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Climate Ethics

Ethical Analysis of Climate Science and Policy

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Equity Issues That Arise From IPCC Scientific and Socioeconomic Assessment Review Processes

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I. Introduction

This post looks at some equity issues that arise because of who the experts are that IPCC relies on in conducting its work. The post examines how the work of IPCC could improve its performance to consider issues raised by procedural justice regarding the selection of experts that perform the synthesis for IPCC and the range of literature that IPCC considers on which it bases its reports.

The Intergovernmental Panel on Climate Change (IPCC) was established in 1988 to assess for policy-makers available information on the science and socio-economic aspects of human-induced climate change.

The major components of the climate system that are important for climatic change are the atmosphere, oceans, terrestrial biosphere, glaciers and ice sheets, and land surface. In order to project the impact of human perturbations on the climate system, it is necessary to assess the effects of all key processes operating in these climate components and the interaction between them. These climate processes can be represented in mathematical terms based on physical laws such as the conservation of mass, momentum, and energy. However, because of the complexity of the system, these mathematical equations are solved numerically using a computer. Complex models of the atmosphere and ocean used to study climate (AOGCMs), physical quantities (e.g. temperature, humidity and wind speed) are represented within a three-dimensional (longitude-latitude-height) grid. The grid, covering most of the surface of the earth, has typical horizontal resolutions of several hundred kilometers.

There are few of such models being developed around the world. Normally, the most referenced studies using General Circulation Models (GCMs) come from the work of groups and institutions in developed countries. These modeling groups include the Geophysical Fluid Dynamics, in Princeton, USA; Main Geophysical Observatory, in Leningrad, Russian Federation; CSIRO in Australia; National Center for Atmospheric Research, in Boulder, Colorado, USA; the Canadian Climate Center; the Meteorological Research Institute, in Japan; Meteorological Office, in the United Kingdom; Meteorologie Institut, University of Hamburg; and the Max Planck Institut für Meteorologie, Hamburg, in Germany.

The IPCC is composed of experts chosen from knowledgeable scientists from all over the world. They are nominated by the individual governments of countries participating in IPCC process and chosen by the IPCC steering committee based on their previous work in the climate change field. The IPCC worldwide composition is only partially accurate because in practice, most of the experts that participated in the Assessment Reports have come from developed countries (the so-called Annex I countries, a list of countries in an Annex to the Climate Convention).

The experts upon whom IPCC relies raise several equity issues.

II. Equity in the process of representation

A simple accounting exercise of experts who have undertaken a role in the IPCC Assessment Report is presented in the tables 1a to 1e below. Considering the total amount of convening lead authors, lead authors and contributors in the Working Group I (science), greater than 90% came from Annex I countries (between 38 and 64% of which were from the United States) and only less than 10% of total experts were composed of scientists from developing nations. Although a larger participation of non-Annex I scientists is achieved in the groups of impacts, adaptation and mitigation and economic and social dimensions, the overall participation presents a similar pattern: the vast majority of scientists represented the participation (greater than 70%, from which greater than 29% were from the USA).



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IPCC Group	Annex I		USA		Non-Annex I		Total	
I (Science)	563	91.1%	217	38.54%	55	8.90%	618	100%
II (Impacts, adaptation)	282	73.82%	71	25.18%	100	26.18%	382	100%
III (Mitigation, Economic, Social)	196	71.79%	57	29.08%	77	28.21%	273	100%
Total	1041	100%	345	100%	232	100%	1273	100%

Table 1a. IPCC AR4 Experts. Convening lead authors, lead authors, and contributors.

IPCC Group	Annex I		USA		Non-Annex I		Total	
I (Science)	689	92.48%	282	40.93%	56	7.52%	745	100%
II (Impacts, adaptation)	486	77.64%	227	46.71%	140	22.36%	626	100%
III (Mitigation, Economic, Social)	160	72.73%	57	35.63%	60	27.27%	220	100%
Total	1335	100%	566	100%	256	100%	1464	100%

Table 1b. IPCC 2001 TAR experts. Convening lead authors, lead authors, and contributors.

IPCC Group	Annex I		USA		Non-Annex I		Total	
I (Science)	335	93.58%	215	64.18%	23	6.42%	358	100%
II (Impacts, adaptation)	635	82.36%	181	28.50	136	17.64%	771	100%
III (Mitigation, Economic, Social)	124	80.52%	33	26.61%	30	19.48%	154	100%
Total	1094	85.27%	429	39.21%	189	14.73%	1283	100%

Table 1c. IPCC 1995 SAR experts. Convening lead authors, lead authors, and contributors.

IPCC Group	Annex I		USA		Non-Annex I		Total	
1994 Report	134	93.71%	85	63.41%	9	6.29%	143	100%

Table 1d. IPCC 1994 Radiative Forcing of Climate Change. Convening lead authors, lead authors, and contributors.

IPCC Group	Annex I		USA		Non-Annex I		Total	
1994 Report	134	93.71%	85	63.41%	9	6.29%	143	100%

Table 1e. IPCC 1992 Supplementary report to the IPCC Scientific Assessment. Convening lead authors, lead authors, and contributors.

This is a serious drawback to the IPCC process because the outcome of the literature review is strongly influenced by the source of information (the vast majority coming from Annex I countries as these stakeholders have the responsibility of selecting the texts for the WG reports, Synthesis Report and SPMs). The political understanding of the current situation of the climate change issue by Annex I scientists is influenced by Annex I governments point of view, public opinion (as perceived by reading newspapers and magazines), and mainstream political trends that formed the tacit knowledge of the scientist. This does not necessarily mean that the result of the process is not correct, but most of the outcome is presented in such a way that "explains" or "emphasizes" the underlying view point of developed societies. Therefore the driving forces that establish IPCC scopes and outlines are strongly influenced by the viewpoint of Annex I societies and policy influences.

If scientists in developing nations do not contribute with their own perspectives of the climate change problem during the negotiation process, the discussion will not spring up from reviewing literature. This can be easily shown by the fact that no attempt has ever been made to estimate the "common but differentiated responsibility", a theme that has never appeared in IPCC literature until Brazil presented its proposal in the process that led to Kyoto in 1997. Another example of this situation was the incomplete discussion of the value of life that occurred in the IPCC Working Group 3. The consideration of the "willingness to pay" for life insurance, for instance, did not take into account the poverty dilemma of "ability to pay" for life insurance in the third world because of lack of financial capacity. Another example that can be mentioned is the formulation of a Vulnerability Index published in the IPCC Second Assessment Report in 1995 and afterwards abandoned in the TAR and AR4.

III. Origin of literature reviewed

Moreover, the IPCC was established to synthesize available scientific and socio-economic literature on climate change as well as formulate a synthesis of response strategies.

Normally most of the scientific literature assessed is written in English or other languages that can be easily assessed by the experts. This is a drawback to the process in the sense that all scientific literature related to climate change written in languages other than those that can be quickly understood by Annex I experts are not reviewed.

The literature on climate change that is not considered under the IPCC review comprises most of scientific literature elaborated in third world countries on this subject (for example, literature available in Japanese and Portuguese). Even the literature peer-reviewed in the other non-English UN official languages are often not reviewed. This is the case of literature available about the functioning of Amazon Forest that is produced in Spanish for instance. The same applies to Chinese and Russian scientific literature.

This is mostly important in relation to the objectives of assessing socioeconomic impacts and formulating response strategies because the perspective of the response and impact assessment is strongly related to the point of view of Annex I societies and policy perspective. Another side of the same coin is that most of reviewed documents produced by IPCC are not widely available or assessed in third world countries, because they are mostly available only in English.

The same difficulties are found in terms of producing independent scientific analysis from a developing country perspective.

Most of developing countries do not have capacity to analyze a GCM, or supercomputer facilities to run or develop this type of sophisticated modeling, normally not available for most of developing countries. This is not the case for the most developed among developing countries, including Brazil. Brazil has a very well equipped Center for Weather Forecast and Climate Studies (CPTEC) at the National Institute for Space Research (INPE), running supercomputer models including GCM. The researchers at CPTEC/INPE are developing specific analyses for Latin-America, in close collaboration with the University of São Paulo, another Brazilian center studying and developing GCMs with very good facilities. However, the effort to undertake this initiative is not well justified within the government, particularly compared to social and poverty eradication priorities.

Another fact is related to the origin of the climate change debate: established by the World Meteorological Organization and the United Nations Environment Program, cosponsors of IPCC, a significant portion of IPCC delegations are formed by meteorologists who have been involved and actively participating since the beginning of the climate change debate.

The United Nations Framework Convention on Climate Change (UNFCCC) has a different constituency. As the UNFCCC was signed and ratified by the vast majority of countries from all over the world, the Annex I and non-Annex I countries are well represented, despite the fact that lack of financial resources prevent a wider participation of developing countries representatives.

The problem with the representation of countries in the UNFCCC process is of a different nature: as the problem is regarded as a political one because diplomats outnumber scientists in most of delegations.

The problem of global warming is in fact related to the climate science and climate long-term forecast. But impacts and mitigation measures are not. Mitigation measures (or inventory preparation) cover different sectors like energy, land-use change and forestry, agriculture and livestock, industry, solvent use and waste treatment, requiring very specific sectoral knowledge. As the discussions tends to become more sector specific and more sophisticated a greater share of technical people are joining the delegations in the Convention process whereas in IPCC the process continues to be dominated by meteorologists that have limited knowledge of sectoral issues.

Political and economic groups have become involved with the climate change issue, mainly from the coal and the oil industries. Some scientists, supported by these groups, argue that when other natural factors are considered, because of an expected cooling next century, the expected greenhouse warming may be partially balanced out by the cooling. They also argue that an increase in atmospheric CO₂ concentration must be considered beneficial for nature and human activities. Only recently other groups like non-governmental organizations have become more activity in the Convention process but their participation in the IPCC process is marginal.

In the case of vulnerability assessment, different expertise should be involved in areas like human health, human settlements, water resources, coastal zones and marine ecosystems, desertification, food (crops and fishery), agriculture (grassland and livestock), forestry, industry and energy, wildlife, rate of extinction of species, etc. This poses a difficult burden on the Subsidiary Bodies of the Convention, in particular the Subsidiary Body for Scientific and Technological Advice, where scientific themes are to be discussed lacking the appropriate multidisciplinary background.

Another issue that is very important in this context is the financial support for studies that normally are based on Annex I institutions funds. Research that is done by experts from developing countries is normally part of projects that study issues that are important for developed countries and therefore very important subjects for developing countries are not well-funded unless a specific program is established for some global issues that are also part of Annex I institutions concerns as is the case of Amazon forest.

Finally, another concern for developing countries arise from the interlinkages between the UNFCCC and IPCC process where some scientific issues will have a deep impact on the policy discussions in the UNFCCC and Kyoto Protocol implementation processes. These issues include deforestation and carbon dioxide capture and storage. Some of the texts and literature reviewed for such issue is selectively chosen to favor a particular constituency of representatives of Annex I countries that enter the processes with particular points of views. For instance, the introduction of carbon dioxide capture and storage methodologies in the IPCC National Inventories Guidelines was adopted by the UNFCCC and is an example of policy influence that was derived from scientific work of IPCC that was influenced by developed country influences.

IV. Conclusions

As IPCC continues its work on synthesizing the scientific and socio-economic literature on climate change for policy-makers in the years ahead, it should:

- Expressly integrate the scientific work being done in developing countries into its analyses and syntheses including, but not limited to, the non-English scientific literature;
- Examine issues under the United Nations Framework Convention on Climate Change of great interest to developing countries including the scientific basis for "common but differentiated responsibilities," "technology transfer", and "equity."

By:

Jose Miguez, Executive Secretary of the Brazilian government's Interministerial Commission on Global Climate Change

Maria Silvia Muylaert, Federal University of Rio de Janeiro,

Donald A. Brown, Penn State University

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