

LONG-TERM LOCAL KNOWLEDGE, HISTORICALLY-BOUND SCIENCE, AND THE POLITICS OF ENVIRONMENTAL POLICY CHANGES: NEW ROLES FOR NORTHERN PEOPLES AND SCIENTISTS

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In this paper I address four issues as an anthropologist and social scientist: social studies of science and some of its implications for global climate change research, ethnologies of local knowledge of environment and environmental changes, an analysis of some problematic contributions of scientists to policy-making, and the need for new policy initiatives by climate change scientists and local peoples. Social studies of science conducts research on science as an activity which is both technical and social to its core, and that is always embedded in a specific historical, professional and socio-political contexts. Natural scientists generally write about what they do as if they are reporting on phenomena that are completely natural parts of the world that exist beyond society. They do not include themselves or the historical contexts in which they work as part of their reporting processes. Indeed to do so is to do poor science, and to show poor form. Nevertheless, these social and historical contexts are essential to all science, and excluding them from scientific writing does not exclude them from scientific practice. Indeed scientists have to be and are very knowledgeable about them in order to do their work successfully. The disciplinary organization of sciences into professional societies and publication outlets, the importance of scholarly meetings such as this where informal knowledge can be communicated and assessed, the regional and national institutes through which interdisciplinary projects and funding can be organized, and the national and transnational agencies for setting science policy and funding agendas are all relatively obvious parts of the world of doing good science.

In global climate change research in northern regions, it is clear that professional, regional, national organizations for science shape the particular areas in which different groups of researchers work, the regional sources of data they often emphasize in their modeling, and they influence the impetus to build new variants and types of models, of which there are already a considerable number (at least dozens). This is all "natural" to science, and it is also a subject for a potential analysis by social studies of science. But such studies have not yet been undertaken of climate change research, although they have for bio-genetics, the 17th century origins of modern science, and several areas of physics and medical research. Nevertheless, I would suggest that even a brief consideration of the social aspects of climate change science can alert us to key issues this area of interdisciplinary research is facing and will increasingly have to address. The main issue I would raise is that the phenomena which climate change science studies are formed from a network of natural and socio-political dimensions, involving land, sea, climate, industrial and other atmospheric emissions, and diverse government policies, economic practices, and social attitudes. Thus the challenges climate change research faces are to develop means of doing truly interdisciplinary work, both among climatologists, oceanographers, terrestrial ecologists and glaciologists, and also among social ecologists, ethnographers, policy scientists and economists. This is a major challenge, one not widely accepted among climate change researchers, and therefore one that may take years and maybe decades to accomplish. Yet the phenomena that are researched are such that their study cannot be completed, nor can it maximize its utility, until that is accomplished. On the other hand, there are some grounds for hope. Climate change researchers are talking across natural science disciplines increasingly, and they are aware, in part as a result of the imperfection and diversity of their models, of the different ways that useful knowledge can be revealed. They are also aware of the extremely complex policy arena that their work is used in, by

governments, corporations, various media and citizens' organizations. They also know from experience that their work is often used in ways that they did not intend. I will address but two concerns flowing from this complex policy process - local knowledge, and the need for new alliances of scientists and sectors of the public.

In this paper I provide two examples of local knowledge of weather and climate. The first is everyday knowledge in Cree "Indian" communities of northern Quebec in Canada, the second highly specialized knowledge. Cree synthesize multi-dimensional observations of weather patterns into four basic "wind" types, each approaching from a different direction and characterized by distinctive temperature, wind, precipitation and cover patterns. I suggest that the concept of "winds" for the Cree performs the same synthetic and descriptive functions as "airmasses" for climatologists and meteorologists. For the Cree hunters, the "winds" are also associated with distinctive patterns of animal activity, and therefore different types of hunting opportunities. A study that I and a climatologist did of daily diary records of wildlife harvests made by Cree hunters correlated well with the storm systems traversing the region, showing a correspondence of harvest patterns and "winds." A more specialized example of local knowledge was the forecast by a 76 year old Cree man in late October of 1969 that Lake Matagami (ca. 30 mi. in length) would freeze over, and then thaw, before freezing for the winter. The elder hunter did not make his forecast lightly, he put his reputation on the line in making it, and he warned people to be very careful traveling on the ice. The Hydro-Quebec monitoring station records show there was a freeze followed by an ice thaw before a winter-long ice cover formed, as he forecast.

These examples of local knowledge, and one could cite many more, raise questions of how communications and cooperation can be established between scientists in the Euro-American tradition and local knowledge experts. I expect that there are no, or few, easy translations between these two types of systems of knowing, so one cannot just feed data from one into the other. Nevertheless, they coexist, and there needs to be mutual recognition, respect, and where appropriate - as in wildlife management - there needs to be collaboration. The growth of research on local knowledge systems, and the widening awareness of the importance, scope, and obligation to recognize local knowledge, have revealed unanticipated forms of such knowledge and unexpected connections between local knowledge and scientific knowledge. Among the unanticipated types of local knowledge being explored are localized insights into long-term, geographically dispersed environmental phenomena, including changes on scales of a century or more. These include glacial retreat and advance, post-disturbance forest regeneration, and infrequent weather phenomena.

However, as new research reveals these types of knowledge new questions are also arising about the inability of policy-makers and scientists to recognize these forms of knowledge and to "hear" some aspects of what is being said. One aspect of this problem arises from the fact that the communication of local knowledge often includes statements that are not simply descriptive, but performative. They inform and direct those with whom the knowledge is shared to act on that information. Often this is one of the main motivations for sharing knowledge, as in the case of the lake thawing forecast. This is particularly the case where local knowledge experts think there is the potential to moderate or reverse negative impacts of human actions on these environments. Under these conditions their knowledge is shared in order to suggest, encourage, cajole or plead for corrective action. Thus Cree knowledge and commentaries on the environmental and social effects of extensive cutting of boreal forests on the lands they occupy and hunt, for example, does more than describe the consequences of forest cutting. The Cree suggest the kinds of changes to cutting practices that they think are necessary to reduce the environmental and human impacts of intensively using the boreal forests on the lands they hunt. They share their knowledge with foresters, government officials and forestry companies in order to reduce the impacts of forestry as it is presently being done.

Often their statements are treated as if they had little expertise behind them, or alternatively as if they were made for political purposes and were not "objective". The result is that they are

often conveniently put aside and ignored. Their voices are ignored to the extent that what they say implies changing policies and politics. When they describe the impacts of intensive and extensive forestry cutting on animals, and on themselves, their knowledge may have a place in impact assessment and environmental review processes. When they explicitly or implicitly show how they think that knowledge could be used to reduce, remedy or ameliorate those impacts in ways that require going beyond the mandates of assessment and review processes, and changing more basic economic and policy-making processes, their comments are dismissed as unrealistic or they are not given recognition at all. I call this "silencing," and I suggest that the failure to "hear" this aspect of what is being said about how to act in the future is partly a function of power of those who are being spoken to. Governments and corporations are not committed to changing forestry practices in ways that Cree think are necessary. This is partly the result of the economic and political "costs" of considering such changes. But these costs are rarely even considered and calculated, so that are not rationally considered or rejected by calculating costs and then considering the full range of social effects and values. Corporations and governments use silencing as a political strategy to marginalize these Cree expressions of concern, and to try to convince the Cree that present conditions are inevitable, as I have documented recently (in C. Scott, ed. *Aboriginal Autonomy and Development in Northern Quebec and Labrador*. Univ. of British Columbia Press. 1991).

Interestingly, I found that scientists also fail to "hear," report and respond to what Cree hunters are saying about how to alter the negative consequences of current forestry practices. The failure of ecologists and foresters in this case is rooted in the distinction between experts and the public. The failure to acknowledge the potential value of local knowledge has led some scientists to exclude the Cree from the joint management regimes they recommend to government for forestry policy-making. While this may not be done in a way that is fully conscious to the scientists, their exclusion of the Cree involves implicit and explicit political judgements, and it has social effects, since it contributes to ignoring and excluding the Cree knowledge and insights from the decision-making processes. This both ignores Cree expertise, and it ignores that Cree suffer the consequences if forestry is not conducted in ways that limit the impacts on hunters. Here exclusion is done in the name of science, by drawing too radical a separation between scientific and other kinds of expert knowledge, and saying that only those who have scientific or managerial forms of knowledge are qualified to participate.

This has serious implications for the effectiveness of science and scientists to address the policy changes needed to respond to the kinds of problems we face today. These problems require concerted scientific research, and also policy-making initiatives. It is therefore a welcome development that some scientists are more actively entering the public policy settings, and working with both public organizations and with governmental agencies. But they need to be careful as they develop policy recommendations and programs not to exclude the public from the key decision-making processes. Special care needs to be taken not to exclude local knowledge holders, or groups potentially directly affected by the issues. As scientists develop the social and political implications of their work they need to avoid taking stances that, by valuing scientific knowledge in a way that excludes all other knowledge, takes an unintended political position. Such actions may favor institutional interests - especially those of governmental and corporate organizations that can afford staff scientists - over the interests and needs of the public, or the most affected sectors of the public. Scientists cannot afford to be naive as they enter policy-making. They need to find ways of serving wide public interests. This is what my research revealed about problems that arose when forestry science was linked to policy-making in northern Quebec.

Let me now shift my approach. To date I have focused on some key things that have been happening in social studies of science, the ethnography of local knowledge, and policy analysis (which I have exemplified with case study research examples familiar to me). In the last part of the paper I adopt a more proscriptive approach, common in the medical sciences repertoire, and I look at possible future solutions. We have become aware that contemporary global environmental

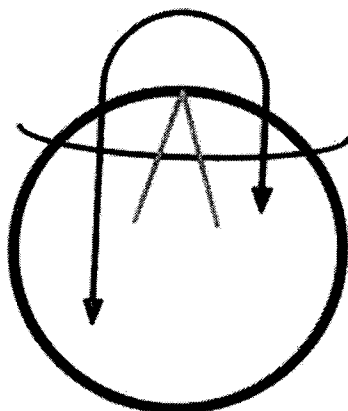
problems require the application of science to policy-making. I will suggest that in the future, cooperation and alliances between local knowledge experts, citizens and scientists may be essential to deal effectively with many contemporary environmental problems. On one hand a synthesis of distinct branches of scientific knowledge is needed even to analytically describe the phenomena discussed here. Local knowledge experts may be contributors to this process. On the other hand the Kyoto Agreement and subsequent processes show the need for informed public support for changes if governments and international agencies are to act, and to follow-up obligations. At least that is the conclusion I draw looking at the North American experience.

To maximize the ability of both scientists and concerned sectors of the public, including those local peoples who use lands and waters intensively, to achieve governmental and corporate commitments to agreements, and to their implementation, will require new forms of social and policy alliances. Scientists who undertake to work on policy issues can address wider national and international audiences better if they work with concerned members of the public than they can on their own. Experience to date suggests that neither group by itself has been fully effective at bringing about the needed shifts in government policies, the marketplace or public opinion. This is not in itself surprising given the fundamental nature of some of the changes required. But new partnerships of local knowledge experts and citizens' organizations and scientists do have potential; not just for gathering and sharing knowledge, but in order to more effectively seek enduring changes in policies and practices with long-term implications. Each brings to the task specific kinds of expert knowledge, of public recognition, and of political legitimacy and leverage. Their collaboration could mobilize a much wider range of public support for change, as well as enhancing public understandings of the kinds of changes that are needed. On one hand, scientists by their mainstream institutional connections and step by step analysis are in the best position to identify the minimal measures that are required. Their public recognition and mainstream professional authority can also assert most effectively to policy-makers and corporate planners that change is needed. But, local experts can help this by showing policy makers and the public that what is needed is not just abstract change, but action – or inaction - with highly personal consequences for real people and everyday lives. On the other hand, local knowledge experts by their synthetic and proactive forms of local knowledge are in the best position to show how expert knowledge and responsible social action can be linked, that is how expertise can be used by “ordinary” people who link expert knowledge and social action. Equally important, they can demonstrate, by the example of their culturally and socially distinct daily lives, that different practices are possible than those now considered by policy-makers and corporate planners to be the only "realistic" choices. The joined voices of scientists, citizens organizations and local peoples can speak more convincingly of needed changes to policy-makers, and especially to the wider public whose support is a vital pressure for change. Not all scientists or local peoples will want to engage in such projects, but those who envisage these needed changes and who have the resources to do so, will need to build newer and more effective bridges to each other in order to address long-term environmental problems.

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