Open letter by Netherlands scientists on IPCC and errors in Climate Change 2007 report

Errors in the IPCC climate change report are being seized by some to discredit climate science. In the Netherlands parliament climate scientists have recently been depicted as 'swindlers' and 'climate mafia'. Such allegations are not supported by the facts and are unwarranted. The fact that IPCC is not infallible does not make its key findings untrue or biased. Still, IPCC should become more generous in acknowledging errors rapidly and openly.

With this open letter from the Netherlands scientific community, we aim to adjust the image that has emerged. We ask to keep the public debate more in accordance to the facts. We discuss the key messages from climate science, the IPCC procedures and the quality control mechanisms of the IPCC. Finally we explain what we will do next to contribute to improvement of the IPCC practice and to the restoration of the tarnished trust in climate science.

The climate problem

Since 1990, our knowledge on human made climate change and the understanding of its urgency have rapidly increased. Within the natural sciences, the major components of the climate system are well understood. It is a well established fact that the amount of anthropogenic greenhouse gases in the atmosphere has increased rapidly since the industrial revolution. The major influence of greenhouse gases in the atmosphere on the temperature on the ground is a matter of elementary physics. The increasing amounts of anthropogenic greenhouse gasses in the atmosphere change the heat radiation balance of the earth, which very likely leads to higher temperatures on the ground. Measurements consistently show a world wide temperature increase of about half a degree Centigrade over the past century. The measured temperature increase lags several decades behind the changes in atmospheric composition: with present day greenhouse gas concentrations the temperature is expected to further increase by at least 1°C in the coming decades.

The increase in greenhouse gas concentrations is mainly caused by the way in which coal, oil and natural gas are being used and by deforestation. Major uncertainties exist regarding future greenhouse gas emissions and their impacts. Studies by reputable research groups show that projected emissions of greenhouse gases may lead to a further warming of 1,1 to 6,4°C by the year 2100 (relative to the period 1980-1999). Given the fact that the climate system exhibits tipping points, this may lead to partly unpredictable and possibly far reaching and irreversible impacts on society and nature.

The Copenhagen Accord acknowledges that dangerous human interference with the climate should be prevented. For that reason governments agreed that global warming should be limited to 2°C at maximum (compared to the preindustrial climate). Research has shown that this is economically and technically feasible with emission reduction measures and changes in consumption patterns.

The IPCC and the Fourth Assessment Report

In 1988 the *World Meteorological Organization* (WMO) and the *United Nations Environment Programme* (UNEP) established the *Intergovernmental Panel on Climate Change* (IPCC) with the aim to provide policy makers regularly with a balanced overview of the state of knowledge on climate change. IPCC is an open network organization in which renowned scientist from all over the world collaborate. These scientists are mainly from universities – including most of the Dutch universities – and research institutes such

as in our country the *Royal Netherlands Meteorological Institute* (KNMI), the Energy Research Centre of the Netherlands (ECN) and the Netherlands Environmental Assessment Agency (PBL). At present 194 countries participate in the IPCC, including the Netherlands.

IPCC publishes an assessment report every six years. The most recent was published in 2007. This report comprises three volumes: *The Physical Science Basis* (Working Group I); *Impacts, Adaptation and Vulnerability* (Working Group II) and *Mitigation of Climate Change* (Working Group III). The 2007 report has been authored by about 44 writing teams with a total of 450 lead authors. These authors have been selected on the basis of their expertise. All 194 countries have a say in this selection. Another 800 scientists have contributed texts on specific aspects. The whole process is supported by four Technical Support Units (TSUs) with 5 to 10 employees each.

Errors in the Fourth Assessment Report

We took cognizance of the commotion surrounding the errors that were found in the IPCC fourth assessment report, in particular in volume II. The wrong year for the projected disappearance of the Himalaya glaciers and the wrong percentage 'land below sea level' of the Netherlands are examples of errors that need be acknowledge frankly and need be rectified properly. However, they do not alter the key finding that human beings are very likely changing the climate, with far reaching impacts in the long run.

In heated debates that emerged around these errors, questions have been raised regarding the quality and integrity of the IPCC. The quality control procedure of IPCC has shown not to be watertight. But the suggestion that scientific data have deliberately been manipulated is not supported by the facts.

Also we strongly contest the impression that the main conclusions of the report are based on dubious sources. The reference list of the approximately three thousand page report refers to about 18,000 sources, the large majority being studies published in peer-reviewed scientific journals. The IPCC has transparent procedures[1] for using non-published and non-peer-reviewed sources in their reports. In the Himalaya case these procedures have not properly been followed. In the writing of new reports the compliance with the procedure requires extra attention.

Quality control within the IPCC

The impression that the IPCC does not have a proper quality control procedure is mistaken. The procedure for compiling reports and its quality control are governed by well documented principles[2]. These principles are reviewed regularly and amended as appropriate. On a website all steps of each chapter can be traced: the *First Order Draft*, the comments by many scientist on that draft, the *Second Order Draft* in which the comments are incorporated and the comments by experts and country representatives on that revised version. In the case of the Fourth Assessment Report, 2,500 reviewers provided together about 90,000 comments on the 44 chapters. For each comment it is documented how and why the comment has or has not been used in the revision. Review editors guarantee that each comment is treated properly and honestly in the revision of the chapter texts. As completion of the procedure, once they are satisfied with the result, review editors sign a statement in this regard.

The IPCC principles also govern how authors have to treat non-published and non-peer reviewed sources. These procedures acknowledge that in peer reviewed scientific

[1] www.ipcc.ch/pdf/ipcc-principles/ipcc-principles.pdf and www.ipcc.ch/pdf/ipcc-principles/ipcc-principles-appendix-a.pdf

[2] www.ipcc-wg2.gov/publications/AR4/ar4review.html

journals little information can be found regarding matters such as the emission reduction potential in a given industrial sector or in a country or regarding vulnerabilities of sectors and countries with regard to climate change. Such information can often only be found in reports from research institutes, reports of workshops and conferences or in publications from the industry or other organizations, the so-called *gray* literature. The IPCC procedure prescribes that authors are obliged to critically assess any *gray* source that they wish to include. The quality and validity of a finding from a non-peer reviewed source needs to be verified before the finding may be included in a chapter text. Each source needs to be completely traceable. In case unpublished sources are used, a copy needs to be made available to the IPCC secretariat to guarantee that it is available upon request for third parties.

We conclude that the IPCC procedures are transparent and thorough, even though they are not infallible. The writing of IPCC reports and its quality control remains the work of humans. A guarantee for an error free report is an unachievable ideal, however much an error free report is highly desired. It is however essential to continuously evaluate the IPCC principles and procedures and to amend them where appropriate and learn from errors that occurred.

What next?

Meanwhile, as a consequence of the impression that has emerged from the – in our view – disproportionate commotion, public trust in the scientific underpinning of climate policies is now tarnished. This is worrying because the climate change issue is serious and urgent. Despite the errors found, the robust key conclusions of the IPCC Fourth Assessment Report that we sketched above, remain valid.

IPCC should become more generous in acknowledging errors rapidly and openly. To this end, IPCC should put an erratum on its website that rectifies all errors that have been discovered in the text after publication. In doing so, a clear distinction needs to be made between errors and progressing knowledge. Progressing knowledge is published in new scientific journal articles and used in the next IPCC climate report; this information should not be in the errata.

Climate research and the IPCC reports on the state of knowledge provide a scientific foundation for climate policy making. We consider the quality of and balance in the knowledge delivered and the explicit communication of uncertainties to be of paramount importance, as IPCC does. Given the recent commotion we find it important to seek for ways to find a solution and restore trust in the climate change community. We will do our best to make sure that a critical evaluation of the IPCC procedure will take place – where possible in close consultation with the Royal Netherlands Academy of Arts and Sciences (KNAW). This should lead to both a better prevention of errors in IPCC reports and a mechanism for adequate rectification of errors found after publication.

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