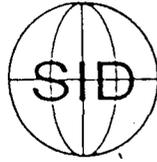


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SOCIETY FOR INTERNATIONAL DEVELOPMENT

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Traditional Environmental Knowledge: a Resource to Manage and Share

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International Development Research Centre
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Traditional Environmental Knowledge: a Resource to Manage and Share

I Introduction

Traditional environmental (or ecological) knowledge, often abbreviated to TEK, refers to the knowledge base acquired by indigenous and local peoples over the generations through direct contact with their environment. This knowledge includes an intimate and detailed understanding of plants, animals and natural phenomena, the development and use of appropriate technologies for hunting, fishing, agriculture and forestry, and a holistic knowledge, or "world view", which parallels the scientific disciplines of ecology and environmental studies. In practice, knowledge and know-how are virtually inseparable, and as such, IK does not lend itself to ready definitions or straightforward extraction and assimilation; it is embedded in a dynamic, multidimensional universe in which cultural, economic, environmental and political factors intersect and influence one another.

Traditional environmental (or ecological) knowledge, gained international recognition through documents such as the *World Conservation Strategy* (IUCN 1980) and the Brundtland Commission's *Our Common Future* (WCDE 1987), which emphasize the importance of the environmental expertise of local people in the management of natural resources. These documents also stress the fact that "sustainable management of natural resources could only be achieved by developing a science based on the priorities of local people and creating a technological base that blends both traditional and modern approaches to solving problems" (Johnson 1992). More recently, the United Nations Conference on the Environment and Development (UNCED 1992) highlighted the need to promote greater awareness and a wider application of indigenous knowledge.

Western scientists in general have been - and very often still are - sceptical of TEK. This attitude is due to a large extent to the belief that, "although TEK may have been impressive in its earlier forms, it is being irreversibly eroded by the assimilation of aboriginal peoples into Western culture and by the failure of elders to pass on the traditional knowledge to younger generations. Undoubtedly, some erosion of TEK has occurred. However, both social scientists and aboriginal peoples confirm the continued vitality of traditional cultures and note that TEK is evolving, not dying" (Johnson 1992).

Traditional knowledge is "traditional" in the sense that it is rooted in the past, within a specific culture and environment, which accounts for the fact that it is also referred to as local or indigenous knowledge. But traditional knowledge systems adapt, borrow, and innovate, and thus build upon what has been learned by previous generations. Thus, the stock of knowledge indigenous to a particular group is most likely to be a mixture of knowledge created within that group through innovation and experimentation, and knowledge acquired from outside and integrated into its knowledge system. To be indigenous, knowledge must not merely be present within a particular group: it must also be an active component of the culture. It must be stored, communicated and used by its members and serve some purpose in relation to activities within the society. Thus, indigenous knowledge is not simply a particular stock of knowledge: it includes the indigenous capabilities to make use of the stock of knowledge and add to it.

This paper will not discuss philosophical underpinnings that separate indigenous and western scientific knowledge, nor will it trace the historic, economic and political factors that have led to a systematic disregard for TEK by governments. A table summarizing some of the differences between TEK and western knowledge systems has been reproduced in Annex 1. It is sufficient here to recognize that these opposing world views are reflected in two very different approaches to the management of natural resources and environmental protection. For the most part, the relationship between indigenous and western knowledge has been asymmetrical, corresponding to the power relationship between governments and indigenous communities. Scientific knowledge has had by far the more powerful influence over decisions concerning the harvesting, management and exploitation of natural resources, whereas TEK has been associated with the poor and the powerless.

This paper, which constitutes a first step in IDRC Information Sciences and Systems Division's effort to define its program in the area of Traditional Environmental Knowledge, relies heavily on the soon-to-be-released Love by Martha Johnson, published by IDRC, and on the Canadian Commission for Unesco's proposal for an international program in TEK. Both documents are cited in the Bibliography.

There is a growing sense today, among indigenous people of many countries, that their own lack of political power and control over natural resources, coupled with the imposition of western development paradigms, has contributed significantly not only to their alienation, but also to a dangerous degradation of the environment. The question that arises - and which we will now address - is how traditional and western environmental knowledge may complement each other, and jointly contribute to sustainable development.

II Traditional Environmental Knowledge and Sustainable Development

During the past decade, evidence indicating a strong relationship between IK and sustainable development has been growing, and recent studies recognize that indigenous knowledge of ecological zones, natural resources, agriculture, aquaculture, forest and game management is far more sophisticated than previously assumed. Thus, this knowledge offers new models for development that are both ecologically and socially sound, and research into the collective wisdom of traditional societies can provide western scientists with an alternative "holistic" insight into the dynamics of sustainable natural resource management.

In recent years, considerable efforts have gone into investigating some of the practical ways in which indigenous and scientific knowledge might be associated, in order to enhance development programs. International and national development agencies are now recognizing the value of participatory approaches to decision-making for sustainable development.

For D.M. Warren, development activities that work with and through indigenous knowledge and organizational structures present many advantages. "Indigenous knowledge provides the basis for grassroots decision-making, much of which takes place at the community level through indigenous organizations and associations where problems are identified and solutions to them are determined. Solution-seeking behaviour is based on indigenous creativity leading to experimentation and innovations as well as the appraisal of knowledge and technologies introduced from other societies" (Warren 1992: 4).

"Despite inherent differences between traditional and scientific knowledge systems, innovative mechanisms are being sought by both scientists and indigenous peoples, to successfully integrate both systems in order to further understand the dynamics of ecologically sound management of commonly shared or valued natural resources. To achieve this, it is first necessary to adequately document, disseminate, and generate credibility and respect for the existing body of IK" (Lalonde 1992).

In many countries, including Canada, indigenous people are becoming actively involved in the field, demanding to participate directly in research on TEK. This has allowed a shift from "scientific" research to "participatory", "community" or "action" research, in which the aboriginal community participates directly in the research design and implementation, and retains control over the results. This approach is coherent with paradigms of grassroots, community-based development; it has its origins partly in the failure of so many top-down non-participatory programs which characterized the 1960s and 1970s approach to development aid, and partly in current political processes in many parts of the world, where increased decentralization and pluralism are allowing a greater role to the civil society and local communities in decision-making.

The integration of traditional and Western scientific environmental knowledge faces a number of obstacles beyond the need to document it and ensure it is more widely disseminated. Perceptual and language barriers bring to light the need, not only to train aboriginal researchers in western methods, but to train western researchers in aboriginal approaches to understanding the environment, and the holistic, rather than compartmentalized way of defining the universe. "Traditional environmental knowledge cannot be properly understood if it is analyzed independently of the social and political structure in which it is embedded. The social perspective includes the way people perceive, use, allocate, transfer, and manage their natural resources" (Johnson 1992).

Traditional environmental knowledge is complex, sophisticated, and certainly not homogenous or "democratic" in itself. It is rooted in specific societies and reflects and affects conflicts and power struggles of those societies. It is the result of a particular (sometimes very localized) "world view", and it feeds and nourishes that world view, reinforcing local beliefs. Furthermore, as Martha Johnson so aptly puts it, "the recognition of aboriginal land rights and self-government are fundamental issues in the struggle to preserve and apply traditional knowledge and cannot be ignored... [nor can] the whole cultural and political reality of traditional environmental

knowledge research as well as the underlying power struggles and opposing world views that are a part of it" (Johnson 1992).

The integration of TEK and western scientific knowledge requires, therefore, the recognition of different forms of political and institutional organization and power. Resource management is generally controlled by the state, and the state must recognize the legitimacy of traditional claims to the control and management over their land for a viable long-term approach to sustainable development.

All these areas - political, methodological, cultural and philosophical - deserve more attention and research, in terms of the obstacles they oppose, but also the opportunities they offer.

III. UNCED, Environmental Knowledge, and Biodiversity

It is heartening that Agenda 21, the UNCED plan of action, devotes an entire chapter to Indigenous Peoples. But more significantly, the importance and role of indigenous knowledge is specifically mentioned in no less than seven other chapters, where it is argued that IK deserves to be widely understood and applied, not only in areas related to environmental management and protection, but in health, education and human settlements.

Other UNCED documents underscore the significance of IK. Principle 22 of the Rio Declaration recommends that "States should recognize and duly support their identity, culture and interests and enable their effective participation in the achievement of sustainable development" (UNCED 1992). And the Preamble of the Convention on Biodiversity mentions "the close and traditional dependence of many indigenous and local communities embodying traditional lifestyles on biological resources, and the desirability of sharing equitably benefits arising from the use of traditional knowledge innovations and practices relevant to the conservation of biological diversity and the sustainable use of its components" (UNCED 1992). Similar recommendations are to be found in the statement of principles relating to sustainable management of forests.

While not all of these documents are legally binding, they do provide a framework and guidelines within which these important issues can be tackled in the years to come.

IV. Environmental Knowledge and Development: Some Canadian Initiatives

a) Canada/MAB Activities in the field of TEK

Unesco Canada's Man and the Biosphere (MAB) Committee has been active in the area of TEK for about two years, working in cooperation with several Canadian aboriginal organizations and other interested parties; more recently, it has worked on defining the elements of an international program on traditional environmental knowledge. This program is based on the premise that, when TEK and western scientific knowledge are used in an appropriate and complementary fashion, the two knowledge systems provide a powerful tool for managing natural resources and achieving sustainable development. The program builds on work being carried out by various communities, governments, organizations and agencies in Canada. The proposal for an international program is also supported by the Unesco national Commissions in Uganda and Costa Rica, and has been recognized under the UN World Decade for Cultural Development.

The goal of the program is to promote and advance the recognition and understanding of traditional knowledge around the world, and to promote its use in the policy and decision-making process. The specific objectives of the program are:

- to foster and support research into the nature, scope, use and preservation of TEK;
- to promote the development and implementation of a Code of Ethics and Practice regarding the acquisition and use of TEK;
- to facilitate the communication, and exchange, of ideas, information, experiences and practices associated with TEK;

to promote the understanding and use of TEK through the formal, non-formal and informal education systems; and
to ensure that both traditional knowledge and western-based science are employed in a complementary manner in planning and decision-making.

A strategic plan is being prepared to address the goal and objectives of Canada/MAB's program. It will be presented at a special workshop on TEK to be held in conjunction with the World Congress on Education and Communication on Environment and Development, Toronto, October 1992 (ECO-ED). This plan is described in Section V below ("Towards an International Program on Traditional Knowledge").

b) International Development Research Centre

IDRC has been described as a "knowledge organization" and as a "knowledge broker", because it supports the generation of new knowledge through research, as well as its organization and dissemination through experimentation with information technologies, systems and networks. The objective of this support is to contribute to social and economic development of Third World nations:

While most of the research supported by IDRC could be described as primarily "modern" or "scientific", a number of projects deal specifically with particular aspects of indigenous knowledge, in the areas of health, farming systems and education, seeking ways of applying this knowledge to current development policy-making and other activities.

Areas of research include the role of traditional healers in national health care systems, the integration of traditional and scientific cultivation techniques in small farming systems, the application of traditional teaching methods to formal educational systems, etc.

Following a recent restructuring process, IDRC is now focusing its efforts on a more narrow set of issues. And, in the wake of the Earth Summit in Rio, where Prime Minister Brian Mulroney declared that IDRC was to become an "Agenda 21" organization, a larger proportion of the Centre's resources will be committed to supporting research and information activities in areas covered by the UNCED Declaration. One of the approaches the Centre has decided to take is to address in a more systematic fashion the entire question of the role of indigenous knowledge in sustainable development and environmental protection.

c) Examples of Recent Canadian Aboriginal Initiatives

The Dene Cultural Institute is documenting TEK, with a view to using it for education and environmental management. The methodology emphasizes the use of a semi-structured questionnaire in the Dene language to gather information about the behaviour of different animal species and traditional rules of management. Local researchers receive training in basic research skills, are involved in designing the questionnaires, and carry out the interviews. The evaluation of the pilot project stresses the need for more direct community control of research, a greater role for elders in interpreting results, and the need for more cooperation and sharing of knowledge between scientists and local researchers.

The Belcher Islands project is a collaborative, community-based research initiative involving the Inuit community of Sanikiluaq and scientists from the Canadian Circumpolar Institute. The traditional environmental knowledge of the Inuit is combined with Western science to develop a cooperative management plan for a herd of reindeer recently introduced to the Belcher Islands. A variety of methods are used to document TEK, including participation in hunting activities, community meetings, informal discussions, and formal interviews.

The Manitoba Keewatinowi Okimakanak is an organization representing some 25 000 people who are members of the 23 northern-most First Nations in the Canadian province of Manitoba. The Natural Resources Secretariat of MKO provides technical support to the chiefs in their effort to develop the resources of northern Manitoba in a sustainable and balanced manner, respecting the culture and traditions of the aboriginal people while ensuring the long-term potential of the northern resource base.

V. Towards an International Program on Traditional Knowledge

A number of centres have come into existence in the last few years, whose purpose is to collect, organize and disseminate information pertaining to indigenous knowledge. CIRAN and LEAD in the Netherlands, and CIKARD in the USA have global mandates and interests; ARCIK in Nigeria and REPIKA in the Philippines have a regional mandate. GhaCIK (Ghana), INRIK (India), PhiCIKSD (The Philippines), and RIDSCA (Mexico) operate at the national level, and about eighteen other regional and national centres are in the process of being established (see Annex II for full names of institutions). Largely through personal and institutional contacts, these centres are already in touch with one another, but could be linked more formally through a global network. A number of collaborative actions have been defined, such as the production of a newsletter, and the design of a database on indigenous knowledge in general.

An International Workshop on Indigenous Knowledge and Community Based Resource Management was organized by the Canadian MAB Program and the Canadian Environmental Assessment Research Council in Winnipeg, Canada, in September 1991. Indigenous peoples, community workers and specialists from around the World unanimously advocated the development of an international program directed at advancing the theory and practice of traditional ecological knowledge. The results of the workshop provided a framework for the development of the program. Since that time, discussions have been held in Africa, Central and South America and Europe, as well as in Canada and the USA, with many of the organizations and agencies actively involved in this subject.

The following is an outline of the proposal put forward by Unesco Canada MAB for an international program on traditional knowledge and recommendations on its development and implementation. The purpose is to **address the challenge of utilizing both the traditional and the western scientific knowledge systems for managing the environment and resources in a sustainable manner.**

The Canadian Commission for Unesco, in cooperation with the partners mentioned above, is proposing that an international program on TEK be established in partnership with indigenous and non-governmental organizations, governments, external aid organizations, research institutes, labour, business, universities, UN agencies, and other interested groups. Grassroots participation would be facilitated through the sustainable development round tables established around the World through ECO-LINK, the outreach program of ECO-ED (World Congress for Education and Communication on Environment and Development).

A Secretariat would be established in Canada or another host country under the auspices of an international organization such as Unesco. A key component of the structure would be a senior level International Advisory Board with representatives of indigenous and local groups concerned with traditional knowledge. Funding for the program would be sought from participating countries and organizations.

First step initiatives currently underway include the publication of a compendium of recent papers on traditional knowledge research and practice, based on the International Workshop on Indigenous Knowledge and Community-Based Resource Management, the International Common Property Conference, both held in Winnipeg in 1991, and papers commissioned by the World Bank; a **sourcebook** on traditional knowledge as an introduction to the literature on various aspects of the subject; a Unesco Environment and Development Brief, commissioned by Unesco to provide senior policy and decision makers with an understanding of the nature of traditional knowledge, its contemporary significance, the issues which surround it, and the action being taken around the world in addressing these issues; and the establishment of a database of bibliographic references, institutional and individual profiles, descriptions of on going activities, and case studies related to traditional knowledge.

The next proposed step is the establishment of an international TEK Management System (TEKMS) with three main components: research, education and training, and communication. This program should be of interest to **three broad groups of partners: indigenous organizations, research centres interested in TEK, and in indigenous knowledge in general, and governments.** It should, from the very beginning, have strong links with the collaborative efforts of the various national, regional and global IK research centres mentioned earlier.

The arguments put forward by Unesco MAB in favour of Canadian involvement in the international program outlined above are as follows:

- TEKMS has been the subject of a great deal of interest among Canadian governments, NGOs, academics, native organizations and business;
- Canadians are at the leading edge in applying TEKMS in the management of natural resources;
- Canada has been actively supporting the use and application of TEKMS in support of sustainable development; and
- TEKMS will be an integral part of co-management arrangements under land claim settlements and in native managed resource programs.

VI. An International TEK Network: Issues to Consider

As discussed in the report of the ILEIA Workshop on participatory technology development in sustainable agriculture held in April 1988, informal networks constitute an important channel of communication to exchange indigenous knowledge (ILEIA 1989). Before establishing new formal networks, research is needed in mapping existing indigenous networks and understanding their dynamics. Descriptions of the benefits of networking are numerous, and need not be repeated here. But it may be useful to point out that too many information networks function in a top-down manner, with no active participation by the "beneficiaires", and that this type of situation significantly limits their usefulness.

From the point of view of information sciences, some of the first questions to ask when considering the establishment of a network to organize and exchange information on TEK are "who are the clients?" and "for whose benefit?". For an institution such as IDRC, there can be only one response: the indigenous populations must be the main beneficiaries of such a network. This does not mean that one cannot envisage an arrangement whereby western researchers are also users and participants in a network, but fundamental issues related to intellectual property rights and research ethics make it essential that the original owners and keepers of the knowledge retain access to and control over any new forms of organization and dissemination of this knowledge.

Secondly, it is important to determine what the contents of a TEK information network would be. It is a very straightforward thing to create a set of computerized data bases, including bibliographic references to documents about TEK, profiles of individual and institutions working in the field, or case studies of the successful application of TEK (or integration of TEK and western knowledge) to particular situations. But consideration must also be given to methods of collecting, recording and organizing specific indigenous technologies and know-how, such as, for example, local taxonomies, spatial data, etc., in such a way as to be useful not only to the communities providing these data, but to people in other, possibly far-off places. Is it possible to codify TEK and extract it from its socio-cultural context, and to give it a wider relevance? Will data have to be "scientifically" validated before being recorded and disseminated throughout the network? How could such validation take place without destroying the nature of the data? Some of these issues were discussed in the above-mentioned ILEIA workshop, which also discussed questions relating to sharing results and sustaining the process of collecting and disseminating IK (ILEIA 1989).

After addressing the quis and the quid, one has to ask why TEK should be systematized into a network distinct from any other. Is it appropriate to the needs of indigenous people to design a system and network dedicated to TEK, when evidence would tend to indicate that TEK and western knowledge have a complementary role to play in environmental protection and sustainable development? Although aboriginal peoples are sometimes reluctant to accept western science because of what appears to be its fundamental need to control and interfere with nature, and its destructive impact on aboriginal cultures, one cannot afford a possibly important role for the technology of western science, which can provide information that is otherwise unavailable through TEK, such as, for example, the ability to view phenomena at the microscopic level or over large distances.

How a regional or international network on TEK should be set up must also be considered seriously. What would be the place of indigenous people in its conception and management? who would control the technology necessary to operate such a system? If a network is designed purely along Western patterns and constructs, will it be hospitable only to "westernized" indigenous people, and exclude those who contribute the knowledge?

Experience with NGONET in Latin America has demonstrated the feasibility of reasonably priced electronic communication among small organizations sharing similar interests. Such a network might facilitate exchange

of data among indigenous organizations, and facilitate collaboration on research activities and sharing of results, teleconferencing to strategize, etc., assuming that the technology could be mastered without alienating its users.

In order to penetrate the specificity of traditional knowledge, it is necessary to consider the relationship between knowledge and action. Scientific knowledge often has practical applications, but this is not a requirement. Research and action are generally separated in time and space, and are the responsibility of different individuals. The division of labour is fundamental to scientific research, and scientific knowledge lends itself to division into individual components on one hand, and to a high level of abstraction and generalization on the other. Traditional knowledge, on the contrary, is so closely linked to know-how, that researcher, practitioner and inventor are all rolled into one. Indigenous peoples' organizations, along with the geographic mobility of individuals, can serve as catalysts in giving TEK a wider dissemination than was previously the case. The systematization of the phenomenon, through a virtual "globalization" of communities, may be the key to successful networking.

IDRC will be exploring these and other related issues over the next few months, with a view to determining IK - and particularly TEK - research and information priorities. To this end, the Centre has begun a process of consultation with IK scholars, indigenous organizations and other interested parties, in order to gauge the need for a global network on TEK and, if such a network is deemed desirable, on its modus operandi. IDRC is supporting and/or organizing a number of related activities in connection with this initiative. A conference on the conservation of biodiversity in Africa was convened in August 1992 by the National Museums of Kenya. A symposium bringing together approximately 50 researchers from some 20 countries, representing most of the IK research centres mentioned above, is being organized by the International Institute of Rural Reconstruction in the Philippines later this month. In October, a workshop on the potential of information technologies for TEK will take place as a partner event of the ECO-ED congress in Toronto; this workshop is primarily for representatives of indigenous organizations. Feedback from these various consultations and events will contribute to planning future directions and to developing a blueprint for the proposed global network. It is hoped that this network might be launched by mid-1993.

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ANNEX 1

Some Comparisons Between Indigenous Knowledge and Western Scientific Knowledge (Wolfe et al, 1991)

<u>Comparison</u>	<u>Indigenous Knowledge (TEK)</u>	<u>Western Scientific Knowledge</u>
1) Relationship:	Subordinate	Dominant
2) Dominant Mode of thinking:	Intuitive (Holistic)	Analytical (Reductionist)
3) Communication:	Oral (story telling/singing) (subjective) (experiential)	Literate/Didactic (academic) (objective) (positivist)
4) Effectiveness:		
- Data Creation:	Slow/Inconclusive	Fast/Selective
- Prediction:	Short-term Cycles (recognize on-set of long-term cycles)	Short-term Linear (poor/unconsistent long-term analysis)
- Explanation:	Spiritual (the inexplicable)	Scientific Enquiry (hypothesis/laws)
- Biological Classification:	Ecological (inconclusive - internally differentiating)	Genetic and Hierarchal (differentiating)



ANNEX II

ESTABLISHED INDIGENOUS KNOWLEDGE RESOURCE CENTERS

August 10, 1992

1. Center for International Research and Advisory Networks (CIRAN): Drs. G. W. von Liebenstein, Director; Nuffic/CIRAN, P.O. Box 90734, 2509 LB The Hague, The Netherlands (telephone 31-70-3510577; FAX 31-70-3510513).
2. Center for Indigenous Knowledge for Agriculture and Rural Development (CIKARD): Dr. D. Michael Warren, Director; CIKARD, 318 Curtiss Hall, Iowa State University, Ames, Iowa 50011 USA (telephone 515-294-0938; FAX 515-294-1708).
3. Leiden Ethnosystems and Development Program (LEAD): Dr. L. Jan Slikkerveer, Director; LEAD, Institute of Cultural and Social Studies, University of Leiden, P.O. Box 9555, 2300 RB Leiden, The Netherlands (telephone 31-71-273469; FAX 31-71-273619).
4. African Resource Centre for Indigenous Knowledge (ARCIK): Prof. Adedotun Phillips, Director, and Dr. Tunji Titilola, Research Coordinator; ARCIK, Nigerian Institute of Social and Economic Research (NISER), PMB 5 - UI Post Office, Ibadan, Nigeria (FAX 022-416129 or 01-614397).
5. Regional Program for the Promotion of Indigenous Knowledge in Asia (REPPIKA): Dr. Evelyn Mathias-Mundy, Coordinator; REPPIKA, International Institute of Rural Reconstruction (IIRRA), Silang, Cavite, Philippines (telephone 0969-9451; FAX 632-522-24-94).
6. Ghana Resource Centre for Indigenous Knowledge (GHARCIK): Mr. Charles Annor-Frempong, Director; GHARCIK, School of Agriculture, University of Cape Coast, Cape Coast, Ghana (Telex 2552 UCC GH).
7. Indonesian Resource Center for Indigenous Knowledge (INRIK): Prof. Dr. Kusnaka Adimihardja, Director; INRIK, Dept. of Anthropology, University of Padjadjaran, Bandung 40132, Indonesia (FAX 022-431938).
8. Mexican Research, Teaching and Service Network on Indigenous Knowledge (RIDSCA - Red de Investigacion, Docencia y Servicio en Conocimientos Autoctonos): Dr. Antonio Macias-Lopez, Director; Colegio de Postgraduados, CEICADAR, Apartado Postal 1-12, C.P. 72130, Col. La Libertad, Puebla, Pue., Mexico. (Tel. 48-00-88, 48-09-78, 48-05-42).
9. Philippines Resource Center for Indigenous Knowledge and Sustainable Development (PhiRCIKSD): Dr. Rogelio C. Serrano, National Coordinator; Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCAARD), Los Banos, Laguna, Philippines (FAX 63-094-50016; Telex 40860 PARRS PM).

INDIGENOUS KNOWLEDGE RESOURCE CENTERS BEING ESTABLISHED

1. Regional/Sub-Regional Centers: European Resource Center for Indigenous Knowledge, Trans-Andean Resource Center for Indigenous Knowledge.
2. National Centers: Kenya, Benin, Namibia, Zimbabwe, Burkina Faso, South Africa, Tanzania, Costa Rica, Venezuela, Colombia, Peru, Bolivia, Nepal, India, Australia.