

# Views of traditional ecological knowledge in co-management bodies in Nunavik, Quebec

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**ABSTRACT.** Although there is increasing recognition that traditional ecological knowledge can make important contributions to environmental and resource-management issues, there are also indications that its use in co-management committees has not been straightforward. Three main sets of challenges have been documented — differences in knowledge systems between western scientific and traditional ecological knowledge, the relatively powerful position of western science and scientists in comparison to traditional ecological knowledge and its users, and challenges in documenting and presenting traditional ecological knowledge. This paper reports the results of a study that surveyed members of co-management committees established in Nunavik, northern Quebec, pursuant to the James Bay and Northern Quebec Agreement to explore their perspectives on these issues. Three elements emerged from this study. They are the complex and sometimes contradictory nature of the views that committee members held about traditional ecological knowledge, the active role of the Inuit in attempting to shape how traditional ecological knowledge is used in decision-making, and the need for documentation of, and research funding for, the collection of traditional ecological knowledge.

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## Introduction

There is increasing interest internationally in the role that traditional ecological knowledge (TEK) can play in resource and environmental management. While any group with knowledge about its environment derived from tradition and experience can be said to possess TEK, this terminology is most commonly used to refer to the knowledge of indigenous peoples. The definition of and appropriate terminology for traditional ecological knowledge has been debated (see Stevenson 1996). This author finds Usher's (2000) definition useful. Usher (2000: 186–187) identified four categories of information to which the term traditional ecological knowledge has been applied. The first is factual knowledge about the environment derived from individual observations. The second is knowledge about past and current use of the environment. The third category includes culturally based value systems about appropriate behaviour concerning animals and the environment. Category four refers to the culturally based cosmology that organises and serves as a framework for the other three categories. Other researchers have also identified observations, practices, and beliefs as components of TEK (Berkes 1999; Berkes and others 2000; Stevenson 1996). Each of these components has a different role to play in decision-making.

There is recognition that TEK can contribute to scientific research and management by contributing unique and useful information (Freeman and Carbyn 1988; Hansen 1994; Inglis 1993; Johnson 1992; Mailhot 1993; Mauro and Hardison 2000; Riedlinger and Berkes 2001; Usher 2000). TEK is also a source of information about diverse resource-management practices (Berkes 1997; Berkes and Folke 1998; Berkes and others 2000; Huntington 2000; Wolfe and others 1992). As the Bruntland Report stated, society could 'learn a great deal' from indigenous people in sustainably managing very complex ecosystems (World Commission on Environment and Development 1987: 115). Finally, TEK is seen to offer new paradigms for organising the natural world and the role in it of humans (Colorado 1988; Deloria 1996; Pierotti and Wildcat 2000). In Canada in the last two decades, indigenous knowledge has had a variety of applications, particularly in resource-management and land-use planning in northern areas (Kuhn and Duerden 1996; Duerden and Kuhn 1998; Usher 2000).

Despite increasing recognition of the potential contribution of indigenous knowledge to questions of environmental and resource management, its incorporation into decision-making processes appears to remain problematic (Feit 1998; Huntington 2000; Johnson 1992; Kruse and others 1998; Sallenave 1994; Usher 2000). The recent Canadian Royal Commission on Aboriginal Peoples noted that incorporating traditional ecological knowledge into decision-making in co-management bodies is not straightforward, but the Commission provided little in the way of guidance other than to recommend cross-cultural education (Royal Commission 1996).

This paper attempts to contribute to this issue by exploring how participants in a variety of co-management committees understand what TEK is, and what the implications and practicalities are of incorporating it into formal decision-making. The Royal Commission defined

co-management committees as ‘institutional arrangements whereby governments and Aboriginal entities (and sometimes other participants) enter into formal agreements specifying their respective rights, powers, and obligations with reference to the management and allocation of resources in a particular area of Crown lands and waters’ (Royal Commission 1996: 666). The analysis is based on interviews with members of co-management committees created to deal with environmental and wildlife management under the 1975 James Bay and Northern Quebec Agreement, with a focus on Nunavik, Quebec. The emphasis is not on evaluating the role that traditional ecological knowledge plays in decision-making in these bodies. Instead, the intent is to understand the frameworks of meaning that committee members employ to make sense of TEK in the context of committee mandates. While there is a considerable literature that discusses the role of TEK in co-management committees, relatively little of this work is based on systematic interviews of committee members (but see Kruse and others 1998).

The paper begins with a review of challenges to the use of TEK in decision-making on co-management committees. The sources of the data and methodology of the paper are outlined. The results of the research follow.

### **Challenges in integrating TEK in decision-making**

The literature that explores barriers to the use of TEK in decision-making about resources and environments can be summarised under three categories — differences in knowledge systems, power differentials, and representation and documentation.

#### **Differences in knowledge systems**

The incompatibility of traditional ecological and western scientific knowledge has often been identified as a challenge to decision-making that incorporates both knowledge systems. Common themes are that indigenous knowledge systems are embedded in local cultures and communities and bounded by local environments, that they have a significant moral and ethical context, and that they emphasise the lack of separation between nature and culture. In contrast, western scientific knowledge systems are often characterised by ‘disembeddedness; universalism; individualism; nature:culture and subject: object dichotomy; mobility; and an instrumental attitude (nature as commodity) toward nature’ (Berkes 1999: 10).

At the same time, it is clear that there are similarities as well as differences between these systems of knowledge, and Agrawal (1995: 6) suggested that the differentiation between western scientific and indigenous knowledge can be overdrawn. Others have suggested that differences are of degree rather than of type (Wenzel 1999) and that it is the reductionism of western scientific approaches that exaggerates the differences (Berkes 1999). Nevertheless, the idea that TEK represents a different system of knowing than western scientific knowledge has often been presented as a barrier to employing both in decision-making. Johnson (1992: 7–8), for example, provides a long list of contrasts between the two knowledge systems,

and suggests that these differences create problems of reconciling two different world views and of translating ideas and concepts from one culture into another. A recent debate over the desirability of incorporating TEK into environmental assessment in Canada rests on an assumption of contrasting and incompatible ways of producing knowledge (Berkes and Henley 1997; Howard and Widdowson 1996, 1997; Stevenson 1997).

#### **Power differentials**

Another perspective emphasises political differences as a barrier to the incorporation of TEK into decision-making processes (Berkes 1999: 11; Mailhot 1993: 15). According to this, the relative power of government representatives and western scientists means that TEK has been devalued in comparison with western scientific knowledge. Some researchers have argued that the attitude of western scientists to TEK has been dismissive at best, and disdainful at worst (Ames 1979; Freeman and Carbyn 1988; Gunn and others 1988; Johannes 1989; Johnson 1992). Sherry and Myers (in press) suggest that negative myths about traditional management systems that see these systems as primitive or disappearing hinder their incorporation into decision-making by state managers. Even where TEK is not actively discounted, indifference and resistance to change can lead to the precedence of western science (Huntington 2000: 1273).

The written nature of western science carries authority that can also challenge the validity of TEK (Inuit Circumpolar Conference 1993: 34). According to Nadasdy (1999: 5) the precedence of western science means that integrating scientific and traditional ecological knowledge becomes an exercise of ‘combining two alternative sets of “data,” while the [western] management system remains essentially unchanged.’ As a result, TEK is compartmentalized, taken out of its cultural context and treated primarily as a source of information. (See also Stevenson 1996.) In this context, the existence of co-management committees with native representation does not guarantee that TEK will have a strong role in decision-making (Mailhot 1993; Nakashima 1993; Usher 1993).

#### **Representation and documentation**

Confusion about what TEK is and therefore how it can be used in decision-making can act as a barrier to its employment in decision-making, even where there is a political will to incorporate it (Inuit Circumpolar Conference 1993: 28). Recently a number of researchers have identified the need for more specificity in definition and usage (Duerden and Kuhn 1998; Stevenson 1996; Usher 2000; Wenzel 1999). Usher (2000: 184) identifies inconsistent definition of TEK as a key problem in incorporating it into decision-making in environmental assessment.

Part of the challenge has to do with an understanding of the role of community representatives. A study by Kruse and others (1998: 455) found that there was ‘a major difference in how Canadian government managers and users view the role of user members. Government managers think of them as authorised to make decisions

Table 1. Co-management bodies for Nunavik, under the James Bay and Northern Quebec Agreement. The Kativik Regional Government represents the Nunavik population.

Committee	Mandate	Membership/ appointed by	Number interviewed
Hunting, Fishing, Trapping Coordinating Committee (HFTCC)	Supervises the harvesting regime, including outfitting; recommends measures to governments, manages harvesting of some species.	3 by Inuit 3 by Crees 2 by Naskapi 4 by Quebec 4 by Canada 1 observer-member for the Société de développement de la Baie James	2 2 2 2 2
Kativik Environmental Advisory Committee (KEAC)	Reviews environmental policies and legislation and makes recommendation to governments.	3 by Kativik 3 by Quebec 3 by Canada	2 3 2
Kativik Environmental Quality Commission (KEQC)	Recommends and sets guidelines for environmental and social impact assessment; decides if project should go forward.	4 by Kativik 5 by Quebec	4 5
Federal Review Committee North (FRC-North)	Recommends and sets guidelines for environmental and social impact assessment.	2 by Kativik 3 by Canada	2 3

on behalf of their communities. Users (and user members) tend not to think this way.' Instead, users emphasised community consultation. The local nature of TEK (Duerden and Kuhn 1998), and the recognition that 'communities' may be crosscut with varying perspectives and complexities (Kendrick 2000: 24–25), suggest that native representatives to co-management committees cannot be expected to represent the knowledge of all native users and all native communities.

In this context, it is important to address how TEK is presented to co-management committees. Usher (2000: 189, 188) cautioned that, while scientific evidence is often presented in a highly organised way, this is not always the case for traditional ecological knowledge. As a result, TEK can be perceived as 'haphazard,' 'conflicting,' and 'untestable' observations. If TEK is to be given equal weight in decision-making, 'it must be documented in a way that is equivalent or comparable to (although not necessarily the same as) scientific claims.' (See also Huntington 2000; Johnson 1992.) At the same time, it is clear that the costs of documentation may be prohibitive (Huntington (2000: 1273).

### Methodology

The information upon which this paper is based was collected through a series of more general interviews that explored the history and operation of co-management committees in Nunavik. These committees were established under the James Bay and Northern Quebec Agreement, signed in 1975. Whereas the Agreement refers to a large area in northern Quebec, Canada, this paper is concerned primarily with the region north of the fifty-fifth parallel, hereafter referred to as Nunavik. Nunavik is

a sparsely populated region with close to 10,000 people. Most of these people are Inuit, living in 14 coastal villages and participating in a mixed economy that features wage employment as well as wildlife harvesting.

In Sections 23 and 24, the Agreement established four committees to manage harvesting and environments in Nunavik (Table 1). These sections also outlined a series of principles or 'regimes' under which decision-making about these issues should occur, including the protection of native hunting economies. The Hunting, Fishing and Trapping Coordinating Committee was established in 1976, and the environmental committees were established around 1978. The focus of the committees on harvesting and environments, the establishment of regimes which take into account native hunting economies, and the participation of regional representatives were meant to ensure that TEK would have an established place in decision-making for all of these committees (Brooke 1996: np). While the committees have different levels of power and jurisdiction, they all address issues relevant to aspects of Inuit TEK.

All of the interviews were conducted in the winter and summer of 2000. The interviews addressed three main topics: how committees functioned and their influence on government decision-making; the role of Inuit cultures and knowledge in committee decision-making; and the contribution of committees to the protection of sources of, and access to, country foods in Nunavik. The material on which this paper is based was drawn from responses to questions about the kind of information the committee used to make decisions, and about the role of Inuit representatives in this process. Interview questions were open-ended, and interviewers were instructed to

probe certain issues if respondents did not volunteer information.

While the project attempted to interview all of the members of each of the committees, seven could not be contacted for a variety of reasons. Two interviews were carried out with members who had recently resigned, but had served on the committee for a very long period of time. It was felt that these members would provide perspectives on the committee's functioning that their recent replacements could not have. All except one of the Inuit representatives were interviewed. Travel costs made it difficult to interview all of the Cree and Naskapi representatives to the Hunting, Fishing and Trapping Coordinating Committee, so only two members appointed by each of the Cree and Naskapi parties were interviewed. We interviewed two committee secretaries and one of the advisors to the Inuit because of their long-standing experience with the work of a committee. Four individuals were members of more than one committee. The interviews attempted to ascertain their views for each committee on which they served, separately. In total, 34 individuals were interviewed.

Graduate students who had experience in research in the north carried out the interviews. Interviews lasted between one and two and one half-hours. Most interviews were conducted face-to-face, but two were conducted by phone. Interviews were conducted in English or French, by choice of the respondents. One Inuit interview was conducted with an interpreter, but the remaining interviews with Inuit representatives were conducted in English.

All of the interviews were taped, except one that was not, by request of the respondent. Interviews were transcribed, and the texts of the interviews were analysed according to themes identified from the review of the literature, and according to themes that emerged from the transcripts themselves. Interviews conducted in French were translated into English. There was some slight editing of some of the quotations included in this paper, when it seemed likely that the identity of the individual respondents might be revealed by the expressions used. Committee memberships are not identified, again in order to protect respondents' identities. Because this paper explores Inuit traditional ecological knowledge, quotations from Inuit representatives are identified when they provided a slightly different perspective on issues. While committee members from Quebec and Canada may have demonstrated different perspectives, this analysis was beyond the scope of this paper. Committee members' responses are often not simple, and so the paper reproduces quotations quite extensively in order to capture at least part of this complexity.

### **Perspectives on TEK in Nunavik co-management bodies**

The analysis of committee members' perspectives on TEK is organised under three categories — differences

in knowledge systems, power differentials, and representation and documentation.

### **Differences in knowledge systems**

Responses to the interviews showed that differences in knowledge systems were viewed as a challenge in co-management decision-making processes. Of the 26 interviewees who compared scientific and traditional ecological knowledge, 20 identified contrasts in the ways these bodies of knowledge are structured, presented, or organised. Differences in knowledge systems were referred to by both Inuit and non-Inuit committee members. Table 2 summarises quotations from different committee members.

At the same time, incorporating TEK was seen as one of the fundamental, underlying purposes for the co-management committees. One member stated: 'Traditional knowledge is important. Using it is one of the objectives of Chapter 23 of the Agreement. It's not only protection of the physical environment but also of the human environment. Traditional knowledge is fundamental to what the [committee] has to do.'

Another said: '[Traditional ecological knowledge] is encouraged on the committee, for sure. I mean people wouldn't support people on the committee if they discouraged it — we'd drum them off. . .no of course it's supported.'

Responses from Inuit members suggested that TEK was respected in committee processes, and that its use had increased during the time committees had been in operation. One stated: 'They have to pay attention to traditional knowledge. They are listening more now than before, on the committees. My knowledge has never been enough, for me, but my knowledge has been respected. Quite a lot.'

A second said: 'I represent Inuit, they and I have traditional knowledge, and try to make sure that the government does not leave the Inuit out. Traditional knowledge is pretty well respected. Government representatives, though university educated, don't say, "you don't know about animals."'

A third commented: 'I'm pretty satisfied with the way it has been treated. And when we think there is an issue that is not being dealt with enough, we just bring it up and they look at it more.'

It was also evident from Inuit responses that they felt responsible for ensuring that this knowledge was part of the proceedings. Some of the Inuit respondents interpreted questions about barriers to the inclusion of Inuit perspectives as a suggestion that Inuit representatives had difficulty coping on co-management committees, and they were concerned to dispel these notions. One interviewee, in response to a question about barriers to Inuit participation, noted that this was a '1940's question' — one reflecting much earlier concerns about Inuit ability to participate in non-Inuit institutions.

In other words, despite an agreement that western scientific and traditional ecological knowledge systems

Table 2. Inuit and scientific knowledge as different systems.

<p>I need a definition of it and a user's manual, because it's difficult to integrate.</p> <p>Traditional knowledge is too large for me, too big. I'm more scientific, so I need that kind of knowledge.</p> <p>Traditional knowledge is always a source of information different from scientific knowledge.</p> <p>I happen to believe very strongly that traditional knowledge is a system of understanding that has its own logic, its own set of premises.</p> <p>For us [as scientists] traditional knowledge is pretty tough to work with, because it does not overlap very well with our reality.</p> <p>The hard scientific data always wins the day, because it can argue that the native picture is only a tiny fraction. But governments with their scientific data don't, by any means, have the whole picture. But the guy who is familiar with his trapping area, if he is persistent enough, attention will be paid to it.</p> <p>I have a partial understanding of the scientific side as well as the society and culture, and an understanding of the land.</p> <p>The Inuit work in Inuit knowledge ways. Other representatives are not Inuit, so we can't expect them to operate in Inuit ways.</p> <p>It doesn't always work [to use traditional knowledge on the committee]. When you speak their [non-Inuit] language you speak their language. When you speak the scientific language you have to speak in English. You cannot combine the two together. You have to have both backgrounds to combine them. Strongly. There's hundreds of ideas which you cannot express.</p> <p>There's a problem like Inuit words that can't be translated to [non-Inuit] words.</p>
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differed, recognition of differences did not imply that using both was an insurmountable barrier. Members described the negotiation process required to reach mutual understanding, for example:

Our best handle on [the traditional] knowledge system is through the members that represent that system, and [individual member] is certainly one of these people. Everybody else also believes this. So that when he says something that we think is crazy, I mean completely off the wall, no one will dismiss it. And, we'll push him a little bit and say, well, you know, 'what do you mean?' 'I don't understand,' 'that sounds crazy'... and we're comfortable enough to tell him 'that sounds like you have had six drinks too many...' and he'll take another shot at it, explain it another way, sometimes a younger Inuit will ask him in Inuktitut 'what the hell are you talking about?' and he'll answer and they'll say 'aw...OK.' Then they'll translate the translation and that's how we get the best handle we can on traditional knowledge systems.

When the entire transcript of each respondent was examined, all of the individuals who identified differences in knowledge systems also emphasised the value of TEK in decision-making. In other words, differences in knowledge systems appear to be viewed by members as a challenge in negotiating understanding, but not as an absolute barrier to communication and decision-making.

### Power differentials

Interviewers asked respondents how TEK was used in committee decision-making, and also asked them to evaluate its use and usefulness. It was found that some committee members questioned its dependability and applicability. Table 3 summarises some examples of such

responses from different interviewees. Clearly, most of the themes the literature identifies as dismissals of TEK are represented in these quotations. They include myths about Aboriginal peoples' primitive management systems, questioning the reliability of this knowledge, and identifying it as 'local knowledge' rather than broader 'scientific knowledge.' However, looking at this 'dismissal' of TEK in the context of the entire interview transcripts creates a different picture.

Of the 25 non-Inuit committee members who expressed scepticism about TEK, only two did not qualify their statements. In other words, two members simply dismissed TEK. Two other individuals indicated that TEK was not relevant because the committee's mandate was administering regulations. Two members indicated that they believed that TEK had an important role to play, but that other committee members tended to ignore or dismiss it. Nineteen members emphasised that TEK was important, but that it needed to be evaluated, or to be placed into context, or that the scale of this knowledge needed to be recognised. In addition to the 25 members who expressed 'scepticism,' six committee members offered no qualification concerning the use of TEK in decision-making. They listed TEK along with sources such as government documents or scientific research reports that the committee used in its deliberations, and, in response to probing by the interviewer, did not offer any caveats about the use of this knowledge.

How can these results be evaluated? Clearly, if we concentrate on the parts of the interview that raise questions about TEK, then it appears that committee members dismiss it. However, if the whole text of the interview is examined, it seems that the majority are treating TEK the way they would treat scientific knowledge — as

Table 3. Non-Inuit scepticism about traditional ecological knowledge.

We can't always pay attention to what an individual representative says. The traditional knowledge of the Inuit, it's like any knowledge. One mustn't think it's a miracle. All the same, it gives a different dimension than scientific research. Traditional knowledge is interesting, but it has limits.

Frequently they express themselves on wildlife and we listen to that. Traditional information is not scientific information, you know. So we try to avoid conflict on the interpretation of that information. Knowledge of the land is very important. For example we have a member comment on the condition of the ice from travelling by skidoo — very good information, we know that. But it is impossible to know how they can know other things. For example if we say that there are one million caribou up north and the Inuit traditional knowledge says that there are not so many. Who knows how many caribou are up north? It is impossible if you do not count them.

The native parties tried to use traditional knowledge any number of times. They tend to be dismissed by the biologists. It was just ignored as not being scientific.

Native people have a knowledge that sometimes is not true. They think that there will always be fish in the rivers. It is not true. Maybe 200 years ago their great-great-great grandfather was going from one river to another, but now with too many people up in the north, they eat a lot of fish.

Sometimes we use traditional knowledge, but sometimes I am sceptical. They told us a few years ago when they see a caribou on the Hudson Bay we won't see any more caribou for the next 100 years. So it is not always true. We do listen to them, we do respect them, but for biologists, with scientific knowledge it is very hard to apply both.

I'm a proponent of the use of local knowledge, as long as it is not used as a political tool to further some other material thing. Some people are very knowledgeable. But if somebody says to you: 'Well, we used to have fish here before and such and such happened and now we have no fish' well I'm not going to disagree or challenge that because I have no basis to challenge them. However, I'd like to look at that from, let's say, a weather perspective. What has the weather and temperature been like during a 20-year period? So I think you have to accept that local knowledge is a tremendous base, but you have to measure that against something else as well.

We always have to take care that [the Inuit representatives] don't tell you this information just for their own purposes. We always need a kind of checkup to make sure that it is really traditional knowledge.

a source of information that needs to be subjected to standards of verification and consistency. This is not a straightforward dismissal of TEK. Moreover, it was interesting to note that many of the Inuit members showed scepticism concerning the knowledge base of committee members who had not lived in Nunavik, or on the land (Table 4). Other researchers have noticed similar responses (Ames 1979; Freeman and Carbyn 1988; Gunn and others 1988; Klein and others 1999; Kofinas 1998).

Some researchers have suggested that another way of devaluing TEK is to view it as supporting western

scientific knowledge, rather than emphasising its role in offering alternative management systems. Respondents were most likely to view TEK in the former role. Table 5 summarises some examples of these responses from different committee members. A commonly mentioned role was the provision of information that would fill a gap in scientific knowledge, such as information about population cycles, climatic history, or details about wildlife feeding and movements. Inuit were viewed as authorities on local geographies of plant and animal life and could provide information at the 'micro' scale, to complement

Table 4. Inuit scepticism of western scientific knowledge.

I think sometimes they need to travel and see the different seasons. . .fall, winter, spring, and summer. Each one has their own life and environments. When you deal with the papers you don't go out. You fool yourself with the paper. Our mind is working hard. If you've never been out. . .it's no good.

I think [the committees] have a good respect for the people of the north but sometimes I think they are asking nonsense questions.

They ought to use traditional knowledge more. For example, the Beluga issue. That's something that's been ongoing for sometime now and they are saying they are threatened. But we know otherwise. When we do go Beluga hunting, in the season, we see whales as far as the eye can see. It's really hard to believe that they are threatened.

We use the knowledge of the Inuit about the land. We have to. But not many experts say that we are experts in our own right. We live there. We live with the species. We have knowledge, but some experts think you have to go to University to be an expert. In many cases especially in wildlife, it's not true. You can't learn about a species in a room. You have to be out there with the species to really know it.

Table 5. Non-Inuit views on the role of traditional ecological knowledge.

<i>Fill gap in scientific knowledge</i>	The government seems to be interested in using this traditional knowledge when it is available so that it can go ahead with their scientific data and try to see a trend or maybe answer just a gap that they have in their knowledge. We have a gap in scientific knowledge since the government doesn't have many data about the past. The aboriginals are very knowledgeable about this.
<i>Provide knowledge at a different (micro) scale</i>	It's information that we usually don't have from a scientific point of view because we look at the general trend in fish and wildlife — from a macro basis. We know for example that the caribou will spend the winter in the west and will go east in June. But we don't know if they use this side of the lake or the other side. But those guys know that they will use this side of the lake because they live close to the lake but they don't know where exactly they come from, so it is complimentary information and very, very interesting. What they know that on a local basis is very important.
<i>Provide knowledge on Inuit values and culture</i>	Well whenever it is possible to have information about traditional knowledge I think it is worth very much. For example, different communities used to go fishing in this area, or the women used to go get the mussels there. It is a good fishing site. So we should not have a project that will destroy this area.  I would say we could have more [traditional knowledge] for background information on understanding the cultural issues or the cultural differences, because I think perhaps the Inuit have a bit more understanding of our culture then we do of theirs. We could have more to avoid cultural differences and to have a better understanding of why some things are important to them.
<i>Provide new explanations or hypotheses</i>	I think that the panel would like to have much more traditional knowledge and to balance traditional knowledge with science. Traditional knowledge is not always the truth but it is sometimes a good indication of what can happen in the environment.  I think it's something that complements things. Often we don't have scientific information. Often traditional knowledge is the beginning of information that we'll go and look for in scientific terms. Often we don't have anything, or almost nothing, and it's people from the area who say 'yes, but there's this and this and this.' When there's nothing, it's the beginning.

the more general information of scientific studies. TEK was also seen as a source of Inuit values and culture, required by committees to minimise the disruption of developments. Even where the role of TEK included the generation of new hypotheses and explanations, the assumption was that these ideas would subsequently be explored using more scientific methods.

However, some members did identify the role of TEK in informing management systems and assumptions. All the respondents addressed the role of TEK, and 32 of 34 respondents viewed it as supplementing scientific knowledge. Sixteen identified an additional role in communicating cultural values and preferences. Finally, 15 suggested that it also had a role in defining better ways of managing wildlife and environments. While Inuit respondents were the most likely to present the latter perspective, they were not alone.

Three of the Inuit responses were of particular interest. The first clearly recognised the priority of non-Inuit interpretations and management frameworks on co-management committees. The implication of this

respondent's argument was that regulations ('the law') did not necessarily reflect Inuit values, and that if TEK was a priority, then it should be reflected in the regulatory framework. This is a clear challenge to a view of TEK primarily as data or information.

I think [traditional knowledge] is a first priority [on the committee] but it's funny. The Inuit they have traditional knowledge and they tell the people who are in charge, and the people who are in charge say 'but the law says. . .' I think that comes in the way of traditional knowledge. For instance, if people decide, for example, that it's best to put the thing there because no animal is using that and it's good for us, but the lawyers or something they say 'but the law says this.' For instance a lady was giving a lecture and she was saying maybe it's best that traditional knowledge and the law work together. But then again she said the law says this and that and that. . .so I pointed out to her that yes, you said maybe the law and the traditional knowledge should work together. In terms of our traditional knowledge, what people have to say up

north about what is best for them and best for the animals, maybe it's best that we put it there and that the law supports that.

Another Inuit respondent challenged the values underlying hunting and fishing by people from 'down south,' suggesting that for them it was like a game. In contrast, Inuit people hunted and fished to survive, and by implication, their rules for organising this activity should be taken seriously and incorporated into decision-making.

And traditional knowledge is very important, especially when it comes to harvesting. We have our own rules too. We're not totally ruleless you know. When we are first starting to hunt or kill animals we're told not to waste or kill more than we need. We never kill animals just for the pleasure. I've been explaining this since I started to get involved. Down south, when they talk about hunting or fishing, they automatically think about their holidays and the fun they are going to have — just sport. It's like a baseball game. But when you go to native communities we do it not to have any fun, we do it to eat. To survive.

Finally, one respondent's perspective was that scientific information has a role to play in helping the Inuit manage their wildlife and environments.

Respondent: I don't have much background underneath water and the ocean. People are not using the tiny little fish, but the bigger animals are eating it. When [the committee] talks about the little fish that I don't know, I don't even know the name. I don't have the background to catch up. It takes me too long to read. It bothers me — they are asking the question about little fish for which I don't have proper answers. They don't talk too much about the fish that is used by the community but they worry about the tiny little fish.

Interviewer: You don't think that they should be asking about the little fish?

Respondent: No. Similar to that is the fallout in the north. I don't have background. Nobody has answers, not even them. I am worried about land animals eating the grasses — eventually they are going to be contaminated. Nobody seems to work on it — nobody finds out how much contaminants is in grass. They talk about it and they don't measure it. When we have public hearings, some people keep asking the questions, nobody had a proper answer. The dollar value is invading our beloved country in the north. Eventually the dollar is going to make more impact in the north. One little ship [with crude oil] hits the rocks — all the games might be finished at once. That make me collapse — I mean it is part of my collapse. Just, you know, there is no answer for certain questions. I don't have proper education but I have enough background, which I learned from my own people not to change the games.

In this exchange, the respondent was concerned about the committee's focus on an organism that was not used by community members, while the fish harvested by the

community was ignored. This bothered him, because it was an example of a variety of questions the Inuit had, for which the committees did not have answers. The need for information was not a matter of idle curiosity. This respondent clearly felt that Inuit communities had skills and knowledge to manage their environments and the wildlife in them, and that they wished to incorporate western scientific knowledge into these management systems. (By 'games' he seemed to mean the way the northern ecology works.) Lack of this information from scientific sources made him 'collapse' because of his concern for the future of his 'beloved country in the north.' In this response, western scientific knowledge becomes information to be inserted into an *Inuit* management system.

In summary, the analysis of interview transcripts presents a perspective that is considerably more complex than a simple devaluation or dismissal of TEK in comparison to scientific knowledge. There is scepticism concerning some statements, but also the sense that TEK is essential. Traditional ecological knowledge is seen predominantly as information, but a significant number of community members also entertained the view that it had a contribution to make to values underlying and organising management systems. Inuit members on the committees actively challenged the value systems underlying the management of environments and wildlife.

### Representation and documentation

There are challenges in getting TEK to co-management committees in forms amenable to decision-making. Included here are issues of representation and documentation. To assess these issues, respondents were asked about how TEK came to the committees and whether they had any observations about how useable it was in decision-making.

The mechanism for blending state-controlled centralised management systems with local-level knowledge has been representation on co-management boards of state representatives and local resource users (Pinkerton 1989; Roseland and others 1998). Clearly some committee members viewed Inuit representatives as the primary source of TEK to inform committee decision-making. One example is: '[Inuit member] is our key person. He's our shaman.' Another stated: 'We always use traditional knowledge through our specialist [Inuit member]. He can provide us some feeling about, well, you think it is wrong or it's right or is it out of the track or is it in the track. . . He is our "spirit."'

However, a number of members pointed out that it was not possible for individual Inuit representatives to have all of the community knowledge of particular issues, or to make decisions for all of the communities affected. One non-Inuit member, for example, pointed out that men and women had different knowledge, perspectives, and preferences, and that these were not equally represented on committees. Another committee member mentioned the reluctance of Inuit members to represent the knowledge and view of all the Inuit in the region:



We expect that the Inuit members have their own networks of information so that they can bring people's perceptions forward. But we've noticed that people are there as individuals. They don't want to carry on their shoulders the perceptions of the Inuit collective. So over the last few years, each time there's an important project that raises the interest of Inuit, [the committee] holds public consultations in the communities involved in the projects.

Inuit committee members echoed the latter view. In addition, various committee members identified a wide variety of sources for the knowledge and preferences required for committee decision-making, in addition to individual committee representatives:

I think we do a very good job, because we have two or three different strategies. One strategy is to talk to the City Council or the Municipal Council. And there are always six points of view, which is fine. Another strategy is to ask [Inuit members] to actually go to a community and talk to the people in Inuktitut, about the project without the [committee] at all. And then there is the more formal public hearing type of thing. Between the three strategies, we do get a pretty good understanding what people like.

Some respondents mentioned the information that the Makivik Corporation, an Inuit corporation developed pursuant to the Agreement, had collected on Inuit land use and harvesting, Inuit knowledge about the environment, ecology and resources of Nunavik. Other sources were interviews with elders and hunters, and letters sent by community members to representatives and committees. At the same time, committee members were more likely to identify Inuit members as sources of information about TEK than they were to identify these other sources. Of the 36 committee members who commented on sources of TEK, 31 identified the views of Inuit representatives as important sources. Twelve indicated that Inuit committee representatives consulted Inuit communities for their views, an equal number mentioned public hearings and community consultation, and nine mentioned Makivik research.

The local nature of some aspects of TEK, and the fact that there are different knowledges among different segments of the population, creates challenges to its use in committee decision-making. Individual Inuit representatives can insist that Inuit perspectives be taken into account, and they can contribute information from their experience and their community. However, they are not, as individuals, repositories of the entire body of Inuit TEK. At the same time, community consultations are costly, both in monetary terms and in terms of the amount of time they take for both communities and committee members. One member noted that communities could be overwhelmed by repeated consultations.

Documentation, in a form that committees can use, therefore, becomes crucial. One respondent indicated that the increasing availability of documented TEK, for example that collected by Makivik, was one reason why

it was used more by committees. However, there are challenges in documenting TEK and committee members indicated that they could not always obtain the information that they would prefer to have for their decision-making. The process of collecting TEK is complex. One member explained: 'Traditional knowledge is information gathered from a lot of individuals. It is difficult to gather all of the information that individuals have. There are a lot of people and each one has his own vision.'

Another member expressed the difficulty in assessing whether or not all of the appropriate questions had been asked, or communities consulted.

For [a particular] project [the committee] had expressly asked that TEK be integrated in the impact study, so that, for example, with the biophysical impacts in the study, there was often a part that said that 'we collected our research, and the people of [a community] confirmed that a certain species of fish does or does not go up such and such a river.' But it is difficult to figure out the extent to which it's complete information or not. Do we have all of the information we need on this aspect? Is there some other information in some other village?

The process of collecting TEK is time-consuming and requires appropriate techniques. None of the committees has a budget assigned to research. This appears to be a longstanding frustration (Wilkinson and Vincelli 1996). Even if research budgets were available, there are challenges in ensuring that the aspects of knowledge required for a particular decision will be available or can be collected within a timeframe necessary for decision-making. Where committee responsibilities include the assessment of the environmental impacts of developments, members indicated that even materials collected by proponents often did not adequately address TEK.

There are also challenges in bringing aspects of TEK to bear on the particular decisions that a committee is asked to make or issues on which it is asked to consider. In some cases, this may be related to reluctance to find ways of translating Inuit knowledge into particular policies or regulations. One member gave an example about a regulation that would reflect Inuit beliefs that caribou herds have leaders and that these leaders should not be harvested because they had an important role in the well-being of the whole herd.

I'm not sure that [traditional knowledge] is taken seriously. People will be asked about traditional knowledge, nobody will challenge that knowledge, but we're not finding any application. To show respect, to listen is one thing, but to act is another thing and I don't see very many occasions where we did something. I mean I wish I could tell you that last year we decided to change the regulation to protect those caribou. But no, we haven't done that. When an Inuit stands up and gives his knowledge about an issue and what happened, people are saying 'It's cool, it's folklore, it's interesting,' but it isn't made into an application.

At the same time, other committee members mentioned this same aspect of TEK, suggesting that the western scientific beliefs about caribou herds defined 'leaders' and the behaviour of leaders in a slightly different way. These varying perspectives could make it difficult to design an appropriate regulation.

Several committee members also indicated that it was not always clear how to translate TEK into specific decision-making. The perspectives of three members follow.

- It's a bit of an educational process, trying to have people understand the value and merits of traditional knowledge. It's still not clear, even in my own mind, exactly how you can directly use a body of knowledge of that type and incorporate it into something like a specific decision — a management decision — because traditional knowledge tends to be localised. We don't always know how to use it — to extrapolate and expand it to every situation.
- It's not structured the same way and it doesn't have the same purpose because it's locally generated. The way we function is on a more all-encompassing level, so there's that difficulty.
- We just don't know how we can mix the information all together and try to make a whole, make sense of the whole picture.

In summary, while Inuit representatives have an important role in ensuring that TEK is part of deliberations, and while they clearly contribute important information, the nature of TEK is such that no individual is a repository of all of the relevant knowledge. Frequent community consultations, on the other hand, are time-consuming and expensive. The provision of research budgets, controlled by committees, would appear to be a positive step. Research budgets might also help to address the concerns, identified in the previous section, that committees cannot answer all of the questions of communities.

### Conclusion

The three most striking elements that emerge from this analysis are: the complex and sometimes contradictory nature of the views that members hold about TEK; the active role of the Inuit in attempting to shape how TEK is used in decision-making; and the need for documentation of and research funding for the collection of TEK.

While it is important to list challenges to the use of TEK on co-management committees, it is also important to examine how individual committee members put together a variety of ideas to construct frameworks of meaning for understanding and using this knowledge. Analysis of individual sentences of the transcripts, taken out of context, would suggest that all of the challenges to using TEK on co-management committees exist in these Nunavik examples. Looking at an individual's whole transcript, and looking at the transcripts for all the members of a committee creates a different impression. Individual members may express seemingly contradictory attitudes.

Thus, while a particular committee member may express scepticism about some statements by native participants, this member may also indicate that TEK is important, and that there needs to be an evaluation of this knowledge, and negotiation to reach a common understanding. Moreover, attitudes toward the use and usefulness of TEK vary among members participating on these committees. For example, while most participants mentioned TEK primarily as a source of information, almost half also suggested that it had a role in informing the values and assumptions underlying systems for managing wildlife and environments. This complexity is not something that is highlighted in the relevant literature. The existing work that identifies the difficulties in integrating different knowledges seems to present these as absolute. It does not accommodate the ways in which individuals construct complex and contradictory frameworks for understanding how TEK can be used in decision-making, and the ways that committees themselves are constituted of members with different perspectives. The implication is that to fully understand how TEK is used in decision-making requires an analysis of the influence of particular individuals in the process — something that is beyond the scope of this study.

The active role that Inuit members take in educating committees and in putting forward Inuit knowledge is something that has not been extensively highlighted in the literature on co-management committees (but see O'Neil and others 1997). A literature that focuses on differences in knowledge systems and the failure of non-native representatives to respond properly to TEK constructs native representatives as largely passive — sharing their knowledge and then largely being ignored. The perspective from the transcripts analysed in this study is one of active Inuit participation, resistance, and attempts at education that need to be emphasised a great deal more in discussions of the work of co-management committees.

Finally, it seems clear that all of the committees could benefit from resources to conduct research that would facilitate decision-making. Clearly, research funding cannot possibly address all of the committees' needs for information. Research takes time, and decisions often need to be made within a specified timeframe. There are also always questions about whether enough information had been collected, or whether all of the right questions have been asked. Kendrick (2000) described the hesitance by members of the Beverly-Quamanirjuaq Caribou Management Board to make recommendations about fire suppression areas because they felt that they lacked all of the relevant information. Finally a member pointed out that if anyone was qualified, the board was, and that they should make a decision on the basis of their best knowledge. At the same time, documenting TEK for use in co-management decision-making is an important issue. The local and individual nature of some aspects of TEK means that individual representatives cannot be treated as a source for all areas and all

practices. The seeming authority of written scientific documents that are much more readily available needs to be balanced by properly collected and presented materials on TEK. Clearly there are important issues here of the control of this knowledge (Stevenson 1996). However, one respondent noted that the increasing availability of materials on Inuit TEK had led, in his opinion, to their greater use in decision-making. This supports the importance of resources that are targeted toward that collection and dissemination of these systems of knowledge.

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