CHAPTER 12

INDIGENOUS KNOWLEDGE, COMMUNITY PARTICIPATION AND TRADITIONAL LAND-USE MAPPING

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Maps have had a longstanding influence upon virtually all levels of social work knowledge. As numerous scholars point out, maps of social networks can significantly clarify the nature and scope of a client's social support (Harold, Mercie, & Colarosis, 1997; Tracy, 1993; Hartman, 1978). Genograms, likewise, have been used extensively for assessing family structures, and have thereby enriched family treatment methods (Ingersoll & Arndt, 1990; Davis, Geikie & Shamaess, 1988). Spatial maps of specific geographies can assess degrees of functional integration within specific client groups (Pearce, 1996). Particular models of neighbourhood maps have also been developed for community practice in urban settings. And social workers who have recently moved to a rural, northern, and/or remote community may map out community networks, in order to discern patterns of institutional and personal relationships that bear upon the worker's agency, and hence the worker's function (Brownlee, Graham & Dimond, 1997).

But to date, little consideration has been given to how mapping skills may further enhance ethnically sensitive community practice in rural, remote, or northern contexts. To this end, the present chapter, which is necessarily exploratory, considers traditional land use mapping as an effective tool in community work with Aboriginal peoples. Drawing from a growing interdisciplinary literature, the chapter considers, firstly, several concepts of indigenous knowledge and their relation to land use mapping. Second, it examines principles of community participation that may be fruitfully applied to land use mapping. Third, case study examples, from northern Canada and northern Russia, shed insight into significant land use mapping applications. A concluding section considers prospects for further community work and research.

Most importantly, the chapter advocates a methodology that is inclusive, empowering, and collaborative (Barter, 1996). Indigenous peoples have been subjected to centuries of colonial oppression. Maps, along with other Western epistemologies, have been shameful instruments of destruction. Traditional land use mapping, in contrast, weds indigenous knowledge to land use mapping processes, rendering the latter a potential instrument of liberation. We emphasize its potential state. As the following pages stress, traditional land use mapping can be a culturally appropriate tool only if its implementation follows certain principles. These include, but are not limited to, all interactions needing

to be framed in the context of differential power relations, community empowerment, meaningful participation, and collaborative and equal co-facilitation at all stages of intervention, from conceptualization to termination. Moreover, since the provenance of any traditional land use map is Aboriginal knowledge, the map's copyright and ownership have to rest with the Aboriginal community, to be used as community members see fit. To do otherwise, we contend, is unethical.

What is Indigenous Knowledge?

What is indigenous knowledge and how has it been defined? Various terms have been used for indigenous knowledge, it has been called people's science, folk-ecology, rural people's knowledge, ethnoecology, ethnohistory, ethnobiology, ethnobotany, ethnoscience, local knowledge, traditional environmental knowledge, traditional ecological knowledge, simply traditional knowledge, indigenous ecological knowledge and even indigenous technical knowledge (Cruikshank, 1998; Sillitoe, 1998; Stevenson, 1996; Agrawa, 1995; Johnson, 1992; Chambers, 1991). This list is by no means exhaustive but it serves to make the point that there is a diversity of terms for indigenous knowledge. It also demonstrates that the notion of indigenous knowledge is being examined from the perspective of various academic disciplines and has qualities that require an interdisciplinary outlook. Furthermore, the variety of terms suggests that the state of scholarship on this subject is still undergoing transformation. Noted below is a selection of descriptions of indigenous knowledge from northern, Aboriginal, academic and international sources.

Descriptions of Indigenous Knowledge

The World Commission on Environment and Development in its 1987 report entitled Our Common Future made a case for the use of indigenous knowledge as a means of empowering vulnerable groups in response to uncontrolled natural resource exploitation and organized development.

> These communities are the repositories of vast accumulations of traditional knowledge and experience that links humanity with its ancient origins. Their disappearance is a loss for the larger society, which could learn a great deal from their traditional skills in sustainably managing very complex ecological systems. It is a terrible irony that as formal development reaches more deeply into rain forests, deserts, and other isolated environments, it tends to destroy the only cultures that have proved able to thrive in these

environments (World Commission on Environment and Development, 1987: 114-115).

Robert Chambers, a development practitioner and researcher suggests his own term for indigenous knowledge calling it "rural people's knowledge."

> The 'rural' includes those farmers, both small and large, who are thoroughly in the market, purchasing inputs and selling cash crops, as well as groups like the San of the Kalahari or the Hanunóo swidden cultivators of the Philippines who have been much more autonomous. The 'people's' part of the term emphasises that much of the knowledge is located in people and only rarely written down. 'Knowledge' refers to the whole system of knowledge, including concepts, beliefs and perceptions, the stock of knowledge, and the process whereby it is acquired, augmented, stored, and transmitted (Chambers, 1991: 83).

The Report of the Traditional Knowledge Working Group produced by the Government of the Northwest Territories uses another term: traditional knowledge.

> Traditional knowledge is knowledge that derives from, or is rooted in the traditional way of life of aboriginal people. Traditional knowledge is the accumulated knowledge and understanding of the human place in relation to the universe. This encompasses spiritual relationships, relationships with the natural environment and use of natural resources, relationships between people, and is reflected in language, social organization, values, institutions and laws (Legat, 1991: 12).

An explanation offered by Martha Johnson in a publication of the Dene Cultural Institute continues to use the words 'traditional' and 'knowledge' but adds to the terminology with the adjective 'environmental' qualifying knowledge.

> Traditional environmental knowledge, or TEK, can generally be defined as a body of knowledge built up by a group of people through generations of living in close contact with nature. It includes a system of classification, a set of empirical observations about the local environment, and a system of self-management that governs resource use.

The quantity and quality of traditional environmental knowledge varies among community members, depending upon gender, age, social status, intellectual capability and profession (hunter, spiritual leader, healer etc.). With its roots firmly in the past, traditional environmental knowledge is both cumulative and dynamic, building upon experience of earlier generations and adapting to the new technological and socioeconomic changes of the present (Johnson, 1992: 4).

Fikret Berkes, a Canadian scholar who has pioneered considerable research on the subject, uses yet another adjective qualifying the word knowledge: traditional ecological knowledge.

Traditional ecological knowledge (TEK) is 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 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).

A group committed to the use of indigenous knowledge for use in international development describes it in yet another manner.

Indigenous knowledge—the local knowledge that is unique to a given culture or society—contrasts with the international knowledge system which is generated through the global network of universities and research institutes. Indigenous knowledge is important as it forms the information base for a society which facilitates communication and decision-making. By taking the time and effort to document these systems, they become accessible to change agents and client groups (Warren, Slikkerveer and Brokensha, 1995: xv).

At first glance these definitions seem to obscure rather than enlighten us as to the meaning of indigenous knowledge. The diversity of terms for indigenous knowledge is sufficiently confounding. Arguably, we learn, at least, as much about the motivations of those describing indigenous knowledge as we do about the concept itself. For instance, references to indigenous

knowledge and natural resource utilization, its potential applications to other regions of the world, and its use by change agents and client groups illustrate the current rhetoric of the market system and application of liberal philosophical ideals on a global scale. In other words, we see from the explanations of indigenous knowledge as much of the ideology and world view of the author of the description as we do about indigenous knowledge. Nonetheless, when viewed collectively these descriptions reveal certain nuances and bring to light certain attributes of indigenous knowledge.

Attributes of Indigenous Knowledge

First, indigenous knowledge is context specific, related to, and contained within, a group of people who live in a defined geographic region. Second, it informs, and is formed by, the cosmology or world view of this group of people. In this sense, it is intimately linked to their spiritual and ethical fabric which manifests itself in practical day to day expressions. Third, it is cumulative, based on the sacredness of the past or tradition. It compels the holders of indigenous knowledge not only to be conscious of the wisdom of their generation but also of the generations that preceded them. This does not mean that tradition is fixed in a particular time or age. In fact, it is dynamic and adaptive. The holders of the knowledge do not only have the perception of the pastness of the past but its presence. New ideas and approaches are quickly adopted if they are seen to benefit the people. Fourth, as a result, neither the knowledge nor its holders are homogenous. Indigenous knowledge, like many knowledge systems, has sufficient complexity that it does not lend itself to terse and easy characterizations. This is the reason why one can only speak of certain attributes of indigenous knowledge rather than providing comprehensive definitions. The degree to which an individual within a group may hold this knowledge varies with age, gender, social class and even interest in the subject. Fifth, indigenous knowledge arises from a closeness to the land and the relationships with living things. In this sense, it grows out of a connection to the natural surroundings. It is obtained by the labour of living and experiencing the context, and not through book-learning. Finally, those who have studied the concept of indigenous knowledge, describe it primarily within the context of Aboriginal cultures with an oral tradition. However, this knowledge is and has been present within non-Aboriginal cultures as well.

How Should Indigenous Knowledge Be Collected?

Ideals, Motivations and Responsibilities

Interest in documenting or mapping indigenous knowledge is utilitarian in

that it is seen as: (1) providing solutions to an environmental crisis propelled by an industrial civilization; (2) another empirical guide to sustainable development planning; (3) a means of exerting Aboriginal control over resources or asserting a land claim; and, (4), a means of transferring aspects of this knowledge to younger generations using the tools of the secular education system and making it available to local schools. These motivations should not be construed as deceptive as long as in the process of mapping and documentation all involved admit to their objectives; acknowledge that by codification and compartmentalization, the knowledge may lose the very context that makes it indigenous and thus drain it of its potency; and, have the complete consent and participation of the community from which this knowledge originates. If in the process of mapping and documentation professionals and practitioners do not recognize the implications of their actions and responsibilities to the communities that hold indigenous knowledge, their work is tantamount to vulgar appropriation and oppression of a living culture. Such an approach, additionally, will hinder the long-term capacity of researchers and development practitioners to learn from indigenous cultures about their knowledge. Ultimately, indigenous communities are best suited to guide the research and documentation of their own knowledge while maintaining control over its application and use.

Often communities which hold indigenous knowledge are the same groups that are vulnerable to intensive resource exploitation, the organized machinery of development, and appropriation of their traditional lands by the state. In an overwhelming number of cases, they are involved in a life and death struggle for cultural and economic survival. In such an environment, the mapping or documentation of indigenous knowledge must take into consideration power relationships (Agrawal, 1995; Cruikshank 1998). Issues such as who collects the indigenous knowledge, how the research is undertaken and who maintains ownership of research results are fundamental. These are important ethical considerations for research professionals (students, academics, and practitioners alike) as the product of their research will affect the communities in which they work. Participatory research is not a neutral technical exercise. Its methodology is value-laden like all research methodologies. It is a normative process that is intrinsically linked to the needs of the community and democratic ideals (Kassam, 1997: 194; Sillitoe, 1998: 231-233).

Community members might not participate in a research exercise unless they perceive certain benefits to their lives. Elders might participate in the mapping of indigenous knowledge in order to transfer this knowledge to younger generations. Aboriginal leaders might wish to map indigenous land-use patterns to exert community ownership of their traditional lands or to influence the process of resource development within their region (Robinson & Kassam, 1998).

Participatory research is also affected by the manner in which the

professional chooses to engage the community members in a dialogue. In participatory research, the community is not the object of study but, in fact, the subject and author(s). The paradigm of the expert is turned on its head. First, there is a reversal of roles. The researcher is learning from the community by living with them and gaining insight from their knowledge. Second, the researcher facilitates the process of documentation and mapping, thereby empowering people to actively take the reigns of their own research (Chambers, 1997). The ideal of empowerment does not dilute the research process and can be effectively achieved through community participation. The tone of the descriptions of indigenous knowledge noted above, irrespective of the authors' specific perspectives, shares the common aim of empowering communities and not to weaken them. Third, professionals should reflect critically on their own values and actions. The spectrum of motivations of professionals using the language of participation may range from a fanatical zeal to bring about social change, paternalism masquerading as democratic ideals, a curiosity to discover something new, to a healthy sense of self-doubt coupled with a genuine desire to assist through learning and listening.

Community Participation

Stating the significance of community participation may seem redundant, after all, it is community members who hold indigenous knowledge and without their participation it cannot be documented or mapped. However, community participation in this case is something more than just informed consent. Meaningful community participation in gathering indigenous knowledge is the involvement of the community in the planning for, undertaking of, and utilization of, research results. In this sense community participation is an active process in which community members are involved in influencing the direction as well as the execution of the research at all stages. The aim of the process is not simply the generation of a research product but also integrating at all times the aspirations and priorities of the community (Paul, 1987: 2).

There are certain obvious benefits to community participation as a methodology for research on indigenous knowledge. First, it enables the process of sharing information. Second, it facilitates effective utilization of local resources because it involves the community in: identifying research participants, setting research priorities, seeking out qualified trainees to undertake interviews and document information, and the overall coordination of the research process in the field. Third, it ensures that short-term benefits from the research project, such as salaries for the community trainees or the long-term benefits such as application of research results accrue to the community. Fourth, it builds capacity within the community at the institutional level through increased control over decision-making and at the individual level through skills training. Finally, it leads to empowerment by placing

control of knowledge and experience securely in the hands of those who are most vulnerable to exploitation (Chambers, 1997; Bamberger, 1988; Paul, 1987). Meaningful community participation, at its core, is strategically seeking to affect power relations in favour of the community that holds the indigenous knowledge.

It is important to note that communities are not a monolithic block of individuals. As the degree of indigenous knowledge varies in quality and quantity amongst community members, similarly social relations within the community manifest a diversity of interests. A community is made up of heterogenous interests which are affected by social class structure, gender, age and ethnicity. Communities are not homogenous. The success of the participatory process is dependent on the ability of researchers to appreciate these nuances.

The language of community participation by outside agencies can be used to expedite the consent of indigenous groups without any real commitment to building capacity or facilitating empowerment within the community. In the current climate of limited budgets, the temptation to get things done using the rhetoric of community participation may be strong for students and practitioners alike. It is conceivable that research teams at universities or other organizations are desirous of the benefits of community participation as a means of accessing information from community members and utilization of community infrastructure as an efficient way to streamline the research process. However, ethical considerations on ownership of data and the economic burden borne by a community with limited resources should be key considerations in the research process.

Furthermore, participation is not synonymous with free services. It should not be assumed that community members have limitless time and energy to devote to a research project. In many small communities, especially where poverty is widespread, members have limited resources. The time and energy of community members may be solely devoted to earning a livelihood which is just sufficient to survive. Activities such as coordination of the research project and participation in research interviews are all time consuming (Durst, 1994). It is reasonable and legitimate for community trainees to receive a stipend for their contribution and as a compensation for taking the time away from their regular work. It reasonable also to provide compensation or support for child-care for participants with children.

Participatory Mapping

A visual mapping technique combined with interviews or discussions in participatory research has significant benefits (see Figure 1). First, participatory mapping is a group activity. Second, it takes attention away from an individual's gender, ethnicity or social class and places it on the issue or

topic at hand. The participant is not judged, instead what has been placed on the map is considered for relevance and value. Participants focus on common interests. Third, it removes control from the outsider and places it within the community that holds the indigenous knowledge. The researcher acts like a catalyst to begin the process and then steps back to let the community participate. Fourth, it enables the marginalised (possibly women, children, Elders or the handicapped) to participate without having to speak up in a public forum. Fifth, there is room for a diversity of views and overlapping of ideas as different aspects of indigenous knowledge are brought to light. Sixth, it enables validation and cross-checking of information. Seventh, the maps are portable and may be taken to various locations in a community for discussion in small groups or to community members who are unable to leave their homes for medical or other cultural reasons and returned with detailed and specific information (Robinson & Kassam, 1998; Chambers, 1997; Wratten, 1994; Gibson et al., 1993).

For instance, the traditional land-use maps of the Russian Sami, an indigenous community living on the Kola Peninsula whose traditional activity is reindeer herding, contained sacred and historical places associated with narratives related to Sami spirituality. An elementary school teacher, who participated as a community researcher, took the maps to her school where she related stories associated with various lakes and sacred places. In addition to the maps being a great teaching tool, they were duplicated by the children and taken home. The next day the children returned with more historical and ethnographic information about the areas than had been discussed in class after talking about it at home with their parents and grandparents (personal communication, Nadezhda Zolotukhina, July 7, 1997).

While the mapping of indigenous knowledge is not a new concept (Brody, 1981, 1976; Freeman, 1979; Brice-Bennett, 1977; Freeman Research, 1976), participatory mapping methods have come together in the 1990s and spread to different developmental contexts (Chambers,1997). Communities contain a vast amount of wisdom and with their guidance and participation this knowledge can be mapped. One form of mapping this indigenous knowledge is traditional land-use mapping. These maps, in turn, have the potential to affect environmental and social policy decisions. The result is that communities have greater control and capacity to influence their own well-being.

Figure 1: Participatory Mapping Process
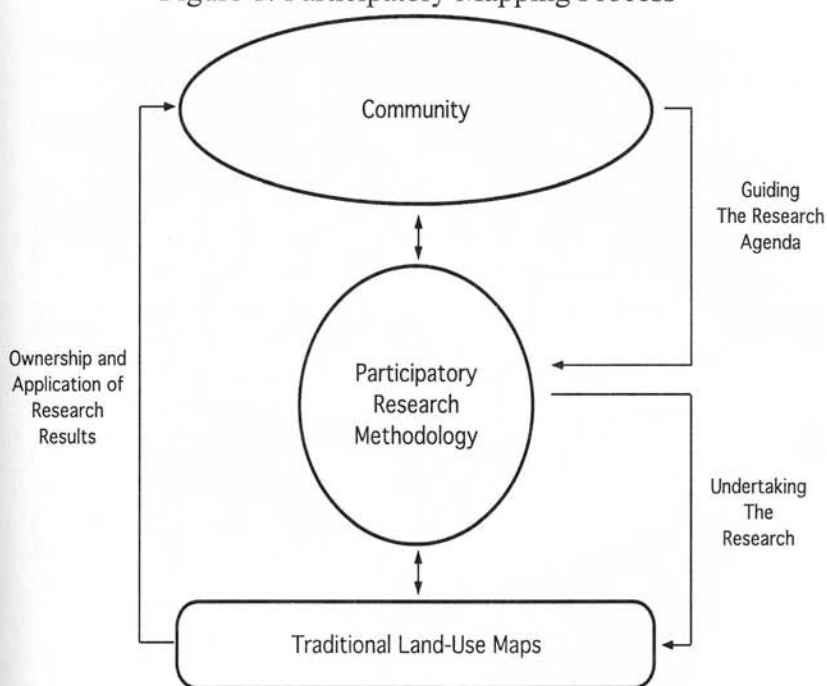
Traditional Land-Use Mapping

What is Traditional Land-Use Mapping?

The map is a Cartesian representation of the land. In other words, it is a two dimensional representation of a geographic region with (x) and (y) co-ordinates[1]. In schools we have been taught to perceive vast pieces of land in this format. Maps are an essential tool in many planning activities related to construction; industrial or resource development; tourism; location of hospitals, schools or other important social infrastructure. The maps that we produce are a reflection of our own ideological or cultural perception of the world.

One of the most effective ways to explain the concept of indigenous knowledge is to use cultural or traditional land-use maps. These maps may illustrate different values indigenous people may associate with the same piece of land than we normally would. For instance, many southern Canadians consider territories in Northern Canada as a hinterland available for lucrative resource exploitation or eco-tourism. However, to people who live in these regions it is a homeland (Berger, 1977). Below are a series of maps of a region

Map 1

in Northern Canada. These maps are hypothetical but serve as good examples of traditional land-use maps. The region that is mapped is at the confluence of the Mackenzie River and the Beaufort Sea. The first map is typical and the landscape looks vast and empty (Map 1).

Historically, we come to view a piece of land in this manner. However, after having talked to trappers and elders in the community living within the region we get a different conception of the same piece of land. We see the various fur-bearers (such as the wolf, arctic fox, black bear, wolverine, lynx and marten) and ungulates (such as caribou and moose) that the community harvests as a part of their livelihood (see Map 2).

Map 2

When fish camps, spiritual, historical and grave sites, and cabins, are added our conception of the land changes yet again (see Map 3).

When trees, medicinal plants, and berries which are widely used by the community are added the delicate relationship between the community and other living creatures with whom it shares the land becomes even more complex (see Map 4).

Map 3

Map 4
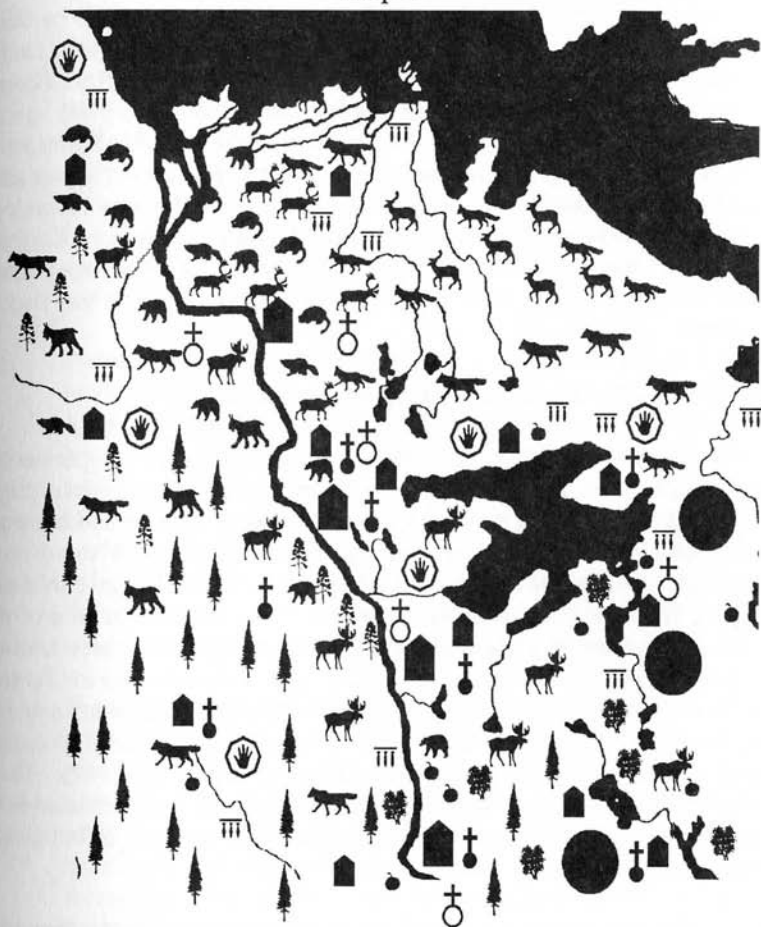
These maps do not have the traplines or location of bird, fish or marine mammal species harvested by the communities as the hypothetical map would become even more busy. Effectively what we have done in these maps is taken one aspect of the indigenous knowledge held by community members such as hunters, trappers, fishers and elders in the region and mapped it in a manner that is meaningful in our cultural and intellectual paradigm (i.e in a Cartesian format).

Consider these maps in the context of making land-use decisions such as construction of a pipe-line to ship oil and gas to southern markets, building of a new highway, or mining of precious minerals. Communities would be greatly empowered to influence public debate with this knowledge presented in a manner in which the average citizen can understand the value and meaning

associated with a region people call a homeland.

Traditional land-use maps describe how indigenous people within a specific geographic region rely on the land. The maps may contain ethnographic, historical and current information on land-use patterns. The map may contain specific knowledge on hunting, fishing, herding, plant species, trapping, forestry practices, migration patterns of wildlife, sacred-sites which are important to indigenous communities but is not restricted to any or all of these details. Traditional land-use maps reflect the distinctive cosmology, albeit in a limited manner, of a people living in a particular region (Robinson & Kassam, 1998; Dene Tha', 1997; Gwich'in Renewable Resources Board, 1997; Robinson & Ross, 1997; Fort McKay First Nations, 1994; Robinson et al., 1994).

How is Traditional Land-Use Mapping Undertaken?

The steps to participatory cultural land-use mapping are partnership formation, networking and linkages, a community advisory committee, project design, training, mapping and interviews, validation, final map and document production, presentation of research results, and follow-up. A step-by-step description of 'how to do land-use mapping' is found in the publication *Mapping How We Use Our Land* (Robinson et al., 1994). The aim of this section is to summarize these steps from the experience of three land-use mapping studies since the publication of this work. These are *There is Survival Out There* (Fort McKay First Nations, 1994), *Dene Tha' Traditional Land-Use and Occupancy Study* (The Dene Tha' Nation, 1997) and *Sami Potatoes: Living with Reindeer and Perestroika* (Robinson & Kassam, 1998). These studies were carried out by the Arctic Institute of North America based at the University of Calgary in partnership with the respective indigenous communities.

(1)   **Probe, scrutinize and reflect** is a stage that precedes the formation of the partnership between the community and research organization. It is a stage in which each partner critically examines the other's commitment and ability to undertake the participatory research process. For instance, the community may consider the willingness of the research partner to take into account the priorities of the community. Are the motives of the research organization self-serving? Will the researchers act like "guerillas" undertaking research and then depart as soon as they have got the basis for yet another publication or conference presentation? Will the organization disrupt the delicate balance between heterogenous community interests? Will the researchers be able to appreciate the cultural subtleties of the community? The research organization will also be

assessing the willingness of the community to undertake participatory research. It may examine the relevance of critical social concerns in the community that may affect the research project, whether the community has members who are qualified to engage in the research process and the capacity of the community to undertake a partnership with all its concomitant obligations. Often, organizations may undertake preliminary social science research on the cultural, economic and political conditions of the community prior to engaging in a research partnership. Similarly, the community leadership may check the credentials of the research organization by scrutinizing the record of its work with other communities.

(2)   **Partnership formation** occurs when trust is established in the relationship. It is where the research organization and the community forge their working relationship. It is a verbal or written agreement between equal partners. The project priorities and parameters in terms of the nature of the land-use mapping project are identified and established. The community may be represented by a Band Council in the case of Fort McKay and Dene Tha' First Nations or an Indigenous Community Association as was the case with the Russian Sami. In most instances the indigenous organization may choose from among their group a set of advisors for the project.

(3)   **Networking and linkages** are the next steps to strengthening the project partnership. It involves informing government, non-governmental and private organizations who may be expected to support or participate in the implementation of the recommendations of the study. This linkage also extends to seeking project funding. In most cases communities lack the funds to carry out such studies themselves. Furthermore, in a funding climate hostile to applied research, research monies for land-use mapping may have to be obtained from various sources such as foundations, governmental departments related to the environment or resource development, and private sector companies that are active in the region. It is key that the collected funds are placed under the control of the community to direct as it wishes in the course of the project with the support of the research partner. This will limit any undue influence on research recommendations by any one sponsoring organization other than the community itself.

(4)   **A community advisory committee** may be formally or informally designated to deal with specific issues. Their role would be to: guide the work and guarantee community control of the project; make the

contacts with, and determine the roles of, community elders in the traditional land-use occupancy study; select project trainees for research; establish personnel policies; examine and approve the budget submitted by the trainer and trainees to conduct the work; discuss concepts and terminology being used in interviews, reviewing difficulties arising during interviews, helping researchers with unfamiliar terms; hold meetings as needed to review work in progress; and, assist in the verification of results and provide a liaison with funding partners.

(5)   **Project design** begins with a partnership agreement but gains momentum after confirmation of research funding. The scope of the project is finalized in terms of what type of indigenous ethnographic and land-use mapping information will be the focus of the study. Special icons for cultural sites, and animal and plant species will be designed. The map scale (1:50,000 , 1:100,000, 1:200,000 etc.) will be determined. The actual combination of visual and verbal documentation procedures for the project will be set. An interview protocol that is to act as a guide for the trainees is drawn up at this point. The community also provides an initial list of community members from whom indigenous knowledge about land-use could be obtained. The community also determines who would be best qualified to undergo training to undertake the research.

(6)   **Training** begins after the community interns have been interviewed and chosen to undertake the research. It is essential that both project partners are involved in the selection of trainees. The involvement of the research organization may be limited to providing the terms of reference and description of the qualities of the trainee for research. The community, on the other hand, may have a say in who best fits this job description. Some of the qualities of the trainees are that the individual: be a local community member; have no problems associated with substance abuse; must have respect for, and be trusted by, community elders and other members; should be able to read and write in English (or Russian depending on the national language); have fluency in an indigenous language such as Cree, Slavey or Sami; should be willing to commit to the project for a certain time period; and, be willing to work flexible hours to suit the schedules of people they interview. Training would include application of participatory research methodology, usage of maps and icons, non-intrusive interview techniques.

(7) **Mapping and interviews** have been discussed in detail in the section on participatory mapping. In this part of the research process the visual and verbal methods act in concert to document indigenous knowledge. Interviews and mapping could take place in groups or individually depending upon the context. It could also take place in someone's home, at a community centre or in the field at a specific site.

(8) **Validation** takes place at every stage of the mapping process as new information overlaps with previously collected data. It also takes place at the final stages of the research process when community members are invited to view the maps and comment on them. Usually an evening with coffee and some food serves as an excellent catalyst to stir discussion on the maps.

(9) **Final map and document production** is essential to bring about a sense of completion to the research phase of the project. A community feast and distribution of research report to members of the community who participated is a respectful way of acknowledging their direct contribution in a public forum in addition to written recognition in the document. The final map with accompanying ethnographic information should also state policy recommendations for next steps.

(10) **Presentation of research results** is required to government, private sector and other organizations to affect policy formulation and obtain indigenous communities' participation in decision-making. At this point the community trainees are graduates of the research project and capable of leading such research projects for the community in the future.

(11) **Follow-up** is the final stage and rests primarily upon the community having acquired capacity through research training to periodically update land-use information. Follow-up is also necessary in terms of pragmatic applications of the land-use study.

Discussion

The steps to cultural land-use mapping are not as linear and distinct as they may appear to be. These categories are intended to guide the process. There is invariably overlap between the various steps to undertaking a traditional land-use study. It is possible for several of these steps to work in concert with

each other, mutually supporting the research process. For instance, the initial scrutiny could be taking place as the partnership between the community and the research organization begins to gel. This partnership, in turn, may be strengthened by the human and financial resources each partner brings to the research project. In another example, the project design could proceed simultaneously as the formation of the community advisory committee. Through discussions on project design, a group of advisors may become obvious for the project.

There are many nuances to each of the steps of this process that are beyond the scope of this paper but are worthy of consideration by the professional researcher. These may include ethical dilemmas a researcher may face in the field. For instance, consider undertaking a cultural land-use mapping project in an region where people have not been paid wages for their work in over six months, where there is an acute shortage of food and medicine, where the military presence rivals that of the legions of Rome, and where governmental infrastructure is volatile due to radical political and social change. This is the case of the Russian Arctic. In such an environment, what are the implications of a short-term capital injection to a small community resulting from a research project because they receive a salary for their participation? Will community members benefit unequally with project trainees being better off than other members of the community? How can the short-term benefits be weighed against long-term gains of the mapping process when day-to-day survival is of paramount concern? These considerations go beyond mere textbook learning and address fundamental ethical considerations which the research professional must have the acumen to recognize, reflect and respond to with guidance from the community.

The follow-up is a matter of consideration even prior to undertaking a research project. The aim of participatory land-use mapping is empowerment of the community. What are the responsibilities of the research organization once funding for the project is completed, the maps produced, and contact between the two partners is reduced? The community may still need support of the research partner. Many leaders and administrators in indigenous communities, who are dealing with the legacy of cultural annihilation, face on a daily basis issues such as high unemployment, an excessive rate of teenage suicides, and heavy pressures for resource development on their traditional lands which combine to make a significant demand on their time. In such cases, a commitment to follow-up may be near impossible. With the knowledge of limited financial resources of small communities and over committed human capital, what are the responsibilities of researchers to continue to maintain strong links and provide support? The mutual trust and respect initiated by the research project also generates expectations for continued commitment to the relationship between partners. Furthermore, researchers can only gain insights into, and appreciate the cultural depth of,

indigenous knowledge by maintaining long-term contact with the community.

Who has access to the completed maps? The knowledge contained in the maps belongs to the community. Therefore, questions of access and usage should be decided by the community. Uncritical application of liberal ideals such as unfettered access to information can be perilous for an indigenous community. Under the current circumstances of Kola Peninsula in the Russian Arctic where food availability is limited, financial resources are scarce, poaching of wildlife is rampant and goes largely unchecked by law enforcement, widespread availability of these maps would spell disaster for the Sami. The result would be disempowering for the community. The implications were clearly expressed on the face of a Sami hunter as he examined the maps and articulated his fear and the risk associated with free access of the maps even to the local municipal administration. Lengthy discussion of these issues is beyond the scope of this paper. However, they are necessary considerations for both students and practitioners alike.

The objective of participatory research and mapping of indigenous knowledge is not to seek knowledge for its own sake. It is applied research for the purposes of empowering communities and marginalised groups within communities. The aim of land-use mapping projects of the Arctic Institute of North America in partnership with communities in Canada or Russia has been to achieve shared management (or co-management) of natural resource use on traditional lands of Aboriginal communities. The maps were made not to satiate a curiosity or confirm indigenous knowledge of the land, but to take a key first step to influence governmental decision-making. In the case of the Russian Sami, these maps constitute the starting point from which to engage in a discussion of land-use policy in particular and indigenous rights in general. In July 1997, the Governor of the Murmansk Oblast, in the presence of the local media, admitted to a poor governmental record of treatment of indigenous people in the region and committed to enabling the input of the Sami in land-use decisions as well as giving the information on the maps a regulatory basis from which to undertake future resource planning efforts (Robinson & Kassam, 1998; Kassam & Avdeeva, 1997).

Conclusion

Social workers could easily involve themselves in traditional land use mapping. Every stage of such intervention, moreover, has the potential to incorporate such social work skills as advocating, brokering, enabling, facilitating, and mediating. Interventions likewise would imply such social work values as beginning where the client is at, being respectful at all times, attending to processes by way of pacing, and enabling informal, formal, and ethnically appropriate and sensitive patterns of communication.

The mapping process itself could be an important source of community empowerment and affirmation. So, too, could the process further validate the integrity of traditional knowledge.

Finally, the creation of a traditional land use map could in turn strengthen indigenous communities' abilities to advocate in such contexts as treaty rights, potential economic exploitation by outside companies, or other instances of intrusion. Future research could consider specific instances wherein the profession's knowledge and skills could be deployed to these ends.

Acknowledgement

Endnotes

1. Cartesian refers to the French rationalist philosopher and mathematician René Descartes. Descartes, who wrote mainly in Latin, signed his name Renatius Cartesius. He made significant contributions to co-ordinate and analytical geometry (in *Discours de la méthode pour bien conduire sa raison, et chercher la vérité dans les sciences*, 1637). From the Latin derivation of his name and this work we get the term: Cartesian co-ordinates. It is noteworthy that Descartes considered his mission to refound knowledge. He argued that there is a dualism between mind and body, maintaining that they are different substances (in *Meditationes de prima philosophia*, 1641). The map and the way we use it today is a legacy of Descartes perception of the world.

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