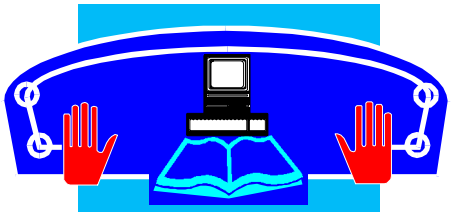

Health And Social Aspects Of The Nwt Diamonds Project - Bhp Diamond Mine Environmental Assessment Panel

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TRADITIONAL KNOWLEDGE AND THE NWT DIAMONDS PROJECT

Submission to the Traditional Knowledge Technical Session

BHP Diamond Mine Environmental Assessment Panel

Yellowknife, NT

Prepared by

Government of the Northwest Territories
Department of Renewable Resources

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EXECUTIVE SUMMARY

The use of traditional knowledge in environmental assessment is relatively new. The GNWT commends the Panel's effort to incorporate traditional knowledge in this environmental assessment and review process. The degree of importance placed on traditional knowledge, and instructions to use it in an applied manner, on par with western science, is unprecedented. The Government of the Northwest Territories (GNWT) is committed to and experienced in the promotion of traditional knowledge. Our objective is to provide recommendations, based on our experience in the area of traditional knowledge, that could guide the Proponent to develop a project plan and long-term monitoring strategy that respects and incorporates traditional knowledge.

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1.0 PURPOSE

This submission examines how traditional knowledge has been incorporated into BHP Diamonds Incorporated and the Backwater Group's (Proponent) Environmental Impact Statement (EIS). The Government of the Northwest Territories (GNWT) is committed to and experienced in the promotion of traditional knowledge. Our objective is to provide recommendations, based on our experience in the area of traditional knowledge, that could guide the Proponent to develop a project plan and long-term monitoring strategy that respects and incorporates traditional knowledge.

2.0 INTRODUCTION

The survival of northern Aboriginal peoples has depended for thousands of years on their knowledge and special relationship with the environment. While physical survival is no longer a daily struggle, northern Aboriginal peoples have become aware that the preservation and continued use of traditional knowledge is fundamental to their cultural survival.

The Northwest Territories is the first jurisdiction in North America to establish a Traditional Knowledge Policy. Through the Traditional Knowledge Policy the government recognizes that traditional knowledge is a valid and essential source of information about the natural environment, the use of natural resources and the relationship of people to the land and to one other. Traditional knowledge encompasses much more than just knowledge. It also relates to a culturally appropriate way of doing things.

The use of traditional knowledge in environmental assessment is relatively new. The GNWT commends the Panel's effort to incorporate traditional knowledge in this environmental assessment and review process. The degree of importance placed on traditional knowledge, and instructions to use it in an applied manner, on par with western science, is unprecedented. We also commend the Proponent for attempting to me-et the objective of the EIS Guidelines for full and equal consideration of traditional knowledge. From information provided in the EIS, the Proponent has demonstrated an awareness and sensitivity to the concerns and wishes of Aboriginal organizations regarding the collection and use of traditional knowledge.

This is a unique opportunity to examine how development projects can use traditional knowledge to determine, assess and mitigate the impacts of their activities. This requires that traditional knowledge be included as part of the baseline information on land, water, wildlife and other areas as applicable. It is important to determine as accurately as possible what conditions were in the past and what they are today so that there will be a

realistic way to monitor changes that occur in the future. Traditional knowledge, derived from thousands of years of observation and learning from the land and people, can play a key role in monitoring and mitigating impacts through the lifetime of a development project.

The recognition and use of traditional knowledge in new settings, by government or by industry, can be a complex undertaking. The task before the Proponent, government, Aboriginal organizations and the traditional knowledge holders is challenging. It is a new way of doing business and there is not yet a path to follow. In fact, processes such **as** the BHP Diamond Mine environmental assessment and review will begin to establish such a path.

3.0 UNDERSTANDING TRADITIONAL KNOWLEDGE

It took more than five years of working with elders, Aboriginal cultural organizations, and community leaders to develop the GNWT Traditional Knowledge Policy. There were lengthy discussions on the definition of traditional knowledge and the identification of actions to make GNWT programs and services more culturally appropriate. Women as well as men contributed to this process and we have recently begun to involve youth in accordance with the wishes of the elders.

In implementing the GNWT Traditional Knowledge Policy, we have encountered barriers to incorporating traditional knowledge into government programs and services. The first difficulty the GNWT encountered was in identifying traditional knowledge holders. The GNWT has learned through experience that consulting with community leaders is not the same as consulting with traditional knowledge holders. The GNWT now relies on Aboriginal cultural organizations, community leaders and, where they exist, Elders Councils, to advise on who should be involved with traditional knowledge research.

There is a shortage of both research and documentation of traditional knowledge. There are also difficulties in accessing research that has been completed or information on successful attempts to use traditional knowledge. Research is often slow, and not all traditional knowledge holders have the interest or ability to spend the time required to pass on their knowledge. Conflicts can emerge with traditional knowledge holders as a result of the methodologies employed by researchers from other cultures. Apprehension about how traditional knowledge will be interpreted and used, and the personal consequences of sharing sensitive information, can also limit the openness of some traditional knowledge holders to this kind of research.

The GNWT has experienced many benefits from involving traditional knowledge holders in its programs. For example, with respect to wildlife studies, traditional knowledge has improved the design of the studies, reduced costs, and improved the acceptance of research results. The opposite has been true when we have not worked closely enough with traditional knowledge holders, communities and Aboriginal groups. It is clear that people in the Northwest Territories, especially Aboriginal people, want more than consultation. They want to be full partners in determining what happens on their land.

4.0 CONDUCTING TRADITIONAL KNOWLEDGE RESEARCH

The Proponent has acknowledged that determining an appropriate process for conducting traditional knowledge research is very important. Through trial and error, the GNWT has developed its own experience which can assist the traditional knowledge program the Proponent has developed.

In addition to the GNWT, agencies such as the Dene Cultural Institute, Nunavut Research Institute, Canadian Polar Commission, Science Institute and others, including traditional knowledge holders themselves, have long been struggling with questions related to the integration and use of traditional knowledge alongside western science. The Proponent can gain from these experiences and work with these agencies in developing appropriate research methods.

There is a need to develop a process, and eventually a research protocol, with Aboriginal cultural organizations, community organizations and traditional knowledge holders. The process should include discussion of what traditional knowledge research is required, who will conduct and interpret the research, which traditional knowledge holders will be involved, how and where the information will be stored, who will have copies and access to the information, how the information will be incorporated into decision making, and how the information and any decisions will be shared with the participating community or region.

Traditional knowledge and its use differs among communities, regions and cultural groups. Therefore, the process must be flexible and may need to be adapted to different communities or regions. The GNWT has found that involving communities at the planning stage leads to more support for the studies conducted and for any decisions made.

Many traditional knowledge holders are not fluent in english. Also, many terms or concepts in an aboriginal language can not be readily translated into english or vice versa. Traditional knowledge research requires accurate interpretation as well as translation. This can make the process time consuming and expensive, but contributes significantly to the usefulness and application of the information and the acceptance of the results.

Just as scientists list the published references they useorreceive recognition for their findings, traditional knowledge holders who are involved in traditional knowledge research should be acknowledged. This reinforces that traditional knowledge is of equal value to scientific knowledge.

Agencies conducting traditional knowledge research should be required to share the results and ensuing decisions with participating traditional knowledge holders and their home communities. This will ensure that the information has not been misused or used without permission. This will also assist in the future cooperation of traditional knowledge holders.

5.0 INCORPORATING TRADITIONAL KNOWLEDGE INTO DECISION MAKING

Traditional knowledge holders and scientists or other experts should work together to identify potential impacts, evaluate the effects of the project, or develop mitigative methods and monitoring plans. This approach to incorporating traditional knowledge into decision making will allow traditional knowledge holders and other experts to assess and integrate their information and develop decisions through a consensus process which results in mutual understanding and support.

Bringing traditional knowledge holders and other experts together to work out solutions to problems does work. This approach was used by the Beverly/Qamanirjuaq Caribou Management Board to develop a management plan for these two barrenground caribou herds. This is also the approach used by the Departments of Health and Social Services, Justice, and Education, Culture and Employment to develop the Community Wellness Strategy.

Involving traditional knowledge holders in decision making will ensure that where appropriate, traditional knowledge research is conducted and incorporated into decisions. If the process involves workshops then traditional knowledge holders should be participants. If the process involves committees then traditional knowledge holders should be members.

6.0 COMMENTS ON THE TRADITIONAL KNOWLEDGE COMPONENTS OF THE ENVIRONMENTAL IMPACT STATEMENT

Although the Proponent attempted to meet the EIS Guidelines requirement of full and equal consideration of traditional knowledge (Guideline 31 O), the Proponent was not successful. The Proponent's EIS and Status Report on the Traditional Knowledge Program (December 15, 1995) has not yet explained how traditional knowledge will be incorporated into project operations, mitigation measures and monitoring programs.

At the scoping meetings, held in April 1995, the GNWT advised the Panel that the Proponent might not be able to acquire and incorporate traditional knowledge to the degree envisaged by the guidelines. Based on our understanding and experience, we believe that there are areas in the environmental assessment and review process where traditional knowledge is both available and relevant. For example, traditional knowledge is an important addition to scientific knowledge in the development of environmental and social mitigation and monitoring plans.

The Proponent has committed to working with local and regional Aboriginal groups to ensure traditional knowledge has a meaningful role in addressing the potential impacts of the mining operations. The following comments provide suggestions on how the Proponent can further incorporate traditional knowledge into the NWT Diamonds Project in a way which will promote northern cultures and be supported by northern people.

Volume 1, Section 1- Project Description, 1.2 Traditional Knowledge

In attempting to meet the guidelines of the Panel, the EIS describes what the Proponent has learned about collecting and incorporating traditional knowledge. The EIS indicates that this process is ongoing having begun in Phase 1 of the Two-Phased Traditional Knowledge Study and will continue in Phase 2 of the Study.

Volume 2, Biological Setting

The Proponent has identified a number of difficulties in conducting traditional knowledge research and noted the lack of information. The Proponent has committed to further studies (e.g. Phase 2 of the Two-Phased Traditional Knowledge Study as described in Volume 1 p. 1.23). The opportunity to collect further baseline data in relation to traditional knowledge still exists. These baseline data are important not only for documenting any biological changes as a result of the project but for identifying potential impacts and appropriate mitigative measures.

Volume 4, Section 3- Biological Impacts and Mitigation

Although the EIS predicts any biological impacts to wildlife will be negligible to minor (Volume 4, p. 3.1), the EIS acknowledges that the potential impact on caribou was one of the most important concerns of Aboriginal people and traditional knowledge holders and that the importance of caribou to the Aboriginal people cannot be overestimated (Volume 4, p. 4.26). If mitigative measures for caribou or other wildlife are to be successful, the Proponent must understand the strong relationship between Aboriginal people and wildlife.

In assessing impacts on wildlife and developing mitigative measures, it is especially important to include traditional knowledge holders in all stages of planning and conducting research for baseline and monitoring purposes. This is one of the most important ways that communities will recognize that the Proponent is addressing their concerns.

Volume 4, Section 4- Socioeconomic Impacts and Mitigation

4.8 Traditional Economies and Lifestyles

The EIS indicates that the Proponent faces a dilemma, which is, how best to mitigate the impacts of a wage-based economy and still respect the traditional land-based lifestyle (Volume 4, p. 4.147). The Proponent's identification of impacts and mitigative measures appear to result primarily from academic research with some information from Aboriginal employees of other mines. Their examination of impacts on renewable resource harvesting activities does not present a comprehensive view of impacts on women and children, and the extended family structures which form an integral part of the traditional lifestyle. The Proponent should discuss additional ways to support the traditional lifestyle and economy with Aboriginal community organizations, cultural organizations and employees.

4.9 Land Users in the Vicinity of the Mine

The most important way that the Proponent can respect both the traditional economy and the land users in the vicinity of the mine is to ensure that employees understand the mitigative measures the Proponent is taking regarding the air, water and wildlife and to ensure that these elements are not negatively affected by project activities.

In the EIS, the Proponent commits to meetings with local outfitters on an annual basis. The Proponent should also commit to meetings with hunters and trappers from communities in the area to discuss potential impacts, monitoring needs and mitigative measures.

4.11.4 Cross Cultural Impacts

The project's organizational design will be based on a team structure and culture (Volume 1, p. 2.202). In order to work together as a team, there must be mutual respect and trust. This is difficult when employees have different cultural backgrounds and customs.

The EIS indicates that the Proponent has corporate policies that allow it to "respect local customs" in part by adapting "employment conditions where necessary to accommodate these customs" and holding "courses in cross cultural awareness and adaptation for its employees" (Volume 1, p. 4.5). Some suggestions to promote cross cultural awareness are described below.

Aboriginal cultural organizations should be involved in developing any cross cultural courses. The instructor should be from the relevant Aboriginal culture. Ideally, the best way to understand Aboriginal culture is for an employee to spend time on the land with Aboriginal harvesters. Not only could this experience provide an opportunity for southern employees to be immersed in an Aboriginal culture, but it would provide them with an appreciation of the importance of the land and provide an opportunity to observe first-hand the application of traditional knowledge in peoples' everyday lives. It would also serve to strengthen their land survival skills. This training is available locally and would increase the economic benefits this project can provide to northerners.

For a large number of Aboriginal employees, english is not their first language. The GNWT recognizes all Aboriginal languages of the NWT as official languages. Consistent with the Official Languages Policy of the NWT, the Proponent could promote the use of Aboriginal languages by: encouraging employees to speak their languages on the job; encouraging other employees who may wish to learn an Aboriginal language to do so; providing an area in the recreational facility where native language programs provided by native radio and television stations (CKLB, CBC, and TVNC) can be heard or watched; and providing signs in appropriate Aboriginal languages and english.

Naming of sites should be done in consultation with traditional knowledge holders and Aboriginal names that are already in place should be recognized by the Proponent. This is occurring throughout the NWT with many communities reverting back to their traditional names in an official capacity. The Proponent should provide maps of the project area with the Aboriginal names.

The Proponent should make a commitment to enlist the assistance of traditional knowledge holders together with existing educational institutions, e.g. Aurora College, Nunavut Arctic College, and the Science Institutes, to develop training programs that reflect cultural differences in learning. The EIS acknowledges that Aboriginal cultures approach learning differently (Volume 4, p. 4.151). The GNWT Department of Education, Culture and Employment works with traditional knowledge holders to develop educational programs (e.g. Dene Kede, Inuqatigiit curricula) that reflect these differences.

Families are important to all employees and the Proponent should investigate options so that employees may communicate with their families (e.g. high frequency radios, computer link-ups with schools, dedicated telephone lines or hours, direct flights back to communities, etc.). This will help to mitigate the potential social problems that can occur when families are apart.

Counseling services should be culturally appropriate. The Proponent should work with the communities, other community-based services, and Aboriginal cultural organizations, to incorporate culturally appropriate practices such as ceremonies, talking circles and the use of elders.

Volume 4, Section 5, Cumulative Effects

The assessment of cumulative effects and proposed monitoring has not incorporated traditional knowledge. The involvement of traditional knowledge holders in the study of cumulative effects is important. Traditional knowledge is based on observation over long periods of time. Although the Proponent has only operated in the Northwest Territories for a few years, mineral development has been occurring in the Northwest Territories for many years.

None of the methods described for monitoring the cumulative effects of the project include the collection or incorporation of traditional knowledge (Volume 4, Table 5.8.1). As this project is expected to have a duration of 25 years, the Proponent should be required to develop comprehensive environmental monitoring plans based on environmental indicators generated in consultation with the affected communities. There is a role for Aboriginal community residents not only in collecting and compiling baseline data, but in providing input to the development of monitoring plans, and in undertaking the monitoring. In fact, this could be a valuable source of employment. Some work on this has already been done in the North, including the identification of impact indicators for renewable resource harvesting (Appendix) and a training course for Aboriginal harvesters in environmental monitoring. This experience can be examined and built upon.

7.0 CONCLUSION

The incorporation of traditional knowledge into a new system is a complex undertaking. It is a process that requires commitment to building new relationships based on partnership, communication and respect. Success in this new venture is not easily quantified or measured. On the other hand, if traditional knowledge is to survive for future generations, and if development projects are to benefit from the wealth of this accumulated knowledge and wisdom, there must be commitment to a process with outcomes that may be intangible.

The task before the Proponent, Aboriginal organizations and traditional knowledge holders is challenging. We urge the Proponent to approach this task with determination and commitment.

APPENDIX

IDENTIFICATION OF IMPACT INDICATORS

FOR RENEWABLE RESOURCE HARVESTING

Identification of Impact Indicators for Renewable Resource Harvesting

Prepared for: Environmental Planning and Assessment
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January, 1986

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1. Introduction

1.1 Terms of Reference

This project stems from a workshop sponsored by the GNWT Dept. of Renewable Resources, Environmental Planning and Assessment Division, in March, 1985. That workshop identified several research priorities, including the need to propose and evaluate possible indicators for monitoring impacts of development on renewable resource harvesting. This project also builds on two papers prepared for that workshop: the background paper by Staples (1985), and the summary report by Allison and Fleck (1985).

Terms of reference for the study as proposed by the consultant and accepted by the client were:

1. To review and evaluate the impact hypotheses generated by the Mackenzie Environmental Monitoring Program (MEMP) workshops and to ensure to the extent possible, that they are both accurate and thorough (see Appendix 1 for an explanation of MEMP);

2. To propose working definitions for such terms as "harvest", "indicator", "harvester", "effort", among others;

3. To propose an initial set of indicators which can be used to assess and monitor impacts of development on renewable resource harvesting.

1.2 Method

The work plan called for an evaluation of the proposed hypotheses; a literature review; and an analysis and report based on the above.

Evaluation of the proposed hypotheses took place primarily in two forums - the harvesters' workshop in Fort Good Hope, conducted by DeLancey (see report below); and the October MEMP technical meeting, attended by Usher. Further refinement and evaluation of hypotheses took place at the final MEMP workshop in

November, which both authors attended.

A fairly extensive literature review was undertaken (see attached list of references) but the results are not summarized per se in this report. For the most part, it was found that the documents reviewed did not differ much in quality from those reviewed by Staples (1985); and that his criticisms applied almost universally. Rather than repeat Staples' work, therefore, we chose to incorporate and build on the useful contents of literature reviewed.

1.3 Background

Staples reviewed the state-of-the-art of impact assessment and its ability to effectively predict and monitor impacts for renewable resource harvesting. Based on a review of four environmental impact statements for proposed northern projects, he concluded that:

> the indicators used appeared to have been chosen indiscriminately, with little regard for identifying social, economic and environmental factors that hold the greatest significance for renewable resource harvesting;
>
> impact predictions generally depended on the use of a wide range of indicators for which adequate baseline data are not available:
>
> impact predictions bore little relationship to the indicators employed;
>
> recommended monitoring programs, designed to address predicted impacts, were not related to clear indicators appropriate for determining real impacts on harvesting.

Based on our own knowledge of the recent literature on socio-economic impact assessment, these deficiencies are by no means restricted to the four documents reviewed by Staples, but are instead quite typical.

Staples went on to recommend, among other things, that:

1. existing indicators used in impact assessment be subject to thorough critical evaluation;

2. new indicators be formulated, and rationalized as to the role and significance they would have in impact assessment;

3. the design of effective monitoring programs be undertaken to reflect these new indicators.

This report is intended primarily to address (2) above. We will touch on (l), and through our findings will enable (3) to be undertaken.

1.4 What is an indicator?

Beanlands and Duinker (1983) define an indicator of change as "(i) a biophysical component or variable which is monitored to detect change in that component or variable or (ii) a calculated index of the condition of all or part of an ecosystem." In other words, indicators are like the clinical symptoms on which a physician bases a diagnosis of health or ill health.

For the present purposes, harvesting (defined in 3.1) is the Valued Ecosystem Component (VEC) for which impacts are to be monitored. Indicators are those variables, or characteristics of variables, which can be monitored - or more specifically, which can be measured, and thus ranked or quantified.

Characteristics of Indicators:

Both Staples, and Allison and Fleck, identified some necessary characteristics for useful impact indicators.

Among the shortcomings of existing indicators in the literature he reviewed, Staples found that there was generally a poor understanding of harvesting as a way of life, rather than simply a means of providing a livelihood. Impacts on harvesting, he said, are often "allocated to a middle world between biophysical and socio-economic effects." Positive impacts, he found, tended to be quantified around a few economic and social indicators, while negative impacts tended to be based on broad and rather vague references to acculturation and quality of life.

In order to effectively assess and monitor impacts, therefore, Staples proposed that harvesting requires a set of indicators that respect it as a social system - i.e. indicators that realistically reflect, and are sensitive to, the features of the social and economic organization of the harvesting economy.

The first pre-requisite for a useful indicator for renewable resource harvesting is thus:

1. indicators must realistically reflect harvesting as a social system.

Discussions at the March workshop on monitoring of development impacts on renewable resource harvesting, resulted in the identification of three additional characteristics of useful indicators:

2. indicators must be amenable to repetitive measurement;

3* indicators should be generated from, and causally related to, a given hypothesis;

4. indicators must be agreed upon by both researcher and harvester.

The indicators suggested in this report conform to the first three requirements stated above. Requirement 4 can only be satisfied through discussions and negotiations between the parties involved.

2. Results of Harvester Review of Hypotheses

A complete report on the workshop discussions is attached as Appendix 8. Some linkages of the hypotheses were considered sound; others were not considered universally applicable. It was recommended that some elements be struck from the hypotheses, as they were considered inaccurate or irrelevant.

Some variables which the Fort Good Hope harvesters considered inaccurate or irrelevant, however, are useful when assessing impacts in other areas of the NWT. For example, "non-retrieval rates" was rejected as a significant factor at the harvesters' workshop, but is unquestionably significant in any discussion on harvesting of marine mammals.

Several recommendations of the Fort Good Hope workshop were confirmed independently at the MEMP technical session held October 7-12 and/or at the MEMP workshop of November 4-8, viz:

- that the "information" variable (i.e., the speculation that involvement in wage employment positively *or* negatively affects an individual's access to harvesting information) be struck, as irrelevant;

- that the "unit of production", rather than individual harvesters only, be considered when assessing impacts on harvesting;

- that trapping as a commercial activity should be distinguished from subsistence harvesting, especially when discussing the relationship between harvest levels and wage employment;

- that the "skills" variable is difficult if not impossible to quantify, and that interpreting the loss of certain specific skills as an impact of development is an oversimplification - the complex set of skills associated with harvesting is changing and adapting in response to changes in technology and other forces.

As a result of discussions at the harvesters' workshop, and the MEMP sessions, it became clear that the hypotheses were neither final nor universally applicable; but would be subject to considerable change and revision. For that reason, we have chosen to focus on the key variables, which remain constant although their hypothesized relationships within the impact model are subject to refinement.

3. Working Definitions and Significant Variables

3.1 Harvesting

Harvesting can be defined in two ways. It can refer simply to a physical output; a quantity of produce resulting from measurable inputs. Changes in input will result in different levels of output. Harvesting also refers to a way of life which, when altered, may have effects on social and cultural well-being. Whether it is to address the concerns of harvesters themselves or of public policy, an effective and acceptable monitoring program must address both .

The first usage may be defined in terms of precise, quantifiable parameters, for example:

> The maintenance of community harvests at per capita levels and at catch per unit effort levels within their recent range of natural variability (see 3.5).

The second usage takes account of the several distinct but overlapping elements of harvesting as an activity that native people value. These include:

1. a socio-economic system of food production;
2. a set of dietary standards, which may be expressed in cultural as well as quantitative nutritional terms;
3. a viable economic option for some portion of the native population; and
4. a social and cultural way of life based on harvesting.

The first usage emphasizes short term cost/benefit calculus as the stimulus to harvesting effort. It is essentially an economic model, which explains behaviour in terms of individual preference and utility. The second emphasizes long term considerations of social system maintenance and their effects on effort. It is an anthropological model, which explains behaviour in terms of

interdependent preferences (in effect, culture). Although the first is easier to quantify and monitor, the two are closely related and both must be considered.

Non-native harvesting, i.e. recreational hunting and fishing, was excluded from this discussion in the terms of reference for this project.

We will identify and define the key variables for monitoring according to the following general categories:

The social unit
The resource base
The factors of effort
Harvests
The agents of change.

3.2 The social units of harvesting

Native hunting, trapping and fishing is a kinship-based system of production. Currently (i.e. for at least the last 20 years in most of the N.W.T.), the household is the most readily observable unit of both production and consumption. This is in contrast to most models of economic activity, which differentiate between the firm (maximizing profit) as the unit of production, and the individual (maximizing utility) as the unit of consumption. In identifying the units of production in harvesting, we define both the functional roles and the interrelations of the individual members.

The basic unit of production consists of several individuals normally resident under the same roof (and also normally family-related). Their economic functions (see below) are determined largely according to sex, age, and experience. The unit of production consists of all those members of a household who in some way contribute economically to the harvesting, processing, marketing and distribution of animals and fish as well as other domestically used renewable resources. This unit endures for many years, with membership fluctuating chiefly on the basis of birth, death, and marriage, but also incorporating other social means of entry and exit.

Although harvesting is organized on a household basis, the typical household is also engaged in other economic activities which it combines with harvesting for its optimum maintenance. For example, household income may be derived from any or all of the following sources:

- wages and salaries;
- transfer payments (e.g. family allowance, child tax credit);
- sale of commodities (e.g. furs, handicrafts);
- domestic production (e.g. meat, fish, wood).

Members of the household, as a unit of production, may thus perform one or more of the following roles:

harvesters (those actually engaged in hunting, fishing and trapping);
processors (those who skin and clean pelts, butcher meat, split fish, prepare food, etc.);
servicers (those who make clothing and gear, clean and maintain them, repair equipment, etc.)
supporters (those who contribute cash obtained from sources other than harvesting to the purchase of gear and supplies).

For a household to be a producing unit, it must have harvesters among its members. It is an advantage to have processors and servicers among its members, although if necessary these functions can be obtained by arrangement with other households, or even commercially. Unless a substantial amount of income from harvesting is in the form of cash, the household must have supporters. Cash support may be obtained by harvesters themselves taking on wage employment, or by other household members contributing employment or other income to the harvesting endeavour.

Any particular harvesting task may be performed by an individual or a group. Harvesting group composition may vary from one form of harvesting to another and even from one occasion to the next. Examples include trapping partnerships, whaling crews, and hunting parties. These groups may consist entirely of members of a single unit of production, or they may consist of members of two or more such units, who or which temporarily or habitually ally themselves (generally on the basis of kinship), for the specific tasks in question.

While the foregoing definitions are generally applicable in the N.W.T., the specificprinciples of household and harvesting group formation are somewhat fluid, and vary in detail over time and space. Consequently they should be empirically verified at the outset of any particular research and monitoring program, and periodically confirmed thereafter (viz. Usher et al. 1985: 162).

It is these basic social units of production, rather than individuals per se, that are the appropriate units of observations in a harvesting monitoring program. It must also be kept in mind, however, that these units are themselves part of a larger social unit: traditionally the co-residential hunting group or the band, more recently the community or some socially integrated section of it, or some regional entity. The key properties of these larger units are:

a) a communal interest in defined harvesting territories;

b) a system of property relations, i.e. rules governing who has what rights over the factors of production, for example the land tenure system, rights of ownership and use with respect to equipment, and rights to command labour;

c) a system of resource management based on rules of allocation and harvesting; and

d) a system of mutual aid and sharing that ensures flexibility among units of production with respect to both the factors of production and the produce itself, so that the basic needs of all households are taken care of.

3.3 The resource base

The resource base consists of the harvested species of animals, birds, and fish, and in particular, the following attributes:

a) abundance, i.e. population as indicated by total number and/or density;
b) distribution, i.e. geographic variation in numbers and density, especially seasonally and from year to year;
c) quality, i.e. suitability of flesh for human consumption, or saleability of pelts or other by-products.

Other renewable resources are also significant in some areas, such as berries and other edible plants, and wood for fuel and tools. We have not, however, attempted to develop criteria for harvest monitoring with any special reference to those resources.

3.4 Factors of production and effort

The factors of production are conventionally considered to consist of land (resources), labour, and capital. The first has been considered in 3.3. The other two, in the context of fish and wildlife harvesting, may be more precisely defined as effort. Effort consists of the following attributes of labour, in combination with operating equipment.

1. Time

With respect to harvesting, time can be defined in two ways:

a) time actually spent harvesting, including preparation, travel, search, kill, retrieval, transport, processing, marketing;
b) amount and distribution of time in which the opportunity to harvest occurs.

The first definition is relevant to a consideration of effort as further defined below, the second to household decision-making.

2. Skills

The physical and mental skills necessary for harvesting, as well as accumulated knowledge of habitat and environment, and especially of the abundance, distribution, behaviour, and natural history of species.

3. Information

Current information on environmental conditions and resource abundance, distribution and quality.

4. Equipment

Productive equipment such as boats, engines, skidoos, rifles, fishnets, as well as gas, lubricants, parts, and ammunition required for their operation and maintenance. Equipment may be measured in terms of its value (quantity x purchase value x depreciation rate), and its effectiveness (productivity).

Effort is the product of equipment, time, skills, and information. Since only the first two are easily quantifiable, the measurement of effort is commonly reduced to a product of equipment (gear) and time. Specific parameters of the **unit of effort** vary by type of harvesting. Some common ones include (in approximate order of their intrinsic precision and their correlation with harvesting success):

Fishing
(length and depth of net x days set)

Trapping
trap checks (traps x trapline trips)
trap days (traps x days set)

Hunting
hunter days (hunters x days out).

3.5 Harvest

1. Volume

Numbers of animals struck and retrieved, normally expressed as the quantity taken over a specified time and in a specified area. (This is the number normally reported by harvesters when surveyed.) Harvest (i.e. success) can also be expressed relative to effort, specifically, catch per unit of effort (C/UE).

Note: Two other definitions are possible:

a) total number of animals removed from a population by virtue of harvesting activities, i.e. retrieved + struck and lost + stress-induced mortality. This quantity, higher than struck and retrieved, is of primary interest to wildlife managers, and may be expressed as the number of animals or as their total live weight (biomass).

b) total number of animals used by the harvesting group, i.e. struck and retrieved less numbers lost in transport, storage, and preparation, less numbers judged inedible or unsalable. This quantity, lower than struck and retrieved, is the basis of the economic value of the harvest. It may be expressed as the number of carcasses or pelts, or as edible weight.

2. **Value**

Based on the above, harvest may be expressed as a value, either precisely in terms of dollar income, weight of produce, quantity of key nutritional elements; somewhat arbitrarily on the basis of imputed values or shadow prices; or as a rank order based on cultural or personal preference (Berger 1977; Usher 1976, 1983). It is the perception of the harvest in these terms by the harvesting groups themselves, not the absolute kill level, which governs the amount and allocation of harvesting effort.

3. Struck and lost

The numbers of animals actually killed or mortally wounded by direct encounters with gear (ammunition, traps, fishnets), but which are not subsequently retrieved by harvesters. This number is significant because it may vary, as a proportion of retrieved harvest, with the skills and equipment of harvesters, and may induce changes in the state regulatory regime in response. Struck and lost may be expressed as an absolute quantity or as a rate, relative to the quantity retrieved.

3.6 Agents of change

Six types of changes entrained by or related to hydrocarbon development have been identified as having significant impacts on the harvesting system.

1. Industrialization

The general process of socio-economic change associated with industrialized societies (as opposed to the more popular usage, i.e. factories and blue-collar work). The key considerations are:

a) the predominant unit of production is the firm, whether publicly or privately owned;
b) the factors of production (capital, labour, and land or resources) are considered to be separate commodities that can be bought and sold by private individuals or firms;
c) in particular, labour is a commodity that is paid for primarily by means of wages or salaries, and firms buy labour itself rather than its products. (It follows that labour should be mobile and hence people, as suppliers of labour, must be separable from their ties to land, kin and community). Employment is thus equated not with gainful activity as such, but the sale of labour by individuals to firms for a wage or salary;
d) in particular, land and resources are commodities that are bought and sold in the market, and are commonly the private property of individuals or firms;
e) there is commonly a separation between the conception and execution of tasks within the productive unit, i.e. of functions between managerial and technical personnel on the one hand, and manual and clerical personnel on the other;
f) there is a hierarchical organization of labour within the productive unit, with owners and/or managers having the predominant right to determine the objectives, organization, and techniques of production.

The above is an indicative rather than exhaustive list. However, it will be seen that industrialization as defined above applies to all of the basic economic institutions of non-native society - government, financial, and business, as well as to what is normally considered as "industry". It is in this sense that the oil and gas industry itself is only a representative part of the overall mode of economic organization.

Industrialization as a general process occurs independently of any particular oil and gas project or activity, and results in certain gradual changes in the harvesting system (in particular, with respect chiefly to the relations of production outlined in 3.2), detectable only as long-term trends rather than in direct response to particular activities. It is nonetheless important to recognize where and how these changes are occurring so as to enable valid interpretation of shorter run changes detected through a monitoring program.

2. Wage employment

The features of wage employment that affect harvesting include:

a) wage rates
b) duration of employment
c) conditions of employment
d) location of employment
e) hiring policies
f) training policies.

All employment, regardless of employer or industry, may be expected to have an impact on the harvesting system. Employment which is directly or indirectly created by the oil and gas industry is significant to the extent that it

a) differs from other types of employment in any or all of the

above respects, and

b) constitutes a major **change in the quantity of employment opportunities available to harvesters.**

The most significant short-run effects of employment upon harvesting are, on the one hand, to reduce the time available for harvesting, and on the other, to provide extra cash which enables the purchase of better harvesting equipment.

Wage rates, a measure of time and income, provide a key indication of purchasing power and hence the likelihood of wage employment actually contributing to harvesting success. By the same token, measures of harvesting costs are also required.

3. Project activity

Specific aspects of oil and gas development such as traffic, construction, seismic, and drilling that may physically affect harvesting when they occur, e.g. through damage to productive equipment and caches, vandalism, interference, and so on.

4. Access (for local native harvesters)

Physical installations or changes as a result of project or project related activities, which affect the harvester's access to resources, e.g. seismic lines which increase or redirect access to trapping areas (at least when relatively new); roads which increase or redirect access to hunting areas; and winter ship traffic creating open water lanes which cannot be crossed by terrestrial vehicles.

5. Competition

Increased numbers of non-local harvesters active in the area. This may occur through:

a) increased non-native settlement or native in-migration from other areas in response to project or project-related employment opportunities;

b) temporary presence of non-local harvesters, native or non-native, due to project employment, e.g. rotational or fly-in situations; and

c) increased road-connectedness which allows non-local harvesters (native and non-native) easier and uncontrolled entry for hunting and fishing.

6. Biophysical effects of industry

The effects of industrial activity on habitat or on fish and wildlife directly, resulting in changes in the abundance, distribution or quality of harvestable resources.

3.7 Specialization

Although the initial MEMP hypotheses make reference to specialization as a variable, we have dropped it from the list of key variables. Subsequent discussion at the Fort Good Hope workshop, and both MEMP sessions, indicates that while specialization may occur among units of production, it is neither a new, nor a permanent, phenomenon; and that total community harvesting effort is most likely not affected.

4. Indicators

In this section we will identify the indicators associated with each variable listed above; give a general idea of how each indicator can be ranked and/or measured; and recommend which indicators should be given priority in establishing monitoring programs.

Table #1 outlines the indicators linked to each variable, with suggestions on how each indicator can be monitored.

Table 1

Monitoring

Variable	Indicator	What	How
resource base	abundance, distribution, and quality	species population, productivity, location, toxicity/ edibility of flesh	biological and biochemical techniques, surveys, anecdotes
integrity and viability of social system	mutual aid and sharing	exchanges of productive factors, gear use rights, distribution and use of bush products	participant observation, survey, anecdote
effort	time, gear, skills, location	participation rates, gear census, land use, units of effort	survey, mapping
income and purchasing power	income, costs	income by source, amount, costs of harvesting	survey
harvests	catch, non-retrieval, disposition	animals taken, by species	survey, anecdote
employment	amount, duration location flexibility	participation rates by age, sex, skill, occupation; conditions of employment and work, training	survey, anecdote
competition	non-local harvesters, local harvesters	non-local effort, harvests, land use conflicts	survey, anecdote
industrial activity	project activities	land use conflicts, compensation claims	survey, anecdote
access	roads, seismic lines, barriers	land use, industry activity	survey, anecdote

4.2 Monitoring techniques

The monitoring techniques proposed fall into three basic categories:

1. Anecdotal

   Routine monitoring of public statements, media reports, reports by informed residents, observers, officials, etc. for unusual events. This is a simple and inexpensive way of alerting one's self to significant new events or trends, and of establishing on a preliminary basis, research priorities according to time, subject, and place.

2. Survey

   The use of unstructured interviews and questionnaires to ascertain social data on a census or sample basis. Confidence in the results is a function of

   a) local involvement in the design of the research program as a whole and the interview schedule in particular, and
   b) adherence to appropriate scientific procedures with respect to sampling and to the evaluation of response bias.

   The use of survey techniques is most appropriate where the data in question are easily quantified or ranked, and are not regarded by respondents as unduly intrusive. Many types of data that are amenable to collection by survey may also exist in usable form in government or private agencies, and should be examined prior to the administration of new surveys. However, where data do not conform to monitoring requirements, or cannot be made to do so through reinterpretation or reaggregation, new surveys will be necessary.

   Since the purposes of monitoring the impact of industrial activities on harvesting include project modification, impact mitigation, and compensation, accurate knowledge of the geographic distribution of impacts and effects is essential. Where data collection should include a mapping component, it is so indicated in Table 1.

3. Participant observation

Participant observation (i.e. observing productive activities and social interaction as an accepted participant) is the basic mode of anthropological investigation. It requires the establishment of familiarity and trust between the observer and the local community, often by means of the former residing in the latter for an extended period. Once the basis for participant observation has been established, actual research may include not only participant observation itself, but also extended informal interviews, and more formal questionnaires which may be serially repeated. The establishment of a trust relationship will normally have the advantage for questionnaire research of enabling the inclusion of a wider range of data, and a more reliable screening and evaluation response bias.

Because participant observation requires a high level of skill and training on the part of the observer, and because of the length of time it requires, data collection is necessarily selective. Whereas several communities at once can be covered by questionnaire, year after year (as in harvest surveys); participant observation normally occurs in only a fraction of the communities, and upon completion after a number of months (or occasionally, years), may not be repeated for a decade or a generation.

For reasons relating to both the internal requirements of bureaucracy, and the relationship between government and the communities, participant observation is rarely undertaken directly by government agencies with program responsibilities. Exceptions include, in Canada, the Social Research Division in DIAND, and the National Museum of Man, both of whose field research programs are now essentially defunct, and in Alaska, the Division of Subsistence in the Alaska Dept. Fish and Game. Even in these cases, the researchers themselves may be contractors or graduate students rather than public servants. Traditionally the most effective participant observation research has been done by independent university graduate students. While the reasons that government and

industry have rarely used participant observation as an impact research technique are obvious, the fact remains that impact assessment has suffered as a consequence. There are Scarcely any currently useful baseline data for the N.W.T. for the variables we have identified as requiring participant observation research, and none will be forthcoming withoutit.

Where such research is required as a matter of public policy, however, it is insufficient to rely on the random choices by graduate students of communities, times, and research themes. Given that participant observation cannot cover all communities, it is important that whatever research of this type is done in support of public policy objectives meet the following criteria:

a) the communities or phenomena to be observed be established as reasonably representative of a larger set of communities or phenomena;
b) the timing and duration of research be such that the results can reasonably be generalized to relevant time periods such as the entire annual harvesting cycle; and
c) the research design and procedures be subject to peer review so as to ensure sufficient conformity with established protocols and general acceptance of the results.

Above all, participant observation research must be acceptable to the local community and consistent with its own objectives. This requires the full involvement of the community in the design and implementation of the research program, and in the analysis and use of the results, through representation on the research staff and/or steering committee as may be appropriate.

In concluding this discussion of research and monitoring techniques, we believe that the chief reasons for the current low status of social impact assessments in the eyes of public policy makers and local residents alike include:

a) inadequate research design;
b) imprecise definition of research categories;
c) sloppy methods of data collection and analysis, and
d) insufficient baseline data with the result that descriptions of the current situation are vague and unsupported by data, and predictions are overly speculative and difficult to test.

4.3 Priorization of Indicators

Two essential criteria for establishing priorities for monitoring are:

a) the accuracy with which the phenomenon can be measured and its reliability as an indicator of any particular variable, and
b) the strength of that variable as a line in a causal chain of events.

For example, harvest statistics are a direct indicator for two of the variables listed. They also constitute an easily quantifiable and measurable set of data, given the right techniques and sufficient resources to implement a monitoring program. Thus, we recommend that collection of harvest data be given a high priority.

Based on the above considerations, a ranking by priority of indicators is proposed below:

Table 2

High Priority	Other
abundance, distribution, quality	mutual aid and sharing
- time, gear location	skills
- costs	- income
- catch	non-retrieval, disposition
amount of employment, duration, location, flexibility	
non-local harvesters	
- project activities	
roads, seismic lines, barriers	

These priorities are recommended on the basis of the two criteria noted above, which are essentially scientific criteria. However, the collection of some of these data may be considered sensitive matters by the individuals and communities that would provide them. Consequently the community involvement in the research recommended *in* 4.2 must come at the earliest possible stage, indeed ideally the research recommendations should be developed with them through a continuing dialogue such as that established by the MEMP program, or by them through their own community and regional institutions. Consequently our recommendations on research priorities should be taken as no more than a basis for discussion with the communities affected.

5. Conclusion/Recommendations

In order to be useful for assessing impacts of development on renewable resource harvesting, indicators must conform to certain criteria, i.e.:

1. They must realistically reflect harvesting as a social system;
2. They must be amenable to repetitive measurement;
3. They must be generated from, and causally related to, a given hypothesis;
4. They must be agreed upon by both researcher and harvester.

The authors have proposed a list of indicators generated from the hypotheses developed during the MEMP process. The proposed indicators conform to (1) - (3) above.

Negotiation and discussion with representative groups of harvesters will be required to satisfy (4).

Some of the proposed indicators are more easily measured and/or quantified than others. However, all can be measured to some degree, by use of survey, anecdotal or participant observation monitoring techniques.

The authors recommend that:

1. Research should be initiated to identify which of these indicators are already being monitored through existing processes, and to evaluate the technical suitability of these data for impact monitoring;

2. Monitoring programs should be developed for the indicators in the "high priority" list which are not already sufficiently addressed;

3. If the Department of Renewable Resources plans to proceed with implementation of new monitoring programs, then consultation should take place with groups who represent harvesters (e.g. native organizations, H.T.A. 's, Inuvialuit Game Council), to assess which indicators harvesters themselves believe are useful and should be monitored.

Appendix 1:

Original MEMP Hypotheses as structured after the Resource Harvesting Technical Meeting held in Yellowknife, June 5 - 7, 1985.

NOTE: The acronym ""MEMP" refers to the Mackenzie Environmental Monitoring Program. This project is an inter-departmental initiative whose goal is to identify Valued Ecosystem Components, to develop a model of impacts from hydrocarbon development, and to recommend environmental monitoring programs, for the area from Fort Norman to the Beaufort. The project was initiated in mid-1984 and a report is anticipated in early 1986.

Hypothesis 1

Effects of wage employment on time, equipment, and information.

1. **Non-local wage employment results in a decrease in the amount of time an individual spends** hunting/fishing in his home community's resource harvesting area.

2. Decreased amounts of time spent in harvesting there results in a **decrease in the volume of harvest by that individual and his household.**

   Assumptions:

   a) There is a scheduling conflict between time of availability of resources and time of working.

   b) The reduction in available search time, regardless of scheduling, is sufficient to affect harvest success.

   c) There is no (or insufficient) replacement labour for that individual in his household.

   d) Technology is held constant (cash is not used to purchase more efficient equipment).

3. Cash earned from wage employment is invested in customary fishing and hunting activities, specifically, more efficient equipment.

   Possibilities:

   a) Investment is in transport technology, reducing "dead" travel time (as opposed to effective search time), and haul time.

   b) Investment is in harvesting technology, increasing CPUE.

4. More efficient equipment results in savings in time per unit of harvest output.

5. Individuals/households are thus enabled to choose between increasing their volume of renewable resource production, or decreasing their volume of renewable resource production, or decreasing their time spent in renewable resource production.

   Possibilities:

   a) capitalization is positively associated with time spent in fishing and hunting, because it enables people to harvest more effectively.

b) Greater amounts of equipment held and used by a household result in greater harvests by that household, but not necessarily greater harvests by a community (see hypothesis 4).

c) For resources where demand usually exceeds supply, as CPUE increases, more resources will be harvested on an individual and a community level.

d) For commercial resources, as CPUE increases, more resources will be harvested on an individual and a community level.

Assumption: Producers are not target harvesting.

e) For resources where demand does not usually exceed supply, as CPUE increases, harvested resources will remain the same on a community level, and labour savings will be spent in alternative activities. Individuals or households may increase their harvests, but the community as a whole will not. This implies a specialization of functions (see hypothesis 4).

6. As time spent in non-local wage employment changes, access to resource information changes.

Possibilities:

a) Wage employment provides opportunities to increase information, through exchanges of information with other workers, and by observation during airplane travel.

b) Wage employment reduces opportunities to obtain information, due to time spent in activities other than harvesting, and to absence from the community which reduces access to information from other active harvesters.

7. Increased use of high-speed travel equipment reduces the opportunities for direct observation by the harvester.

8. Changes in the information available to harvesters affects their harvests.

NOTE : Information is an aspect of skills - see hypothesis 2.

NOTE: Non-local wage employment may lead to an expansion of harvest effort into new geographic areas, and harvests of new types of resources (see hypothesis 5 on access).

Hypothesis 2

Skills.

1. Changes in work group (harvesting group) composition may affect the transmission of harvesting skills between persons.

2. Reduction in harvesting skills of a person may decrease that person's CPUE.

3. Reduction in harvesting skills may result in greater loss of struck animals (lower retrieval rate).

4. A decline in retrieval rate leads to a decline in harvesting success. Reduction in harvesting success of a person may increase that person's participation in wage employment.

   Assumption:

   a) No compensatory steps are taken, such as increased capitalization, or the formation of hunting partnerships with skilled persons.

5. An increase in the number of animals that are struck but not retrieved may result in regulations requiring struck but lost animals to be included in total harvest quotas.

6. Regulations requiring that struck but lost animals be included in harvest quotas will reduce the overall harvest that reaches the community.

   NOTE: This hypothesis does not specify the cause of changes in work group composition. They may be due to the assumption by some members of wage employment in industry, or they may be due to other changes in occupational preference, or to changes in motivation, more associated with development in general than the oil and gas industry in particular.

Hypothesis 3

Effects of capitalization.

1. Increased wage employment leads to increased capital investment in harvesting.

2. Increased capital investment may lead to rising indebtedness.

3. Assuming that net cash returns per unit of time expended are greater in wage employment than from harvesting, rising indebtedness may in turn require increasing attention to wage employment.

4. As a result of 2 and 3, the time balance (on either an individual or household basis) may become sufficiently adverse that significant levels (or certain types) of harvesting are no longer possible.

5. Increased capital investment may lead to rising cost per unit of output relative to price (whether expressed as cash or imputed value). Due to biological limits on output, the increased application of capital cannot result indefinitely in increased output.

6. Increased debt and increased production costs lead to greater risk.

7. Higher risks will lead to the loss of productive factors and result in fewer households engaged in resource harvesting.

8. Individual</households reduce capitalization (substitute labour for capital) so as to reduce risk, and maintain means of entry into harvesting.

9. A reduction in capitalization may reduce efficiency and possibly the overall harvest taken by the household (see hypothesis 1; links 4 and 5).

10. There will be a decline in the number of productive units within the community.

11. Depending on the degree of specialization that occurs, there are two possible outcomes:

    a) There is no specialization in the community, the volume of production of each unit (household) remains the same, and the total volume of production in each community declines;

    b) There is specialization, the volume of production of each unit (household) is distributed amongst a wider network, and the total volume of production in each community remains the same (see hypothesis 4).

12. Depending on the form of capital investment, there may be a **change in the mix of species harvested.**

Possibilities:

a) The nature of the technology is such that in order to maximize the return to capital, harvesters concentrate on fewer target species (e.g., where biomass is concentrated in time and/or space).

b) The nature of the technology serves to enlarge the community's harvest area and hence make accessible species not previously harvested (more likely to occur with marine species than terrestrial species).

NOTE : This hypothesis considers only private investment at the level of the individual production unit. Further consideration is required with respect to public investment in harvesting, whether in the form of assistance programs to harvesters or to capital investments in outpost camps, etc. At what point is community wealth seen to be high enough that these funds are reduced or withdrawn?

Hypothesis 4

Patterns of sharing and redistribution.

1. Long term wage employment of a part of a community's labour force will result in a division of labour (i.e., labour will be differentiated into harvesting labour and wage labour).

   Possibilities:

   a) Division will occur within households. so that individuals specialize in their contribution to total household-income (cash and/or imputed).

   b) Division will occur between households (production units) so that some households will be responsible for producing food for distribution to others.

2. The division of labour (especially between households) will result in rising variation in household harvest levels.

3. Variations in household harvest levels will change distribution patterns.

   Possibilities:

   a) "Labouring" households will introduce cash, purchased consumer goods, and capital goods into local circulation.

   b) "Harvesting" households will increase distribution of harvested resources.

   c) Specific resources will acquire commercial significance within the community's economy.

If harvesting regulations are not adjusted to this new situation, the production of the specialized harvesting households could be artificially limited and therefore total community harvest would decreased.

NOTE : This hypothesis requires further elaboration with respect to the individualization of income and its effects on the mutual obligations and internal strategies of households as production units.

Hypothesis 5

Effects of changes in availability and quality of resources of harvest.

1. Oil and gas development may lead to a decreased local availability of certain species because of decreases in the size, local distribution or individual behaviour of harvested species.

2. Development can result in changes in access to renewable resources - either increasing it through the provision of roads, cutlines, etc., or decreasing it.

3. Improvements in access can increase the availability of a resource while the population remains the same. The converse can also be true.

4. Changes in availability of resources can have varying effects on effort, depending on the demand for the resource and the degree to which the take is incidental .

5. Effort and harvest are linked with changes in availability such that increased availability can result in slightly increased effort and greatly increased harvest for a high demand species (such as moose or caribou). Effort may remain the same and harvest increase; or effort may decrease while harvest remains the same.

6. Changes in harvest over time will affect access, population size and availability of resources. There may be a decrease, an increase, or no change depending on the circumstances. The actual effect seems to depend on the relationship between the supply of and the demand for a species, and the extent to which harvest is incidental.

7. Industrial activities can affect the quality of harvested resources. Examples of harvesters' perceptions of low quality include ungulates with bucillosis, high parasite loads or in poor condition, or damaged fish.

a. Reduced quality will result in lowered effort and harvest if animals are 100% affected. Assuming that some animals are usable, harvest of a high demand species may increase to provide the necessary quantity, for example, of food. Quality of resource-harvest effort will increase if the resource has not been uniformly tainted. If only some animals are, then a greater proportion of the harvest is culled, and a higher total harvest is required to get the same usable harvest. If the species is taken or used incidentally, there may be no effect.

NOTE : In this case, harvest is being defined as the number taken, not the number used.

9. If local availability is recognized to have decreased, effort will eventually also decrease or be removed to another location.

Hypothesis 6

Conflicts between industry and harvesters.

1. Industrial activities in harvesting areas often result in conflict between industry and harvesters.

   Direct conflicts between industry and harvesters will generally revolve around interference with harvesting activities themselves by disturbing concentrations of animals or interfering with the hunt (e.g., white whales), or specific use of certain geographic locations. Permanent installations of industry inevitably alienate some amount of land thatis within the land use area of a given community. Either actual damage or perceptions of damage can affect activities of harvesters.

2. If conflicts are such that hunters and trappers have to travel further, then increased effort may be the result (expressed here as increased travel time).

3. Where conflicts arise over the timing or extent of industry's activities in relation to a specific hunt (e.g., white whales), industry may be able to accommodate the needs of the harvesters or may be able to respond positively to desires of harvesters for increasedaccess.

4. In the event of an extensive conflict over specific resource harvesting areas which cannot be resolved, the affected harvesters may be forced to move elsewhere.

5. They may move into other's harvesting areas bringing them into conflict and competition with harvesters who are already there.

6. The influence of most of those conflicts on the area harvest will be to decrease it. However, specific assistance from industry may also result in increases. To the extent that harvesters remain in the general area, and continue to use land-based resources at the same rate, area or resource population-based harvests will not change.

7. Compensation was brought up as some form of payment from industry to harvesters as a group or as individuals. Compensation may be applied at three stages inthis process but will only influence the results if it causes harvesters to leave resource-based activities.

Hypothesis 7

Effects of in-migration.

1. Development will result in in-migration.
2. New population will result in increased competition for resources.
3. Increased competition will result in decreased resource abundance (or availability in any one place).
4. Decreases in resource availability will lead to reduced native harvest.

   Decreased resource available may also lead to relocation of harvesting activities.
5. Increased competition may lead to harvest regulation.
6. Decreased resource availability will lead to harvest regulation.
7. Regulation of harvest will reduce native harvest.

Appendix 2:

Results of Harvesters' Workshop

To Evaluate the MEMP Hypotheses

Fort Good Hope, N.W.T.
October 8, 1985

Seven people took part in the discussion - three women and four men, ranging in age from early 20s to mid-40s. All have extensive harvesting/processing experience and also varying levels of involvement in wage employment. The men have all worked for the oil and gas industry sometime in the last 15 years.

The discussion provided some valuable insights into the hypotheses; and although no new hypotheses were generated, some clarification to the existing set resulted.

Participants were asked to base their remarks on their knowledge of the community as a whole, not simply their own experience. However, remarks are only directly applicable to one community and should be evaluated in that context. Also, the insights provided are of course entirely subjective and not intended to be derived from "scientific method".

NOTE : Comments are referenced to the MEMP hypotheses.

List of participants:

George Barnaby
Dora Grandjambe
George Grandjambe
Phoebe McNeely
Ronald Pierrot
Bells T'Seleie
Kenny Tureau

Hypothesis 1:

Effects of wage employment on time, equipment and information:

There was strong agreement that people involved in wage employment do not lose interest in land-based activities, but re-schedule those activities, or adapt their schedules to accommodate them.

1.2 Time

People with employment do spend less time harvesting. The activity that is dropped first is trapping, which is seen as a less reliable employment option than wage employment. On a year-round basis, however, it was felt that most wage earners continue to hunt for specific species, and that harvest levels do not decrease significantly. Decreased effort is perceived to be balanced off by the use of better equipment purchased with wages.

3. Equipment

(a)/(b) Investment may be in both transport technology (including gas) or harvest technology (guns, shells).

4. "More efficient equipment results in savings in time per unit of harvest output", is definitely considered to be true.

5. a, b, and c - agreed to be fairly accurate.
d - no comment
e - implicitly accurate although no specific comment.

NOTE : A question was raised on effects of processors' involvement in wage employment. It was felt that this might affect the species and quantities harvested, i.e. availability of processors' effort. Generally it was felt that processors' role must be considered in any discussion of harvesting.

6. Information

Strongly recommended that most information comes from other harvesters in the community. An individual who has been working out of town is at a disadvantage but can catch up quickly. Significance of information obtained by observation while traveling was felt to be nil - and isolated incidents where moose, etc. might be observed from aircraft probably balanced off by passengers sleeping, etc.

A general point regarding information was raised - that availability or scarcity of information must be considered in the context of the whole body of knowledge that harvesters already have regarding animal behaviour, likely harvesting areas at different times of year, etc. In other words, the idea of a harvester relying on information gained while traveling struck the group as somewhat ludicrous.

Therefore: (a) rejected
(b) true but not significant.

7. Rejected because equipment is geared to harvest, not vice-versa.

8. Not considered to be accurate for reasons outlined above.

Hypothesis 2

1. Changes in transmission of skills was not seen to be a direct result of involvement by any age group in wage employment. In this community, it was felt that involvement in wage labour is not preventing young men from developing harvesting skills. Most young men prefer wage employment but continue their harvesting. It was also felt that most have trapping skills to fall back on as an option. However, there was also general agreement that there is a loss of bush skills among young women, although it is not related to wage labour occupation by older women.

   There was some recognition among the group that trends upon which this hypothesis is based may develop in this region over the coming years.

2. No specific comment.

3. This element of the hypothesis was considered to be inaccurate and based on a lack of understanding of Dene hunting methods and resource management principles. Struck animals are rarely left but are tracked until they can be killed - or until the hunter is fairly sure that the injury was insignificant. The recommendation was that this portion of the hypothesis be struck.

4. This might be true in the case of an individual who was attempting to make a living by trapping, although it was felt that factors other than skill would most likely be the determining factor. In fact, assumption (a) was refuted; it was suggested that we assume that partnerships with skilled persons would be formed.

5. Not considered relevant, at least for this region (may apply to marine mammals) .

6. (As above)

Hypothesis 3

Effects of capitalization.

1-8 The trend outlined here was agreed to be valid. However, while there was general agreement that people do get caught up in the "debt-credit" cycle, it was felt that for most it is a temporary phenomenon - i.e. an individual may stay in town this year to earn money to pay off his bills but it will not keep him from harvesting; or from choosing the bush over wage employment another season.

Thus (8) was seen as the most likely result while (10) was rejected.

Also, harvesters noted the assumption of being caught in a debt-credit cycle was based on southern perceptions, where the magnitude of debt (mortgage, new cars) is greater than is generally true in northern communities.

12.(a) Not felt to be significant.

12.(b) Harvesters rejected this notion because, they said, equipment is geared to harvesting needs, not vice-versa. People do not harvest in a larger area now than they traditionally have used - and they pointed out that, e.g. 10 years ago when there was no caribou closer than Colville Lake, all harvesters travelled there regardless of quality of equipment. Methods may have changed, but not the species harvested or, to any great extent, numbers taken.

Hypothesis 4

Patterns of sharing.

General Comments: There was strong resistance to the concept of "commercialization" of bush products, at least among Dene people. It was felt that patterns of sharing have not changed. All agreed that some bush" products are commonly exchanged within the community for money - notably wood, beaverskins, and moosehide - but this is seen as an extension of the barter economy.

1-3 were in fact seen as occurring, but the concept of "commercialization" was rejected. Instead, specialization is viewed as an adaptation of the informal economy.

Meat is only sold for money to institutions (hostel, hotel) although some people give meat and fish to these institutions because they are part of the community. While all insisted that commercialization was not becoming a factor in the community, however, they pointed out they would not hesitate to sell meat to a white person from out of town.

Re: Harvesting Regulations

The hotel manager (present as a processor) did point out that the GNWT requirement for individuals to have commercial licenses before selling meat was ludicrous and does not reflect how people operate. General agreement that this should be noted as a problem - that there should be no regulations on how people choose to distribute meat within the community.

Hypothesis 5

Access to resources (availability and quality of harvest).

1. Yes - decreased availability especially seen around seismic activity.

2. True - both increase (e.g. cutlines) and decrease (eg. ice roads on lake providing barriers).

3. Yes.

4-6 Points noted:

(a) Although access is easier, this doesn't lead to overharvesting, because of recognition of natural resource management principles by harvesters.

(b) Improved access doesn't mean that harvesters couldn't get there before !

(c) Often increased access and decreased availability do go hand in hand and cancel each other out.

7. True.

8. Most likely that effort will drop off until problem resolves itself - as with loche over last few years. Not just because of effort required but again because of natural resource management principles. It has been done in the past.

Hypothesis 6

Conflicts.

1. Yes - e.g. running over traps, blowing up fish lakes, burial grounds.

2. Yes.

3. No comment.

4. Yes - relocation preferable to straight compensation.

5. Yes - or not areas defined as someone else's but simply too many harvesters in one area.

6-7 Necessary to keep control of quality harvest land.

Hypothesis 7

Effects of in-migration.

1-2 Yes - perceived as real problem.

3-4 Most likely possibility seen as increased relocation of native harvesting activities.

5-7 Better possibility - keep them from harvesting.

More competition for scarce resources may lead to decrease in availability - not just because of harvesting impacts directly but because old people say it will drive the animals away - e.g. moose will migrate back to the mountains.

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