

# **Giving Traditional Ecological Knowledge Its Rightful Place in Environmental Impact Assessment**

*by John Sallenave*

---

## **Introduction**

Over the past two decades, governments and southern developers have turned increasingly to the North in their search for economic opportunities. Their interest has been drawn by the apparent bonanza of renewable and non-renewable resources—hydro-electric power, minerals and ores, oil and gas, and timber—in Canada's northern regions. This growing interest, and the coincident planning and investment in northern development projects, raises environmental concerns within aboriginal communities, environmental organizations, and public-interest groups. One concern of these parties is that adequate safeguards to protect the environment have not been put in place.

Environmental impact assessment (EIA) is one method of safeguarding the environment from adverse impacts of development projects. An EIA can be defined as a tool to predict, evaluate, and monitor the environmental impacts of particular human activities, but prediction has been a consistent problem since the inception of EIAs. The problems with EIAs have been accentuated in the past two decades as the size of proposed development projects has increased. For example, the sheer size of and the potential for wide-ranging impacts from the La Grande Hydro-electric Project in northern Quebec have increased the complexity and scope of an EIA to seemingly unmanageable limits. Thus, as the demand for and the reliance on EIAs increase, so does scrutiny of the research, process, policy, and the underlying assumptions. This is especially true for EIAs undertaken in the North where the impacts of development affect aboriginal communities.

Two of the fundamental limitations of northern EIAs are the lack of adequate ecological baseline data and the lack of an adequate framework or method to link ecological and social components of the environment. To mitigate these limitations, the EIA process should include significant roles for aboriginal peoples. Aboriginal traditional ecological knowledge should be integrated formally into the process, and aboriginal peoples should be given greater decision-making powers concerning EIA research and policy. At present, most environmental assessments and most monitoring systems for northern development projects neither involve aboriginal communities significantly nor include northern aboriginal peoples' vast knowledge of the natural environment. As a result, most northern EIAs are ineffective.

## **The Lack of Ecological Baseline Data**

Adequate ecological baseline data in northern regions do not exist because research is inadequately funded and because the region's relative remoteness and sometimes harsh

weather conditions limit the research season and increase costs. Policy makers cannot control the weather conditions of the North; however, they can address inadequate funding by reallocating existing government research funds to reflect the growing need for and importance of research in the North and by including local aboriginal residents—hunters, fishermen, elders, etc.—as members of the impact assessment research teams.

Researchers such as Freeman (1979), Howes (1980), Johnson (1989), and Nakashima (1990) have examined the advantages of involving aboriginal peoples as environmental researchers. Nakashima contends that much field research and data collection could be achieved with greater speed and less cost with the use of Inuit hunters than with traditional scientific research methods. Freeman concurs with this view:

how often do I hear from government circles in Canada that such and such research cannot be done because we can't afford to send a man in there this year. My thesis here is that we do not need to send a man in there this year, unless it be to inform a resident hunter what data needed to be collected (1979:358).

Limited research time and inadequate funds also present a problem of priorities to EIA researchers—what components of the environment do they focus on? To answer this question, they must identify what are known as **Valued Ecosystem Components** (VEC)—key species of wildlife, plants, water systems, etc.—for the region under study.

Of course, the use of the term "value" invariably raises questions: What components are to be valued? And who will decide what is of value (Sallenave 1993)? As long as aboriginal communities in the study region are not involved in the research, it will be difficult—if not impossible—and more costly for researchers to identify and *understand* the ecological, social, cultural, economic, and spiritual value of the various components of the environment.

### **Linking Ecological and Social Impacts**

The second limitation—the inability to link the ecological and social components of the environment properly—is particularly problematic for EIAs in the North. In general, the scope for contemporary environmental assessment and monitoring approaches is limited to the biophysical components and excludes the socio-cultural components of the study area.

Berkes (1988) cites the example of the James Bay Ecological Monitoring Program (EMP) to illustrate this limitation. Put into place following the construction of the La Grande River Hydro-electric Project in northern Quebec, the EMP was designed to measure a set of factors throughout the reservoir system and at some downstream sites. It did not, and could not, however, address the social concerns of the Cree population, which included the harvesting of animals and having access to hunting areas. Berkes points out that

The EMP...was not set up to address problems of social impact and human ecology. In designing the EMP, there was local consultation but no effective local participation in

setting up objectives, and there was little direct effort to try to anticipate and solve practical problems such as access to hunting areas (1988:213).

In essence, EIAs are reductionist in their approach, breaking down each study into various biophysical components, which are then measured and evaluated independently from one another and from the human components. This process of compartmentalizing biophysical components is inconsistent with the aboriginal view of the world, which sees all aspects of the environment as equally important. In aboriginal peoples' "holistic" view, biophysical components can be separated neither from each other nor from the human components—the social, cultural, spiritual, and economic aspects of the environment. One significant reason that monitoring systems such as the EMP have not been successful is that they have not incorporated a "human ecology" factor.

If social and environmental impacts are to be linked, aboriginal communities and their traditional ecological knowledge (TEK) must be part of the environmental assessment process. One of the most difficult tasks in achieving this integration will be to create a framework for research and planning that views science and TEK as complementary—not competing—forms of knowledge. By undertaking co-operative field research and by allowing for varying perspectives and views, researchers will discover the commonalities between TEK and science.

### **Applying Traditional Ecological Knowledge in EIAs**

Although there is a growing body of literature on the value of traditional ecological knowledge throughout the world, only in recent years have researchers seriously examined the potential of using this knowledge in conjunction with western science to study the impacts arising from development projects.

TEK can be defined as a cumulative body of knowledge and beliefs, handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment. Further, TEK is an attribute of societies with historical continuity in resource use practices; by and large, these are non-industrial or less technologically advanced societies, many of them indigenous or tribal (Berkes 1993:3).

### **Research priorities for TEK**

Robert Johannes (1993) examined the potential for integrating TEK into environmental impact assessments. He suggests that for traditional ecological knowledge to be useful for EIAs, research on traditional ecological knowledge and management systems (TEKMS) should include four perspectives: a taxonomic perspective, a spatial perspective, a temporal perspective, and a social perspective. His rationale for this suggestion is as follows:

***Taxonomic perspective:*** When doing an EIA, researchers must identify and understand the significance of the wildlife, plants, and soil/rock taxon to the inhabitants of the region.

The direct involvement of the aboriginal communities at the planning and research stage would greatly ease this task.

***Spahal perspective:*** EIA research in the North requires the identification of wildlife migration patterns and aggregation sites. The areas that scientists believe to be sensitive, however, are not always those identified by the residents of the region. For this reason, it is important that EIA research includes local hunters' knowledge of migration routes and aggregation sites.

***Temporal perspective:*** The timing of wildlife migrations and aggregations also must be understood by EIA researchers. In the North, however, migration patterns and aggregation sites are typically variable. Thus, scientists may not obtain reliable results from seasonal observations during a one- or two-year study. Aboriginal hunters, on the other hand, observe wildlife habits throughout the year, during all seasons, night and day.

***Social perspective:*** The use of TEK in northern EIAs requires an understanding of how aboriginal peoples perceive and use the environment. TEK cannot be used outside of its political and social context.

### **Cases where TEK has been used**

The inclusion of TEK in the EIA process is seen today not only as a way to improve the effectiveness of impact studies in the North—increasing the knowledge base of a region—but also as a mechanism by which aboriginal peoples can become an integral part of the planning and undertaking of scientific research.

## **The Growing Influence of Traditional Ecological Knowledge**

### ***Case 1:***

The Berger Inquiry was the first environmental social impact assessment that took into consideration the views and knowledge of the aboriginal inhabitants—Inuit, Dene, and Metis— of the proposed pipeline area in the northwest corner of Canada. Local aboriginal residents were represented by the Committee for Original Peoples' Entitlement (COPE), the Council for Yukon Indians, and the Indian Brotherhood of the Northwest Territories/Metis Association (Lalonde & LeBlanc 1991) to express their concerns about the proposed pipeline project. Consequently, Freeman (1979:353) points out that "since the publication of the Berger Inquiry report, the credibility of native hunters as accurate interpreters of nature has become more widely accepted."

### ***Case 2:***

Douglas Nakashima, a researcher from McGill University, undertook, with the help of Inuit hunters, to collect and compile Inuit knowledge of the temporal and spacial distribution of the Hudson Bay eider. One reason for the collection of this information was to obtain baseline ecological data on the eider in case of an oil spill in the region. His research was not simply aimed at acquiring the views and opinions of Inuit residents in

the area, but rather it was to create a process by which there would be "formal integration of the Inuit into the EIA process as environmental experts who possess information not readily available to scientists" (Nakashima 1990:1).

***Case 3:***

Manitoba Keewatinowi Okimakanak (MKO) and Environmental Protection Laboratories have designed a program aimed at identifying sampling sites and sample types near the Ruttan copper-zinc mine as a result of aboriginal hunters and fishermen refusing to eat the wildlife or drink the water because of a change in taste over the past two years. The sampling sites initially were selected following interviews with local aboriginal hunters and fishermen and subsequently were confirmed by field sampling technicians. Efforts are now being made to establish a comprehensive environmental monitoring system in northern Manitoba that would make use of both TEK and laboratory analyses (Wavey 1993).

***Case 4:***

The Hudson Bay Programme (HBP) is a 3-year collaborative research initiative involving the Canadian Arctic Resources Committee, the Environmental Committee of Sanikiluaq, and the Rawson Academy of Aquatic Science. Its goal is to examine the various approaches to assessing cumulative impacts in the Hudson Bay bioregion. The HBP, which relies on both scientific data and TEK in its examination of cumulative impacts in the region, is based on the assumption that TEK can be used in conjunction with science to identify ecosystem components or processes deemed to be under stress or undergoing change. The first step is to identify the changes; the next step is to evaluate the ecosystem's susceptibility to the cumulative impacts of past and present development.

**Barriers to the Integration of TEK**

The first barrier to the integration of TEK is perceptual. There is a distinct difference between what aboriginal peoples interpret as "significant" impacts and what policy makers and proponents of development projects perceive as significant impacts. This poses an obstacle to both the effective monitoring of impacts and the possible incorporation of TEK into the EIA process. The chasm between the two perceptions is understandable since the reactions of a society or culture to development cannot be understood outside the context of its particular history; however, the continued exclusion of aboriginal peoples and their traditional knowledge only exacerbates the problem. To bridge the gap between the perceptions and to develop a meaningful dialogue among all parties, aboriginal peoples must play a greater role in the EIA process.

A second barrier to the inclusion of traditional knowledge in the EIA process is the skepticism within the scientific community about the credibility or reliability of aboriginal information elicited through interviews. Over the past few years this view has been challenged increasingly from within the broad scientific community; however, in general, EIA researchers rely primarily on "hard" data—such as biophysical data. This reliance on "objective" data is found particularly among scientists on policy or regulatory

committees, who tend to dismiss aboriginal knowledge as subjective, anecdotal, and unscientific.

The third, and perhaps most overwhelming, barrier to the inclusion of traditional knowledge is the political obstacle. The decision-making process for EIAs would have to be altered significantly to accommodate the use of TEK, and such alteration may not be politically palatable to policy makers.

Change must be considered, however. The research and application of traditional knowledge to the EIA process can be successful only if the following conditions are met: aboriginal peoples must control the research and the application of traditional knowledge, and they must have decision-making authority regarding the use of the research results.

## **Conclusion**

Developers and governments have made known their intentions to continue development initiatives in the North. If development is to proceed, then an effective process for the evaluation and monitoring of potential impacts must be incorporated into the planning stages of all proposed projects. In past northern impact assessments, limitations such as the lack of ecological baseline data and the inability to link the ecological and social effects of projects have rendered the assessment process ineffective, unfair, and, some would contend, invalid.

Including aboriginal peoples and their traditional ecological knowledge in the environmental assessment and monitoring process is one way to address the limitations associated with past and current EIAs. There are numerous knowledge gaps in the ecological information about northern regions that science alone cannot fill. TEK, which encompasses the biophysical, economic, social, cultural, and spiritual aspects of the environment, is in many instances better suited to answer scientists' many questions (Freeman 1992). Traditional ecological knowledge emphasizes the inter-relationships between components of the environment and avoids scientific reductionism. Moreover, traditional ecological knowledge views humans as part of the natural environment, not simply as observers or controllers. Thus, any study aimed at understanding the natural environment must include the role of humans as "participants" within the natural environment.

It requires political will and scientific support to fund TEK research adequately and ensure its viability. Integrating TEK into the EIA process entails more than a transfer of information from one culture to another: it will require a change in the mind set of policy makers and of many in the scientific community. If knowledge truly is power, then appropriate decision-making power must be transferred to those at the source of the knowledge to be used. They may then use their power to protect the environment, culture, and way of life of northern aboriginal communities.

**John Sallenave is Senior Policy Advisor with the Canadian Arctic Resources Committee.**

## REFERENCES

Berkes, Fikret. 1988. The Intrinsic Difficulty of Predicting Impacts: Lessons from the James Bay Project. *Environmental Impact Assessment Review* 8:201 -220.

Berkes, Fikret. 1993. Traditional Ecological Knowledge in Perspective. In Inglis, J.T. (ed). *Traditional Ecological Knowledge: Concepts and Cases*. Ottawa: International Program on Traditional Ecological Knowledge and International Development Research Centre.

Freeman, Milton. 1992. The Nature and Utility of Traditional Ecological Knowledge. *Northern Perspectives* 20:1.

Freeman, Milton. 1979. Traditional Land Users as a Legitimate Source of Environmental Expertise. In Nelson, G. (ed). *The Canadian National Parks: Today and Tomorrow-Conference 11, Ten Years Later*. Waterloo, Canada: Waterloo University Studies in Land Use, History and Landscape Change.

Howes, Michael. 1980. The Uses of Indigenous Technical Knowledge: Analysis, Implications and Issues. In Brokensha, D. et al. (eds). *Indigenous Knowledge Systems and Development*. Lanham, MD.: University Press of America.

Johannes, Robert E.1993. Integrating Traditional Ecological Knowledge and Management with Environmental Impact Assessment. In Inglis. J.T. (ed), op. cit.

Johnson, Martha. 1989. The Role of Traditional Knowledge in Northern Development. *Northern Hydrocarbon Development in the Nineties: A Global Perspective*. Ottawa: Geotechnical Science Laboratories, Carleton University, pp.29-34.

Lalonde, Andre, and Patrice LeBlanc. 1991. Applied traditional ecological knowledge. A preliminary review of six case-studies investigating some theoretical and practical integrations of native knowledge and participation in renewable resources co-management, including aspects of the environmental/social impact assessment and land-use planning process. Unpublished.

Nakashima, Douglas J. 1990. *Application of Native Knowledge in EIA: Inuit, Eiders and Hudson Bay Oil*. Hull: C.E.A.R.C.

Sallenave, John. (ed). 1993. *Towards the Assessment of Cumulative Impacts in Hudson Bay*. A Report from the Cumulative Impact Assessment Workshop, 18 & 19 May 1993. Ottawa: The Hudson Bay Programme.

Wavey, Robert.1993. International Workshop on Indigenous Knowledge and Community-Based Resource Management: Keynote Address. In Inglis, J.T. (ed), op. cit.