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IPCC Third Assessment Report
Working Group II
Climate Change: Impacts, Adaptation, and Vulnerability

Part I. Setting the Stage for Impact, Adaptation, and Vulnerability Assessment

Chapter 1. Overview (15 pp.)

Chapter 1 will explain the importance of the issue of climate change impacts on environmental and human systems, introduce some of the concepts and terms used in the report, and provide a guide for using the report in language accessible to non-specialist audiences.

Executive Summary

1.1 Climate change impacts: what is potentially at stake

1.2 Overview of policy-relevant scientific/technical questions addressed in the report

1.3 The nature of impacts, adaptation, and vulnerability: illustration and integration of key concepts

1.4 Audiences and information needs addressed

1.5 "Users' Guide" to the WG II TAR (e.g., treatment of uncertainties/levels of confidence)

Chapter 2. Methods and Tools (20 pp.)

This chapter will assess approaches available in the literature and describe the methods and tools that will be used in regional and sectoral analyses.

Executive Summary

2.1 Observational studies, including non-climate indicators of climate change and responses to climate variability

2.2 Methods for assessing impacts and vulnerability, including historical case studies, scenario analysis, thresholds, modeling, critical zones and populations, tolerable windows, and integrated assessment

2.3 Costing and valuation methods and issues (joint with WG III, Chapter 7)

2.4 Decision analytic methods and frameworks (joint with WG III, Chapter 10)

2.5 Alternative methods for explicitly incorporating uncertainty and characterizing "levels of confidence"

Chapter 3: Development and Application of Scenarios in Climate Change Impact, Adaptation, and Vulnerability Assessment (20 pp.)

Executive Summary

3.1 Definitions and uses of scenarios

3.2 Types of global change scenarios

3.3 Characterizing present-day conditions (baselines)

3.4 Developing socio-economic scenarios (c.f. WG III Chapter 2)

3.5 Developing land surface change scenarios

3.6 Developing environmental scenarios

3.7 Developing climate change scenarios (cross cut to WG I Chapter 13)

3.8 Representing feedbacks and consistency between scenarios

3.9 Description and evaluation of baseline data and projections provided by the IPCC Data Distribution Centre (DDC)

3.10 Facilitating the distribution, use, and interpretation of scenarios

Part II. Sectors and Systems: Impacts, Adaptation, and Vulnerability

Building on the conclusions of the SAR, recent developments in the state of knowledge of climate change impacts will be assessed. Special attention will be given to vulnerabilities, natural variability, baseline trends, cross-sectoral issues, non-linear interactions, and adaptation options. The developments in experimental work, observations, and modeling that contributed to advances in the state of knowledge will be assessed, including estimation of confidence in reported results. For major components and subcomponents, the chapters of this section will assess or review (as relevant):

- Current status and projected trends/demands
- Major findings of SAR with respect to systems and human uses
- Analysis of natural response of systems (sensitivity, vulnerability, adaptation) using scenarios as per Chapter 3
- New knowledge, including:
    a. direct effects of CO_2 fertilization/N deposition, surface ozone
    b. direct effects of climate variables
    c. effects of variability/extreme events
    d. interactions with other environmental conditions (e.g., pollution)
    e. effects on production, distribution (market/non-market) systems, and human communities
    f. effects on biodiversity and wildlifeg. potential surprises, thresholds, and indicators of system instability
    h. directed adaptation and responses
    i. tools/methods/approaches/models used in developing new knowledge, including assumptions, sensitivities, and scenarios used in models

Chapter 4: Hydrology and Water Resources (20 pp.)

Executive Summary

4.1 Introduction and scope (including types of effects and cross-sectoral impacts)

4.2 The state of knowledge of climate change impacts on hydrology and water resources

4.3 The hydrological cycle, including precipitation, evaporation, runoff, soil moisture, groundwater, and extreme hydrological events, including effects on erosion

4.4 Water demands (quantity and quality) for natural and managed ecosystems, municipal, industrial, navigation, and recreational uses, and competition among demands

4.5 Water supply (quantity and quality) for different types of systems

4.6 Management implications and adaptation options, including responses to extreme hydrological events

4.7 Integration, including relative importance of climate change and other pressures, identification of key vulnerabilities, potential for non-linear interactions, and other cross-cutting issues

4.8 Science and information needs, including monitoring

Chapter 5: Natural and Managed Ecosystems (40 pp.)

Executive Summary

5.1 Introduction and scope (including types of effects and cross-sectoral impacts)

5.2 The state of knowledge of climate change impacts on landscapes: global distribution of biomes/vegetation types/ecotones, including transitions from one type of system to another; ecosystem functions/processes, including state of knowledge of carbon budget; biodiversity, migratory wildlife, and endangered species; protected areas and conservation reserves; global markets and distribution of food and fiber

5.3 Agriculture

5.4 Grasslands/Rangelands/Grazing systems

5.5 Savannas/Woodlands

5.6 Forests/Forestry

5.7 Deserts

5.8 Lakes/Streams/Freshwater fisheries and aquaculture

5.9 Wetlands

5.10 Mountain Regions

5.11 Cryosphere

5.12 Integration, including relative importance of climate change and other pressures, identification of key vulnerabilities, adaptation potential and opportunities, valuation of systems and their services, potential for non-linear interactions, and other cross-cutting issues

5.13 Science and information needs, including monitoring

Chapter 6: Coastal Zones and Marine Ecosystems (20 pp.)

Executive Summary

6.1 Introduction and scope (including types of effects and cross-sectoral impacts)

6.2 The state of knowledge of climate change impacts on coastal zones and marine ecosystems, including sea-level rise

6.3 Ecosystems (including fisheries) and biogeochemical functions

6.4 Biogeophysical aspects of coastal zones

6.5 Indices of social and economic vulnerability of coastal zones to climate change and sea-level change

6.6 Adaptation

6.7 Integration, including relative importance of climate change and other pressures, identification of key vulnerabilities, potential for non-linear interactions, and other cross-cutting issues

6.8 Science and information needs, including monitoring

Chapter 7: Energy, Industry, and Settlements (20 pp.)

Executive Summary

7.1 Introduction and scope (including types of effects and cross-sectoral impacts)

7.2 The state of knowledge of climate change impacts on human population migration/security and settlements

7.3 Industry, energy, transportation, and other climate-sensitive sectors

7.4 Infrastructure (e.g., utilities, waste management, sanitation)

7.5 Vulnerabilities of human settlements by type (e.g., coastal, arid region, agrarian, urban)

7.6 Management implications and adaptation options

7.7 Integration, including relative importance of climate change and other pressures, identification of key vulnerabilities, potential for non-linear interactions, and other cross-cutting issues

7.8 Science and information needs, including monitoring

Chapter 8: Financial Services (15 pp.)

Executive Summary

8.1 Introduction and scope (including types of effects and cross-sectoral impacts)

8.2 The state of knowledge of climate change impacts and adaptation

8.3 Financial aspects of impacts and adaptation

8.4 Institutional mechanisms to cover the cost of impacts and adaptation investment, including insurance, governmental, and multi-lateral mechanisms

8.5 Private-sector mechanisms, including primary insurance and reinsurance

8.6 Governmental and multilateral financial mechanisms

8.7 Other financial services

8.8 Case studies

8.9 Integration, including relative importance of climate change and other pressures, identification of key vulnerabilities, potential for non-linear interactions, and other cross-cutting issues

8.10 Science and information needs, including monitoring

Chapter 9: Human Health (20 pp.)

Executive Summary

9.1 Introduction and scope (including types of effects and cross-sectoral impacts)

9.2 The state of knowledge of climate change impacts on health

9.3 Sensitivity, adaptation and vulnerability

9.4 Thermal stresses (heatwaves, cold seasons)

9.5 Extreme weather events

9.6 Air pollution (gases, fine particulates)

9.7 Aeroallergens (spores, moulds, etc.)

9.8 Vector-borne infectious diseases

9.9 Other infectious diseases (esp. water-borne and food-borne)

9.10 Integration, including relative importance of climate change and other pressures; identification of key vulnerabilities; health as integrating concept and its relationship to water resources/quality, food/fiber security, natural and managed ecosystems interactions, and socio-economic disruption/migration; potential for non-linear interactions; and other cross-cutting issues

9.11 Science and information needs, including monitoring

Part III. Regional Analyses: Impacts, Adaptation, and Vulnerability

Each chapter will focus on key findings of the Regional Impacts Special Report and update regional baselines and trends (climate, socio-economic, and other environmental). Each chapter and subchapter will explore what has been learned regarding the context of change, sensitivity, adaptation, and vulnerability of key sectors and an integrated cross-sectoral and cross-regional analyses. The template will be tailored as appropriate for each region, giving full consideration to social/equity issues relevant to the region or sectors.

Common template for each chapter

Executive Summary

X.1 Summary of the important issues in the Regional Impacts Special Report

X.2 Baseline data, including climatic and socio-economic

X.3 Regional scenarios

X.4 Hydrology and water resources

X.5 Ecosystems and agriculture, including food security

X.6 Coastal zones and marine ecosystems, and sea-level change

X.7 Energy, industry, and settlements

X.8 Financial services

X.9 Human health

X.10 Integration and synthesis, including relative importance of climate change and other pressures, identification of key vulnerabilities, adaptation potential and opportunities, valuation of systems and their services, potential for non-linear interactions, risks and uncertainties, and other cross-cutting issues. A variety of approaches will be used, including historical case studies, scenario analysis, thresholds, modeling, critical zones and populations, tolerable windows, and integrated assessment

Chapter 10: Africa (25 pp.)

Chapter 11: Asia (45 pp.)

Chapter 12: Australasia (20 pp.)

Chapter 13: Europe (25 pp.)

Chapter 14: Latin America (25 pp.)

Chapter 15: North America (25 pp.)

Chapter 16: Polar Regions (Arctic and Antarctic) (15 pp.)

Chapter 17: Small Island States (25 pp.)

Part IV. Global Issues and Synthesis

This section will focus on cross sectoral and cross regional analyses, building upon the preceding sections and considering cumulative effects. Such comparison will allow relative scaling of vulnerability across sectors and regions with respect to ecosystems, including wildlife, hydrology and water resources, agriculture and forestry, coastal zones and marine ecosystems, human settlements, financial services, and human health. This section will synthesize the scientific, technical, environmental, economic, and social aspects of impacts, adaptation, and vulnerability.

Chapter 18. Adaptation to Climate Change in the Context of Sustainable Development and Equity (20 pp.)

This chapter will analyze the opportunities for and barriers to adaptation identified in the regional chapters of the report. It will highlight options for a) the UNFCCC; b) multilateral organizations; c) national governments; and d) other actors (including the private sector) to facilitate adaptation, particularly for vulnerable populations, countries, or zones. The chapter will be organized around a series of key questions.

Executive Summary

18.1 Summary of sectoral and regional changes, and adaptation options

18.2 Lessons learned from past experience with adaptation to climate variability and change, including discussion of importance of time frames

18.3 Factors that account for adaptation success (and failure), and current trends

18.4 Adaptation to climate change in the development context

18.5 Equity and adaptation to climate change

18.6 Barriers and limits that hinder adaptation, and options for enhancing successful adaptation

Chapter 19: Synthesis and Integration of Impacts, Adaptation, and Vulnerability (35 pp.)

In this chapter, emphasis will be placed on Article 2 of the UNFCCC and key provisions [e.g., Articles 2.3, 3.14, and 10(d)] of the Kyoto Protocol, drawing on important issues that occur in many regions/sectors, or for which there will be cross-regional or global interactions. Potential global impacts of stabilization of atmospheric concentrations of GHGs at a variety of levels will be assessed, including assessment of uncertainties. Information from the other sections of the report also will be integrated to address key policy-relevant questions identified by Parties to the UNFCCC and other stakeholders. The authors will assess vulnerability within the framework of sustainable development and equity, acknowledging common but differentiated responsibilities. The chapter will be divided into the following sections:

Executive Summary

19.1 Impacts associated with different rates and magnitudes of change: A review of comprehensive approaches, including intercomparison of results

19.2 Comparative analysis of vulnerability in different regions and across different sectors/systems

19.3 Analysis of sensitivities and critical thresholds of change (magnitudes and rates) for sectors and systems, including biospheric components of the climate system

19.4 What observations are necessary to test estimates of the relationship between emissions trajectories and impacts?

19.5 The potential for unexpected changes

19.6 Strengths and weaknesses of current approaches, and implicit research needs

19.7 Analyses focusing on policy-relevant scientific/technical questions, including decisionmaking in the face of uncertainties; state of knowledge regarding the extent and distribution of vulnerability; equity issues; and, with Working Group III, balancing adaptation and mitigation.

TOTAL PAGE LENGTH = ~450 pp. (plus references)