

# Getting the Facts Right: The Intergovernmental Panel on Climate Change and the New Climate Regime<sup>1</sup>

by John Mathiason and Medani Prasad Bhandari, Maxwell School,  
Syracuse University

*The effective creation of a regime to manage climate change at the international level starts with an agreement by all key stakeholders on the factual basis for action. For climate change, this responsibility has been given to the Intergovernmental Panel on Climate Change, whose four assessments have shaped how governments have negotiated agreements. The IPCC working method combines processes for obtaining a scientific consensus with those that lead to an intergovernmental consensus. The effectiveness of the consensus depends on who created it and the article describes the composition of the authors and reviewers who completed the last two assessments. It shows the members of the IPCC represent a wide and diverse group of scientists, largely from developed countries and balanced between government and academic employees. The analysis shows the consensus from this group is credible and the mechanism is effective.*

## Science, Politics, and the Creation of International Regimes

Media commentators and political leaders who are opposed to dealing with climate change have often questioned the validity and reliability of the scientific predictions about the causes and consequences of global warming. To do so, they have often attacked the scientists as academics who are removed from reality or are biased. The recent “climate-gate” scandal, based on hacking the e-mails of some scientists in the United Kingdom has helped fuel skepticism among critics about the value of the scientific arguments (Revkin, 2009). The evidence shows the scientific consensus arrived at by the Intergovernmental Panel on Climate Change (IPCC) is a solid one, given the composition of the panel, and an innovative means of connecting science with politics.

Determining the facts of climate change obviously involves the relationship of science and politics. The relationship is complex, since the criteria for truth are different in the two spheres. When asked “why is it that when the mind of man has stretched so far as to discover the structure of the atom we have been unable to devise the political means to keep the atom from destroying us?” Albert Einstein is said to have replied, “That is simple, my friend. It is because politics is more difficult than physics” (Clark, 1955).

---

1. Thanks are in order to Professor Mathiason's graduate assistants who coded the participation lists, including Sarah Yagoda, Uwe Gneiting, Katherine Aston, and Pierpaolo Capalbo.

Dealing with climate change involves creating an international regime, a set of arrangements among states and other stakeholders designed to solve a global problem that cannot be solved by individual nation-states. While international regimes rest on intergovernmental agreement, one dealing with climate change will go beyond the capacity of governments and will need support from non-state actors as well, creating a multi-stakeholder regime. And, because it involves the physical world, it must engage science as well as politics. This analysis shows how the IPCC bridges the two fields, by getting the facts right so the policies may be effective. In effect, if scientists cannot agree, political leaders and other stakeholders are unlikely to agree either.

Regime theory is increasingly being used to explain the process of negotiating the international agreements to solve global problems. Developed to help explain the creation of regimes like the law of the sea, regimes were defined as “sets of implicit or explicit principles, norms, rules, and decision-making procedures around which actors’ expectations converge in a given area of international relations” (Krasner 1983, 2). While this was not originally designed to describe the negotiation process, it serves this well since, in practice, agreements must be reached sequentially on principles, norms, rules and procedures.<sup>2</sup>

The sequence of steps to create a regime starts with an agreement on the facts. Making this possible for managing climate change has been the continuing contribution of the International Panel on Climate Change (IPCC), which has been designed to show the extent to which scientists have a consensus on the science underlying climate change estimates. Beyond this, the IPCC has established a key precedent for how to achieve a multi-stakeholder approach involving scientists as well as other actors to dealing with global problems.

The process of deciding on the principles, which, as Krasner put it, “are beliefs of fact, causation, and rectitude” (Krasner 1983, p. 2), can be very long. Deciding on the shape of a problem is a prerequisite to deciding what to do about it. If there is no agreement on the principles, it is almost impossible to agree on the other elements of the regime. State obligations that would be set out in norms and rules depend on the nature of the problem and its facts, and decision-making procedures similarly depend on these facts, if only to verify whether states are in compliance with obligations that they have taken on. A large portion of the debates during the negotiation process have to do with which facts to believe and how to apply them to possible remedies.

In the case of climate change, agreeing there was a problem and what caused it took about twenty years, as has been very well documented by Paterson (1996, Chapter 1) and Bolin (2007). One problem is there are natural changes in climate, so any data on change has to be seen in that context. A second problem is climatic changes are gradual, so many of the scientific conclusions must be based on a projection into the future, using models that can be, and have been, questioned. Before non-scientists can be convinced there is a problem, scientists must achieve their own consensus.

Although many climate scientists had begun to accept the hypothesis that human behavior could alter the climate over the first two-thirds of the twentieth century, the idea was given an initial boost at the first United Nations Conference on the Human Environment in Stock-

2. This was discussed extensively in a paper presented to the International Studies Association in 2007 (Mathiason, 2007).

holm in 1972. While pollution rather than climate change was the main focus of the conference, at least one recommendation suggested a need to look at climate. Stockholm Conference (SC) recommendation 70 read:

It is recommended that Governments be mindful of activities in which there is an appreciable risk of effects on climate, and to this end: Carefully evaluate the likelihood and magnitude of climatic effects and disseminate their findings to the maximum extent feasible before embarking on such activities;

And SC Recommendation 79 set in motion a larger process:

It is recommended a) That approximately 10 baseline stations be set up, with the consent of the States involved, in areas remote from all sources of pollution in order to monitor long-term global trends in atmospheric constituents and properties which may cause changes in meteorological properties, including climatic changes; b) That a much larger network of not less than 100 stations be set up, with the consent of the States involved, for monitoring properties and constituents of the atmosphere on a regional basis and especially changes in the distribution and concentration of contaminants; c) That these programmes be guided and coordinated by the World Meteorological Organization; and d) That the World Meteorological Organization, in cooperation with the International Council of Scientific Unions (ICSU), continue to carry out the Global Atmospheric Research Programme (GARP), and if necessary establish new programmes to understand better the general circulation of the atmosphere and the causes of climatic changes whether these causes are natural or the result of man's activities.

That public international organizations would become facilitators of scientific endeavors was one of the changes in the relationship of science and politics that grew in the late twentieth century (Zurn 1998; Andresen, Skodvin, Underdal and Wettestad, 2000; Miller, 2001). The traditional international face of science was through nongovernmental or quasi-governmental organizations, such as the International Conference of Scientific Unions (ICSU) founded in 1931 or the International Union for the Conservation of Nature (IUCN) founded in 1948 that brought together national scientific unions in different disciplines. As Miller (2001, 495) notes in an analysis of the Subsidiary Body for Scientific and Technological Advice (SBSTA) of the UNFCCC:

The relationship between science and politics has become increasingly sophisticated over the past half-century. Three features of this growing sophistication stand out. First, the relatively simple institutional landscape of earlier eras, in which scientists inhabited the laboratory and public officials the legislature and bureaucracy, has grown increasingly complex as a wide variety of novel institutional forms-what we have termed boundary organizations in this special issue-has emerged, each of which mixes elements of science and politics. Second, it has become increasingly obvious that neither science nor politics has a monopoly on truth or power. Rather, the construction of objective knowledge and authoritative orderings of society require increasingly nuanced arrangements that orchestrate activities in the worlds of both science and politics. Finally, the discourses, material artifacts, and institutions that increasingly populate all three domains are hybrids, complex mixtures of facts and values.

While the scientific NGOs could partner with governments at the international level, they were not formally part of the international governance structure in the same way as international public organizations of the United Nations System.

Connecting these nongovernmental institutions with the World Meteorological Organization, which linked national public meteorological services that had a formal interest in climate, a clear science-politics link could be secured. The WMO saw itself as a technical agency somewhat divorced from the political issues that affected other organizations, but was, by its intergovernmental status, connected to politics. Its Secretary-General was inevitably from a public meteorological entity.

The World Climate Programme, established in 1979, was one result of the collaboration, and its activities led to a slow, but increasing consensus among the climate scientists, led by meteorologists, that much of the observed climate change was caused by human behavior. The program ran a series of workshops and seminars that gradually mobilized this consensus culminating in an international conference at Villach, Austria, in 1985 on “Assessment of the Role of Carbon Dioxide and Other Greenhouse Gases in Climate Variations and Associated Impacts.” The Villach Conference was the first to express a scientific consensus that based on projections, there would be a significant increase in global temperatures and it led to a movement of the climate change debate to the political sphere.<sup>3</sup>

### The IPCC's Origins and Role

The governments participating in the World Meteorological Organization and UNEP Governing Council recognized the importance of obtaining a scientific consensus on climate. These two bodies agreed to the establishment of an Intergovernmental Panel on Climate Change in 1988. Paterson (1996, 40) reports that the U.S. instigated the establishment of the IPCC. The recommendation was endorsed by the General Assembly in its resolution 43/53 of 6 December 1988 on Protection of Global Climate for Present and Future Generations of Mankind. The resolution stated:

5. Endorses the action of the World Meteorological Organization and the United Nations Environment Programme in jointly establishing an Intergovernmental Panel on Climate Change to provide internationally coordinated scientific assessments of the magnitude, timing and potential environmental and socio-economic impact of climate change and realistic response strategies, and expresses appreciation for the work already initiated by the Panel;

The mandate itself was fairly open-ended and provided the IPCC with considerable flexibility in determining its procedures, as well as in how it would present its findings.

The IPCC began its work almost immediately, in order to prepare an assessment for the Second World Climate Conference in November 1990. The role of the IPCC is:

to assess on a comprehensive, objective, open and transparent basis the scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts and options for adaptation and

3. 1986 *Report of the International Conference on the Assessment of the Role of Carbon Dioxide and of Other Greenhouse Gases in Climate Variations and Associated Impacts, Villach, Austria, 9-15 October 1985* World Meteorological Organization, [Paris]

mitigation. Review by experts and governments is an essential part of the IPCC process. The Panel does not conduct new research, monitor climate-related data or recommend policies. It is open to all member countries of WMO and UNEP (IPCC Brochure 2001).

In organizational terms, this was innovative. Unlike the SBSTA, it was not a body established by treaty, nor was it an ad hoc expert body as is sometime used in international bodies. Nor was it established to formally report to an intergovernmental body. It was intended, in effect, to be independent of politics. In fact, in the UNFCCC, the only reference to the IPCC is under Article 21 on Interim Arrangements where “the head of the interim secretariat referred to in paragraph 1 above will cooperate closely with the Intergovernmental Panel on Climate Change to ensure that the Panel can respond to the need for objective scientific and technical advice.” The panel was subsequently included in the Kyoto Protocol to the Convention where “the methodological work of the Intergovernmental Panel on Climate Change” should be taken into account in formulating guidelines on verification of emission reductions.

At the outset, the IPCC elected Bert Bolin, a professor of meteorology from Sweden, as the first chair, a position in which he served until 1997, covering the first two IPCC assessments. Bolin’s book (2007) is a thorough insider’s view of the processes followed by the IPCC, using his perspectives. While it focuses primarily on the substantive issues, it includes considerable detail on the procedural elements of the IPCC work.

In its initial organization, the respective secretariats played a key role. The IPCC set up three working groups dealing respectively with science, impacts, and responses on the basis of a suggestion, according to Bolin, of Mostapha Tolba, the Executive Secretary of UNEP. Tolba, having been a negotiator at UNCED, was well aware of how multilateral negotiations took place. In the early period, the secretariats of UNEP and WMO were active in ensuring the IPCC would be set up to be effective. In so doing, they decided to maintain a remarkably low profile, restricting their activities to providing the administrative services necessary for the IPCC to function and essentially leaving the governance to the members themselves.

The three working groups were intended to draw on slightly different scientific constituencies, since impact and responses would require factoring in research outside the physical sciences and would touch on political issues. Working Group I would be dominated by climate scientists, while Working Groups II and III would have a wider participation, including, as time went on, by economists and other social scientists.

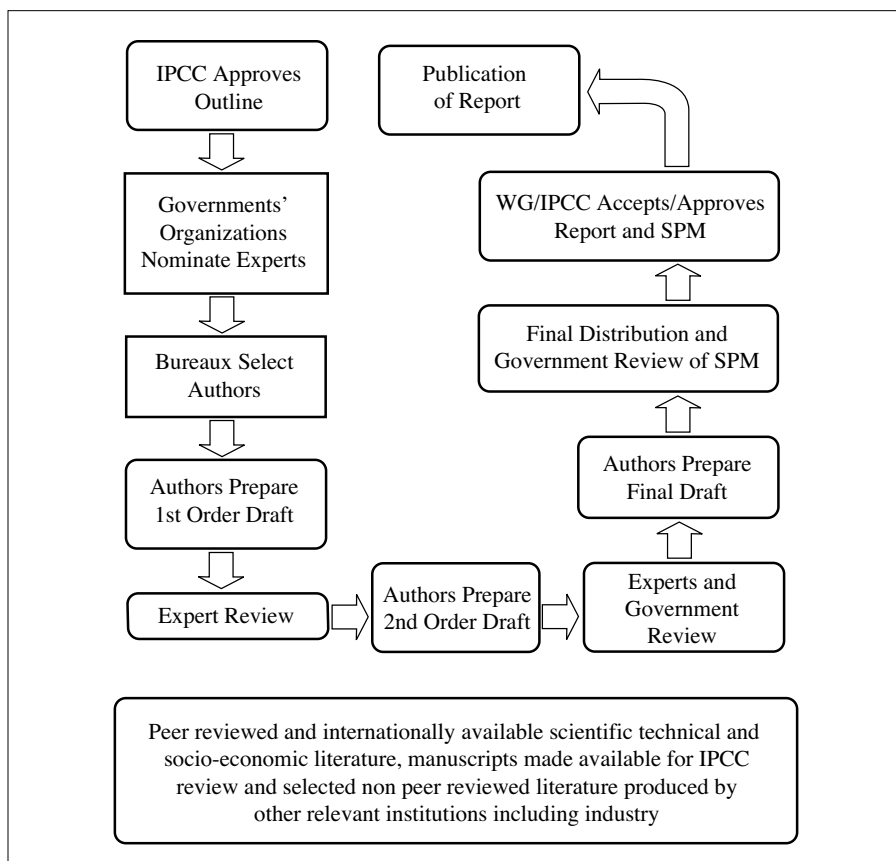
The members of the Working Groups proceeded quickly and prepared three reports in time for the 1990 Conference. Each working group issued its own report and there was no common synthesis. As has been the case throughout, the Working Group I report was considered most important, since it established the scientific basis for political negotiations. It also included a summary for policy-makers that reflected a consensus of the different drafters.

The institutional and procedural agreements set at the outset have continued over the next twenty-one years. The mandate has remained the same, the structure of working groups also generally the same, and the procedures being followed to complete the assessments the same. One change is the three working groups are now called, respectively, science, adaptation, and mitigation.

The procedure for developing, drafting, and approving an assessment has been remarkably consistent over the four assessments that have been completed (1990, 1995, 2001 and 2007). The current procedures were worked out in detail in 1999 and amended in 2003 in an appendix to the Principles Governing IPCC Work. Figure 1 shows the process (as described by the IPCC). It reflects a combination of the procedures used in science with those used in multilateral governance. The first stage involves an effort to survey scientific research systematically to answer questions that are particularly relevant for policy. Bolin (2007, 165) reports that the nine major papers leading up to the Third Assessment in 2001 contained over 25,000 references to papers in the relevant scientific and technical literature.

In the second phase, the initial draft is subject to an intensive peer-review by other scientists to assess the quality of the drafts. This is a procedure applied to determining whether research can be published in scientific journals. On the basis of the review, the drafts are revised to address comments and concerns. The process of selecting both the drafters and reviewers has always been a matter of networking and applications, but has largely been driven by the same criteria that would be applied to selecting reviewers for a journal.

**Figure 1. IPCC Assessment Preparation Process**



Source: <http://www1.ipcc.ch/ipccreports/index.htm> as of 3 November 2009.

The third phase derives from intergovernmental practice, where a draft is submitted to a government-influenced review. In other UN contexts, this is done through expert groups in which proposals are put on the table and considered by a group that is mindful of both factual and political considerations. The SBSTA analyzed by Miller is more of this type, but it is the starting point rather than a third phase as is the case with IPCC. On this basis, a final draft is prepared that may be accepted by most governments. The sequence of phases leads to addressing or eliminating issues that might impede a consensus about the facts.

The final phase is adoption by the IPCC (or in some cases, by the working group itself) with predominance given to governmental input. Once this is done, the report has intergovernmental standing and can be used in other contexts. This was important for the final negotiations of the United Nations Framework Convention on Climate Change (First Assessment Report), the Kyoto Protocol (Second Assessment Report), and the Bali Roadmap (Fourth Assessment Report).

The procedures for decision-making in the IPCC have been formalized since the beginning. The current Principles Governing IPCC Work were originally approved in 1998 and were amended in 2003 and 2006, usually to respond to concerns and to improve the process. A key element in decision-making is consensus. As the Principles (No. 10) state:

In taking decisions, and approving, adopting and accepting reports, the Panel, its Working Groups and any Task Forces shall use all best endeavours to reach consensus. If consensus is judged by the relevant body not possible: (a) for decisions on procedural issues, these shall be decided according to the General Regulations of the WMO; (b) for approval, adoption and acceptance of reports, differing views shall be explained and, upon request, recorded. Differing views on matters of a scientific, technical or socio-economic nature shall, as appropriate in the context, be represented in the scientific, technical or socio-economic document concerned. Differences of views on matters of policy or procedure shall, as appropriate in the context, be recorded in the Report of the Session.

The purpose of this is to eliminate the possibility that findings could be discredited on grounds that alternative points of view were not considered.

There have been two arguments made in the last two years that the IPCC consensus is not real. The first is that one set of information included in the 2007 appraisal was faulty. The second is that the members of the IPCC purposely excluded alternative views. In the first case, there has been a detailed explanation based on the idea that information about the rate of change in Himalayan glaciers was erroneously reported based on an inaccurate citation of otherwise correct research (Kargel, et al., 2010). The second argument was based on “climate gate,” where e-mails were hacked at one of the United Kingdom’s climate science research facilities.

As a result of the criticism of the IPCC based on these two allegations, the UN requested the InterAcademy Council:

a multinational organization of science academies created to produce reports on scientific, technological, and health issues related to the great global challenges of our time, providing knowledge and advice to national governments and international organizations. (InterAcademy Council, 2010).

The IAC is expected to “conduct an independent review of the IPCC policies and the procedures by which it prepares its assessments of climate change.”

While the procedures are one element of credibility, the other element is the individuals who apply the procedures. If the composition of the IPCC is biased, presumably the scientific consensus that it achieves would also be biased.

### **Who is the IPCC?**

The public face of the IPCC is its overall chair and to a lesser extent the working group chairs, who together with vice-chairs and regional representatives constitute the IPCC Bureau. The bureau in the IPCC, as in most intergovernmental bodies, functions primarily to make decisions about procedural matters. There have been three chairs of the IPCC. The first, as noted, was Bert Bolin, from Sweden, who organized the first two appraisals. The second was Robert Watson, from the United States, who organized the third appraisal. The third is Rajendra Pachauri, from India, who organized the fourth appraisal and is organizing the fifth.

Early in Bolin’s chairmanship and on his proposal (Bolin, 2007, 82), the IPCC decided to ensure balance in the working groups by having co-chairs. Using the usual UN’s approach to geographical balance, one of the co-chairs was from a developing country, and the other from a developed country. Over time, there has been some movement among these figures. For example, Watson was originally the chair of Working Group III in the FAR, eventually moving up to chair the IPCC.

However, the IPCC is composed of a much larger group of people. In order to prepare the drafts, there is a complex system of lead authors, coordinating lead authors, contributing authors, expert reviewers, review editors, and government focal points. As set out in the procedures found in Appendix A of the Principles (4.2.1), the compilation of lists is a very open-ended process:

At the request of Working Group/Task Force Bureau Co-Chairs through their respective Working Group /Task Force Bureau, and the IPCC Secretariat, governments, and participating organisations and the Working Group/Task Force Bureaux should identify appropriate experts for each area in the Report who can act as potential Coordinating Lead Authors, Lead Authors, Contributing Authors, expert reviewers or Review Editors. To facilitate the identification of experts and later review by governments, governments should also designate their respective Focal Points. IPCC Bureau Members and Members of the Task Force Bureau should contribute where necessary to identifying appropriate Coordinating Lead Authors, Lead Authors, Contributing Authors, expert reviewers, and Review Editors in cooperation with the Government Focal Points within their region to ensure an appropriate representation of experts from developing and developed countries and countries with economies in transition. These should be assembled into lists available to all IPCC Members and maintained by the IPCC Secretariat.

The process is intended to be inclusive, with some accountability, and if it is successful, the participants will clearly represent the range of scientific opinion and knowledge. To a large extent, the IPCC’s credibility depends on its composition, since this is the only factor that determines whether the consensus on facts represents a consensus of all—or most—scientists



or only of a limited group. This will determine whether the principles needed to create an international regime may be accepted.

The full composition of the IPCC has not been analyzed before. For this paper, we analyzed the formal lists of participants for 2001 and 2007 and coded them by country of nationality, type of organization for which they worked, and profession.<sup>4</sup> This helps describe the extent to which different stakeholders (countries, governments, nongovernmental organizations, academia, and the private sector) have had an input into the facts as agreed.

Over the last two assessments, scientists from 106 countries have been members of the IPCC working groups. As would be expected, scientists from the industrialized countries heavily dominate, although that has been changing slowly. Table 1 shows the distribution of the members of the IPCC for the Third (2001) and Fourth (2007) assessments by country group. These are the main caucusing groups in climate change negotiations. JUSCANNZ consists of Japan, the United States, Canada, Norway, Australia, and New Zealand; however, because of its predominance, the United States is shown separately from the other members in the tables. The other developed countries category includes the Russian Federation and former states of the Soviet Union that have not joined the Group of 77 as well as South Korea, Mexico, and Switzerland. The main change that may be noted is the reduction in the proportion of scientists from the United States. The geographical distribution is improving over time. In 2007, scientists from ninety-one countries were involved, compared with seventy-nine countries in 2001.

**Table 1. Membership in the IPCC by Country Group and Assessment**

Country Group	2001	2007
U.S.	36.9%	25.6%
Other JUSCANNZ	16.2%	18.0%
European Union	28.5%	32.3%
Other Developed	3.6%	6.0%
G-77 and China	14.8%	18.2%
Total Number	1,429	1,268

This summary table masks some significant differences by working group. Working Group I on science is more likely to depend on the well-funded scientific research programs, either in universities or government, that are only found in the industrialized countries. As may be seen from Table 2, the dominance of these countries is more pronounced. Although the representation of scientists from developing countries has increased, this is from a low base and reflects a slight drop in the proportion of U.S. scientists who are involved.

In contrast, Working Group II, which deals with adaptation, has had a growing relative participation of scientists from developing countries, although much of that is due to a reduction in the participation of scientists from the U.S. and a general reduction in the number of individuals

4. To obtain the list of participants we used the secondary documentary sources published by the IPCC itself, mostly online. We compared and compiled the list of IPCC experts from the 2001 and 2007 publications' appendices where a list of experts is found and put them into an Excel spreadsheet for coding and analysis. Coding was done in each case by two coders using standard inter-coder reliability checks. When information was missing, we used online search engines. In addition to the secondary data, we also collected field data (through interviews) from India, Nepal, Bangladesh, and Pakistan, to get to know whether environmental experts of South Asia were actually aware of the contribution of IPCC's role.

participating in the Working Group. In contrast, the geographical composition of Working Group III, dealing with mitigation, has been stable.

**Table 2. Working Group I by Country Group and Assessment**

Country Group/Assessment	2001	2007
U.S.	38.7%	33.4%
Other JUSCANNZ	16.7%	17.6%
European Union	34.1%	34.1%
Other Developed	4.0%	5.7%
G-77 and China	6.5%	9.2%
Total number	618	619

One factor noticeable in the figures is Working Group I has a much larger participation than the other two. This may reflect the idea that the results of Working Group I, whose conclusions form the basis for the work of the other two Groups, needs to be comprehensive. It may also reflect a concern that the voluminous and highly technical hard science behind the conclusions needs a firm consensus that can only be credible if it involves a large number of scientists.

**Table 3. Working Group II by Country Group and Assessment**

Country Group/Assessment	2001	2007
U.S.	38.4%	15.8%
Other JUSCANNZ	16.2%	18.9%
EU	23.6%	31.1%
Other Developed	2.7%	7.6%
G-77 and China	19.1%	26.6%
Total Number	593	380

**Table 4. Working Group III by Country Group and Assessment**

Country Group/Assessment	2001	2007
U.S.	27.9%	21.2%
Other JUSCANNZ	14.4%	17.5%
EU	26.1%	29.7%
Other Developed	4.5%	4.5%
G-77 and China	27.0%	27.1%
Total Number	222	269

The IPCC is formally intergovernmental, but the participants may come from a variety of sources. While all must be accepted by the governments who oversee the panel, slightly less than half of the participants actually work for a government. Most of the rest come from universities. The only change over time has been a slight decline in the proportion coming from government and a corresponding increase in personnel from universities (Table 5). This primarily took place in Working Group II, as may be seen from Table 6. Perhaps more significantly, the composition of Working Group III dealing with mitigation always has the lowest percentage of government employees, but perhaps more significantly, it has a sizeable (one

quarter) proportion of persons who are from either nongovernmental organizations, the private sector, or international organizations.

**Table 5. Place of Employment by Assessment**

Place of Employment/Assessment	2001	2007
Government	48.2%	41.4%
Universities	37.0%	43.2%
Nongovernmental	8.2%	6.6%
Private Sector	4.6%	4.6%
International Organization	2.0%	4.2%

**Table 6. Composition of Working Groups by Place of Employment**

Place of Employment/ Assessment	Working Group I		Working Group II		Working Group III	
	2001	2007	2001	2007	2001	2007
Government	51.6%	53.3%	53.4%	30.8%	25.0%	29.0%
Universities	37.4%	40.4%	34.7%	50.8%	42.3%	39.0%
Nongovernmental	8.4%	4.2%	5.9%	7.6%	13.6%	10.8%
Private Sector	1.9%	0.8%	4.2%	3.2%	12.7%	15.2%
International Organization	0.6%	1.3%	1.7%	7.6%	6.4%	5.9%

There are also geographical differences in where the participant scientists are employed. In the U.S., there has been a consistent balance between government and university employment, while in the G-77 countries, with the exception of Asia, the balance is tipped to universities. The exception is due to Chinese participants, most of whom work for government institutions. Over time, for most country groups the proportion of participants from universities has increased.

**Table 7. Composition of Working Group I by Country, Place of Employment, and Assessment**

Assessment	2001			2007		
Country Group/ Place of Employment	Government	Universities	Other	Government	Universities	Other
U.S.	47.8%	38.9%	13.2%	40.1%	47.2%	12.7%
Other JUSCANNZ	62.8%	31.6%	5.6%	50.0%	39.9%	10.1%
EU	40.6%	36.9%	22.5%	38.9%	41.3%	19.8%
Other Developed	43.7%	49.7%	6.6%	66.7%	16.7%	9.2%
Asian Developing	57.7%	27.9%	14.4%	47.7%	34.2%	18.0%
Africa	35.3%	51.0%	13.7%	34.4%	48.4%	17.2%
Latin America and Caribbean Developing	37.5%	39.3%	23.2%	30.4%	48.2%	21.4%
Total	46.5%	39.3%	14.2%	44.2%	39.8%	19.0%

In both 2001 and 2007, almost all of the participants in Working Group I were physical scientists. However, in 2007, a quarter of the participants in Working Group II were social scientists, and in Working Group III, over half of the participants were social scientists. This reflected a concern noted by Bolin that to deal with the policies necessary for adaptation and mitigation, it was necessary to engage economists, sociologists, and other social scientists to explore the implications of the scenarios generated by the physical scientists in Working Group I.

There is some overlap between the two assessments. Of the total number of individuals who have been involved, 18 percent participated in both the 2001 and 2007 assessments. Most were involved in only one, suggesting that the consensus is not based on having the same persons involved. In any of the two assessments, between 22 and 38 percent of the working groups included persons who were ultimately in both, as is shown in Table 8. (Note the total for each working group includes both those scientists who are only in one assessment and those in both. The latter group are double counted in the assessment years but counted only once in the total).

**Table 8. Proportion of Scientists Who were in both 2001 and 2007 Assessments**

Year	WG I	WG II	WG III	TOTAL
2001	33.5%	21.5%	37.8%	29.2%
2007	32.6%	32.6%	31.5%	32.4%
Total	19.8%	14.9%	20.8%	18.1%

There are few differences in this by country group. Only 16 and 17 percent of the European Union and U.S. participants respectively carried over from 2001 to 2007. Less than a quarter of the participants from the Group of 77 countries carried over.

The mix between carry-over and new scientists strengthens the notion that the consensus is solid. There is no evident “old boys” network in the IPCC but rather that the IPCC has benefited from new research and new researchers.

Over time, the importance of the assessments to governments in helping drive the negotiation process has clearly increased. The Fifth Assessment is expected by 2014, and initial scoping discussions have already been held. Many of these took place at a special expert group meeting in Venice in July 2009. Table 9 shows the composition of the participants by country group and type of organization. The largest group of participants was composed of academics with university affiliations, reflecting the trend noted above. However, there were differences. The Group of 77 participants were more heavily from governments, as were the participants from other developed countries. The U.S. had the lowest relative participation of governmental experts. This suggests that country groups had different constituencies for the assessment. In addition, there were seventeen representatives from separate international organizations.

The Fifth Assessment will build on the work of the previous four. The various participants in the working groups will be selected during 2010, but the scoping suggests that while many will be new, many will also carry over from previous assessments. This process of renewal coupled with consistency will ensure the Fifth Assessment will be as credible as its predecessors.

**Table 9. Participation in July 2009 Expert Meeting on Scoping for the Fifth Assessment**

Country Group/ Institutional type	Government	Universities	Nongovernmental	Private Sector	Number Country Group	Percent Country Group
U.S.	19.4%	58.3%	19.4%	2.8%	36	20.0%
Other JUSCANNZ	33.3%	62.5%	0.0%	4.2%	24	13.3%
European Union	31.4%	45.1%	21.6%	2.0%	51	28.3%
Other Developed	62.5%	37.5%	0.0%	0	16	8.9%
G77 and China	49.1%	35.8%	15.1%	0	53	29.4%
Total	37.2%	46.7%	10.5%	1.7%	180	100%

The relatively low representation of experts from developing countries has been a concern since the outset of the IPCC and is one of the issues that will be addressed in the Fifth Assessment. The reasons for this have more to do with the de-linkage of researchers from developing countries from epistemic communities that are based in developed countries. The problems inherent in this are reflected in research carried out by Bhandari in the summer of 2009 as part of a study of the International Union for the Conservation of Nature (IUCN).

Interviews with environmental experts from South Asia during summer 2009 asked about the role of IPCC in the experts' respective countries. The research participants were mostly IUCN members, IUCN staff, and university faculty members. The selection criteria of the participants in this research was 1) at least a master's degree or above academic qualification, 2) working experiences in the environment field more than three years, 3) been involved in environment and climate change policy at the local, national, or international level. Forty-five interviews were made (5 from Nepal, 15 from India, 10 from Bangladesh, and 10 from Pakistan).

Out of the forty-five, only twenty-five were aware how the IPCC works and what it produces for whom (9 from India, 4 from Nepal, 6 from Bangladesh, and 6 from Pakistan), while all had heard about the IPCC. The research participants from India and Bangladesh said the IPCC is a knowledge producer (like academic publications) that has minimal impact on the global climate change debate. They accepted that IPCC produces very good knowledge but does not have any mechanism to ensure the government and other stakeholders apply that knowledge. Of the twenty-five, fifteen said that until the IPCC obtained the Nobel Peace Prize in 2007, none of them gave any attention to its role. They stated the role of IPCC is to produce the facts and figures on climate change to governments through the UNFCCC.

On a question about the relevance of the knowledge produced, the interviewees had mixed reactions. They considered it another Western hegemonic body of global environment governance that identifies problems but does not successfully provide options to solve the problem. In terms of the process for selecting experts for the IPCC, the interviewees stated that experts were mainly chosen from the governments and that an individual only had a chance to be an expert if he or she had a good relationship with the government. While they did not question the expertise of IPCC participants, the interviewees did not consider

them to be good representatives of the developing world, a point also made by Chairman Pachauri (2009).

One priority announced by the IPCC for the Fifth Assessment is to engage developing countries more fully. As Pachauri said at the first scoping meeting for AR5:

There is still another reason for high expectations, which is essentially related to the lack of scientific work on climate change on a very specific basis as it relates to several locations in the world. We hope that the AR5 will be able to provide much greater regional detail than available literature has allowed in the past. We all have to make a major effort to do full justice to expectations in different parts of the world, and for this reason in the meeting beginning today we must take care of this aspect as diligently as possible. We would need to be equally diligent in going the extra mile in assessing literature in local languages where for scientific reasons we would be able to enrich the AR5 with comprehensive knowledge and information. . . .

The composition of AR5 will be announced over the course of 2010, and should be reviewed to see if the trends observed in this analysis are maintained.

### **Implications for Multi-Stakeholder Governance in the Future**

The IPCC process has been successful in ensuring the climate change negotiation process generally follows the facts to the extent scientists may agree on them. Despite the arguments made by critics, the IPCC consensus is both wide and deep. Further analysis being undertaken by the authors will show the growth of consensus over the first four assessments, but preliminary data suggest that consensus-building is sequential. Further research being undertaken by the authors is tracking issues that have been considered in the third and fourth assessment in terms of the structure of the fifth.

The process has been an ingenious combination of academic review processes and inter-governmental consensus-building practices within a flexible organizational structure. The composition of the participants is equally heterogeneous and, while maintaining a formal governmental oversight, ensures the various disciplines concerned with climate change are represented. It is a clearly a multi-stakeholder process.

The net effect of the structure and process is to present a credible consensus on the facts so any changes to the predictions will be acceptable and taken into account. The IPCC has, as a matter of design, stayed away from making policy recommendations, although the work of its working groups on adaptation and mitigation, by drawing out alternative scenarios, may affect policy discussions. And yet, while there is a consensus among the IPCC participants, there have been deniers outside the process. Bolin (2007) notes that it is the practice of the IPCC to note any dissents from specific findings in the body of reports to ensure transparency. With regard to many of the critics, he further notes the most prominent of them do not come from the disciplines that specialize in the findings that have been agreed upon.

There is no doubt that climate change and policy issues surrounding it will continue over the next decades. The resolution of disputes, verification of commitments, and monitoring of changes will be helped by the now well-articulated network of professionals who can reach consensus on facts and feed them to policy makers, key stakeholders, and to those who are expected

to manage the regime. This model may be applied to other international policy areas where science and politics need to be linked, perhaps showing that politics may be easier if science is used.

## REFERENCES

- Andresen, S., T. Skodvin, A. Underdal and J. Wettestad (2000): *Science and Politics in International Environmental Regimes. Between integrity and involvement*. Manchester: Manchester University Press.
- Bolin, Bert (2007): *A History of the Science and Politics of Climate Change: The Role of the Intergovernmental Panel on Climate Change*, Cambridge: Cambridge University Press.
- Clark, Grenville (1955): "Einstein Quoted on Politics," Letters to the Times, *New York Times*, April 22, 1955.
- InterAcademy Council (2010): "IAC in Brief" <http://www.interacademycouncil.net/CMS/3239/5933.aspx> accessed on 11 May 2010.
- Intergovernmental Panel on Climate Change, *Principles Governing IPCC Work*, <http://www.ipcc.ch/pdf/ipcc-principles/ipcc-principles.pdf> and Appendix A, *Procedures for the Preparation, Review, Acceptance, Adoption, Approval and Publication of IPCC Reports*, <http://www.ipcc.ch/pdf/ipcc-principles/ipcc-principles-appendix-a.pdf>.
- Intergovernmental Panel on Climate Change (2001): *Tenth Anniversary Brochure*, <http://www1.ipcc.ch/pdf/10th-anniversary/anniversary-brochure.pdf>.
- Kargel, Jeffrey S., Richard Armstrong, Yves Arnaud, Etienne Berthier, Michael P. Bishop, Tobias Bolch, Andy Bush, Graham Cogley, Koji Fujita, Roberto Furfaro, Alan Gillespie, Umesh Haritashya, Georg Kaser, SiriJodhaSingh Khalsa, Greg Leonard, Bruce Molnia, Adina Racoviteanu, Bruce Raup, and Cornelis Van der Veen (2010): "Satellite-era glacier changes in High Asia Complex and shifting Himalayan glacier changes point to complex and shifting climate driving processes," background support presentation for NASA "Black Carbon and Aerosols" press conference associated with Fall AGU, Dec. 14, 2009. Updated and expanded Feb. 17, 2010. <http://web.hwr.arizona.edu/~gleonard/2009Dec-FallAGU-Soot-PressConference-Backgrounder-Kargel.pdf>.
- Krasner, Stephen D. ed. (1983): *International Regimes*. Ithaca, NY: Cornell University Press.
- Mathiason, John (2007): "Reviving Functionalism and Regime Theory to Explain the Role of International Secretariats," paper prepared for the panel on The Agency and Influence of International Organizations at the 2007 Convention of the International Studies Association, Chicago, February 28, 2007.
- Miller, Clark (2001): "Hybrid Management: Boundary Organizations, Science Policy, and Environmental Governance in the Climate Regime," *Science, Technology and Human Values* 26; 478.
- Pachauri, Rajendra (2009): Speech by Mr Rajendra K. Pachauri, Chairman, IPCC at the Opening Ceremony of the Scoping Meeting for the Fifth Assessment Report (AR5) of the IPCC, Venice, Italy 13 July 2009, <http://www.ipcc.ch/graphics/speeches/rkp-speech-venice-07-2009.pdf>.
- Paterson, Matthew (1996): *Global Warming and Global Politics*, London: Routledge
- Revkin, Andrew C. (2009): "Hacked E-Mail Data Prompts Calls for Changes in Climate Research," *New York Times*, November 27, 2009.
- Zürn, Michael (1998): "Review: The Rise of International Environmental Politics: A Review of Current Research," *World Politics*, Vol. 50, No. 4 (Jul., 1998), pp. 617–49.