The *Naturalized Knowledge Systems* of Indigenous Communities

by Salli M.K. benedict

Richard David: preserving traditional environmental knowledge

May we now gather our minds together as one to give greetings and thanks that we are in good health and are able to give greetings, thanks and careful consideration for the: Human-kind, Mother Earth, Great Waters, Plant-life, Animal-kind, Bird-kind, Four Winds, Grandfather Thunderers, Elder Brother Sun, Grandmother Moon, Stars and Celestial Bodies, Spirit Beings, the Creator, each integral element of Creation.

Now that we have directed our voices toward the Creator in the best way that we are able to do, let it be our thought that we will abide by his instructions so that we may continue to be happy. If we have left something out, or if there are some who have other needs or other words, let them send their voices to the Creator in their own ways. Let us be satisfied that we have gone as far as it was possible to fulfill our responsibility.

Now our minds are one. Agreed.

- opening address of the Haudenosaunee (Iroquois) people, condensed version

Ernest Benedict, a Mohawk elder, opens a gathering with the *Ohenten Karihwatehkwen*. In English it means "the words that come before all else." This Haudenosaunee thanksgiving prayer is usually heard before any other business, and reflects the belief that humans have been given instructions about sustainable living upon Mother Earth.

Ernest Benedict's son, Lloyd Skaroniiati Benedict, a Mohawk of Akwesasne, a community on the St. Lawrence River some 100 km from Montreal, believes indigenous peoples throughout the world have developed special knowledge of the lands and waters in which they live. "Over many generations, our people have used this knowledge to adapt their cultural lifeways to suit their environments," he says. Benedict believes that what comes out of the peoples' collective experience is a "naturalized knowledge system" (NKS).

INVESTIGATING NATURALIZED KNOWLEDGE SYSTEMS

Benedict participates in a research project conducted by the environmental division of the Mohawk Council of Akwesasne under the direction of biologist and chief investigator F. Henry Lickers. The project is supported by IDRC. Now in its third year, the project aims to learn more about the importance of naturalized knowledge systems for several Canadian indigenous communities. More specifically, the project analyzes the separation of lifestyle in indigenous communities from the physical and human environment. Eventually, the research will lead to proposals for reducing this separation through new approaches to the environment.

For Henry Lickers, a key element of the research is the principle of "community." The research model, based on ancient Haudenosaunee and other indigenous principles, directly involves members of the indigenous communities. "They identify their own environmental priorities, criteria, and indicators, and suggest the methods for utilization of natural resources," says Lickers. "We have great respect for the knowledge that each community holds and great confidence in their abilities to show us their own answers."

SOLVING TODAY'S PROBLEMS

According to Richard David, assistant director of the environmental division at Akwesasne, "it is important that our people do their own research. We are the the only ones who will be able to find solutions that work for us, for long and short-term environmental problems. If we look at the systems our people once practiced, there are clues to fixing the troubled indigenous communities of today."

David feels there is great urgency in gathering traditional environmental knowledge from the elders. It is unfortunate that the normal lines of transmission of this information have been severed, leaving some elders isolated with the knowledge, he says.

KNOWLEDGE GATHERING

The traditional knowledge is being gathered from a diverse selection of indigenous communities across Canada that participate in the study: Tobique, New Brunswick (Maliseet); Akwesasne, Ontario-Quebec (Mohawk); Kitigan-Zibi, Quebec (Anishnaabeg); Opaskwayak, Manitoba (Swampy Cree); and Little Red River, Alberta (Cree). The communities represent different lifestyles -- hunter-gatherer, agricultural, fishing -- and varying sizes of populations, land bases, and traditional use territories.

According to Henry Lickers, the research has yielded good results in its first 2 years. All five communities used the same basic strategy, essentially identifying indicators of environmental change, the causes of environmental change, and the means of learning about the environment. The techniques for gathering information included questionnaires, interviews, and discussions, with attention paid to representing both genders, as well as young and old community members.

COMMUNITY PROFILES

Already, intimate community profiles have been produced, providing rich documentation of the community evolution and history, sociology and social conditions, and land base and territorial land usage

boundaries. The profiles also detail the relationships of the individual communities to others. This information is directly useful almost as soon as it is gathered.

René Tenasco, band councillor and research coordinator for Kitigan-Zibi, says his community has discovered a rich oral history about the uses of traditional territory. The information is transmitted through legends, stories, and anecdotes. A detailed study of place names documents the intimate knowledge people had about their environment. "The environment has its own language that it reveals to us, and the place names reveal environmental knowledge that was once common," says Tenasco. "It may now be in need of revitalizing. We believe that the Anishnaabeg have a great contribution to make in helping humanity redirect its thinking and understand how to live within what the environment can sustain."

APPLYING TRADITIONAL KNOWLEDGE

In Tobique, the community is applying rekindled knowledge of its salmon fisheries and examining socio-economic issues that have arisen with recent increases in its population. At Kitigan-Zibi, the people are developing their relationship with the forests, and studying the history of the territory and its environmental character through the Anishnaabeg language and the English place names. At Opaskwayak, the people are using their knowledge to manage the sturgeon fishery. Residents of Akwesasne are applying knowledge of the fisheries, protecting fragile wildlife environments and the shoreline of the St. Lawrence River, growing black ash trees, and developing environments for the cultivation of sweetgrass.

Although it is sometimes advantageous to put knowledge into practice quickly, further analysis of the documentation can be equally useful. The analysis and formal description of environmental changes, and of changes in natural resources, is critical to the understanding and eventual modification of economic and social development within each community.

The community research was carried out in cooperation with the University of Ottawa-based Institute for Research on Environment and Economy (IREE), which provided assistance in relevant areas of science such as geography, sociology, and biology in ways that did not jeopardize local control. Project co-investigator George Haas, from the IREE, termed himself a facilitator. The University has expressed long-term commitment to the project by offering to stay in contact with the communities beyond the life of the project. IREE, with the support of IDRC, has begun efforts to extend the principles set forth in the Canadian research model to indigenous communities in Mexico and Belize.

Salli M. R. Benedict is a staff member of Akwesasne Notes *magazine.*

Resource Persons:

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Octubre 2003

IDRC Reports
STORIES ON RESEARCH IN THE DEVELOPING WORLD

1996 (April - December)

Environment, Society, and Economy: Policies Working Together

by David B. Brooks and Jamie Schnurr

Viet Nam is one of many countries attempting to harmonize environmental, social, and economic policies

Among Southeast Asian nations, Viet Nam is poised to join the next wave of Asian "tigers." But the heady pace of economic growth has carried with it significant social and environmental stresses -- and this in a country where four of every five persons works in agriculture, fisheries, or forestry. Rapid industrialization of these sectors, coupled with hurried urbanization as people are forced from traditional employment in rural areas, has contributed to the degradation of the natural resources that in many ways are the foundation of Viet Nam's society and economy. Therefore, Viet Nam is now attempting to harmonize its environmental, social, and economic objectives through a national environmental action plan.

The Vietnamese experience is by no means unique. In no country of the world are there neat divisions among goals for ecological sustainability, social equity, and economic efficiency. Policies and programs targeted at each objective have impacts in more than one sector -- typically, many sectors -- at once. Nonetheless, researchers and policy makers are more likely to focus on particular problems. Although the

need for policy integration is assumed, it is often left to others to address explicitly.

BARRIERS

Not surprisingly, the task of integrating policy invariably faces significant barriers. Interactions among ecological, social, and economic systems create complex cause and effect relationships that are not easily unravelled. Government agencies, corporate departments, and research and academic institutes are typically set up according to discrete sectors and disciplines, each with its own interests (and interest groups), virtually assuring policy segregation. Our political economy emphasizes discounting the future value of human development, natural resources, and ecological processes in exchange for shorter-term economic development. We find ourselves short of **experience in the effective application** of analytical tools and decision-making processes to identify, evaluate, and manage the necessary trade-offs among objectives.

WHAT SORT OF INTEGRATED POLICY?

One way of confronting the problem of complexity is to define the different levels at which integration should take place, whether this is local, regional, national, or international. Another strategy is to approach policy from an ecosystem perspective, such as fluvial or watershed regions, or bio-regions based on vegetation.

There are varying degrees of integration. A sectoral policy that is sensitive to other sectoral policies or issues could be considered one degree of integration. Command and control forms of legislation that require social and/or environmental impact assessments of development projects, or "end-of-the-pipe" abatement technology applied to industrial production systems, are more advanced forms of integration. Even deeper degrees of integration involve market-based instruments, green or socially responsible procurement measures, and various types of voluntary arrangements to attempt to make environmentally and socially responsible management a priority throughout government, industry, and among citizens. Strategic environmental planning, life cycle assessment and integrated impact assessment techniques are other tools that can foster forms of deeper integration.

One case study suggests that various degrees of integration can occur incrementally along a continuum. In this case, a series of legislated impact assessments created awareness of the environmental impacts of building hydro lines on a preselected site. The "learning" that took place during the assessments and the desire to apply the new knowledge, eventually led to change within the utility, which instituted strategic environmental planning processes and self-directed assessments. In the end, new management practices were introduced that proactively assessed the impacts of alternate sites for its transmission lines.

COORDINATION AND PARTICIPATION

Integration of any sort requires coordination and collaboration in designing, planning, and implementing policy to establish clear objectives and divisions of responsibility. More advanced degrees of integration require more sophisticated forms of communication, decision-making, and organizational behaviour.

Mechanisms and tools such as multi-stakeholder fora and "user-friendly" information systems can provide a range of people with the means for having input into policy processes. As well as contributing to informed decision-making, the process also helps policy makers understand the socio-economic and ecological context in which they work, and all stakeholders to appreciate the trade-offs entailed in a given policy decision.

GOVERNANCE SYSTEMS

Whether multi-stakeholder processes and other forms of participation can be applied in developing

countries depends on specific political, social, and cultural conditions. Systems of "governance" that can anticipate societal responses to various integrative measures and accommodate the policy objectives of a range of stakeholders and sectors are crucial.

In this perspective, governance means the inter and intra-organizational arrangements, decision-making processes, incentives, and disincentives through which government and non-government actors -- including civil society, the public, communities, and the private sector -- influence decisions about societal priorities and resource allocations. It goes beyond the formal institutions of government and recognizes the significant role of non-governmental actors in policy formulation and implementation, particularly in developing countries.

INTEGRATION MODELS

One model for policy integration uses a triangle whose points represent environmental, social, and economic objectives. This approach is useful, but it subsumes political activity under the "social" category. Political activity is the main way that any society does the integration. A tetrahedral -- or three-sided pyramid -- model, where the upper point is politics, would include not only government as elected officials but also all the institutions set up by government to carry out its policies.

Despite coordination and participation strategies, efforts to balance conflicting objectives often cannot avoid some degree of conflict. Success in managing conflict lies in structuring the process so that it involves the affected parties' representatives in the design and evolution of the process itself, as well as in the negotiation of substantive issues.

Interest-based negotiation is one example of a structured, deliberate attempt to cooperatively seek an outcome that attempts to accommodate rather than compromise the interests of all concerned.

LEARNING

In structured multi-stakeholder and negotiation processes, learning is fostered through decision-making guidelines, communication rules and process steps. Learning can also be fostered even when specific structures are absent. In the case of the hydro utility discussed above, legislation, along with encouragement from management and an inter-departmental committee, prompted line departments to learn from their experiences and develop more effective integrative tools.

Learning can best be encouraged when the various parties jointly define rules for communication and negotiation, have equal access to information, create incentives for risk taking, and allow a margin for error. Other positive elements involve the delegation of responsibility and a willingness and ability to capture and build on unexpected results.

IDRC'S APPROACH TO POLICY INTEGRATION

IDRC has taken a dual approach to policy integration as a research question. One component is exploration and the other is "learning by doing." Among other things, the Centre has reviewed all projects it funds under the theme of integrating environmental, social, and economic policy (INTESEP) to identify common threads. It has supported case studies where specific information was lacking and funded workshops in different regions to learn how researchers and policy makers address policy integration.

ROLE OF RESEARCH

There is no longer any question that research can play a valuable role in a successful integration process. For example, research can identify policy options or alternative institutional mechanisms under different scenarios, and analyze their advantages and disadvantages. Research can also develop the tools and

techniques for analysis and evaluation.

Not surprisingly, the policy emphasis in integration varies by region or country. The focus in Africa tends to be on impacts of macro-level economic policies on social development, whereas in Asia the environmental implications of economic growth are paramount.

The findings also highlight challenging questions for policy integration. In what context is integration appropriate? From a governance perspective, how should integration be managed and by whom?

LESSONS LEARNED

One key conclusion drawn from the research to date is that integration hinges on the process by which the trade-offs inherent in any policy choice are evaluated and managed. Political institutions and policy-making processes need to have the flexibility to promote and foster integration when appropriate.

Ultimately, policy integration unleashes processes whose outcomes cannot be predicted at the outset. A variety of stakeholders may be relevant in any given context, which will affect both substance and process. As a result, inputs can arrive from diverse sources, leading to several possible outcomes, any of which may meet goals of equity and sustainability.

David B. Brooks and Jamie Schnurr are chief scientist and research officer, respectively, for integrating environmental, social, and economic policy (INTESEP) at IDRC. Neale MacMillan is editor-in-chief of IDRC Reports.

Integration: a skeptic's view *David Brooks discusses the problems with using integration as an analytical tool for policy development.*

ISSN 0315-9981. This magazine is listed in the Canadian Magazine Index.

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IDRC Reports
STORIES ON RESEARCH IN THE DEVELOPING WORLD

Vol. 21, No. 1 (April 1993)

Knowledge, Change and the Preservation of Progress

by Daniel Moralez-Gomez

As geographic borders become more permeable, and knowledge more easily transformed into a marketable commodity, there is a growing realization that the traditional wisdom imprinting our cultural identities is being lost.

At the doorstep of the 21st century, both North and South face a tremendous diversity of global challenges. More than ever before, change invites reconsideration of the value of cultural practices, conventional social attitudes, traditional beliefs, and ancient forms of collective behaviours that many people thought had been transcended by progress and modernization.

Despite the captivating rhetoric of the development discourse in the early 1990s, the blueprint for remodelling the world order continues to be drawn by a Western concept of correctness, science and progress. Although the current trend is toward cultural homogenization, the spread of science, and the centrality of capital as the currency of development, there is also an emerging attempt to recover what modernization has systematically ignored over the years: traditional cultural knowledge.

Throughout the centuries, societies evolved by learning from experience. The collective ability to accumulate and transmit knowledge from generation to generation, and to apply it to produce new knowledge, have underpinned development. However, the speed of change today, the insatiable demand for solutions to the problems of a modern world, and the predominance of technology centred around market power rather than the empowerment of people, present new threats.

Developed and developing countries are finding it increasingly difficult to preserve the shared products of human learning. Science and wealth create for a relative few the ability to amass and transmit facts, rearrange social structures, and alter the natural order in dimensions never imagined before. For both developed and developing societies the meaning of collective symbols, customary practices, cultural identities, and, ultimately, the history of peoples, fades at a worrisome speed.

Unquestionably, international development priorities have suffered dramatic shifts in the last few decades. From a bipolar geopolitical order in the post-war period, attention moved toward expanding a dominant economic order and its perceived benefits to all corners of the globe. All along, the premise underlying the development discourse has been to extend the "gains" of progress beyond the industrialized world. However, reality shows that poverty, malnutrition, preventable child mortality, and various forms of discrimination persist in most of the world.

CULTURAL SPECIFICITY

Present-day concerns focus on yet another politically correct development agenda driven mainly by the North, that of environmental sustainability. Today's changes are global in scope, and national and corporate in their motivation. But people in the North often misunderstand the cultural specificity of the

South. They continue to neglect the human and socio-cultural base of knowledge at the root of sustainable development.

Nonetheless, a trend is growing to reclaim traditional cultural knowledge as a driving force of development. Northern countries in particular are recognizing what people in the South have understood for years: that to enter the next century, modern societies must comprehend traditional cultural knowledge. Questions then arise about how to better understand traditional knowledge, how to preserve it in a meaningful way, and how to apply it to sustain development. The responses are not easily found and are often controversial.

Traditional cultural knowledge is a complex concept that reflects an even more complex set of empirical, intellectual, social and spiritual factors that constitute human culture. It refers to the integrated expression of collective values and customs that guide interaction among peoples, and between people and nature.

By definition, traditional cultural knowledge is systemic and addresses aspects as diverse as how communities use and help reproduce their natural environment, how they manage their social organizations, and how they educate their children. Because of the diverse realities it reflects, there is no consensus about what traditional knowledge is, or how it is most genuinely expressed. Efforts to understand traditional knowledge tend too often to frame the concept within politically correct dimensions currently in vogue. In a world system engineered to respond to measurable parameters of consumption, efficiency, and constant change, culture and human learning too often become convenient instruments by which to manage crises created by neglect of the human side of development.

CONTRADICTIONS

The notion of traditional cultural knowledge is not free from contradictions. It helps some to legitimize static visions of the world, while others see idealized hope. In essence, however, traditional knowledge is a combined expression of culturally diverse individual and collective capacities to manage the social, political, economic and natural environment. To restrict its meaning to any single set of issues, or to see it as the domain of a single cultural group, separate from the collective, oversimplifies its development potential and makes it purely instrumental to short-term concerns.

Pressures to find quick solutions to the problems confronting industrialized culture lead to romanticized visions of traditional cultural knowledge. Too often it is perceived as an ancient pre-science that holds universal solutions to modern world problems. Unfortunately, these perceptions fail to grasp the integral, holistic and cultural roots of traditional knowledge.

When perceived strictly in a time-line dimension, traditional knowledge becomes a collection of facts and practices frozen in the past. Its relevance for the modern world becomes tangential, reduced to ahistorical and acultural attempts to bring clusters of information forward to resolve diverse problems of the present. Traditional knowledge under such circumstances ceases to be systemic and historical, and becomes an accessory separated from its cultural milieu.

Those who look upon traditional knowledge purely from an ethnic perspective label it "indigenous." It is an expression of "curious" traditions and practices of native peoples whom modern societies still fail to see as part of their own social fabric. This perception dehumanizes traditional cultural knowledge and detaches it from the rites, languages and community practices that give it a historical dimension.

If traditional cultural knowledge is reduced to a utilitarian economic notion, its scope and potential impact are limited to the lessons drawn from the survival technologies and practices of materially impoverished peoples. But when it comes to applying such knowledge in modern science and business, little is done to recognize or compensate its originators.

DEEPER UNDERSTANDING NEEDED

Western societies' understanding of traditional cultural knowledge still has far to go to master the deeply rooted values beneath the cultures of peoples at the centre of development agendas. Industrialized societies concerned with preserving their own progress must drastically change their cultural perception of development. From a position of cultural dominance, current Western notions of progress, modernity, and human development must give way to a broader recognition of the ethos that gives meaning to traditional knowledge in cultures different from our own.

A full agenda of issues needs to be better understood before we may place traditional cultural knowledge at the centre of our search for direction in development and change. Rather than addressing traditional knowledge as a curiosity that complements our visions of where societies should go, it should be approached as a source of learning to understand from where our societies come. This perspective implies going beyond functional aspects of traditional knowledge to comprehend the complex interaction among artistic and spiritual practices, language and communication, patterns of social reproduction, practices in community governance, and management of natural and human resources. In sum, it implies a different way of looking at what development is about.

- Daniel A. Morales-Gomez is Director of IDRC's Social Policy Program.

ISSN 0315-9981. This magazine is listed in the Canadian Magazine Index.

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IDRC Reports
STORIES ON RESEARCH IN THE DEVELOPING WORLD

Vol. 21, No. 1 (April 1993)

Recognizing Traditional Environmental Knowledge

by Deborah Carter

Western science's failure to recognize traditional environmental knowledge (TEK) was first made obvious to Martha Johnson more than ten years ago when she was working as a high school teacher in Povungnituk, an Inuit community in northern Quebec.

She remembered realizing that "as a non-Aboriginal trying to teach science from a Western perspective, it wasn't working. So I asked myself, "How do the Inuit perceive the environment?"

Johnson began experimenting in learning techniques to find ways of tapping the knowledge passed down among the Inuit. In one exercise, she gave students a diagram of the Arctic food chain and asked them to make the links. One practically illiterate boy made the connections without any problems.

Later, Johnson pursued a Master's degree in Environmental Studies and Anthropology at the University of Toronto. Her major paper examined Inuit folk ornithology, comparing Inuit classification of birds to Western groupings.

Johnson's grassroots experience with Aboriginal communities and her formal studies helped her recognize the holistic nature of TEK. "It combines biology, linguistics, social sciences, and other disciplines and connects them in an interdisciplinary way to examine how people perceive their world, live within it and use its resources" she comments.

Johnson spoke about traditional environmental knowledge, the reasons behind its growing recognition, and current research in this field during an interview in Ottawa early this year. She is now Research Director of the Dene Cultural Institute in Canada's Northwest Territories. The Institute works with Dene communities to preserve and promote this Canadian aboriginal group's culture, through research and education.

Much of the Institute's work has focused on TEK through research and the publication of a book entitled Lore: Capturing Traditional Environmental Knowledge, edited by Johnson. The book was based on papers produced from a 1990 workshop on TEK, organized by the Dene Cultural Institute. IDRC funded the workshop as a cultural exchange between researchers in developing countries and those working in Canadian aboriginal communities.

Community-based projects on TEK in the Amazon Rainforest, the African Sahel, the South Pacific and Southeast Asia were represented at the workshop. The Institute also invited aboriginal community members and researchers from northern Canada's Belcher Islands.

Workshop participants discussed the problems of gathering TEK and integrating it with Western Science to improve natural resource management. They also experienced Dene culture through food, music and dance. The participants' papers, outlining their project's research methodology, were incorporated in Lore.

ASSIMILATION OF KNOWLEDGE

According to Johnson, Western scientists have until recently ignored TEK because they assume much of its validity has been lost owing to Western assimilation of indigenous peoples and their knowledge systems. A separate factor is that, unlike Western science, TEK is not easily quantifiable.

In the past, Western scientists have interpreted the traditional emphasis on spiritual explanations as superstition. They also dismissed any emotional or subjective aspects of traditional knowledge in favour of the Western preoccupation with objectivity and the separation of self from the object of study. Johnson says TEK challenges Western science's foundation in the Judeo-Christian belief in humanity's dominance over nature.

Johnson attributes the changing attitude of Western scientists towards TEK to heightened political consciousness among indigenous peoples and their struggles for self-determination, more documentation of TEK, and a growing international environmental movement searching for new alternatives to natural resource management.

"Western society is searching for the spiritual element of life that it has been lacking for so long," she commented, refering to "Deep Ecology" as one movement that examines the spiritual interconnection between humanity and nature.

Johnson and other advocates of TEK are anxious that the shift in Western attitudes not lead to the cultural appropriation of indigenous knowledge systems in ways that do not benefit indigenous peoples. "It disturbs me when people are not given credit for what they've created or aren't able to enjoy the benefits of their work." For Johnson, traditional communities could be given credit for the concept of sustainable development, a concept they have long understood and which is now trumpeted throughout the West. "Indigenous peoples have lived within the means of their communities, its land and its resources. They have conserved natural resources while thinking of other communities and future generations."

Johnson says there is a willingness in aboriginal communities in northern Canada to preserve existing sustainable systems and to consider increasing the application of TEK. This belief is based on her involvement in a pilot research project undertaken by the Dene Cultural Institute in 1989 and completed in 1992. The goal was to develop a research methodology to discover from community members what TEK is still in use by the Dene, along with evidence of how this knowledge continues to govern their land and resource use. This information was to be used for environmental management and education. Fort Good Hope, on the Deh Cho (Mackenzie) River in the Northwest Territories, and the neighbouring community of Colville Lake were the pilot project sites. Data collection relied on interviews, translated into the Dene language of North Slavey, and participant observation. Researchers recorded community knowledge on animal ecology, local ecosystems, and traditional rules of land and resource management.

TRADITIONAL RESOURCE MANAGEMENT

The research indicated that a traditional Dene system of resource management still exists among the elders and to a lesser extent, among younger Dene. Although the younger generations use more modern technology, Johnson says the research showed that they still rely on their environmental knowledge to hunt and survive on the land. This reality points to the continued relevance of traditional environmental knowledge, Johnson says, noting that many Dene will have to live off the land because their communities lack wage labour. Most Dene want to remain in their communities, she says.

Johnson says a drawback of this type of research is its failure to involve younger Dene. Because they often lack fluency in the Dene languages, they are excluded from being project researchers. "There has to be a means of encouraging young people not only to learn about traditional environmental knowledge but to apply it to their everyday living. Traditional environmental knowledge will have no future unless major steps are taken to stop the movement of youth away from aboriginal culture."

A further drawback was poor communication within the two Dene communities, which produced low community support for the project. Johnson says part of the reason was that the Dene Cultural Institute rather than the community itself made key project decisions.

But the Institute is building on the experience of the pilot project. It has initiated other research projects on traditional medicine and justice in co-operation with the Arctic Institute of North America, based in Calgary, Alberta.

On top of safeguarding TEK within aboriginal communities, Johnson also calls for integrating it more broadly with Western science. Global ecological interdependence makes this marriage a necessity, Johnson says. TEK could provide insights into natural resource management in under-studied areas such as wetlands, high altitude zones, coastal regions, drylands, and circumpolar regions. It could also promote conservation education and offer holistic environmental assessments for development planning.

In Johnson's view, local indigenous researchers and professional researchers trained formally in Western methodology can collaborate to great effect. She points to the way aboriginal researchers made the pilot project more responsive to Dene culture by signalling the concept of "management" as unacceptable because it implies human control of nature. The Dene believe that, without human interference, nature takes care of itself. Dene opposition to putting radio collars on caribou is an example of this belief, says Johnson.

Aboriginal researchers also opposed asking community members for specific numbers of animals killed in hunts. They said that many Dene would not provide accurate numbers for fear of government reprisals or of being seen to brag about hunting accomplishments, an unacceptable practice in their culture.

For their part, the professional researchers, including Johnson, possessed complementary research skills and continually asked for explanations about things the indigenous researchers considered obvious. Aboriginal researchers suggested omitting certain questions from the interview guides because they assumed the answers were common knowledge. Yet for the outsider or younger Dene, these answers are often important for understanding TEK and its application. "Researchers must focus on the strengths of both traditional environmental knowledge and Western science," says Johnson.

WHO DECIDES?

Will traditional environmental knowledge lose much of its content and significance if it is integrated with Western science? "Key to the integration process is letting aboriginal people make choices about resource management and knowledge systems," Johnson answers. "This will ultimately give control back to these people and ensure that traditional environmental knowledge systems survive as systems which meet their needs. The real issue is who is making the decisions rather than what knowledge base they are adhering to."

Johnson says it is difficult to evaluate the success of integration with Western science because of the strikingly different ecological, economic and political contexts of the world's indigenous peoples. At one end of the spectrum is the widespread killing of Brazilian aboriginal people and simultaneous destruction of their indigenous knowledge. At the opposite end are the indigenous people of the South Pacific's Solomon Islands who both govern themselves and enjoy the authority to utilize traditional systems.

Yet overall, Johnson says she is optimistic about the future of TEK. Aboriginal self-government has the potential to ensure the survival of such knowledge among aboriginal communities in Canada if it is made a priority of self- determination. There are increasing partnerships between indigenous peoples, governments, and development and research organizations that strengthen indigenous knowledge, Johnson noted.

Most uplifting to Johnson is the growing recognition that TEK connects Canadian aboriginal communities

and other indigenous people in the South. "Traditional environmental knowledge and its research have emphasized the commonality of problems, concerns and solutions that are to be found among the world's indigenous peoples." For Martha Johnson and other advocates of TEK, the hope remains that this knowledge will help preserve the identity of indigenous communities and contribute to resolving their common problems of poverty, assimilation and cultural misunderstanding.

- Deborah Carter in Ottawa

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Lore: capturing traditional environmental knowledge.
Ottawa, Ont., IDRC, 1992. X + 190 p. : ill.
ISBN 0-88936-644-6 (An IDRC publication).

ISSN 0315-9981. This magazine is listed in the Canadian Magazine Index.

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IDRC Reports
STORIES ON RESEARCH IN THE DEVELOPING WORLD

Vol. 21, No. 1 (April 1993)

Threads of Common Knowledge

by Paul Icamina

More and more, researchers on sustainable development are taking a serious look at indigenous knowledge (IK). They can hardly avoid doing so since IK is like a thread running through the human community, touching on biodiversity, climate and countless other activities. Take shamanism, for instance.

"The origins of Amerindian shamanism are Asiatic, possibly proceeding from millenia of shamanistic religions in Northern Asia and Southeast Asia," says Elizabeth Reichel, a professor of anthropology at the Universidad de los Andes, Colombia.

Prof Reichel defines shamanism as a political and religious technique for managing societies through certain ritual performances, myths, and world views, such that a community respects the natural environment and community life as a social common good. Shamanism is still the basic worldview of 70,000 Amazonian Indians in Colombia and of more than 30 million Amerindians in Latin America, she adds.

Prof Reichel shared her observations with participants at a symposium on indigenous knowledge and sustainable development, held in late 1992 in Silang, Philippines. It was convened by the International Institute for Rural Reconstruction (or IIRR, based in Silang) and IDRC.

In the Miritiparana area near the Colombian Brazilian border, says Prof Reichel, shamans practice environmental "accounting": an awareness that action upon the environment always begets reaction. "These indigenous societies can be said to be among the few ones left with a strong cultural tradition of indigenous sustainable development. In Colombia, shamanism is a form of eco-politics, a mechanism for the regulation and control of resources."

Prof Reichel laments the diminishing role of shamans as the government opens Amazonian lands by recognizing land titles. The system creates new forms of land tenure and political representation on top of the old. Where before the shaman decided the best ways to hunt or harvest food and forest products, he is now unrepresented in the new system of elected officials.

"The native people in Asia, Africa, Canada or Latin America have far more in common in terms of their conceptualization of nature and its bearing on our life compared to the rest of the population," observes Kirit K. Patel of the Center for Management in Agriculture, Indian Institute of Management, in Ahmedabad. "The Inuit, Australian Aborigines, Mohawk and other Indian tribes have always considered that a common thread runs through animals, earth and human beings."

On Malalison Island in the central Philippines, reefs are known by names handed down through generations, and islanders reckon distances in terms of fathoms and take their bearings from human landmarks such as a house on the mainland. The island was chosen by the Southeast Asian Fisheries Development Center (SEAFDEC) as a pilot site for sea- farming technologies, sea-ranching and the

granting of territorial use rights in fisheries. The cornerstone of the project was local involvement, so the research turned to the ways of the fisherfolk.

While the people's fishing methods are specific to the island, "Malalison fishers are not unique," said SEAFDEC's Susana V. Siar. "The islanders are no different from the islanders of the Torres Strait or the raft fishermen and shore dwellers of Brazil, who possess a system of naming sea space and marking specific fishing spots through landmarks."

SUSTAINABLE DEVELOPMENT AND IK

"Many people realize one cannot talk of the value of natural resources in human terms without falling back to what people know about them and how they use them," says Christine Kabuye, the botanist in charge of the National Museums of Kenya's East African Herbarium. "And when it comes to sustainable development, incorporating indigenous knowledge is a must."

The Herbarium has collected data on plant uses since 1900, mostly on medicinal and chemically interesting plants. But it was not until three years ago that it started looking at wild food plants as substitutes for common crops that cannot be grown sustainably on marginal land. The results show that some indigenous food plants are far more nutritious than exotic ones.

"Because indigenous knowledge has been largely derived through oral traditions passed down over generations, much has been lost forever," says Raymond Obomsawin, a senior consultant at the ONAKE International Applied Research Project in Ontario, Canada. "The question of its preservation, expansion and practical use is especially urgent."

IK can be lost in unpredictable ways. The Green Revolution, for instance, made its own contribution, says Gordan Prain of UPWARD (User's Perspective with Agricultural Research and Development), based in the Philippines. "The successful exploitation of wheat and rice germplasm diversity was causing the disappearance of that diversity as farmers switched to the new varieties." The response to vanishing diversity was to collect accessions for more than 50 crops in over 100 gene banks worldwide. But little in the collections has been characterized properly. Without systematic characterization, gene banks are like "pharmacies filled with miracle drugs without labels."

"Almost absent from this potted history of plant genetic resources are the past and present users and originators of genetic diversity: farming households the world over, but especially rural people living in the more diverse and difficult environments of tropical and sub-tropical regions where the great majority of crop diversity is to be found," says Mr Prain. "Modern crop varieties often bring with them novel practices and these combine to erode the communal memory." UPWARD has completed "memory banking" in two communities in southern Philippines where the practices of local farmers with traditional varieties of staple and supplementary crops were documented systematically.

TIME-TESTED RESOURCE MANAGEMENT

Conservationists emphasize the importance of IK with respect to biological diversity, which must be preserved before as yet undiscovered species are lost forever. For David Hyndman, a senior lecturer in anthropology at Australia's University of Queensland, converting rainforests and inshore coral reefs into wilderness preserves is "no more than robbing indigenous peoples of their homeland and assigning it an artificial idealized landscape in which humans have no place. Biological and cultural diversity would best be achieved by keeping indigenous people on their homeland and allowing them to employ their own time-tested sustainable resource management."

Another theme addressed by the symposium was access to IK and intellectual property rights. How can local people be protected from exploitation of their knowledge and resources? What compensation can they get for their valuable information?

The annual value of medicinal plants derived from IK is estimated at some $54 billion in 1989. But indigenous people see no financial compensation for the hundreds of years of experimentation and innovation that led to the use of these plants.

"At present there are no provisions for the protection of knowledge rights of indigenous peoples," says Prof Hyndman. "Dissatisfaction with this exploitation led to the fight for indigenous intellectual property rights of the kind granted to universities and individuals for innovative R & D in the form of patents and copyrights." The keynote speaker at the symposium, the Honourable James Bourque, a Canadian indigenous person, urged participants to focus on the practical application of IK in development activities to the advantage of local people. He saw a danger that the retrieval of IK would benefit only the scientific community and the Western world.

"For whose benefit?" asks Shahid Akhtar, Director of the Information and Communication Systems and Networks Program at IDRC. "The indigenous populations must be the main beneficiaries of any information system or network that is established. Western researchers [can] also be users and participants but fundamental issues related to intellectual property rights and research ethics make it essential that original owners and keepers of the knowledge retain access and control."

There must also be opportunities for giving IK wider relevance, according to D. Michael Warren, director of the Center for Indigenous Knowledge for Agriculture and Rural Development, in the United States. Research should look "on the utility of indigenous knowledge and innovations from one ecological zone to a similar zone in a different part of the world."

The symposium identified many such research gaps. These included agriculture, genetic resources, forestry, natural resource management, aquaculture, human health, veterinary medicine and livestock management, and communication and organizations. The role of primary and elementary education in promoting and displacing local knowledge among children also attracted attention.

"A study in a rural Mexican village revealed that non-Indian school age children identified and knew the uses of 37 plants compared to Otomi children able to do the same for some 138 plants," observes Raymond Obomsawin. "Yet, it is the Indian Otomi children who are deemed ignorant and in need of an education." Around the world, institutionalized childhood education, "has undermined viable indigenous traditions of familial based education," he says.

In other disciplines too the professional perspective takes on special importance. To many foresters doing research in Nepal, a formerly forested area that has been reduced to shrubland is considered "degraded." They often advise replanting with high canopy timber.

"From the perspective of the local farmer, with his need for fuel, fodder and grazing land for cattle, such shrubland often has survival meaning, in contradiction to its production meaning to foresters," says Dr Donald A. Messerschmidt, a social forestry adviser to the Institute of Forestry in Pokhara, Nepal. "The benefits of tall timber generally go to loggers and middlemen and seldom to poor farmers. Benefits of shrubland may be many -- more species to harvest, more land available to graze, less erosion and gullying."

Forestry, education and the many other issues related to IK will be further explored by IDRC in coming months, with a view to determining IK research and information priorities. It has begun consulting with IK scholars, indigenous groups and others to guage the need for IK networks.

The symposium has advanced this work by developing recommendations for recording IK, preparing training manuals, communicating and using IK, and for research and policy relating to IK. It also formulated an action plan for an IK network. Discussion on methodology dealt with recording, storage, validation and selection of IK as well as training in all these aspects.

Indigenous knowledge, says IDRC's Shahid Akhtar, "provides the basis for grassroots or local-level

decision-making, much of which takes place at the community level in rural areas where the majority still lives. Very little of this knowledge has been recorded, yet it represents an immensely valuable data base with insights on how numerous communities have interacted with their changing environment."

ISSN 0315-9981. This magazine is listed in the Canadian Magazine Index.

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