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INTERGOVERNMENTAL PANEL ON climate change

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DECISION

CHAPTER OUTLINE OF THE WORKING GROUP II CONTRIBUTION TO THE IPCC SIXTH ASSESSMENT REPORT (AR6)

As Adopted by the Panel at the 46th Session of the IPCC

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IPCC Secretariat

c/o WMO • 7bis, Avenue de la Paix • C.P. 2300 • 1211 Geneva 2 • Switzerland
telephone : +41 (0) 22 730 8208 / 54 / 84 • fax : +41 (0) 22 730 8025 / 13 • email : IPCC-Sec@wmo.int • www.ipcc.ch



CHAPTER OUTLINE OF THE WORKING GROUP II CONTRIBUTION TO THE IPCC SIXTH ASSESSMENT REPORT (AR6)

The Intergovernmental Panel on Climate Change decides:

(1) to agree with the outline of the contribution of *Working Group II to the Sixth Assessment Report* as contained in Annex 1 to this document;

(2) that this report assesses relevant literature, especially since the Fifth Assessment Report (AR5), in a manner consistent with the IPCC guidance on the use of literature.

(3) that the bulleted text in Annex 1 to this Decision, that resulted from the scoping process and refined through comments by the Plenary, be considered by authors as indicative.

(4) to invite the Co-Chairs of Working Group II and the Co-Chairs of WGI and WGIII to develop appropriate mechanisms to ensure the effective coordination of Working Group contributions to the IPCC Sixth Assessment Report, to oversee the treatment of cross-cutting themes, and to prepare a Glossary common to Working Groups I, II and III.

(5) In order to achieve this, the timetable for the production of the Working Group II contribution to the AR6 is as follows:

15 September – 27 October 2017	Call for nominations of Coordinating Lead Authors, Lead Authors and Review Editors
29 January – 4 February 2018	Selection of Authors
21–25 January 2019	First Lead Authors Meeting
8–12 July 2019	Second Lead Authors Meeting
21 October – 16 December 2019	Expert Review of the First Order Draft
27–31 January 2020	Third Lead Authors Meeting
7 August – 2 October 2020	Expert and Government Review of the Second Order Draft
2–7 November 2020	Fourth Lead Authors Meeting
11 June – 6 August 2021	Final Government Distribution of the Final Draft and Final Government Review of the Summary for Policymakers
4 – 8 October 2021	IPCC approval of the Summary for Policymakers and acceptance of the underlying Report

(6) that the budget for the production of the Working Group II contribution to the IPCC Sixth Assessment Report is as contained in Decision (IPCC/XLVI-1) on the IPCC Trust Fund Programme and Budget.

Chapter outline of the Working Group II contribution to the IPCC Sixth Assessment Report (AR6)

Summary for Policymakers [pages TBD]

Technical Summary [40 pages]

Chapter 1: Point of departure and key concepts [30 pages]

- Changing policy context (including UNFCCC, Paris Agreement and Global Stocktake, SDGs, etc.); AR5 and SR findings and critical messages, goals of this report
- The significance of sectoral and regional climate risks to natural and human systems and their interactions in the context of culture, values, ethics, identity, behaviour, historical experience, and knowledge systems (e.g., indigenous and local)
- The climate risk framework used in this report encompassing hazard, exposure, and vulnerabilities, including their spatial distribution, cascading impacts, disaster risk reduction, and risk uncertainties
- The significance of adaptation, in addressing climate change risks, including diverse adaptation responses, technologies including nature and ecosystem-based adaptation, outcomes, common principles, resilience, and issues of scale
- Detection and attribution of climate impacts and methods to evaluate adaptation responses
- Understanding dynamic climate risks from scenarios that reflect multiple interacting drivers
- Scientific, technical and socioeconomic aspects of current and future residual impacts of climate change, including residual damage, irreversible loss, and economic and non-economic losses caused by slow onset and extreme events
- Limits to adaptation, and enabling conditions for effective adaptation including governance, institutions, and economic aspects
- Climate change responses and their interactions with sustainable development, including adaptation with mitigation co-benefits and trade-offs
- Opportunities for enhancing climate resilient development pathways

SECTION 1: Risks, adaptation and sustainability for systems impacted by climate change

Chapter 2: Terrestrial and freshwater ecosystems and their services [60 pages]

- Point of departure, key findings of other reports, organised by biomes including freshwater ecosystems, taking into account ecological disequilibria
- Historical and paleontological aspects of climate change impacts and risks
- Trends in critical ecosystems including detection and attribution of observed impacts and responses
- Projected hazards and exposure (link to WGI), including extreme events and interactions of multiple climatic, non-climatic and anthropogenic stressors at relevant temporal and spatial scales
- Projected impacts: species, ecosystem structure and biodiversity, emergence of novel communities, process rates, functions, and the implication for their services, at relevant temporal and spatial scales
- Vulnerability and resilience, enablers and limits to natural and planned adaptation, and maladaptation
- Assessing risks, opportunities, costs, and trade-offs including consideration of scenarios and impacts of adaptation and mitigation responses

- Planned adaptation and mitigation for management of risk within sustainable development and relevant policy contexts (SDGs), informed by cultural, ethical, identity, economic and behavioural dimensions
- Lessons from case studies

Chapter 3: Ocean and coastal ecosystems and their services [60 pages]

- Point of departure, key findings of other reports, organised by systems, taking into account ecological disequilibria
- Historical and paleontological aspects of climate change impacts and risks
- Trends in critical ecosystems including detection and attribution of observed impacts
- Projected hazards and exposure (link to WGI), including extreme events and interactions of multiple climatic, non-climatic and anthropogenic stressors at relevant temporal and spatial scales, including ocean warming, ocean acidification, and oxygen loss
- Projected impacts: species, ecosystem structure and biodiversity, emergence of novel communities, process rates, functions, and the implication for their services, at relevant temporal and spatial scales
- Vulnerability and resilience, enablers and limits to natural adaptation
- Assessing risk, opportunities, costs, and trade-offs including consideration of scenarios and impacts of adaptation and mitigation responses
- Planned adaptation and mitigation for management of risk within sustainable development and relevant policy contexts (SDGs), informed by cultural, ethical, identity, economic and behavioural dimensions
- Lessons from case studies

Chapter 4: Water [60 pages]

- Observed and projected hydrological changes on basin and watershed scales and water related hazards including floods, droughts and landslides
- Key short, medium and long term risks to water security, including quantity and quality in the context of critical sectors (including food-energy-water-health nexus) and different users and systems under alternative scenarios
- Adaptation responses including cooperation in different climatic zones to water security risks with co-benefits for sustainable development including consideration of impacts of adaptation and mitigation responses
- Societal responses to changes in shared water resources
- Approaches to achieving resilience in water systems and assessments of outcomes, costs, benefits, and where maladaptations were evident
- Lessons from case studies

Chapter 5: Food, fibre, and other ecosystem products [60 pages]

- Climate-driven historical changes in agriculture, fisheries and forestry, detection and attribution of impacts, including impacts of adaptation and mitigation responses, considering key findings of other reports
- Current and projected risks for food and nutrition security, food systems on land and in the ocean, and the food-energy-water-health nexus
- Current and projected risks for wood, fibre and natural products, such as medicinal organisms, rubber and dyes
- Adaptation options for the production and use of food, fibre, and other ecosystem products across scales and regions including limits and barriers, knowledge systems and aspects of sustainable development
- Competition for the use of land and ocean, including conflicts with indigenous rights to land and water bodies, and other tradeoffs in the context of adaptation and mitigation responses

- Current and projected risks for provisioning and cultural ecosystem services with considerations of ethics and identity
- Lessons from case studies

Chapter 6: Cities, settlements and key infrastructure [60 pages]

- Changes in the international policy architecture for settlements since AR5 (including SDGs)
- Interactions of climate risks with urban and rural change processes including food-energy-water-health nexus (e.g., air quality)
- Risk-reducing infrastructure and services (including ecological and social), their deficits, and implications for vulnerability, exposure and adaptation, particularly in the context of extreme events
- Detection and attribution of observed impacts and responses and projected risks from climate change under alternative scenarios for cities and settlements, and related infrastructure
- Adaptation options, adaptive capacity, responses and outcomes, including equity considerations, and links to mitigation
- Institutional, financial, and governance structures that enhance resilience of and enable adaptation in settlements, cities and key infrastructure
- Lessons from case studies

Chapter 7: Health, wellbeing and the changing structure of communities [50 pages]

- Health and wellbeing impacts, including detection and attribution
- Projected risks to health and wellbeing under alternative scenarios, including food-energy-water-health nexus
- Vulnerable populations and communities
- Adaptation options, limits to adaptation, and their social, environmental and economic implications in the context of sustainable development
- Observed impacts and projected changes in migration, displacement, and trapped populations, and linkages to adaptation
- Psychological, social, and cultural dimensions
- Lessons from case studies

Chapter 8: Poverty, livelihoods and sustainable development [60 pages]

- Detection and attribution of observed impacts and responses
- Projected climate change risks under alternative development scenarios as differentiated by economic opportunity and shifting livelihoods
- Observed and projected risks and losses and the challenges for equity and sustainable development
- Adaptation options, adaptive capacity and actions, and their outcomes for resilience and transformation, focusing on low-income households and communities
- Opportunities for development including adaptation with mitigation co-benefits and tradeoffs, economic diversification, equity, human security, coping with loss, residual risk, and sustainable development
- Lessons from case studies

SECTION 2: Regions

Common elements across all *regional* chapters (guidance points not an outline)

- Information on selected regional and sub-regional climate characteristics and zones
- Summary Table and/or figures with WGI and WGII information, combined with risk assessment (e.g., SREX SPM.1)

- Detection and attribution of observed impacts in natural and human systems on diverse time scales
- Region specific information on exposure and vulnerability
- Current sectoral climate risks, including specific regional and sub-regional considerations related to land, coasts and regional oceans Cultural and psychological dimensions (values, attitudes, ethical aspects, identity, behaviours, and different types of knowledge systems)
- Observed impacts and projected risks including identifying key risks and residual risks as well as development pathways depending on rate and level of climate change, including extremes and sea level rise
- Diverse adaptation options including opportunities, enablers, limits, barriers, adaptive capacity, and finances
- Governance and economic aspects including legal, institutional, financing, price responses, and trade
- Cross sectoral, intra-regional, and inter-regional issues including consideration of temporal scale
- Interaction of risks and responses to climate change with sustainable development pathways
- Implications of availability and heterogeneity of data, including the use of 'grey literature'
- Lessons from case studies

Chapter 9: Africa [50 pages]

Chapter 10: Asia [50 pages]

Chapter 11: Australasia [30 pages]

Chapter 12: Central and South America [50 pages]

Chapter 13: Europe [40 pages]

Chapter 14: North America [40 pages]

Chapter 15: Small Islands [30 pages]

CROSS-CHAPTER PAPERS (with material for TS/SPM as appropriate)

- **Biodiversity hotspots (land, coasts and oceans) [10 pages]**
- **Cities and settlements by the sea [10 pages]**
- **Deserts, semi-arid areas, and desertification [10 pages]**
- **Mediterranean region [10 pages]**
- **Mountains [15 pages]**
- **Polar regions [15 pages]**
- **Tropical forests [10 pages]**

SECTION 3: Sustainable development pathways: integrating adaptation and mitigation

Chapter 16: Key risks across sectors and regions [40 pages]

- Synthesis of observed impacts and responses, including detection and attribution
- Key risks and avoided impacts under a range of climate and development pathways, across temporal and spatial scales
- Limits to adaptation and residual risks in natural and human systems
- Reasons for Concern across scales
- Lessons from case studies at different scales, including trans-boundary risks

Chapter 17: Decision-making options for managing risk [40 pages]

- Drivers of decision-making: values, perceptions, differential power and influence, behaviour, incentives, and financial opportunities
- Decision-making and governance for managing risk considering residual risk and limits to risk management across multiple scales, institutions, and systems
- Costs and non-monetized loss, benefits, synergies, and trade-offs, including distributional aspects

- Adaptation planning, implementation, finance needs and international cooperation, including consideration of public and private financial flows
- Lessons from case studies at different scales, including issues of governance and finance

Chapter 18: Climate resilient development pathways* [40 pages]

- Synergies and trade-offs of sustainable development (including SDGs), adaptation and mitigation, including the social effects of greenhouse gas emissions
- Adaptation pathways, including transformation and economic diversification, technologies, and strategies that strengthen resilience, reduce inequalities, and improve climate related human wellbeing
- Synthesis of risks and levels of adaptation in climate resilient pathways
- Lessons from case studies at different scales

**connection to WG III*

ANNEX I: Regional Atlas

ANNEX II: Glossary

ANNEX III: List of Acronyms

ANNEX IV: List of Contributors

ANNEX V: List of Reviewers

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