Team

@IPCC_CH
#IPCCReport

@IPCC

@IPCC

linkedin.com/
company/ipcc

For more information: IPCC Secretariat: ipcc-sec@wmo.int IPCC Press Office: ipcc-media@wmo.int Visit ipcc.ch