Introduction
(15 May 2007)

This Synthesis Report, based on the assessment carried out by the three Working Groups of the Intergovernmental Panel on Climate Change (IPCC), provides an updated view of climate change as the final integrated product of the Fourth Assessment Report. It covers the relationships between the causes of climate change, its effects and response options and other policy relevant aspects based on scientific advances since the publication of the Third Assessment Report in 2001.

The various aspects of and linkages between different components of anthropogenic climate change and related socio-economic variables, shown in Figure I.1, are covered in specific topics of this Report. Topic 1 summarises observed changes in climate and their effects on human and natural systems, regardless of their causes, while Topic 2 assesses both natural and anthropogenic causes of the observed changes. Topic 3 presents future projections of climate change and related impacts for a range of different scenarios of greenhouse gas emissions and concentrations.

A major component of this Report is the assessment of impacts of human induced climate change and possible responses within a development context. Accordingly, Topic 4 discusses adaptation and mitigation options stretching over the next few decades and their nexus with essential aspects of sustainable development. Topic 5 assesses adaptation and mitigation responses within a long-term perspective, also within the context of sustainable development. Much greater regional detail is provided in this Report than was available in the previous assessment. Topic 6 summarises the major robust findings and remaining key uncertainties in the assessment presented.

Based on an enhanced understanding of the links (represented by arrows) between various elements shown in Figure I.1, this Report allows better characterisation of impacts related to different socio-economic factors and levels of climate change, and vice versa.

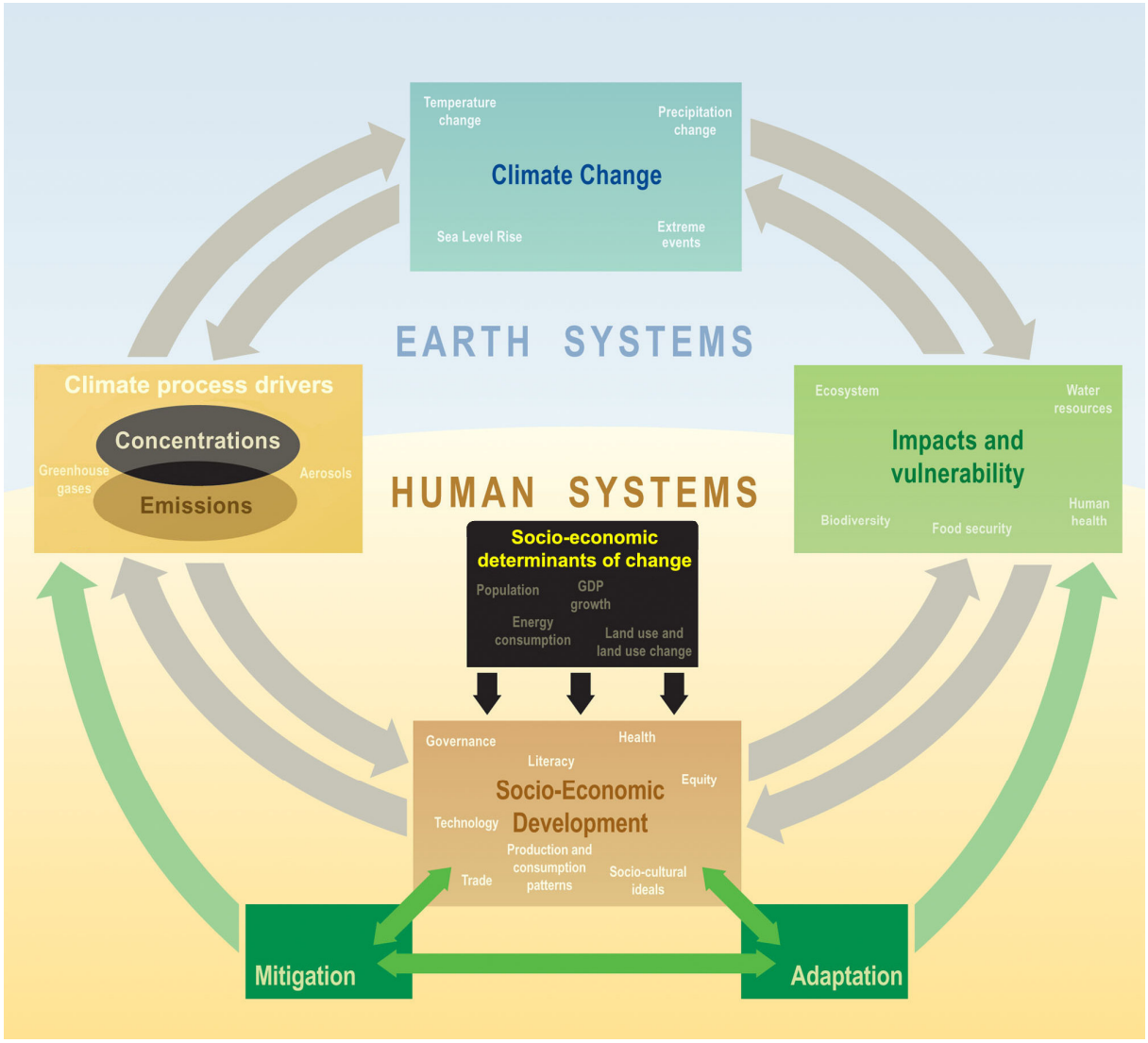

Figure I.1. Schematic and simplified representation of an integrated framework for considering anthropogenic drivers and impacts of, and responses to, climate change.

BOX I.1: Treatment of uncertainty

The IPCC uncertainty guidance note[1] defines a consistent framework for the treatment of uncertainties across all Working Groups and in this Synthesis Report. This framework is broad because the Working Group reports assess material from different disciplines and cover a diversity of approaches to uncertainty drawn from the underlying literature. The nature of data, indicators and analyses used in the natural sciences is often different from that used in the social sciences. WG I focuses on the former, WG III on the latter, and WG II covers both.

Three different approaches are used to describe uncertainties each with a distinct form of language. Choices among these three approaches depend both on the nature of the information available and the authors' expert judgment of the correctness and completeness of current scientific understanding.

[1] See http://www.ipcc.ch/activity/uncertaintyguidancenote.pdf

Where uncertainty is assessed qualitatively, it is characterised by providing a relative sense of the amount and quality of evidence (that is, information or signs from theory, observations or models indicating whether a belief or proposition is true or valid) and agreement (that is, the level of concurrence in the literature on a particular finding). This approach has been selected by WG III and uses a series of self-explanatory terms such as: *high agreement, much evidence; high agreement, little evidence; medium agreement, medium evidence; etc*.

Where uncertainty is assessed in terms of the correctness of underlying data, models or analyses using a scale of confidence levels, then the following terminology is used to express the assessed chance of being correct: v*ery high confidence* at least 9 out of 10; *high confidence* about 8 out of 10; *medium confidence* about 5 out of 10; *low confidence* about 2 out of 10; and *very low confidence* less than 1 out of 10.

Where uncertainty in specific outcomes can be assessed in a probabilistic way from a body of evidence (e.g. observations or model results) using a scale of likelihood levels, then the following terminology is used to express the assessed probability of occurrence: *virtually certain* >99%; *extremely likely* >95%; *very likely* >90%; *likely* >66%; *more likely than not* > 50%; *about as likely as not* 33% to 66%; *unlikely* <33%; *very unlikely* <10%; *extremely unlikely* <5%; *exceptionally unlikely* <1%.

Working Group II have used a combination of confidence and likelihood assessments and Working Group I have predominantly used likelihood assessments. Unless otherwise stated, numerical ranges given in square brackets in this report indicate 90% uncertainty intervals (i.e. the true value is *very likely* to lie within the stated range). Uncertainty intervals are not necessarily symmetric around the best estimate.

The Synthesis Report follows the uncertainty assessment of the underlying Working Groups. However, where synthesised findings are based on information from more than one Working Group, the authors have chosen the most appropriate representation of uncertainty, while ensuring consistency with assessments in the underlying reports.