



WMO

# INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE



UNEP

INTERGOVERNMENTAL PANEL  
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## **PROPOSED CHAPTER OUTLINE OF THE WORKING GROUP II CONTRIBUTION TO THE IPCC FOURTH ASSESSMENT REPORT (AR4)**

(Submitted by the Co-chairs of Working Group II)

# PROPOSED OUTLINE FOR THE WORKING GROUP II CONTRIBUTION TO THE IPCC FOURTH ASSESSMENT REPORT

## CLIMATE CHANGE: IMPACTS, ADAPTATION AND VULNERABILITY

### Summary for Policymakers

### Technical Summary

#### **Introduction**

- *Scope of this Assessment*
- *Relation to other reports and studies*

## I. ASSESSMENT OF OBSERVED CHANGES

### 1. Assessment of Observed Changes in Natural and Managed Systems

- Methods in detection and attribution of observed changes
  - Data and methods in observation of current and recent changes, including extremes
  - Climate and non-climate drivers of change
  - Exploring confidence in methods and results
- Systems under investigation
  - Cryosphere
  - Hydrology and water resources
  - Coastal processes and zones
  - Terrestrial biological systems
  - Aquatic biological systems
  - Agriculture and forestry
  - Human health
  - Disasters and hazards
- Larger scale aggregation and attribution
  - Relative sensitivity, resilience and adaptive capacity of different systems
  - Assessing the relation of observed changes in systems to regional climate trends
  - Assessing the relation of observed regional climate trends to anthropogenic climate change
  - Uncertainties and confidence levels
  - Learning from current and recent observed adaptation

## II. ASSESSMENT OF FUTURE IMPACTS AND ADAPTATION: SECTORS AND SYSTEMS

### 2. New Methods and Scenarios of the Future

- New developments in methods
  - Resulting uncertainties and confidence levels
- Scenarios: climate/other environmental/socio-economic assumptions
  - Data requirements for assessment
  - Sensivity analysis
  - The development and application of scenarios
  - Characterisations of future conditions, including extreme events
  - Stabilisation scenarios
  - Future requirements for data and scenarios; caveats and uncertainties

*Content guide for subsequent chapters in Section II:*

1. Scope, key issues, summary of TAR conclusions, specific methods
2. Current sensitivity/vulnerability: to weather and climate; and to other stresses; current adaptation
3. Assumptions about future trends: climate, development, technology, etc.
4. Key magnitudes/rates of impacts and future vulnerabilities; costs and other economic aspects
5. Adaptation: practices, options and constraints
6. Implications for sustainable development
7. Key uncertainties, unknowns, research gaps and priorities

### **3. Fresh Water Resources and their Management**

- Water and climate: precipitation, evapotranspiration, soil moisture, snow cover
- Surface water: rivers, lakes, ice cover; quantity and quality
- Groundwater: extraction, salinisation, quality
- Water demand and use: agriculture, industry, energy, domestic
- Extreme events: floods and droughts
- Management options

### **4. Ecosystems and their Services**

- Grasslands and savannahs
- Forests and woodlands
- Deserts
- Wetlands
- Freshwater lakes and rivers
- Mountains
- Oceans, shallow seas and marine ecosystems

### **5. Food, Fibre, Forestry, and Fisheries**

- Crop farming
- Livestock production
- Industrial crops and biofuels
- Forestry
- Fisheries: marine and fresh water
- Global food trade and food security
- Local food supply, regional employment and rural livelihood
- Environmental issues: water use, run-off, land use

### **6. Coasts and Low-lying Areas**

- Natural systems
  - Wetlands, mangroves, coral reefs
  - Deltas, estuaries and lagoons
  - Beaches and cliffed coasts
- Human society

- Water supply (incl.aquifers)
- Agriculture, aquaculture and forestry
- Human settlement, including industrial development; migration
- Health, security
- Tourism / recreation
- Extra-coastal effects on coastal environments
  - Inland effects: freshwater input and quality, sediment input
  - Oceanic effects

## **7. Industry, Settlement, and Society**

- Industry: manufacturing, construction
- Services: retailing and trade, transport, tourism, insurance and finance
- Utilities: water supply, energy, waste disposal, air quality
- Human settlement: urbanisation, urban design, planning, settlement
- Social issues: demography, migration, livelihood and culture

## **8. Human Health**

- Thermal stress
- Physical effects of extreme weather and climate events
- Combined effects with air pollution and aeroallergens
- Combined effects with water pollution
- Infectious diseases (including water- and vector-borne) and changing distributions; emerging diseases
- Changes in food quality, food supply and nutrition
- Demographic, economic and social aspects of health
- Cumulative effects; multiple stresses

## **III. ASSESSMENT OF FUTURE IMPACTS AND ADAPTATION: REGIONS**

*Content guide for chapters in Section III:*

1. Summary of knowledge assessed in the TAR
2. Current sensitivity/vulnerability: to weather and climate; and to other stresses; current adaptation
3. Assumptions about future trends: climate, development, technology, etc.
4. Summary of expected impacts: key vulnerabilities and their regional variation
5. Adaptation: regional differences in practices, options and constraints
6. Case studies
7. Implications for sustainable development
8. Key uncertainties, unknown research gaps and priorities

**Chapter 9 : Africa**

**Chapter 10 : Asia**

**Chapter 11 : Australia and New Zealand**

**Chapter 12 : Europe**

## **Chapter 13 : Latin America**

## **Chapter 14 : North America**

## **Chapter 15 : Polar Regions (Arctic and Antarctic)**

## **Chapter 16 : Small Islands**

# **IV. ASSESSMENT OF RESPONSES TO IMPACTS**

## **17. Assessment of Adaptation Options, Capacity and Practice**

- Methods and concepts: vulnerability, resilience, adaptive capacity
- Assessment of current adaptation practices: current vulnerability, risk management, local knowledge; adapting to current climate and other stresses; policies and institutions
- Assessment of adaptation capacity and options: criteria for decision making; effectiveness, benefits and costs; barriers; equity and security
- Enhancing adaptation capacity: links to mitigative capacity; opportunities; constraints; adaptive learning

## **18. Assessment of Inter-relationships between Adaptation and Mitigation**

- Comparisons (between adaptation and mitigation strategies) of prerequisites for effective implementation: determinants, capacities
- Comparisons of objectives and decision processes: reducing sensitivity vs exposure; dealing with risk
- Comparisons of scale: at global, national, sectoral, local and project levels
- Comparisons of timing: timing of outcomes, including rates of change, time discounting
- Differences between stakeholders: governments, private, civil society
- Comparison of costs and damages avoided
- Synthesis of trade-offs and synergies between adaptation and mitigation; mixes of strategies, uncertainties

## **19. Assessing Key Vulnerabilities**

- Methods and concepts: measuring damage, identifying key impacts and vulnerabilities, and their risk of occurrence
- Approaches to determining levels of climate change for key impacts: metrics, occurrence, timing, uncertainty
- Assessing key global risks
- Assessing risks for key regions and sectors
- Assessment of response strategies to avoid occurrence: stabilisation scenarios; mitigation/adaptation strategies; avoiding irreversibilities, role of sustainable development; treatment of uncertainty

## **20. Perspectives on Climate Change and Sustainability**

- Global and aggregate impacts, and multiple stresses
- Implications for regional development, access to resources and technology, and equity
- Regional differences in impacts and adaptive capacity, and implications for vulnerability and security
- Opportunities and challenges for adaptation (including over long term)
- Uncertainties, unknowns, priorities for research

## **List of authors, reviewers**

## **Glossary**

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