

## CHAPTER OUTLINES OF THE WORKING GROUP II CONTRIBUTION TO THE IPCC SEVENTH ASSESSMENT REPORT (AR7)

*Version before final copyedit*

**Title: Climate Change 202X: Impacts, Adaptation and Vulnerability**

**Summary for Policymakers**

**Technical Summary**

### **Chapter 1: Point of departure, framing and key concepts**

- Framing in the context of the IPCC Seventh Assessment Report providing key concepts related to impacts, losses and damages, adaptation, risk, vulnerability and sustainable development that are covered in subsequent chapters
- Facing accelerating climate change impacts and risks and adapting to complex, compounding and cascading challenges and opportunities
- Setting the stage: evolving climate policy and knowledge landscapes in a changing world
- Introducing Global, Regional and Thematic Assessments
- Introducing the 202X Technical Guidelines for Assessing Climate Change Impacts and Adaptation including Indicators, Metrics and Methodologies
- From assessment to effective implementation: overcoming barriers and enabling climate adaptation and responses to losses and damages

### **Global Assessment Chapters**

### **Chapter 2: Vulnerabilities, impacts and risks**

- Multiple dimensions of vulnerability across temporal and spatial scales
- Synthesis of observed and projected reversible and irreversible impacts, building on both slow to rapid onset events and climate extremes, including quantification, detection and attribution as appropriate
- Assessment of methodologies and synthesis of observed and projected economic and non-economic losses and damages, building on both slow to rapid onset events and climate extremes, including quantification, as appropriate
- Key risks including complex, compound, cascading, reversible, irreversible and residual risks under a range of climate scenarios, and different levels of global warming, development, adaptation and other responses

- Risks, risk management and ethics of Solar Radiation Modification
- Reasons for Concern
- Lessons from other approaches to risk assessment across scales

### **Chapter 3: Current adaptation progress, effectiveness and adequacy**

- Adaptation progress, gaps, limits and barriers and capacity building
- Indicators and metrics to measure adaptation
- Adequacy and effectiveness of support for adaptation and risk management
- Adaptation costs, trade-offs, benefits and co-benefits
- Evidence of effectiveness and scope of state and non-state actions at various scales

### **Chapter 4: Adaptation options and conditions for accelerating action**

- Effectiveness and feasibility of adaptation options considering current context, interdependencies, and a range of climate scenarios, and different levels of global warming, development, and adaptation
- Approaches for adaptive and continuous learning, monitoring and evaluation to design better policies, options and actions, and to enhance implementation including to avoid adverse outcomes
- Drivers, enablers and conditions for accelerated adaptation action, including means of implementation and using various technologies
- Ways of adaptation decision making and planning under uncertainty and enabling and constraining conditions
- Enhancing agency and capacity of stakeholders and empowering Indigenous Peoples and local communities
- Synergies, opportunities and trade-offs of adaptation such as with Disaster Risk Reduction, mitigation and sustainable development

### **Chapter 5: Responses to losses and damages**

- Types of responses to economic and non-economic losses and damages by a diversity of actors at various scales and their interactions
- Policy contexts, institutional arrangements and other approaches for responding to losses and damages at various scales

- Drivers of decision-making including values, perceptions, differential power and influence, behaviour, incentives and capacities
- Approaches of categorizations and metrics to assess losses and damages
- Existing and potential responses to losses and damages including effectiveness and feasibility under a range of climate scenarios and different levels of global warming, development and adaptation
- Needs, gaps, barriers and enablers in responses to losses and damages

## **Chapter 6: Finance**

- Background considerations, including broader macroeconomic context, other international commitments, barriers and enablers to finance
- Financial adequacy, access (equity and justice), inclusion, effectiveness, and outcomes considering finance at different scales (including national, regional, and global)
- Funding for adaptation – overview of financing needs, current climate finance flows, instruments and gaps, effectiveness and access, methodologies for tracking finance flows, and costs and benefits
- Funding for responses to losses and damages – overview of financing needs, current climate finance flows, instruments and gaps, effectiveness and access, methodologies for tracking finance flows
- Public and private finance for climate adaptation action and responses to losses and damages: finance flows at domestic and international levels
- Equitable financial systems and schemes including related approaches and policies
- Approaches to accelerate finance flows and investments, including the diversity of instruments and schemes for adaptation action
- Synergies between climate finance and climate resilience

## **Regional Assessment Chapters**

### **Common Bullets to all Regional Assessment Chapters**

- Consider regional setting, including intra-regional variabilities, areas of special concerns, such as hotspots and geographies, socio-political contexts and the thematic assessment chapters
- Multiple dimensions of vulnerability and adaptive capacity across temporal and spatial scales

- Observed and projected impacts, including economic and non-economic losses and damages, building on both slow onset and extreme Climatic-Impact Drivers
- Key risks including complex, compound, cascading, transboundary, residual risks, and risks under a range of climate scenarios and different levels of global warming, development and adaptation
- Adaptation progress, options, solutions, gaps, limits and barriers
- Range of adaptation options and responses to losses and damages, means of implementation, costs, benefits, effectiveness and feasibility of different options
- Barriers and enablers to climate action, including finance, capacity building, education, technology development and transfer
- Perception, beliefs, values, behavioural aspects and cultural practices of adaptation, including locally led adaptation and community-based responses
- Distributional nature of effects, including consideration of human rights, equity and justice, Indigenous Peoples, local communities, gender, disability, informality and intergenerational justice, and other vulnerable groups
- Institutional and governance frameworks critical to planning and implementation, including social, economic and political considerations
- Role of diverse knowledge systems including Indigenous Knowledge, local knowledge and experiential learning
- Linkages with sustainable development and climate resilient development, including co-benefits, synergies, trade-offs and opportunities for innovation and transformation
- Regional and local case studies
- Cross-chapter Papers: polar, dryland and deserts, high altitude and mountain regions, least developed countries, Mediterranean

## **Chapter 7: Africa**

## **Chapter 8: Asia**

## **Chapter 9: Australasia**

## **Chapter 10: Central and South America**

## **Chapter 11: Europe**

## Chapter 12: North America

## Chapter 13: Small Islands

### Thematic Assessment Chapters

#### **Common bullets to all thematic assessment chapters**

- Observed and projected impacts, including economic and non-economic losses and damages, building on both slow onset and extreme Climatic-Impact Drivers
- Multiple dimensions of vulnerability and adaptive capacity across temporal and spatial scales
- Key risks including complex, compound, cascading, transboundary, residual risks, and risks under a range of climate scenarios and different levels of global warming, development and adaptation
- Perceptions, beliefs, values, behavioural aspects and cultural practices of adaptation, including locally led adaptation and community-based responses
- Range of adaptation options and responses to losses and damages, means of implementation, costs, benefits, effectiveness and feasibility of different options
- Barriers and enablers to climate action, including finance, capacity building, education, technology development and transfer
- Distributional nature of effects including consideration of human rights, equity and justice, Indigenous Peoples, local communities, gender, disability, informality and intergenerational justice, and other vulnerable groups
- Institutional and governance frameworks critical to planning and implementation, including social, economic and political considerations
- Role of diverse knowledge systems including Indigenous Knowledge and local knowledge and experiential learning
- Linkages with sustainable development and climate resilient development, including co-benefits, synergies, trade-offs, and opportunities for innovation and transformation
- Case studies of implementation

## **Chapter 14: Terrestrial, freshwater and cryospheric biodiversity, ecosystems and their services**

- Considering distinct geographies and biomes, including cryosphere, polar, forests, grasslands, mountains, wetlands, deserts and drylands
- Vulnerability, resilience and climate change feedbacks of biodiversity, ecosystem structure and functions, and the implication for their services under a range of projected scenarios including climate extremes and slow to rapid onset events such as drought, sand and dust storms, and emergence of novel biological communities
- Emerging threats, challenges and management of risk to critical biodiversity, ecosystems, critical species and related cultural heritage
- Enablers, limits and barriers to natural adaptation

## **Chapter 15: Ocean, coastal and cryospheric biodiversity, ecosystems and their services**

- Considering distinct geographies and biomes, including cryosphere, polar, mangroves, sea grasses and sea weeds, coral reefs, estuaries, open ocean, intertidal zone, and salt marshes
- Vulnerability, resilience and climate change feedbacks of biodiversity, ecosystem structure and functions, and the implication for their services under a range of projected scenarios including climate extremes and slow to rapid onset events, emergence of novel biological communities
- Emerging threats, challenges and management of risk to critical biodiversity, ecosystems, critical species and related cultural heritage
- Enablers, limits and barriers to natural adaptation

## **Chapter 16: Water**

- Water security addressing the issues of too little, too much, and polluted water in the context of climate change to meet the needs of people, food production and ecosystems
- Water scarcity in arid and semi-arid regions in context of climate change
- Water use and budgeting including virtual water, water footprints, water-related nexus
- Water management across scales including non-economic and cultural values of water as appropriate
- Risks from response options, including water cooperation and sharing

## **Chapter 17: Agriculture, food, forestry, fibre and fisheries**

- Adaptation options for livelihoods, food supply chains, agricultural production and food and nutritional security, considering affordability, dietary diversity, accessibility, agency and sustainability

- Synergies and trade-offs concerning land and ocean use
- Livelihood security, risks to cultural heritage and adaptation options for key vulnerable groups such as smallholder farmers, women farmers, pastoralists, forestry, artisanal and traditional fishing dependent communities
- The role of international cooperation in addressing the adverse effect of climate change and enhancing adaptive capacity in global agriculture, livestock, fisheries and aquaculture
- Impacts of climate change on inter- and intra-regional trade for food security

## **Chapter 18: Adaptation of human settlements, infrastructure and industry systems**

- Supply chain risk, business risk, cascading impacts, risks of failure of infrastructure systems and risks to cultural heritage
- Adapting infrastructure, industry, energy systems and human settlements to reduce risk, enhance opportunities and build response capacity at multiple levels
- Developing and utilizing climate resilient infrastructure to build adaptive capacity and support sustainable development at multiple levels
- Adaptation solutions including new technologies, methods of construction, materials and innovations, green and grey and natural infrastructure, social and behavioural change, increasing energy access in the context of sustainable development
- Relevant updates to Special Report on Climate Change and Cities

## **Chapter 19: Health and well-being**

- Observed impacts and projected risks from factors such as extreme weather, emerging pathogens, and infectious diseases to physical and mental health and well-being due to multi-scale climate change, extremes, compound and cascading events
- Intersectionality of drivers of vulnerability and exposure to climate hazards within populations and communities
- Adapting health systems, and health prevention and promotion activities to reduce risk and build capacity at multiple levels
- Intersection between climate change, health and wellbeing, and non-climatic drivers of health, and other health determining factors
- Innovative and collaborative partnerships in the health sector involving different stakeholders

## **Chapter 20: Poverty, livelihoods, mobility and fragility**

- Livelihood options, households with low-income and social deprivations in rural and urban contexts, Indigenous Peoples, local communities, informal settlements, contexts of fragility, displaced, mobile and immobile populations

- Interaction of climate change and development with poverty, vulnerability and livelihoods
- Human mobility, including transhumance in the context of climate change
- Risks and adaptation in fragile contexts, and in contexts of social unrest and conflict
- Integrating adaptation and resilience into efforts towards poverty eradication, livelihood enhancement, formal and informal social protection mechanisms
- Differentiated capabilities and responsibilities, and asymmetric access to information, knowledge, finance and decision-making fora

#### **Annex I: Atlas**

- Inter- and intra-regional mapping of hazards, vulnerability, exposure, impacts, risks, adaptation, and responses to losses and damages

#### **Annex II: Linkage to TGIA: Overview of Technical Guidelines on Impacts and Adaptation**

#### **Annex III: Glossary**

#### **Annex IV: Acronyms**

#### **Annex V: List of Contributor**

#### **Annex VI: List of Reviewers**



**202X IPCC Technical Guidelines for Assessing Climate Change Impacts and  
Adaptation Including Indicators, Metrics and Methodologies:**  
*Update to the 1994 IPCC Technical Guidelines for Assessing  
Climate Change Impacts and Adaptations*

**Section 1: Introduction**

- Rationale for updating the Technical Guidelines
- Framing, purpose and audience for the Technical Guidelines

**Section 2: Adaptation in practice**

- Key principles and concepts for the Technical Guidelines, such as effective and adequate adaptation; equity and justice; co-development, flexibility and adaptive planning; integrated thinking and consideration of planning as an integrated approach suitable for practical application; synergies and trade-offs
- Considering multiple levels of governance and levels of assessment and adaptation action
- Adaptation in relation to societal development needs and values, and adaptation as both a stand-alone, iterative and continuous, mainstreamed activity

**Section 3: Technical Guidelines**

- **Scoping and goal setting** (analysis of current risk management capacities; and analysis of impact of adaptation measures on equity and justice outcomes; identification of risk distribution and risk tolerance across communities, regions and time scales; assessment of sectoral and development policies, data and knowledge sources, resources, enablers and barriers; identifying and addressing information gaps)
- **Impact, vulnerability and risk assessment** (analysis of climate impacts, including economic and non-economic losses and damages; relationship between global temperature goals and adapting to their impacts; assessment of climate risks, considering climatic and non-climatic risk drivers; identification of new and emerging risks; analysis of tolerance of residual risk; demand for adaptation; assessing uncertainty)
- **Planning** (identifying entry points for adaptation; participatory and inclusive planning processes; mainstreaming adaptation in existing policies, regulations and practices; costs and benefits, and budgeting of adaptation; identifying, appraising and prioritising adaptation options using criteria such as effectiveness, adequacy, feasibility, equity, synergies and trade-offs; iterative planning)
- **Implementation** (identifying roles and responsibilities of relevant stakeholders; identifying and mobilizing resources; development of workflow and institutional collaboration mechanisms; development of communication channels)
- **Learning, monitoring and evaluation** (impact, thematic targets and adaptation metrics and indicators to monitor and track progress, uptake and performance; systematic tracking of

lessons and feedback from implementation for continuous learning and adaptive management; ex-post evaluations including equity and justice outcomes)

#### **Section 4: Tools, building blocks and enablers**

- Systematic exploration of methodologies and tools for assessing impacts, risks, vulnerabilities and adaptation, including climate scenarios, metrics and indicators, adaptation options, prioritization and costing
- Co-development principles and practices (stakeholder engagement; locally-led approaches; gender-responsive approaches; mutual learning with marginalized communities, Indigenous Peoples, non-governmental organizations, and technical and scientific communities; communication and outreach)
- Services and data to support adaptation planning (climate information services; geophysical, environmental and socioeconomic information)
- Financing adaptation and mobilising resources for managing adaptation programs, and identification of funding mechanisms
- Survey of governance and regulatory enablers (frameworks to accelerate implementation of adaptation; identifying approaches for integrating adaptation into national and sectoral policies, laws and regulations; frameworks for adaptive management)