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PROPOSED CHAPTER OUTLINES OF THE WORKING GROUP III CONTRIBUTION TO THE IPCC SIXTH ASSESSMENT REPORT (AR6)

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

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

1. INTRODUCTION

The proposed outline for the WG III contribution to the AR6 was prepared during the five day AR6 Scoping Meeting in Addis Ababa, Ethiopia (1-5 May 2017). This Document presents: the proposed timeline leading to the approval of the WG III AR6 Report in July 2021; the proposed content and outline of the WG III contribution to AR6; and the provisional budget estimation. Further detailed information is presented in the Information Document about the rationale behind the outline and the annotation of the proposed chapters developed by the WG III Technical Support Unit (TSU).

2. TIMELINE SCHEDULE

In order to contribute to the IPCC commitments to the UNFCCC in such a tight schedule, the timetable for the WG III contribution to the AR6 is as follows:

May 1 – 5, 2017	AR6 Scoping Meeting
Sep 6 – 10, 2017	Panel consideration of outline for AR6
Sep 11 – Oct 22, 2017	Call for CLA/LA/RE Nominations
Jan 29 – Feb 4, 2018	Decision on selection of CLA/LA/RE
Apr 1 – 5, 2019	1st Lead Author Meeting (LAM1)
Sep 30 – Oct 4, 2019	2nd Lead Author Meeting (LAM2)
Dec 9, 2019 – Jan 31, 2020	1st Order Draft (FOD) Expert Review
Mar 30 – Apr 3, 2020	3rd Lead Author Meeting (LAM3)
Jun 1 – Jul 24, 2020	2nd Order Draft (SOD) Expert Review
Oct 19 – 23, 2020	4th Lead Author Meeting (LAM4)
Feb 1– Mar 26, 2021	FGD Government Review of SPM
Jul 12 – 14, 2021	IPCC acceptance/adoption/approval

A call for nominations of Coordinating Lead Authors (CLAs), Lead Authors (LAs) and Review Editors (REs) will be issued by the Secretary of the IPCC, in September 2017. The selection process is planned to take place between January 29 and February 4, 2018, during the 55th Session of the IPCC Bureau.

In line with section 4.2 of the Appendix A to the Principles Governing IPCC Work on the Procedures for the Preparation, Review, Acceptance, Adoption, Approval and Publication of IPCC Reports, and in the light of the very tight deadlines the Panel may consider authorising reducing exceptionally Expert reviews and Government and government/expert reviews to six weeks where necessary.

3. SCOPING MEETING

A scoping meeting for the IPCC Sixth Assessment Report (AR6) was held in Addis Ababa, Ethiopia, from 1-5 May 2017. A panel of expert participants was invited to discuss all aspects of the scope, including chapters structure, outline, and contents of the report. The proposed outline for the AR6 was developed over the course of the scoping meeting. After intensive discussions within an iterative process between WG III Breakout Groups (BOGs), crosscutting BOGs between the three WGs, and plenary sessions with WGs I and II, participants agreed on the structure presented in Annex I.

4. PROPOSED CONTENT AND STRUCTURE OF THE AR6

The proposed chapters and outline of chapter headings for the WG III AR6 is presented as below. The outline and chapter bullets are detailed in Annex I.

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ANNEX I: PROPOSED CHAPTER OUTLINE

Outline with Chapter Headings and indicative bullet points

Chapter 1: Introduction and Framing

- Recent developments (Paris Agreement: NDCs, global stocktake, markets and finance, below 2°C goal; SDGs; technology and other developments; multiple entry points to climate mitigation)
- Sustainable development (including SDGs)
- Policy (multiple goal setting)
- Regional breakdown as relevant — local institutions, cultures, circumstances
- Solution orientation: Are we on track?, How can we realise ambition?, How do we accelerate progress?
- Sectors, services and systems
- Methods and framings (models, analysis, top-down/bottom-up, scenario framework, cost-benefit, treatment of uncertainty, risk assessment, data, including social science framings)
- Strong link with Chapter 17
- Robust findings so far: AR5, SR1.5, SRLCC and SROCC

Chapter 2: Past emissions trends and drivers

- Past and present trends of cumulative emissions and flows (per region, sector, GHG, GDP, etc.)
- Trends of consumption-based emissions
- Socio-economic and demographic drivers (GDP and population) and their trends
- Bird's eye view of sectoral emission drivers and their trends
- Policies and measures, related to NDCs, sustainable development perspectives and other policy goals
- Production and consumption patterns, international trade
- Technological choices and changes and impacts of technological breakthroughs
- Infrastructural lock-in and committed emissions
- Behavioural choices and lifestyles at individual and societal levels

Chapter 3: Long-term mitigation goals and pathways

- Methods of assessment, including approaches to analysis of mitigation and development pathways
- Socio-cultural-techno-economic assumptions and projections, including regional differences (referring to baseline and mitigation scenarios, shared socio-economic pathways, etc.)
- Emission pathways compatible with long-term goals and reaching higher warming levels, taking into account CO_2, non-CO_2 and short-lived climate pollutants (including peaking, rates of change and balancing sources and sinks)
- Role of changing climate on emissions
- System transformations compatible with long-term goals, including supply and demand and [integrating] sectoral information
- Economics of mitigation and development pathways, including mitigation costs, investment needs, employment effects, etc.
- Technological and behavioural aspects of mitigation pathways and socio-technical transitions
- Interaction between near- to mid-term action, including NDCs, and long-term mitigation pathways and goals

- International cooperation in mitigation pathways in the context of international mechanisms, including financial contributions
- Links to sustainable development (including co-benefits, synergies and trade-offs)
- Risk analysis of emission pathways considering uncertainty about climate response
- Benefits of mitigation, including information from WG II

Chapter 4: Mitigation and development pathways in the near- to mid-term

- Accelerating mitigation in the context of SD at a national scale
- Aggregate effects of NDCs in the context of long-term goals, including methodologies and gap analysis
- NDC implementation in the context of national and subnational action plans and policies
- Regional and national modelling of mitigation and development pathways, including scenarios consistent with Paris goals, NDCs and mid-century strategies, and transformative changes in sectors
- Implications of mitigation for national development objectives, including: employment, competitiveness, GDP, poverty, etc., and contributions of sustainable development pathways to mitigation (E.g.: green growth)
- Enabling conditions for mitigation, including technology development and transfer, capacity building, finance, and private and public sector participation
- Interactions between national actions across countries (E.g.: transboundary infrastructure, trade)
- Uncertainties and risks to the achievement of mitigation goals

Chapter 5: Demand, services and social aspects of transformation

- Mitigation, sustainable development and the SDGs (human needs, access to services, and affordability)
- Patterns of growth and welfare indicators
- Sustainable consumption and production
- Linking services with demand, sectors, systems - implications for mitigation and sustainable development
- Culture, social norms, practices and behavioural changes for lower resource requirements
- Sharing economy, collaborative consumption, community energy
- Implications of ICT for mitigation opportunities taking account of social change
- Insights from life cycle assessment and material flow analysis
- Social acceptability of supply and demand solutions
- Leapfrogging, capacity for and feasible rates of change, lock-ins
- Identifying actors, their roles and relationships
- Impacts of non-mitigation policies (welfare, housing, land use, employment, etc.)
- Policies facilitating behavioural and lifestyle change
- Case studies and regional specificities

Chapter 6: Energy systems

- Key conclusions from AR5. Do we have progress with filling gaps in knowledge after AR5?
- Energy services, energy systems and energy sector, integrations with other systems (including food supply system, buildings, transportation, industrial systems)
- Energy resources (fossil and non-fossil) and their regional distribution
- Global and regional new trends, drivers and policies, fossil fuel prices and supply systems (natural gas, coal, petroleum etc.)

- Emissions trends (including fugitive emissions and non-CO_2).
- Global and regional new trends for electricity and low carbon energy supply systems, including renewables deployment and costs.
- Smart energy systems, decentralized systems and the integration of the supply and demand
- Mitigation options (including CCS), practices and behavioural aspects (including public perception and social acceptance)
- Interconnection, storage, infrastructure and lock-in
- Role of energy systems in the transformation pathways
- Bridging long-term targets with short and mid-term policies
- Sectoral policies and goals (including feed-in tariffs, renewables obligations and others)
- Mainstreaming climate into energy policy
- Case studies
- Adaptation-mitigation co-benefits, synergies and trade-offs
- Links to sustainable development: co-benefits, synergies and trade-offs (E.g. air quality, energy access)
- Gaps in knowledge and data

Chapter 7: AFOLU

- Robust findings from the SRCCL and other SRs, and updates since AR5
- Trends in emissions and drivers
- Emerging technologies
- Mitigation measures – supply and demand - effectiveness, costs, economics
- Impacts of climate on emissions and mitigation potentials
- Adaptation-mitigation co-benefits, synergies and trade-offs
- Links to sustainable development (including co-benefits, synergies and trade-offs)
- Mitigation potentials – supply and demand - global and regional
- Constraints and opportunities across different contexts and regions
- Provision of food, feed, fibre, fuel, and ecosystem services from land
- Effectiveness of social and policy responses (public and private)
- Accounting for emissions and stocks in AFOLU and non-managed land for GST
- Case studies

Chapter 8: Urban systems and other settlements

- Links to climate change impacts and adaptation
- Links to sustainable development (including co-benefits, such as air quality and livelihood, synergies, and trade-offs)
- Demographic perspectives, migration, and urbanisation trends
- Consumption, lifestyle, and linkages between urban and rural areas
- Urbanisation wedge in future emissions and mitigation at global and national levels
- City emissions and drivers analysis, including waste and wastewater, city typologies
- Urban emissions and infrastructure lock-in
- Low-carbon city scenarios, options and costs, deep decarbonisation
- Urban form, design, and role of spatial planning
- Urban disruptive technologies and big data
- Innovative strategies and climate actions, urban experimentation, city networks and coalitions
- Urban mitigation governance – levels, barriers, and opportunities
- Policy instruments and infrastructure investments
- Rural settlements: leapfrogging opportunities
- Case studies

Chapter 9: Buildings

- Summary of key messages from AR5
- Components (building shell, appliances, lightning), system boundaries
- Links to SD
- Access to sector specific services (E.g. affordability, energy poverty)
- Services (including comfort, nutrition, illumination, communication)
- Mitigation options and strategies towards zero carbon buildings: developments since AR5 and emerging solutions
- Trends and Drivers (regional specificities)
- Systemic interactions, insights from LCA, MFA
- Scenarios, costs and potentials, links with targets (including sectorial targets)
- Sector specific policies and policy packages, financing, and enabling conditions
- Links to sustainable development (including co-benefits, synergies and trade-offs)
- Links to climate change impacts and adaptation options and its synergies and trade-offs with mitigation
- Regional specificities
- Case studies

Chapter 10: Transport

- Summary of key messages from AR5
- Components and system boundaries
- Links to SD
- Access to mobility services, affordability
- Aviation and shipping (including the treatment of aviation and maritime inventories)
- Mobility Services (passengers and goods)
- Mitigation options and strategies towards zero carbon transport: developments since AR5 and emerging solutions
- Mobility trends and drivers (regional specifies)
- Systemic interactions (E.g. energy sector, urban) and insights from LCA, MFA
- Scenarios, costs and potentials, links with targets (including sectorial targets)
- Sector specific policies and policy packages, financing. Enabling conditions
- Links to sustainable development (including co-benefits, synergies and trade-offs)
- Links to climate change impacts and adaptation options and its synergies and trade-offs with mitigation
- Regional specificities
- Case studies

Chapter 11: Industry

- What is new for AR6 based on knowledge gaps in AR5?
- Boundary and scope of the chapter
- Changing context: Paris Agreement, Kigali Agreement, SDGs, etc.
- Emission drivers, policies and trends
- Industrial development patterns and supply chains
- Circular economy
- Evolving demand for industrial products in the context of cross sectoral demand and supply developments
- Mitigation technologies, efficient system options and potential costs, including industrial waste and carbon capture and utilisation
- Scenarios and mitigation options for deep decarbonisation, potential costs and cross system implications
- Assessment of the effectiveness of policies

- Implications of ambitious climate targets and SD for future policy
- Knowledge gaps and FAQs

Chapter 12: Responses across and beyond sectors

- Scope of the chapter
- Competition for finite resources from large-scale land-based mitigation: land, water, management and governance
- Food systems including aquaculture and fisheries, regional aspects
- Interaction of food supply chains including food waste and human waste and leverages for mitigation, including emerging food technologies
- Links to adaptation and sustainable development (including co-benefits, synergies and trade-offs)
- Mitigation opportunities in diet changes
- Policies related to food system and food security including food waste and food demand
- Ocean based GHG removal techniques, potentials and spill-over effects, costs and governance
- Techniques for direct air capture of CO2 and other GHGs, potentials and limitations, costs and governance
- Summary of sectoral costs and potentials
- Summary of sectoral co-benefits and trade-offs
- Ethics and governance of land, water and space based solar radiation management

Chapter 13: National and sub-national policies and institutions

- Cross-country lessons from NDC implementation, including national and sub-national plans and strategies
- Trends in national climate legislation, strategies and institutions, in the context of sustainable development
- Building public agreement - public opinion formation, media roles, policy frames and normative change
- Political systems and climate action – comparative case analysis
- Policy instruments and regimes – effectiveness, links to multiple objectives of sustainable development (including co-benefits synergies and trade-offs)
- Integrated analysis of sectoral policies – integration with national policy, interactions across sectors, policy packages, enabling conditions, and infrastructure planning and investment
- Institutions for climate governance – lessons from cross country experience, including for capacity building, coordination, implementation, and monitoring
- Subnational climate action, including cities and states/provinces - prevalence, effectiveness, and lessons from comparative cases
- Partnerships for climate governance – multi-sectoral networks of government, civil society and private sector, private governance, and community-led governance
- Metrics to monitor climate action in the context of sustainable development (including co-benefits, synergies and trade-offs) – national, sub-national, and local
- Mitigation and adaptation linkages

Chapter 14: International cooperation

- Lessons learnt from AR5 and what is new since AR5
- International cooperation and institutions
- Paris Agreement and UNFCCC- efficacy, implementation and enhancement
- International Civil Aviation Organization and International Maritime Organization

- International sectorial agreements and approaches
- Linkages with International Organizations and processes (E.g.: WTO, World Bank, G20, IRENA and others)
- Implementing the energy transition and mitigation pathways
- Enabling institutions for finance and investment
- Capacity building institutions and approaches
- International Partnerships, including business partnerships (E.g.: Oil and gas Climate Initiative)
- International co-operation at the regional, sub-national and city level
- Transparency and accountability frameworks
- Lessons of implementation from relevant international agreements outside the climate arena
- Links to non-climate development policy (SDGs)
- International climate policy and international emissions trading system

Chapter 15: Mobilising finance

- Lessons learnt from AR5 and what is new since AR5
- Need for finance – the Paris temperature targets and the NDCs
- Public climate finance flows, including multilateral and bilateral, and taking into account effectiveness and scaling up of such flows
- International private flows of climate finance
- National and sub-national climate finance mobilization and flows, including link to climate policy
- Links between national and international finance: Moving the Trillions, including innovative financial mechanisms and public-private partnerships
- Successful case studies
- The difference in climate-resilient financing consistent with 2, well-below 2 and 1.5 degrees scenarios or pathways
- Links to adaptation and sustainable development (including co-benefits, synergies and trade-offs)
- Financial accountability, including disclosure of climate risks to assets
- Emerging trend (E.g.: community involvement in climate finance, sustainable investment criteria by institutional investors)

Chapter 16: Innovation, technology development and transfer

- Relevant findings in AR5 and what is new since AR5
- Role of innovation, technology development, diffusion and transfer in sustainable development and the Paris temperature targets
- Innovation and technology as systemic issues, evaluating literature on cases of technological innovation systems and innovation policy
- Assessment of international institutions relevant to technology and innovation, including the Paris Agreement, UNFCCC Technology Mechanism
- Non-UNFCCC partnerships and cooperative approaches on R&D cooperation, such as Mission Innovation, Breakthrough Coalition and the Cement Sustainability Initiative.
- Capacity for transformative change, including, e.g., capabilities for innovation, governance, R&D cooperation and engineering capacity
- Assessment of experiences with accelerating technological change through innovation policy for climate change at the national level, including successful case studies
- Specific challenges in emerging economies and least-developed countries, e.g. SIDS and land-locked countries

- Acceptability and social inclusion in decision-making, communication and information diffusion
- Implications of new disruptive technologies
- Links to adaptation and sustainable development (including co-benefits, synergies and trade-offs)

Chapter 17: Accelerating the transition in the context of sustainable development

- Learning from integrative perspectives on sustainable development and climate change responses (synergies and trade-offs)
- Pathways for joint responses to climate change and sustainable development challenges
- Climate change mitigation responses in the context of multi-objective policies across scales
- Climate change mitigation response capacities and enabling conditions, including technology, finance & cooperation for sustainable development
- Mitigation-adaptation interlinkages, including potential synergies & conflicts
- Regional perspectives on climate change mitigation, including regional case studies on mitigation-adaptation interactions
- Other emerging issues dealing with climate change responses and sustainable development in relation to the Agenda for Development 2030 and beyond