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The Social Construction of Climate Change

Power, Knowledge, Norms, Discourses

Edited by

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Chapter 8

Trust Through Participation? Problems of Knowledge in Climate Decision Making

Myanna Lahsen

Introduction

Our discussion was lively and ranged widely when I in the late 1990s interviewed an influential US global change science administrator in a federal agency in Washington D.C. At his initiative, we embarked on the issue of distrust in science and the related issue of participation in international forums under the United Nations Framework Convention on Climate Change (UNFCCC). He said:

> Given the suspicions that exist in the world – and which I have gotten in touch with better now but obviously still don't fully understand – imagine you're a South African [diplomat], and you're at a negotiation. And there are some scientists standing up there and they are saying: …'by the way, we've discovered through these measurements that South Africa is a major carbon source.' Now, if you're the leader of South Africa, are you happy that you are going to be responding to a monitoring program in which you have not a single investigator? No! It is unacceptable! It will not work. [*Small pause*] Now, if someone stands over there and says 'I am from such and such a project group, and we've done global monitoring, and it shows this for America and this for Europe and this for South Africa.' If the guy from South Africa knows that he had two investigators that were integral to that study and one of them is at MIT [Massachusetts Institute of Technology] getting a degree right now, suddenly those data have meaning. And it is literally the difference between assuming a conspiracy and assuming that the information is objective.

The science administrator articulates a dominant discourse of science according to which participation in the production or adjudication of scientific facts ensures that the latter will be viewed or described as such by scientists and decision makers. Scientists and science administrators are especially likely to reinforce this discourse which reflects assumptions at odds with constructivist understandings of science. As argued in other chapters in this volume as well, scientific facts, and hence also, of course, discourses about them, do not transcend particularities of perspective. If scientific interpretations are inextricably interwoven with politics and particularities of perspective, the fact of receiving an education abroad does more than merely enhance technical capacity of individuals: It also shapes subjectivities and political agendas. Integrating this insight, constructivist literature on the effectiveness of

international cooperation around the environment identifies capacity building as a process that transforms values, beliefs, expectations and policy preferences (VanDeever 2005; Lahsen 2004; Mol 2002; Conca and Dabelko 2002; Cortell and Davis 2000).

While constructivist literature challenges dominant, objectivist discourses related to science, as a whole, it has attended insufficiently to the full range of political dimensions and consequences of such transformations, including problematic power dynamics whereby geopolitical and material advantage, such as that enjoyed by the United States, might translate into the ability to "preclude virtually any undesired normative developments, drown out competing frames, and ... attempt to shape potential outcomes according to [particular] instrumental interests" (Payne 2001, 53–4). There is an insufficient amount of empirically based literature investigating the extent to which power inequities impact scientific interpretations and associated political agendas, including the more diffuse effects of power, such as the full range of consequences of entraining less developed country scientists into international science, to return to the example above. To what extent does the fact that many scientists from less developed countries receive their educations in the US and Europe and participate in international science shape the problems on which they work and how they think of these problems? To the extent that it does affect their selection and construction of problems at the scientific level, what are the practical and political consequences? To what extent are their problem choices and constructions bundled up with particularities of normative structures and political agendas? The quote above begs these questions and an additional series of questions related to trust: To what extent do suspicions related to science exist and shape global environmental politics? How much is known of their systemic causes, including the role played by global inequalities in scientific capacity and power? To what extent does participation and scientific capacity reduce suspicions and their expressions and practical consequences?

It can be difficult to identify expressions of distrust related to science, especially when they are part of what one, following Michel Foucault (1980), might call a "subjugated" construction of science, a way of understanding that functionalist and systematizing thought suppresses and devalues as illegitimate, inappropriate, inferior and wanting at the levels of cognition or scientificity. On the other hand, one might argue that objectivist understandings of science that have dominated what Foucault refers to as functionalist and systematizing thought are no longer (as?) dominant. The strength of science as a force in the rhetoric of liberal-democratic politics has been eroded by new meta-narratives, and deconstruction of scientific knowledge has become an increasingly marked feature in policy related discourses (Lahsen forthcoming; Lahsen 2004; Fischer 2003; Marcus 1995; Beck 1992; Ezrahi 1990; Jasanoff 1990a). Nevertheless, objectivist discourses related to science arguably remain dominant. As I have shown elsewhere, deconstructions of science in political arenas also tend to be partial and "lop-sided," as actors typically deconstruct the scientific arguments of their opponents while resorting to objectivist language to

promote their own preferred scientific interpretations and political agendas (Lahsen 1998).

In what follows, I reflect on the above-mentioned questions concerning trust on the basis of scholarly literature and empirical research among Brazilian environmental scientists and decision makers responsible for Brazil's foreign policy in the area of human-induced climate change. I discuss indications of distrust related to scientific knowledge underpinning international environmental negotiations, as evidenced especially on the part of less developed state leaders. I argue that the role of such intersubjective factors in climate change politics needs to be better understood, and relate this knowledge gap to broader tendencies in the fields of global environmental politics, international relations and beyond. The conclusion offers some thoughts about how to fill the gap, and draws out implications of the empirical data for the common emphasis on national scientific capacity and participation as a means of ensuring developing countries' trust in global environmental negotiations and associated science. It suggests that solutions to the problem of knowledge and distrust in international negotiations requires more deep-cutting solutions.

Below, I refer to non-discursive phenomena such as perceptions and economic structures. However, following a Gramscian framework, I understand economic dimensions to structure (but not determine) interpretive dimensions and, thus, discourses. Following others (Najam 2005; Williams 2005, 1993), I do not conceive of less developed countries (or the global "South") as a merely economic category but as also a political coalition associated with particular interpretive inclinations in international politics even as they do not share meaning in a uniform, monolithic nor unchanging manner. Consistent with this, while less developed countries' positions and discourses related to the global environment are heterogeneous, they have been remarkably consistent in their expressed aspirations and demands (ibid.).

I also diverge from a purely discursive analysis when referring to perceptions, and to distrust in particular. However, I acknowledge that it is impossible to access perceptions and experiences in any unmediated manner (Foucault 1980), and thus also to distinguish between suspicions and their expressions, whether verbal or non-verbal. To the extent that I here may seem to distinguish between perceptions and their expressions, I mean to indicate that dominant and official discourses related to science tend to omit discussion or expression of suspicions, and to suggest that some cognitive dimensions are thus suppressed, rendered more or less invisible. To the extent I argue that distrust exists, this is, nevertheless, on the basis of expressed manifestations, mostly discursive in nature, some instances of which are presented here.

The Role of Science in Global Environmental Politics and Its Treatment in International Relations

When strong assumptions and interests are at stake—whether rooted in shared disciplinary orientations, economic interests, or political convictions—uncertainties

tend to be highlighted as actors seek to impugn the quality of countervailing science. This dynamic appears to be a general one, applying in the North (Lahsen 2005a, 1998; Oreskes 2004; Sarewitz 2000)[1] as in the South (Lahsen and Öberg 2006; Lahsen 2004; Lahsen 2001). The importance of science in international environmental regimes is thus also disputed. Backed by other, subsequent studies (Andresen, et al 2000), an analysis of international environmental treaties of the decades up until the early 1990s found science to play "a surprisingly small role in issue definition, fact-finding, bargaining, and regime strengthening" (Susskind 1994, 63). Yet, subsequent studies suggest that scientific input is critical to environmental policy formation (Dimitrov 2006; Haas 2004; Miles, et al 2001; Mitchell, et al 2005). At a minimum, scientific knowledge constitutes a necessary (albeit by no means sufficient) condition for policy advancement, shaping political discussions and outcomes as much as these shape competing framings of scientific knowledge. Moreover, the discussion that follows suggests that drawing conclusions about the overall role of science in international environmental regimes is premature, since much research has yet to be done to better identify its role.

Numerous studies stress the importance of the design and dynamics of the science-policy interface for scientific knowledge to impact environmental decision making processes (Mitchell, et al 2005; Fogel 2004; Siebenhüner 2003; Cash et al 2003; Cash and Moser 2000; Miller 1998; Global Environmental Assessment Project 1997; Pielke Jr. 1994). Information use and effectiveness are known to depend on multiple factors, including how the information is distributed and the nature of decision makers' interpretive frameworks and political agendas (Stern and Easterling 1999; Jasanoff and Wynne 1998; Global Environmental Assessment Project 1997). Yet there is little consensus on how to bridge the gap between science and policy (McNie forthcoming; Smith and Kelly 2003). A comprehensive conceptualization of science-policy interfaces at the national and international levels is not easily forthcoming because of an inadequate amount of investigation into how knowledge systems work and how they might be better integrated with decision making to facilitate sustainability (Cash, et al 2003; Bradshaw and Borchers 2000). The research gap reflects a more general lack of critical, empirical investigation at the nexus of science, technology and politics in general, and in environmental politics in particular (Jasanoff 2004, 1996).

The knowledge gaps related to knowledge systems and the global environment are particularly acute in the case of less developed countries (LDCs). Paul F. Steinberg has articulated the problem as follows:

> At present, environmental policymaking in developing countries is rarely studied and poorly understood. Social science research on global environmental problems has clustered at two levels of analysis—international cooperation and local resources management—

1 For an interesting study revealing the correlation between attributions of "junk science" and ideological bias, see Herrick and Jamieson 2000. For analysis of the varied intensity of political contestation of science in different national political cultures, see Jasanoff 1990b.

> leaving a gap where one would hope to find studies exploring the dynamics of national policy reform in the South […] The result provides little guidance for understanding domestic-international linkages in the South, where most of the world's people, land, and species are found (Steinberg 2001, 5)

The role of science in developing states' environmental policy making receives even less attention.

The continued influence of the rational choice model in IR as in the social sciences more broadly (Rayner, et al 2002) is one of the obstacles to filling the above knowledge gaps related to science, power, capacity, and participation. This model posits decision makers as strongly motivated to optimize integration of new information into their decisions, while sociological studies reveal the knowledge transmission process to be highly uneven, complex, difficult and varied depending on socio-cultural, institutional and political factors, including the characteristics of the receiver, the sources of the knowledge, and the type of knowledge at hand as well as its implications (Rayner et al 2002; Jasanoff and Wynne 1998; O'Riordan, Cooper and Jordan 1998; Proctor 1998; Sarachick and Shea 1997; Shapin 1995; Powell and DiMaggio 1991; Douglas and Wildavsky 1984). Typically focused on the actors who use science to mobilize around the same issue, the field pays less attention to areas where such mobilization has *not* occurred. Yet, as has been argued by analysts focused on regime formation (Dimitrov 2006) and norm transmission (Payne 2001; Checkel 1999), understanding the complex and possibly contradictory effects of science in international treaties requires similar examination of instances of failed epistemic convergence. The insufficient investigation related to science—and to knowledge more broadly—in international affairs characterizes various levels of analysis, from the implications of normative convergence or divergence through science to the differential effect of various types of knowledge. For instance, IR literature, including that on epistemic communities, has paid scant attention to problematic dimensions and limits of the supposed normative convergence often associated with global environmental problems and with science (Lahsen 2004, 2001; Miller 1998; Jasanoff 1996; Yearley 1996).

Radoslav Dimitrov (2006, 2003) argues that policy makers tend to act when they have reliable information of the socio-environmental consequences of any given environmental threat, and that this becomes apparent only when breaking knowledge down into different domains related, respectively, to the extent of a problem, the causes of the problem, and its consequences. Without denying the importance of studying the processes by which science is produced, legitimated, and accepted or rejected, Dimitrov leaves out of his analysis the interlinked issues of power, culture and reception, choosing to focus on knowledge only as an independent variable, that is to say, as a finished, legitimized product. While he justifies this by claiming that the dominant trend in IR is to treat the role of science in environmental policy processes as dependent on discursive strategies shaped by interests, values and power, recent literature reviews (Lahsen and Öberg 2006; McNie forthcoming) suggest that relatively little work has been done in IR and beyond to answer questions such as

these: Why, and by what processes, do some scientific and political framings of issues come to be seen as reliable and authoritative? To what extent, and in what ways, do factors such as (lack of) capacity, trust, or dependence influence the shaping of knowledge and its acceptance or rejection? The scarcity of work answering such questions is a function of a number of factors, including (1) the general difficulty and disinclination in academic environments, and specifically among IR scholars, to study less tangible, intersubjective factors (Litfin 2000); (2) a general tendency to value "hard" and quantitative approaches over "soft" and more qualitative approaches; and (3), the dominance of the rational, unitary actor models and the associated limited impact of critical social theory in the field of IR. These tendencies work to place a "black box" around decision making processes, and to preclude normative questioning of the relationship between science (including the increasing role of scientific expertise) and democratic governance, including the impact of issues of trust, legitimacy and authority associated with the uptake of knowledge (Bäckstrand 2003; Litfin 2000; Jasanoff 1996).

The scarcity of work in this area persists despite calls for greater attention to power/knowledge dimensions in global environmental politics (Jasanoff and Martello 2004; Jasanoff 1996) and indications of the importance of such social dimensions, also referred to as "soft systems" or "social capital," in the transfer and uptake of knowledge (Smith and Kelly 2003; Putnam 1993).

Indications that Suspicions Related to Science are Important

In order to understand how issues related to culture and power impact global environmental politics, I return to my original questions: to what extent do suspicions related to science exist and shape global environmental politics? And to the extent that they do, are their systemic causes known, including the role played by global inequalities in scientific capacity and power?

The science administrator quoted in the introduction indicated the important role of suspicion related to scientific knowledge in international environmental politics. Emerging, empirical studies support his observation and relate the so-called "North-South divide" that marks global environmental politics to inequities in national capacities to produce and frame knowledge and policy initiatives. Though the causes, dynamics and full range of consequences of the "North-South divide" remain insufficiently understood, there are indications that it reflects disenfranchisement on the part of LDCs tied to power differentials, including inequities in the area of human, technological, financial and informational resources (Fisher and Green 2004; Liverman and O'Brien 2002; Kandlikar and Sagar 1999).

Displaying broader societal tendencies in discourses related to science (Lahsen 2005a), it is still commonplace for IR scholars to characterize decision makers' attitudes to science as essentially trusting (Lahsen 2006) and marked by a perception of science as operating in a "rather rarefied atmosphere, immune to the vagaries of political power and subjective opinion … in a different realm and according to very

different norms than politics" (Litfin 2000, 130). This may be what appearances often suggest, at least in international arenas. In domestic arenas, including the US Congress, suspicions and conspiracy charges abound, prompted by partisan politics and desires to prevent national support for the Kyoto Protocol and related policy agendas; rather than hidden, suspicions are used in US climate politics as political ammunition, and unwarranted charges of conspiracy are even deliberately produced when this serves powerful political interests (Lahsen 2005a; 1998).

In international arenas, by contrast, expressions of suspicion tend to be more muted, wherefore they are easily overlooked (Lahsen 2006). While suspicions also may serve powerful actors at the national level in LDCs (see below), in scientific and international arenas, they represent subjugated knowledge and are not readily expressed. An experience relayed by the US science administrator maker quoted above illustrates the need to probe beneath surfaces in order to identify commonly unspoken suspicions of the interplay of geopolitics and science on the part of LDC actors. This decision maker told me of an incident which impressed upon him the existence of distrust, even among collegial scientists and science administrators. In this case, scientists and administrators were working together to build and run the Inter-American Institute (IAI), a Brazil-based international organization supported by nineteen countries in the Americas. As described on its website, the IAI is "dedicated to pursuing the principles of scientific excellence, international cooperation, and the open exchange of scientific information to increase the understanding of global change phenomena and their socio-economic implications" (IAI 2006). The science administrator was instrumental in creating the IAI and described the "startling" experience of realizing, some nine years into the project, that his Latin American collaborators suspected that it served to advance US geopolitical interests:

> I don't even remember what precipitated it but somehow something came along and a person from one of the countries of the Americas – from Chile – after 9 years of [being involved with] this, said "There it is! There is the US motive for IAI. I knew they were up to something, I knew there was a larger political motive. It took over eight years, but now it has been revealed." It was actually a group of people from several countries, joined by Chile, who said that IAI was an American rip-off. … These are friends of mine, people I have known for years, and I suddenly realized: oh my God, they have been sitting there in their respective countries, these pals of mine, wondering what devious thing I was up to.

Another example is Joyeeta Gupta's empirical study which focused on the World Bank-coordinated Global Environmental Facility (GEF) and revealed suspicion and resentment on the part of less developed country representatives with regards to this institution which oversees funding for global change science and development projects in developing countries (Gupta 1995). Gupta found the GEF to be the object of deep, if generally unstated, suspicion and resentment among developing country representatives, who believed the GEF's institutionalized power hierarchy served developed (i.e., donor) states' interests. Her study suggests that suspicions about scientific knowledge extend to this multi-lateral institution, and the political processes and discussions that structure and surround it. As I describe below, my

interviews in Brazil also revealed suspicions that the GEF uses scientific studies to obtain political effects. Most prominently, a UNFCCC-involved governmental decision maker described pressures from GEF and other multi-lateral organizations for Brazil to produce vulnerability and adaptation studies as an indirect attempt to weaken the government's ability to control climate-related political agendas at the national and international levels. Stressing the great uncertainties marring such impact and vulnerability assessments, he judged them unreliable as a basis for decision making but expected that they nevertheless would galvanize civil society against the government's strategy to emphasize mitigation over adaptation and place the burden for mitigation on developed countries.

Some argue that global resource disparities bearing on science and environmental policy shape such suspicions and the conditions that give rise to them. The dynamics of the science-policy interface in LDCs are different from those of developed countries in important respects because of resource disparities. Making this point, Milind Kandlikar and Ambuj Sagar (1999) identify five "gaps" that mark these disparities:

1. Resource gap: availability of human and material resources
2. Relevance gap: relevancy of existing research to issues faced by different countries and regions of the world
3. Participation gap: participation levels and input countries have in international scientific programs and processes
4. Perception gap: perceptions of the role and dynamics of research, analysis, and assessment processes—of what is being done, why, and how
5. Policy-culture gap: ability and approach to connect science and policy.

Northern nations, particularly the United States, overwhelmingly dominate the production and framing of science underpinning international environmental negotiations. An emblematic case in point is the Intergovernmental Panel on Climate Change which supports the UNFCCC. Less developed country scientists made up a total of 17.5 percent of the scientists producing and reviewing the IPCC's Third Assessment Report involved, with developed country scientists making up the difference with 82.5 percent (the figures are derived from Table 1 in Haas 2004, 582). In the production of the IPCC's *Special Report on Land Use, Land Use Change and Forestry (LULUCF)* in 2000, the US had roughly as many or more participating scientists as three continents combined (Africa, Asia and Latin America) while most peer reviewers originated in a handful of countries, notably the United States (Fogel 2004, 2002).

Analysts have paid scant attention to the existence and the policy consequences of such inequities in expert networks (Biermann 2000). According to Cathleen Fogel (2004, 2002), the unequal representation of LDC scientists in the politically consequential IPCC LULUCF report affected the policy outcome in favor of the more powerful developed countries, the United States in particular. In short, global inequity in states' abilities to produce science and direct research agendas has given

rise to "an international climate change research enterprise that, when viewed from a Southern perspective, does not live up to its 'global' label;" an enterprise which, despite its apparent transnational dimensions, remains "headquartered in the North, comprised primarily of researchers in the North, dominated by Northern interests and agendas, and shaped by Northern perspectives" (Kandlikar and Sagar 1999, 133).

Less developed country representatives are not blind to their disadvantage in science-infused political discussions. A majority of IPCC-involved actors interviewed by Kandlikar and Sagar in the Indian context expressed that they, along with actors of the South as a whole, did not have much influence over the IPCC agenda (ibid., 134). Their inferior power reflects the more general economic weakness and associated "influence poverty" suffered by their countries, a shared condition among them that has engendered commonalities in their interpretive and discourse tendencies in global environmental politics (Najam 2005, 113). Frank Biermann's (2000) empirical studies in India similarly identified a perception of bias among actors there that the "international science" offered by transnational expert networks is biased and not to be accepted at face value. His interviews revealed "war[iness] of prejudice in the framing of assessments;" "great suspicion" of the IPCC and perceptions of it as "a 'political-scientific' institution with little transparency and inherent Northern intellectual supremacy" (Biermann 2001, 299). Cathleen Fogel's empirical studies of the production of the IPCC LULUCF report yielded expressions of disempowerment on the part of less developed country negotiators that harmonize with the aspirations and demands that have been voiced by these countries on environmental issues since the 1970s, in particular the desire for systematic change in global political relations (Najam 2005). Fogel perceived a "continuous and deep 'North-South' divide linger[ing] on palpably" in policy makers' engagement in forums related to the IPCC report in question, seeing in supposedly technical debates a microcosm of the mistrust and different perspectives between developed and developing countries on the issue of responsibility for climate change and the meaning of tropical deforestation (Fogel 2002, 366 and 267). Moreover, there are indications that at least some less developed country decision makers at times perceive science as "politics by other means" (Elzinga 1993) favoring dominant geopolitical powers. For instance, Fogel identified variation in the extent to which these global inequities in scientific capacity and power affected LDC delegates' reception of the IPCC LULUCF report. A number of delegates appeared to "perceive the report as relatively credible and non-controversial" (Fogel 2002, 338), whereas others described the report as a deeply political document. The latter delegates portrayed it as designed to advance hegemonic power, "a decoy mobilized by more powerful countries in the battle to prevent attention to the real issues at stake—developing country sovereignty and control of land" (ibid., 337–339).

Suspicions Related to Science in Brazil and the Promise of Participation as Solution

My own research in the Brazilian context confirms the above findings, including LDC policy makers' perceptions of the GEF and of links between science and domination. In interviews, Brazilian decision makers expressed suspicion that the GEF directs science agendas in LDCs in ways that favor Northern donor countries' policy preferences while weakening the Brazilian government's control over national climate affairs. Stressing the great uncertainties marring impact and vulnerability assessments, he judged them unreliable as a basis for decision making and resisted attempts by the GEF and other international organizations to get Brazil to produce such studies. He expected that the studies' uncertainties would be overlooked and that the international institutions pushing for the studies did so with the intention of galvanizing civil society to increase pressure for national policy action at odds with the government's two-pronged strategy to emphasize mitigation over adaptation and place the burden for mitigation on developed countries.

His prediction appears well-founded. Brazilian activist organizations, whose ability to mobilize civil society groups in the area of climate change has thus far been limited by the lack of detailed impacts studies (Lutes 2006), would likely use such studies to stimulate greater policy response at the national level. This example underscores the importance of scientific studies, or in this case, the deliberate absence of such studies, for the development of environmental policy and politics. It also suggests the ways in which suspicions related to science shape the dynamics of global environmental politics, but in ways that go largely uncharted in scholarly literature. As discussed below, an important part of the suspicions are tied to global disparities in power and scientific capacity.

Participation has been found to be of fundamental importance to the success of environmental assessments and associated international environmental policy initiatives. This was also evident in the statement by the US science administrator reproduced in the introduction. Prefaced with an acknowledgement of at best partial understanding of the nature and causes of the suspicions in global environmental science and related political arenas, he suggested a remedy to the attitudes of suspicion to environmental knowledge on the part of LDC decision makers: participation. As the IPCC's first chairman claimed in the beginning stages of the IPCC, many countries, and especially developing countries, "simply do not trust assessments in which their scientists and policymakers have not participated" (quoted in Siebenhüner 2003, 124). IPCC architects and policy analysts thus rightly stress the importance of national scientific participation and capacity for national political leaders' trust and involvement in the associated political negotiations (Mitchell, et al 2005; Lahsen 2004, 2001; Siebenhüner 2003; Fogel 2002; Biermann 2002, 2000; Miller 1998; Global Environmental Assessment Project 1997).

Highlighting the importance of scientific capacity, a central Brazilian decision maker posited Brazilian capacity in the area of climate modeling as a prerequisite to the production of adequate national impact assessments. He expressed discomfort

at having to rely on foreign climate model results, whose representation of climate-related systems in the Southern hemisphere he described as inadequate. The same decision maker also emphasized the need for better identification of baselines against which to produce estimates of future impacts of climate changes, and the difficulty of improving knowledge of baselines due to limited capacity. This suggests that resource disparities reduce the effectiveness of international efforts to assess and combat human-induced climate change.

Analysts also stress the importance of national scientific capacity to secure national interests in international environmental arenas:

> [I]ndigenous capacity to gather and analyze data, to build ones' own appropriate models, and 'deconstruct' those built by others is key to appropriately shaping international discussions and safeguarding national interests. Building internal capacity for knowledge generation and analysis in the South will be the first step in truly globalizing the climate discussions and feeding a variety of perspectives into the analytical efforts that are the basis of most policy considerations (Kandlikar and Sagar 1999, 135).

The above mentioned case studies (Siebenhüner 2003; Fogel 2002; Biermann 2001; Kandlikar and Sagar 1999) suggest that poorer states' limited scientific capacity, and associated weak participation and influence in political and scientific processes under the UNFCCC, leave their scientists and political leaders alienated and less inclined to trust the reports and the alleged concerns propelling them. These studies underscore the fundamental need to attend to how institutions such as the IPCC and UNFCCC are perceived, and to study the consequences and the structural causes of inequities in scientific capacity, representation and influence within these forums.

However, participation in itself is unlikely to solve the problem of distrust in international environmental politics. Importantly, since the problem of participation for the South is closely linked to disparities in scientific capacity, solving the problem of participation requires changes in the conditions causing the scientific disparities. Yet the recent emphasis on participation has not significantly altered these conditions, leaving unchanged the basic discursive and structural dimensions that empower richer states over poorer states in science-related processes such as those associated with the IPCC and the UNFCCC. This is true in this specific case and is also a critique more generally advanced against policy and development efforts emphasizing participation (Cleaver 2001). Moreover, everything else being equal, one cannot assume that improvements in participation and scientific capacity will necessarily reduce negative impressions and mistrust. Contrary to assumptions in IR and policy literatures, the outcomes of enhanced capacity and participation are unpredictable; the latter may in some instances invite rather than discourage distrust and disagreement (Jasanoff and Wynne 1998). Assumptions that transparency and participation enhance trust are premised on the faith that the processes guiding science are fair and will be perceived as such.

The US science administrator quoted in the introduction also manifests the above assumption. He takes for granted that, given the right credentials, the credibility of LDC scientists will be established in the eyes of their national political leaders. He

assumes that the very act of participating in international science ensures recognition of the science in question as objective, and that national scientific participation renders politically consequential scientific findings trustworthy in the eyes of South African politicians, especially if the national scientists in question have received their educations from prestigious institutions in the global North, such as the prestigious MIT. In this hypothetical example, the South African scientists serve as expert witnesses who certify the inter-subjective nature of international science. Participation, in this model, is little more than a mechanism by which to reassure unnecessarily distrusting political leaders that everything is just and true. And it is assumed that if science is just and true (itself a construct, of course, albeit not recognized as such in this scenario), it will also be perceived as such. Much as it is impossible to observe climate change 'as it is,' perceptual filters shape understandings of science, especially in politically consequential issue areas involving significant uncertainties. In practice, South African scientists might interpret the scientific issues quite differently and perceive political bias in associated framings. And if they do not, this would not necessarily prove the objective truth of the scientific matter at hand, nor would it necessarily reassure South African decision makers. It could be that personal or political factors led the scientists to sign on to particular interpretations. It could be that the scientists choose not to express their disagreement, intimidated or resigned in the face of well-documented discrimination in science (Wennerås and Wold 1997; Gibbs 1995) and the intimidation less developed country participants can experience in international scientific assessment processes (Lahsen 2004, 2001). It also could be the case that scientists' educations in the North and their participation in Northern-dominated science had shaped their subjectivities and political agendas such that they accepted the science and associated framings, and/or that decision makers suspected this to be the case, with the effect of undermining their trust in national scientists. Aside from its potential to generate beneficial consequences, participation also can be a means of co-optation and control, aided by factors such as intimidation, the Abilene paradox, other forms of group-think and coercive persuasion (Cooke 2001). Likewise, apparent consent can be ambiguous and superficial, concealing dissent and ambivalence.

Such possible power-laden and ethical dimensions of normative convergence are often overlooked in IR (Lahsen 2004, 2001; Miller 1998; Jasanoff 1996). As a whole, development studies are similarly marked by a lack of critical reflective examination of deeper determinants of social change and policy processes in particular, including the impact of power-laden social relationships, social psychological processes, and access to and control over, information and other resources (Cooke and Kothari 2001).

Brazilian policy makers whom I interviewed (some of whom have themselves participated as both experts and policy makers in the production of the scientific assessments under the IPCC) did not reveal understandings of the associated processes and products as objective and apolitical. One policy maker, who is involved with the IPCC and the international negotiations related to climate change, thus described the IPCC as biased in favor of Northern framings of responsibility, a function of the

huge disparity in scientific representation between more and less developed states. He claimed that the overwhelming representation of Northern scientists in the IPCC compared to their less developed counterparts, on the order of ten to one at the time of the 1999 interview, meant that the IPCC was "bound to reflect their perspective." Brazilian leaders thus believe that their lesser scientific capacity places them at a disadvantage in international science, and that this has political consequences. They perceive that their lesser scientific strength helps restrain their already more limited political power in the face of states with greater means and powers, rendering them comparatively less able to advance their perceived national interest in international forums (see Lahsen 2004, 2001). Thus, the policy maker mentioned immediately above criticized the IPCC for "playing dirty" by using its scientific edge to forge political advantage, suggesting that it advanced Northern political interests under false pretenses of value neutrality and objectivity (Lahsen 2004, 162–3). Studies focusing strictly on policy outcomes at the expense of the forces shaping the construction, deliberation and reception of associated knowledge and knowledge framings, fail to acknowledge this level of meaning-making and politics. As such, they can tend to encourage misleading perceptions regarding the existence of consensus and faith in science and in the processes by which science is produced and harnessed to political agendas (Lahsen and Öberg 2006).

Likewise, efforts at capacity training are generally understood by those designing these programs in uncritical terms, reflecting an inclination to conceive of science as unmarked by discourses and associated biases or, otherwise put, as little more than "a set of facts, skills, hypotheses, theories, and other information that can be communicated without reference to the social contexts of production, validation, or use" (Miller 1998, 11).

My research among Brazilian environmental scientists and decision makers suggests that the possibility of socio-political consequences of capacity building does not go unnoticed in Brazil, with roughly half of the persons obtaining PhDs presently doing so in the US (Ministry of Science and Technology 2006). To the extent that this possibility is perceived, the associated normative convergence is not uniformly or automatically assumed to be benign. This is true for decision makers with central power over Brazilian climate affairs. In interviews with me, decision makers within the Ministry of Science and Technology and Foreign Relations have described Brazilian scientists' ability to perceive the national interest as impaired by cultural and political indoctrination which accompanied their scientific training abroad and their engagement with international science in general. In one of the strongest expressions to this effect, a UNFCCC-involved policy maker in the Ministry of Science and Technology suggested that Brazilian scientists' foreign educations reduce their critical awareness and their ability to understand and serve national interests:

> If you don't have a kind of domestic way of thinking, that reflects in your thinking of [the environment and related policy issues]. You are like a parrot, you are repeating what

> people are teaching you. And even in universities you see this; people repeat what they hear in the literature. And that [literature] is from the developed countries.

"It is not a conspiracy," he added, it is that how you think reflects "the common sense of the community in which you live." I have encountered discourses to the same effect among other important decision makers in these two ministries. They understand international science as situated knowledge and a potential vector for hegemonic power.

At least some Brazilian scientists reflect on these questions themselves, acknowledging the possibility that their foreign educations and connections may bring them to align themselves with scientific and political agendas in conflict with more local and national environmental agendas and priorities (Lahsen 2004). However, decision makers' renditions of national scientists along these lines are also resented by scientists and associated with a top-down approach to decision making with deep roots in Brazilian political culture.

A subtle but real effect of this conceptualization of national scientists is to legitimate limited inclusion of national scientists and other segments of civil society in decision making related to politically charged environmental issues such as climate change and deforestation (Lahsen 2004). In other words, when Brazilian decision makers present the science as a hegemonic weapon in international politics, this can bolster tendencies in Brazil towards centralized decision making and the perpetuation of environmentally destructive development.[2] On the other hand, alternative tendencies to portray science as shaped by geopolitics are present as well and validated by extensive empirical studies. Thus, decision makers' perceptions to this effect may also lead them to counter prominent and potentially hegemonic renditions of science, as well as currents in Brazilian environmental politics favoring Northern problem framing agendas (Tesh and Paes-Machado 2004).

The extent of these perceptions among Brazilian decision makers is an open question requiring greater study; they are presented here mainly as a means of highlighting overlooked dimensions in IR and development literature related to science and policy, and the role of trust, participation and capacity building in particular. The extent to which Brazilian decision makers' perceptions of the relationship between science, power and politics have shaped the country's official position on climate change in international negotiations is unclear. Thus far, national trust in the science has not been put to great test; the "faults" in the science underpinning concern about human-induced climate change—in particular the general circulation models—have not yet become a focus at the national level. An important, likely reason is that Brazil stands to gain more from the UNFCCC in financial terms than it stands to lose, and, as commonly recognized, scientific evidence tends to be deconstructed to the extent that it threatens powerful political and economic interests (Lahsen 2005a; Jasanoff 1994, 1990a; Beck 1992; Dickson 1989).

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2 Analyses suggest that authoritarian regimes as a whole tend to sacrifice the environment in favor of other concerns (Desai 1998).

Brazil has used the climate change negotiations to pursue long-standing national interests, even when they diverge from the position of the Group of 77 (G77) and China (Johnson 2001). In this, it is little different from the rest of the developing world. Despite pressures from Annex I states (in particular the United States), Brazil and China have led LDCs in their resistance to binding commitments under the Protocol. Argentina proposed voluntary commitments on the part of developing countries to reduce greenhouse gas emissions, but this idea was forcefully—and successfully—rejected by the Brazilian delegation, along with other G77 members and China. As informal leader of the G-77 coalition of LDCs with China in the climate negotiations, the Brazilian government has consistently upheld the Berlin Mandate according to which developing states need to reduce greenhouse gas emissions only after developed states have done so (Johnson 2001).

To the extent that developing states have shown interest in climate change negotiations, which they have done only to a limited extent (Najam, Huq and Sokona 2003), they have insisted on the principle of common but differentiated responsibilities. They have pushed strongly to reconcile national economic interests with environmental policy agendas, hinging their voluntary participation on Northern provision of financial resources and technology and insisting upon the need for capacity building and a longer time frame for the implementation of new rules in developing countries. The UNFCCC and subsequent international environmental policy agendas articulate and inscribe these demands (Williams 2005).

In short, free of commitments to limit economic interests in order to partake in the Kyoto Protocol, Brazilian leaders have not had compelling reasons for questioning the science or for voicing suspicions of the sort discussed above. The extent to which they will do so in the future is thus likely to depend on whether Brazil will be pressed to deepen its commitment under the Kyoto Protocol or adopt similar mechanisms in the future that could threaten powerful economic and political interests. As states begin discussions for the second commitment period, it appears highly uncertain whether Brazil (or by extension, the whole G-77 coalition) will even accept *voluntary* commitments for the second commitment period. The issue of distrust in science and associated global inequities in geopolitical and economic power are likely to impact a variety of issue areas requiring environmental decision making. For this reason, but also for ethical reasons beyond it, it behooves us to pay greater attention to the existence, dynamics and causes of the interplay between science and (dis)trust.

Conclusion

As this chapter has demonstrated, the implicit and explicit value of science in policy decisions is fundamentally shaped by socio-cultural dynamics at the level of systems, institutions, groups and individuals; yet, these dimensions receive relatively little attention in IR literature on climate change and global environmental politics in general. Even constructivist IR studies fall short when it comes to empirically

grounded analysis of the mechanisms, dynamics and consequences of the diffusion of science and associated norms and interpretive frames.

Returning to the policy maker quoted in the beginning with the benefit of knowing the above-mentioned Brazilian understandings of international science and the role of foreign educations in advancing hegemonic agendas, it becomes clear that an MIT education and participation in international science is a double-edged sword which at times might *undermine* rather than *enhance* the credibility of LDC scientists in the eyes of their national decision makers. To the extent that future research reveals other LDC decision makers holding similar reservations regarding science to those in Brazil, this would increase the urgency of efforts to identify ways for LDC actors, not only government representatives but also relevant members of the scientific community and civil society, to participate on a more equal footing in science-laden international negotiations and associated processes.

The full range of consequences of science and the role of national scientists on the part of decision makers, in Brazil and beyond, has yet to be subjected to more extensive and systematic study sensitive to the particularities of national contexts. For instance, conceptualizations of science as hegemonic might at times be used to discredit and reject science when the latter supports inconvenient policy agendas. In addition, the locus of moral authority is a research question in need of reflexive, normative deliberation rather than something that can be decided a priori (Lahsen, forthcoming). There is a need to study perceptions of science and their impacts on a case-by-case basis and in cross-national perspective to identify global patterns and variations in understandings of the relationship between science and politics, as well as the structures that shape both. For instance, future studies might probe the factors explaining why LDC decision makers interviewed by Fogel differed in their expressions of relative trust or distrust with regards to the final LULUCF report. Did the differences reflect diverse interests in the findings and associated policy outcomes on this particular issue, and/or did they reflect deeper differences in political culture and in socio-political and economic structures shaping the science-policy interface in the various countries? Answers to these questions would be useful to the practical goal of improving international environmental policy and would help improve understanding of the interplay between science, power, culture and politics in a context of global environmental change. It would be interesting to know, for instance, whether LDC actors are less inclined to accept objectivist understandings of science compared to those from more developed and hegemonic countries, and if so, why and to what consequence, at the levels of theory *and* practice.

Also interesting to investigate is whether any given set of patterns related to perceptions of science shifts depending on the issue at hand. In the case of Brazil, do Brazilian decision makers only indicate anti-hegemonic understandings of science when this is politically expedient, while expressing more trusting and objectivist views when that is more conducive to political goals? Certainly, if taken at face value, Brazilian decision makers seem to embrace hegemonic science in their emphasis on the need for improved national scientific capacity in the area of computer modeling, in addition to considerable financial investments in that area, indicating that their

skepticism regarding science and the reliability of national scientists is moderate. It bears emphasis that the evidence presented above was specifically selected to critique tendencies in IR and development literature, and does not capture the complexities characterizing Brazilian decision makers' attitudes towards science. Indeed, science is frequently invoked by Brazilians as an important weapon in defense of national territorial integrity and national interests (Lahsen 2005b). More definitive conclusions in the case of Brazil and beyond require additional analysis of discourses, uses, and policies related to science.

The central conclusion is that solutions to the problem of knowledge construction in climate change politics need to press beyond the common emphasis on participation and, even, enhanced national scientific capacity in LDCs. These common solutions are premised on an overly simplistic perception of the relationship between scientists and policy makers, obscuring the impact of globalization and the extent to which *lack of trust* characterizes relationships between decision makers and scientists at the national level. Such lack of trust, the above suggests, may be especially likely to characterize the science-policy interface in countries with limited means to direct national science agendas because of the disparities identified by Kandlikar and Sagar. As noted, these disparities result from, and perpetuate, a general dependence on foreign donors and the fact that national scientists are acculturated in Northern science and associated interpretive frameworks.

Whatever else they do, it is clear that suspicions such as those identified among Brazilian decision makers above pose a fundamental challenge to assumptions that national participation—or variants of the idea, such as regional "centers of scientific excellence" in the global South (Huntingford and Gash 2005) will, in themselves, entirely solve the problem of how to produce and legitimize "global knowledge" related to climate change and the environment.

In sum, this analysis supports Stacy VanDeveer's (2005) point that analyses and programs intended to improve capacities bearing on environmental decision making tend to focus on the policy implementation phase, and that there is a need to attend relatively more to social processes, e.g., research, assessment and reception capacities and processes, that precede the implementation phase. Huge amounts of time and resources continue to be devoted overwhelmingly to the production and scientific assessment of climate science, while comparatively little attention is being given to whether or not intended audiences are receptive to the information being produced and, if they are, why, i.e., what factors have conditioned their attitudes, and with what practical and normative consequences?

If science is resisted and deconstructed as a function of its bearing on perceived interests, and if distrust in science indeed is prevalent among less developed country decision makers, the latter is likely to surface and shape global environmental politics more if these countries encounter mounting pressures to make binding commitments under the Kyoto Protocol, as is presently the case. It would thus benefit international policy efforts to attend to distrust related to science and to its causes, whatever their basis. Scholarly analyses can help by identifying national level interpretive biases and evaluating them in terms of democratic norms, ethics and equity. This

would help identify obvious political interests underpinning various constructions of science as an institution and of scientific facts bearing on environmental policy, and help evaluate competing interests and views.

For practitioners, a first step might be to facilitate reflection and discussion among scientists and politicians about the directions of science agendas globally and about actual and potential political uses of science, along with associated normative and equity-related questions. Heeding the insight that science in many cases *is* the politics of climate change, and that the design and management of science agendas is a central medium through which social and political systems are produced and maintained (Jasanoff 2004, 1996; Lahsen 2001; Miller and Edwards 2001), such discussion must subsume open and broadly participative international debate about how to ensure greater participation by LDC actors not only in policy processes but also in shaping associated science agendas and problem framings worldwide. This is no tall order, but it is a more honest approach than the present maintenance of misleading non-constructivist constructions of science (Lahsen 2006), whether upheld by mere inattention or by the questionable assumption that a sanitized (but misleading) image of science is necessary for policy advance, and that this image, in fact, is being believed.

Doing away with objectivist discourses related to science can help reduce alienation and suspicion on the part of LDC actors skeptical that science is an apolitical and benign force in international politics (Lahsen 2006, 2004, 2001; Yearley 1996). Similar to Heather Smith's story of the Inuit hunter's intervention (this volume), bringing overlooked places, spaces and perspectives to bear on science agendas will reveal the Northern domination of "international" climate science and associated policy programs. While the increased complexity resulting from the inclusion of more and different voices challenges management, it promises to ultimately translate into policy advancement, not the least in light of the finding that states are more inclined to comply with international policy norms if they perceive themselves as legitimate member of the international community of states. To the extent that the proposed science-focused discussions link policy advancement to resource and development concerns in LDCs, the result could be an instance of the civic environmentalism that Karin Bäckstrand and Eva Lövbrand (this volume) posit as the new discursive compromise between the global North and South in post Kyoto climate politics. It might help refresh thinking, and thereby also action, related to climate science and policy, though an obstacle to be expected will be the resilience of national and regional boundaries and global structures of inequity when it comes to funding, and thus, defining science agendas.[3]

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