GERICS
Climate Service Center
Germany

IPCC “made easy”

This document guides you through selected documents from the fifth Assessment Report (AR5) of the Intergovernmental Panel on Climate Change (IPCC). It explains briefly selected documents of special interest, providing an overview of the new features of the current report as well as some important insights from the “Europe chapter” in an understandable way. Our aim is that the reader of this document becomes more familiar with the results of IPCC without giving any judgment and interpretation. We will be happy to answer any further questions about the three volumes and the individual chapters. We also provide PowerPoint slides for the various chapters available on request.

For selected documents from AR5 of Intergovernmental Panel on Climate Change (IPCC) please visit the following link:

www.gerics.de/products_and_publications/publications/IPCC/detail/077836/index.php.en

- Working group 1, 2, 3: **Summary for Policymaker** (SPM)
- Working group 1, 2, 3: **Technical Summary**
- Working group 1: ***Atlas of global and regional climate projections***
- Working group 2: Chapter 23 ***Europe***
- Working group 2: ***Volume-wide frequently asked questions*** (FAQs)
- Synthesis Report of AR5: **Summary for Policymaker**

What are these documents?

The ***Summary for Policymakers (SPM)*** with approximately 30 pages has been published by the IPCC for each of the three parts of the report. The governments can give their input, but may not alter the scientific content of the underlying report.The SPM draft is worked through line by line in meetings lasting several days each. The governments may propose formulations, which should be based, of course, on the underlying scientific reports. Here, the scientific lead authors of the respective chapters always have the final say and the scientists involved have a right of veto regarding all formulations. The underlying idea is that governments explicitly acknowledge the scientific statements of the IPCC with their final agreement to the reports.

A ***Technical Summary*** in the IPCC process is an optional component of a Report, such as an Assessment Report, that provides a policy-relevant but policy-neutral summary. It is similar to a Summary for Policymakers (SPM), but with extended information targeted to a more technical audience. Technical Summaries may be in the same format as the chapters in the Report, or may be in a story-line format that reflects the key findings of the report in an alternative structure. Similar to Chapters and the SPM, it is reviewed as part of the Government and Expert Review (IPCC, 2014, September 9: Retrieved from http://www.ipcc-wg3.de/assessment-reports/fifth-assessment-report/technical-summary).

In the “***Europe Chapter***” (Chapter 23 prepared by Working Group 2 (WG 2)), current and possible future trends are discussed first, under consideration of non- climatic as well as observed and projected climatic changes. The latest scientific evidence on climate sensitivity, observed and projected climate change impacts, and adaptation options are examined with respect to four main categories:

a) Production Systems and Physical Infrastructure,

b) Agriculture, Fisheries, Forestry, and Bioenergy Production,

c) Health and Social Welfare,

d) Protection of Environmental Quality and Biological Conservation.

Particular attention is paid to decision-making regarding cross-sectoral adaptation and risk management. New aspects are the debates about "co-benefits" and unintended consequences of adaptation and mitigation. The conclusion of this chapter provides a synthesis of key findings with particular emphasis on key vulnerabilities, effects of observed climate change climate change impacts outside Europe and interregional implications, knowledge gaps, and research needs.

Across all chapters, the ***volume-wide frequently asked questions (FAQs)*** provide an entry point to the approach and scientific findings of the Working Group II AR5. These FAQs are presented in clear and accessible language. The sources of the relevant assessment in the report are noted by chapter numbers in square brackets. (cf. IPCC, 2014, March 31: WGII AR5 Chapter-specific FAQs. Retrieved from http://ipcc-wg2.gov/AR5/images/uploads/WGIIAR5-Volume-FAQs_FGD.pdf)

The ***Atlas of global and regional climate projections*** presents a series of figures showing global and regional patterns of climate change computed from global climate model output. Maps of surface air temperature change and relative precipitation change for scenario RCP 4.5 (Representative Concentration Pathway 4.5) are given for three time periods (near, mid and long term future). Temperature change is shown for the meteorological seasons June to August and December to February. Relative changes in precipitation are shown for the half-year periods April to September and October to March. Additional scenarios and seasons can be found in the Supplementary Material (Annex 1). For each region the climate change information is also presented in form of time series for the RCPs 2.6, 4.5, 6.0 and 8.5. This is done for every individual model simulation and the multi-model mean. In total the atlas displays projections for 35 regions. (cf. IPCC, 2013: Annex I: Atlas of Global and Regional Climate Projections [van Oldenborgh, G.J., et al. (eds.)]. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., et al. (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.)

What is new in IPCC AR5? (based on: www.de-ipcc.de)

- **New scenarios:** Updated and internally consistent assumptions about the future development of climatic factors, such as greenhouse gas emissions or land use changes, have been used by all Working groups. The new scenarios, so-called “Representative Concentration Pathways”, are based on assumptions about economic, social and policy development of the earth’s societies. For the first time, climate policy has also been considered *(further information in Moss, R.H. et al., 2010: The next generation of scenario for climatic change research and assessment. Nature 463, 747-756*).
- **Regional aspects:** A new feature is the extensive atlas presenting global climate change information established by Working Group 1 for different regions of the world. An extra volume of Working Group 2 integrates information on climate change mitigation and adaptation for nine selected regions.
- **Integrated approach:** Socio-economic aspects of climate change and its consequences as well as measures to mitigate climate change and adaptation are increasingly viewed in the context of sustainable development.
- **Dangers of climate change:** The interaction of multiple stressors is investigated, e.g. poverty or environmental damage can be exacerbated by climate change. Such an approach allows a better risk assessment.
- **Pathways of transformation:** Evaluations of scientifically political, financial and institutional approaches are made, which are necessary to achieve different temperature targets.

Synthesis of the Europe chapter of AR5 of IPCC from Dr. Daniela Jacob (Lead author of the Europe Chapter IPCC AR5 WG2 and director of Climate Service Center Germany)

The core concept of the WGII AR5 is illustrated in the following figure: Risk of climate-related impacts results from the interaction of climate-related hazards with the vulnerability and exposure of human and natural systems.

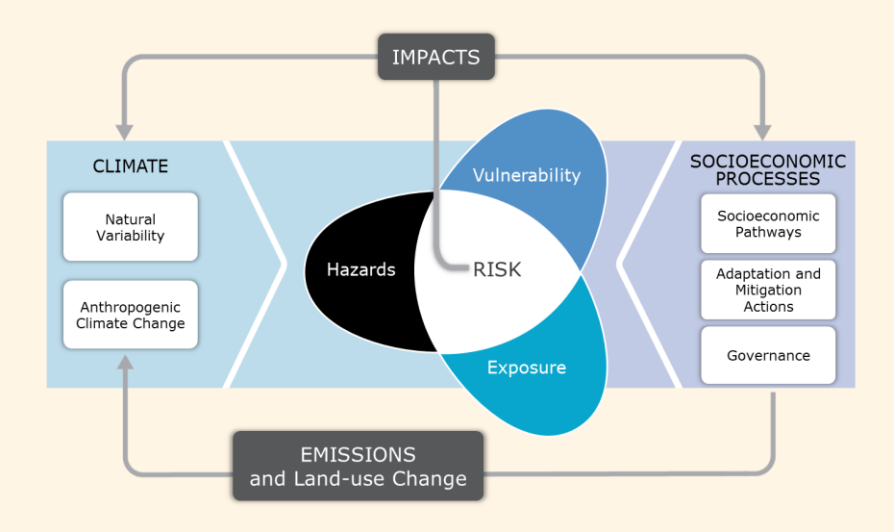

Figure: Risk concept of working group 2 (see: SPM, Figure 1)

This concept is also key for the Europe Chapter, which reviews the scientific evidence on observed and projected impacts of anthropogenic climate change and adaptation responses, published since AR4. The chapter is structured around key policy areas and five sub-regions. The benefit of assessing evidence in a regional chapter is that impacts across sectors can be described and interactions between impacts can be identified. The content of the Europe Chapter is structured according to the following sub items:

- **Introduction**
- **Current and Future Trends**
- **Implications of Climate Change for Production Systems and Physical Infrastructure**
- **Implications of Climate Change for Agriculture, Fisheries, Forestry, and Bioenergy Production**
- **Implications of Climate Change for Health and Social Welfare**
- **Implications of Climate Change for the Protection of Environmental Quality and Biological Conservation**
- **Cross-Sectoral Adaptation Decision-making and Risk Management**
- **Co-Benefits and Unintended Consequences of Adaptation and Mitigation**
- **Synthesis of Key Findings**

In addition, chapter boxes illustrate the

- Assessment of Climate Change impacts on Ecosystem Services by sub-region,
- Implications of climate change for European wine and vineyards
- National and Local Adaptation Strategies.

Three frequently asked questions are answered:

- Will I still be able to live on the coast in Europe?
- Will climate change introduce new infectious diseases into Europe?

- Will Europe need to import more food because of climate change?

In the following, a few topics from the executive summary are presented, which examine some European features, cross-sectoral information, co-benefits and unintended consequences of adaptation and mitigation. The related confidence statement [e.g. *medium confidence*] reflects the level of understanding and scientific agreement about a given phenomena (see also: *Mastrandrea, M.D. et al., 2010: Guidance Note for Lead Authors of the IPCC Fifth Assessment Report on Consistent Treatment of Uncertainties. Intergovernmental Panel on Climate Change)*.

- Climate projections show a marked increase in high temperature extremes [*high confidence*], meteorological droughts [*medium confidence*], and heavy precipitation events [*high confidence*], with variations across Europe, and small or no changes in wind speed extremes [*low confidence*] except increases in winter wind speed extremes over Central and Northern Europe [*medium confidence*].
- Climate change will increase the likelihood of systemic failures across European countries caused by extreme climate events affecting multiple sectors [*medium confidence*].
- Extreme weather events currently have significant impacts in Europe in multiple economic sectors as well as adverse social and health effects [*high confidence*]. There is limited evidence that resilience to heat waves and fires has improved in Europe [*medium confidence*], while some countries have improved their flood protection following major flood events.
- The capacity to adapt in Europe is high compared to other world regions, but there are important differences in impacts and in the capacity to respond between and within the European sub-regions.
- In Europe, adaptation policy has been developed at international (European Union), national, and local government levels, including the prioritization of adaptation options. There is limited systematic information on current implementation or effectiveness of adaptation measures or policies.
- There is also emerging evidence regarding opportunities and unintended consequences of policies, strategies, and measures that address adaptation and/or mitigation goals.

Further Information about the original documents can be found on the following websites:

Official websites of IPCC with all available documents:

- ***The Physical Science Basis*** (WG1): www.climatechange2013.org
- ***Impacts, Adaptation and Vulnerability*** (WG2): ipcc-wg2.gov/AR5
- ***Mitigation of Climate Change*** (WG3): mitigation2014.org
- ***Synthesis Report:*** www.ipcc-syr.nl

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