

WORKING GROUP III – FIFTEENTH SESSION
Hangzhou, China, 25 – 26 February 2025

WG-III: 15th/ Doc. 2
(24.I.2025)
Agenda Item: 2
ENGLISH ONLY

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

Proposed Chapter outlines of the Working Group III contribution to the IPCC Seventh Assessment Report

(Submitted by the Co-Chairs of Working Group III)

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

Proposed Chapter outlines of the Working Group III contribution to the IPCC Seventh Assessment Report

Summary for Policy Makers

Technical Summary

Chapter 1: Introduction and framing

- Introduction to WGIII report chapters and sections (and what is not going to be covered in the WGIII report)
- Framing providing overarching concepts and key policy-relevant issues of the mitigation of climate change including equity within and between countries, just transition in its broader sense, differentiation in the context of development, regionalization, and considerations of Indigenous knowledges
- Sustainable development (not limited to SDGs), national and regional priorities, and their synergies and trade-offs as a framing concept
- Framing, key concepts, and definitions of scenarios and pathways, including qualitative and quantitative scenarios
- Highlighting past performance and achievements in implementation of climate change mitigation and evolution of innovation (including social innovation), technology, capacity building, mitigation finance, governance, and climate policy
- Role of the ocean, ecosystems, and biodiversity in mitigation
- Social and socio-economic impacts of climate mitigation policy and action
- Adaptation interlinkages to mitigation
- Cross-Working Group linkages, as appropriate

Chapter 2: Past and current emissions and their drivers

- Assessment of historical emissions and emissions trends on an annual and cumulative basis (global, by region, sector, GHG, non-GHG, etc., using different indicators and definitions, at different scales), including estimates of uncertainty, and consistency with national inventories, and relationship to remaining carbon budgets
- Emissions associated with existing and planned long-lived infrastructure
- Trends in drivers, including a broad set of drivers, at different scales
- Policy, actions, and governance at different scales (global, regional, national, and local), including ex-post analysis of impacts on emissions and drivers

Chapter 3: National and global futures in the context of sustainable development and climate change

- Assessment of methodologies, models, databases, development tools for scenarios and emissions pathways, methods for assessing emissions scenarios (including justice and equity assumptions and implications), and consistency of land-use emissions definitions with national inventories
- Implications of mitigation for development pathways, such as well-being, employment, poverty, and sustainability, including the Rio Conventions
- Assessment of how development pathways and sustainable development pathways consider and affect mitigation, including implications of Rio Conventions, meeting SDGs, and beyond
- Assessment of a broad range of futures for socioeconomic development, scenarios, and their underlying assumptions and outcomes, including assessments of feasibility (geophysical, environmental-ecological, technological, economic, socio-cultural, and institutional)
- Assessment of systems transitions under different futures
- Economics of global and national mitigation and development pathways, including mitigation costs and benefits, investment needs, employment effects, co-benefits, and spillover effects

- Climate change impacts on mitigation strategies; synergies and tradeoffs between mitigation and adaptation
- Assessment of current policies, NDCs, long-term targets, other national policies and scenarios, and consistency between national and global futures, in the context of the UNFCCC and the Paris Agreement
- Opportunities to accelerate national climate action from current policies in the context of equity and justice
- Relationship between global climate targets and mitigation action, including overshoot, relationship between gross emissions reductions, residual emissions, and negative emissions
- Relationship(s) between equity, justice, and mitigation across and within countries and generations
- Robustness of mitigation strategies and pathways under uncertainty

Chapter 4: Development, mitigation, sustainability

- Sustainable development including and beyond SDGs as an integrative perspective for climate change responses (synergies and tradeoffs)
- Distributional consequences, across groups and countries
- Losers and winners: political economy of, co-benefits, and livelihood impacts of transitions related to mitigation
- Climate change mitigation response capacities and enabling conditions, including technology, finance, and cooperation for sustainable development
- Equity and justice (with a focus on just transitions and unpacking that at sectoral, national, regional, and global levels)
- Social and socioeconomic dimensions of climate mitigation and sufficiency
- Climate change mitigation responses in the context of multi-objective policies across scales (economic development and prosperity, poverty eradication, improving living standards, etc.)
- Mitigation-adaptation interlinkages and other sustainable development objectives, including potential synergies and conflicts
- Uncertainties and knowledge needs
- Implications of climate change mitigation responses on biodiversity and ecosystems, conservation, and restoration
- Ocean-based mitigation in the context of sustainable development and blue economy including synergies with global food and nutritional security
- Pathways in the context of sustainable development, including links to Chapter 3

Chapter 5: Enablers and barriers

- Feasibility of mitigation in different contexts and under multiple barriers and enablers
- Development as enabler of mitigation
- Capacity for mitigation, including technological, institutional, economic, and human capacity
- Technology, including access, cost, infrastructure, innovation, and speed of and disparity in adoption
- Finance, investment, policies and governance
- Distribution of benefits, costs, and impacts of mitigation
- Inequality and inequity within and across countries
- Social enablers, barriers, and impacts of mitigation, including public perception and support, lifestyles and behavior, communication, information, engagement, education, health and well-being
- Labor as enabler and barrier to mitigation, including supply, organization, wellbeing, skills, just transition
- Environmental and natural resources enablers and barriers for mitigation at national, international, and subnational levels, including land, water, natural resources, minerals, and climate services
- Indigenous rights, governance, and knowledge systems
- Political economy of mitigation including public preferences, interest groups, and political institutions
- International relations and cooperation, trade, and supply chains

- Peace, security, and conflict

Chapter 6: Policies and governance at national, international, and subnational levels

- Alignment of policies and governance with development pathways, equity, justice, distribution and integration with adaptation and sustainable development
- Approaches to policy and institutional design, including development-led approaches, economy-wide approaches, sectoral transition policies and international cooperation, taking into account political economy dimensions
- Multiple objectives, tradeoffs and co-benefits with climate and non-climate objectives
- Approaches, indicators, and methods for ex-post policy and governance evaluation
- Ex-post policy and governance evaluation, including synthesis of sector analysis
- Policy innovation, learning, and diffusion
- Corporate climate action including financial institutions, standards, labelling, and effectiveness
- Other non-state actors' roles at different levels, including civil society, labor and informal economy, media, social, gender and youth movements; intersection with Indigenous Peoples and local communities
- Policy packages, including coordination and consistency, sequencing and approaches for ratcheting up ambition and action
- Subnational mitigation policies and action
- Legal frameworks and litigation for climate action
- International climate and non-climate cooperation and agreements, including trade, biodiversity, and marine governance
- Governance of net-negative emissions and solar radiation modification

Chapter 7: Finance

- Scaling finance to meet current and future finance needs
- Innovation for financing, including schemes, instruments (e.g., green bonds, green credits, green taxonomies), and case studies of successful innovations
- Types of finance and financing mechanisms: public, private, bilateral, multilateral, blended finance, market-based instruments (including carbon markets)
- Financial adequacy, access (equity and justice), inclusion, and effectiveness, considering finance at different scales (including national, regional, and global)
- Financial flows (including to developing countries), tracking by sources, sectors and levels of governance, channels, regions, countries, and instruments
- Finance for innovation and for national and sectoral transitions
- Cost of capital, debt, and debt instruments
- Enabling environments for finance
- Governance of finance, including regulation and coordination of finance actors
- Transition risks in the financial sector
- Ex-post analysis of mitigation finance
- Gender, Indigenous Peoples and local communities climate finance

Common elements across Chapters 8-13

- Key findings from the Sixth Assessment Report (AR6) and the Special Report on Climate Change and Cities
- Ex-post policy analysis and evaluation
- Drivers and current trends in emissions and removals, as appropriate
- Mitigation measures and potentials and futures in the context of sustainable development, justice, equity, and global warming levels
- Feasibility and social acceptance
- Links to national and global futures
- Links to sustainable development and adaptation, including risks, co-benefits, synergies, tradeoffs, and spill-over effects, as appropriate
- Links to Indigenous Peoples and local communities
- Sector implications and interactions between relevant UN Conventions and other relevant international instruments

- Finance (e.g., market and non-market instruments, state and non-state actors)
- Knowledge gaps
- Case studies, as appropriate

Chapter 8: Services and demand

- Human needs, aspirations, inclusive well-being, and development
- Demand, equity, and access to services (e.g., nutrition, shelter, mobility) across regions and social groups including the informal sector
- Demand-side mitigation potential of different service provisioning options (e.g., active mobility, shared services) including at system scale
- Mitigation costs of demand-side options for comparison with other emission reductions options
- Social drivers of behavioral change, such as lifestyles, culture, value systems, psychology, communications, education, Indigenous knowledge systems, capacity building, social trust, and governance
- Other drivers of change, e.g., access to digitalization, new technologies, new business models, and infrastructure
- Empirical evidence of the speed for diffusion of social innovations, including business model, behavioral, community based, and institutional innovations
- Policy, governance, and the roles of state and non-state actors for faster diffusion of demand-side solutions
- Synergies and co-benefits, including cross-sectoral implications for adaptation, health, energy security, inclusive development, and materials
- Feasibility dimensions of demand-side solutions, including synergies and tradeoffs with sectors and with sustainable development dimensions
- Services and demands related to oceans

Chapter 9: Energy systems

- Trends, historical, current and future
- Options and technologies for mitigation
- Abatement potentials, costs, and implications
- Energy access for household and productive use, including distributed approach potential, security, affordability, sustainability, and adequacy
- Energy system infrastructure, including distributed and off-grid energy systems
- Navigating transitions from unabated fossil fuels to electrification and clean energy carriers across sectors, load balancing and storage, demand-side management, and smart energy systems
- Energy governance, political economy, and lock in effects (including energy markets and supply chains)
- Material and resource needs and constraints
- Capacity building and capacities (technology transfer and assimilation)
- Renewable and synthetic energy carriers
- Equity, justice, just transitions, and distributional impacts
- Fugitive emissions and methane mitigation

Chapter 10: Industry

- Industry, society, well-being and inclusive development
- Current and future demand for industrial products to meet end-use services
- Current level of emissions by industries
- Material end-use demand, material efficiency, consumption patterns, circularity, waste; CCU and CCS; critical minerals, deep sea mining
- Sector mitigation options (e.g., energy efficiency, clean fuel switching, feedstocks; process changes, such as electrification and hydrogen; carbon management), costs, and co-benefits
- Access to technology, infrastructure, and capacity
- Governance, institutions, laws, and barriers
- Impacts on and interactions with local communities and Indigenous Peoples

- Policies to drive mitigation and co-benefits in a context of sustainable development, equity, and justice
- International aspects and trade

Chapter 11: Transport and mobility services and systems

- Socioeconomic, geographic-related context circumstances
- Mobility access, affordability, and equity
- Spatial planning, infrastructure, and supply chains for mobility and energy carriers (passenger and freight; road, rail, micromobility, aviation, maritime, and other water-based)
- Mitigation options and strategies for passenger and freight transport (including Avoid, Shift, Improve options and social and technological innovation) towards zero emissions transport
- Costs and mitigation potentials of different options
- Interaction with adaptation, disaster risk and resilience, synergies and tradeoffs with sustainable development, including environment and health
- Sector-specific policies and policy packages, laws, multi-level governance, financing, and enabling conditions

Chapter 12: Buildings and human settlements

- Framing the scope and new developments
- Emission trends and drivers
- Services (including comfort, nutrition, illumination, communication)
- Scenarios and links with targets (including sectoral targets)
- Mitigation options and strategies for buildings and human settlements (e.g., spatial planning and land use, design and construction, technologies, behavior)
- Embodied emissions reduction, including biomaterials and material efficiency
- Interaction with adaptation, disaster risk and resilience, synergies and tradeoffs with sustainable development
- Distribution impacts under different urban, rural, and regional specificities/informal settlements, social vulnerability, and land use
- Barriers and opportunities (technological, physical, financial, institutional, cultural, legal, etc.)
- Costs and mitigation potential both in direct and embodied emissions
- Sector-specific policies and policy packages, governance, financing, and enabling conditions
- Infrastructure, systemic interactions, cross-sectoral benefits, circular economy, insights from life cycle assessment and material flow analysis

Chapter 13: AFOLU

- Mitigation measures (emissions and removals) and potentials in the context of sustainable development and global warming levels (including equity and justice, costs, cost of inaction, risks, feasibility, regions, tradeoffs, and synergies)
- Use of consolidated national/regional data on emission factors, forest parameters, and livestock production systems from under-represented regions, including recent data on fragile ecosystems
- Future mitigation pathways, including alternative demand scenarios, that assess the scale of land mitigation measures, impacts on gross and net land-use change across different ecosystems, and social and environmental
- Effects of climate impacts on socio-ecological systems, responses, and consequences for mitigation potentials and scenarios
- Consideration of the role of Indigenous Peoples and local communities in codesigning and implementing mitigation measures
- Evaluation and integration of economic (market and non-market), social, technological, and policy responses and their efficacy for delivering mitigation and multiple outcomes (including scales and typologies of production systems, biodiversity, water, food security, social well-being, and human health, and adaptation in a landscape context)
- Consideration of how the AFOLU sector is treated in the NDCs under the Paris Agreement and interactions with other relevant UN Conventions and other relevant international instruments

- Comparing and reconciling land use emissions with national inventories (including the effects of increasing background fluxes on total and net GHG flux from AFOLU)
- Tradeoffs and synergies of measures with sustainable development (beyond SDGs) at regional and subregional levels (including food and water nexus and efficiency and validation for low, intermediate, and high inputs in agricultural and forest systems)
- Systems integration related to AFOLU, including linkages to Chapter 14

Chapter 14: Integration and interactions across sectors and systems

- System integration, including energy, transport, buildings, and industry (in particular electrification)
- Infrastructure used by multiple sectors for enabling net-zero economies
- The role of urban systems in mitigation
- Materials, circularity, and waste
- Energy system integration (power-to-heat, power-to-transport, power-to-water, power-to-fuels, energy storage)
- Water-energy-food-ecosystem-climate change nexus, food systems, bioeconomy
- Costs and potentials, including the effects of integration
- Policies and enabling conditions for system integration and cross-sector synergies, including sequencing considerations
- Digitalization and communication for enabling system integration and interaction

Chapter 15: Potentials, limits, and risks of Carbon Dioxide Removal (CDR)

- Minimum levels of residual emissions achievable in different climate sustainable development futures
- Effectiveness of CDR approaches before, during, and after a period of temperature overshoot
- The role of CDR strategies in net-zero and net-negative futures
- Technical and economic potential, sustainability limits, equity implications and costs of different CDR approaches, including approaches in other chapters and marine carbon dioxide removal
- Non-CO₂ GHG removal approaches
- Co-benefits, synergies, tradeoffs and, adverse effects of different CDR approaches on land, biodiversity and ecosystems, energy, materials, food, and oceans
- Feasibility assessment of CDR approaches (including geophysical, environmental-ecological, technological, economic, institutional and sociocultural) reflecting different regional and sub-regional contexts and scales
- Risks related to permanence, durability and reversibility of CDR approaches at different scales
- Assessment of current status and limits of MRV approaches
- Policies and governance, market, non-market and financing for research and development and implementation of CDR approaches
- Interactions with sustainable development, adaptation, and other mitigation options
- Technology transfer and capacity building for novel CDR approaches

Annex: Glossary