

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

## CLIMATE CHANGE 2007: IMPACTS, ADAPTATION AND VULNERABILITY

### Summary for Policymakers

### Technical Summary

#### Introduction

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

### A. ASSESSMENT OF OBSERVED CHANGES

#### 1. Assessment of Observed Changes and Responses 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 and sectors under investigation: observed changes including vulnerability and adaptation
  - Cryosphere
  - Hydrology and water resources
  - Coastal processes and zones
  - Terrestrial biological systems
  - Freshwater and marine biological systems
  - Agriculture and forestry
  - Human health
  - Aspects of socio-economic systems
  - Disasters and hazards
- Larger scale aggregation and attribution
  - Regional aspects and dimensions of the issue
  - 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

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

#### 2. New Assessment Methodologies and the Characterisation of Future Conditions

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

*Content guide for subsequent chapters in section B:*

1. Scope, key issues, summary of TAR conclusions, specific methods
2. Current sensitivity/vulnerability: to weather and climate (including extreme events); and to other stresses; recent and current trends; current adaptation
3. Assumptions about future trends: climate, development, technology, etc.
4. Key future impacts and vulnerabilities
5. Costs and other socio-economic aspects
6. Adaptation: practices, options and constraints
7. Implications for sustainable development
8. Key uncertainties, confidence levels, unknowns, research gaps and priorities

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

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

### **4. Ecosystems, their Properties, Goods and Services**

- Grasslands and savannahs
- Forests and woodlands
- Deserts
- Tundra
- Mediterranean ecosystems
- Wetlands
- Freshwater lakes and rivers
- Mountains
- Oceans, shallow seas and their ecosystems
- Overall implications for biodiversity

### **5. Food, Fibre and Forest Products**

- Food-crop farming
- Livestock production
- Industrial crops and biofuels
- Forestry
- Fisheries: marine and fresh water; aquaculture and marine farming
- Global food trade and food security
- Subsistence systems, local food supply, regional employment and rural livelihood
- Further environmental consequences with respect to: water use, run-off, land use

### **6. Coastal Systems and Low-lying Areas**

- Natural systems, including their services
  - Wetlands, mangroves, mudflats and coral reefs
  - Deltas, estuaries and lagoons
  - Beaches and cliffed coasts
  - Atoll island systems
- Human society

- Water supply (including aquifers)
- Agriculture, forestry and fisheries (including aquaculture)
- Human settlement, built infrastructure, industrial development; migration
- Health
- 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, energy
- Services: retailing and trade, transport, tourism, insurance and finance
- Utilities: water supply, energy, waste disposal
- Human settlement: urbanisation, urban design, planning, rural settlement
- Social issues: demography, migration, employment, livelihood and culture

## **8. Human Health**

- Thermal stress
- Physical effects of extreme weather and climate events
- Synergies and interactions with environmental quality e.g. air and water quality and aeroallergens
- 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

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

*Content guide for chapters in section C:*

1. Summary of knowledge assessed in the TAR
2. Current sensitivity/vulnerability: to weather and climate (including extreme events); and to other stresses; recent and current trends; current adaptation
3. Assumptions about future trends: climate, development, technology, etc.
4. Summary of expected key future impacts and vulnerabilities and their spatial variation
5. Adaptation: practices, options and constraints and their spatial variation
6. Case studies
7. Implications for sustainable development
8. Key uncertainties, confidence levels, unknowns, 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**

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

#### **17. Assessment of Adaptation Practices, Options, Constraints and Capacity**

- 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, options and constraints: criteria for decision making; effectiveness; benefits and costs; limitations/barriers; role of technology; links to development; equity issues
- Enhancing adaptation: opportunities; development and transfer of technologies and know-how; constraints; adaptive learning

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

- Elements for effective implementation: determinants, capacities
- Objectives and decision processes: reducing sensitivity vs. exposure; dealing with risk
- Scale issues: global, national, sectoral, local and project levels
- Timing issues: timing of outcomes, including rates of change; time discounting
- Differing roles of stakeholders: governments, private, civil society
- Consideration of costs and damages avoided and/or benefits gained
- Synthesis of complementarities and differences between adaptation and mitigation; mixes of strategies
- Uncertainties, unknowns, priorities for research

#### **19. Assessing Key Vulnerabilities and the Risk from Climate Change**

- Methods and concepts: issues relating to Article 2 of the UNFCCC; reasons for concern; measuring damage; identifying key impacts and vulnerabilities, and their risk of occurrence
- Approaches to determining levels of climate change for key impacts
- Assessing key global risks
- Assessing key risks for regions and sectors
- Assessment of response strategies to avoid occurrence: stabilisation scenarios; mitigation/adaptation strategies; avoiding irreversibilities; role of sustainable development; treatment of uncertainty
- Uncertainties, unknowns, priorities for research

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

- Summary of new knowledge relating to impacts and adaptation
- Impacts and adaptation in the context of multiple stresses
- Implications for environmental quality
- Implications for risk, hazard and disaster management
- Global and aggregate impacts
- Implications for regional and sectoral development; access to resources and technology; equity
- Sub-regional and local issues
- Opportunities, co-benefits and challenges for adaptation (including over long term)
- Uncertainties, unknowns, priorities for research

### **List of authors, reviewers**

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