

Climate change 2022: Impacts, adaptation and vulnerability

Towards Climate Resilient Development

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SIXTH ASSESSMENT REPORT

Working Group II - Impacts, Adaptation and Vulnerability

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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

Co-Sponsored Workshop Report on Biodiversity and Climate Change

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:





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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, causing losses and damages

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



IPCC WGII AR6 Chapter 8

Observed impacts of climate change on ecosystems





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,

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



IPCC WGII AR6 Report Figure AI.15



Nature's crucial services at risk in a warming world



Pollination



Coastal protection



Tourism / recreation



Food source



Health



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





Level of added impacts/risks

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The IPCC concept of risk

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

Confidence level for transition

[IPCC SROCC, WGII AR6]

	— 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.	•••• = Very high ••• = High
	— High ———	 Red: Significant and widespread impacts/risks. 	•• = Medium
·	— Moderate ———	– Yellow: Impacts/risks are detectable and attributable to climate change with at least medium confidence.	• = Low = Transition range
	— Undetectable ———	- White: Impacts/risks are undetectable.	**see figure caption for definition

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Global and regional risk provide orientation for action (adaptation and mitigation) ... minimizing risk by keeping global warming below 1.5°C



Africa

Mediterranean

Europe

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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



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

There are increasing gaps between adaptation action taken and what's needed ... how do we accelerate and sustain adaptation?

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Towards Transformative Adaptation: Five System Transitions



Land, ocean, coastal and freshwater ecosystems



Urban, rural and infrastructure



Energy



Industry



Society

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

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

						Dimensions of potential feasibility						
				\checkmark	Synergies))		₫ ŧ	Â		
System transitions	Representa key risks	itive	Climate responses ¹ and adaptation options	Potential feasibility	with mitigation	Economic	Techno- logical	Insti- tutional	Social	Environ- mental	Geo- physical	
transitions	Key Hisks			reasibility	Intigation	Leonomic	logical		Jocial		physical	
	Coastal soc	io-	Coastal defence and hardening		not assessed					•		
	ecological systems		Integrated coastal zone management				•	•				
			Forest-based adaptation ²									
Land and	Terrestrial	and	Sustainable aquaculture and fisheries				•	•	•	Ö		
ocean ecosystems	ocean ecos services	ystem	Agroforestry							ð		
		Biodiversity m	anagement and ecosystem connectivity		Ŏ		Ŏ			ŏ		
	Water security	Water use effi	ciency and water resource management		•			•				
	-		Improved cropland management									
	Food security		Efficient livestock systems	•			•	•		6	•	
										-		
	Confidence level in potential feasibility and in synergies with mitigati			ion	Feasibili	asibility level and synergies with mitigation						
	Low	Medium	High		\circ Low		lium (High	/ 1	nsufficient	evidence	

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

Current imbalance ...

Climate Resilient Development... Climate Change Future Climate Change causes the state Impacts and Risks Limiting Global Warming Greenhouse 935 Entiss nts to, mitigates mitigate From urgent to **Climate Resilient** timely action Risks Development Human health & well-being Human Society **Ecosystems** equity, justice Limits to adaptation including biodiversity Losses and damages Limits to adaptation **Human Systems Ecosystem health Ecosystems** Governance Losses and damages **Planetary health** Transitions Transitions mpacts Finance Knowledge and capacity Societal | Energy Land | Freshwater Onserves, restores **Catalysing conditions** Industry | Urban, Rural Coastal | Ocean & Infrastructure **Technologies Ecosystems and** impact ivelihoods, Ecosystem Services provision their biodiversity conserve, restore cosystem based approach The risk propeller shows that risk emerges from the overlap of: provision Livelihoods, Ecosystem Services Climate hazard(s) **Vulnerability** Exposure Source: **IPCC WGII AR6** ... of human systems, ecosystems and their biodiversity SPM Figure 1

towards a sustainable future =

Co-Sponsored Workshop Report on Biodiversity and Climate Change

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.



INTERGOVERNMENTAL PANEL ON CLIMPTE CHANGE

Climate Change 2022 Impacts, Adaptation and Vulnerability



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!

INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE



Discussion points

INTERGOVERNMENTAL PANEL ON CIIMBLE CHBREE



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.)



Discussion points

ERGOVERNMENTAL PANEL ON CLIMATE CHARGE

Climate Change 2022 Impacts, Adaptation and Vulnerability



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.





Thank you!

IPCC Working Group II Author Team

