The Indigenous Knowledge and Development Monitor is a publication that promotes the exchange of information on indigenous knowledge as it relates to sustainable development. The Monitor is published three times a year and produced by the Centre for International Research and Advisory Networks (CIRAN) in cooperation with the indigenous knowledge resource centres (see page 20).

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Editorial

There are many ways in which sustainable development can be achieved, but this rich ecological and cultural diversity cannot be fully appreciated if we restrict our understanding to formal scientific concepts and methods. Our thinking on development must also proceed from indigenous knowledge systems and practices (IKSP). This is in line with the conclusion of the 1998 World Development Report that in the promotion of economic and social well-being, knowledge is as critical to development as are labour and capital.

Since 1993 Nuffic-CIRAN and the international Indigenous Knowledge and Development network have been active in raising the awareness of scientists, decision makers, educators, and the general public concerning the relevance of indigenous knowledge for development. There are many cases which demonstrate the valuable contribution of IKSP to locally manageable and cost-effective solutions to such problems as income generation, poverty alleviation, and simple survival. The potential contribution of IK to development has gradually been acknowledged by mainstream organizations, such as the World Bank, which launched its own Indigenous Knowledge and Development Initiative in 1998.

We are also witnessing a growing interest in indigenous knowledge on the part of scientists. Today virtually all disciplines call upon the knowledge bases of communities around the world. And these local communities in turn make use of insights drawn from the international knowledge system in their search for solutions to their development problems. This interactive flow of knowledge can reinforce efforts to come up with new paradigms for sustainable development.

In this light, the news that UNESCO professionals Paul de Guchteneire and Douglas Nakashima present in their guest column is heartening indeed. The World conference on Science (Budapest, 26 June - 1 July 1999) recently established priorities for science in the 21st century, one of which is other knowledge systems. This opens the way to an era where there will be room for traditions and new insights that deserve to be taken as seriously as science, and, if proved reliable, to be implemented in the same way.

To concretize these concepts, let us look for a moment at some of the keywords in the field of sustainable development: ‘diversity’, ‘understanding’, ‘indigenous knowledge’, and ‘resource management’. It is significant that these keywords appear in the titles of the four articles in this issue. Authors Erdelen, Adimihardja, Sidik, and Moesdarsono explore biological diversity and advocate an integrated approach aimed at the sustainable use of Indonesia’s twofold wealth. ‘Understanding interactions between indigenous knowledge and scientific information’ is an interesting contribution by Oscar Ortiz from Peru, who presents a typology of cognitive interactions based on his work among potato growers in the Peruvian Andes. The term ‘indigenous knowledge’ also plays a crucial role in the article by Henry P. Huntington and María E. Fernández-Giménez on the application of IK in the Arctic. Resource management is a major issue in all regions where the contribution of indigenous knowledge to sustainable development has been recognized. The Ashanti region of Ghana was selected by authors Hyma and Appiah-Opoku for their research project devoted to indigenous institutions. They show that such institutions are a promising ‘point of entry’ for local solutions designed to ensure sustainable resource management well into the next century.
The Indigenous Knowledge and Development Monitor serves everyone around the world who has an interest in the role that indigenous knowledge (local knowledge, traditional knowledge) plays in participatory approaches to sustainable development. It provides:

- an instrument for the exchange of information;
- a platform for debate on the concept of indigenous knowledge in a variety of disciplines;
- an overview of activities in the field of indigenous knowledge and sustainable development.

The Indigenous Knowledge and Development Monitor has two sections: Articles and Communications. The articles reflect the state of the art of indigenous knowledge (IK) in various policy sectors and disciplines by presenting information on:

- research: studies of indigenous knowledge systems, research methodology, research needs, research results, cooperation in research, and organizational aspects of research;
- theory and practice: the interface of indigenous knowledge and scientific knowledge, and the use of research results in the preparation and implementation of development projects;
- policy: indigenous knowledge as an area of interest and a policy instrument for donors, international organizations, governments, NGOs and development organizations.

The section Communications is divided into sub-sections: Resource Centres; Calls (for information and cooperation, papers, and research proposals); Databases; Networks, International Organizations, Websites; Films and Audio-Visual Devices; Mailing Lists; Conferences (coming and past); Research; and Publications. The major function of this section is to disseminate information, to inform a broader public about various local initiatives and activities, and to stimulate national and international cooperation.

The editorial board of the Monitor is responsible for editorial policy. The editor is responsible for producing the Monitor in accordance with the policies of the editorial board and Nuffic-CIRAN.

**IK Network**

Nuffic-CIRAN produces the Monitor in close cooperation with 36 indigenous knowledge resource centres around the world. The IK resource centres provide a framework for networking. Each centre has a corresponding editor. Similarly, associate corresponding editors are affiliated with organizations that are active in the field of indigenous knowledge. The international IK network consists of some 3000 persons and institutions in 130 countries, that are working in the field of application of local specific knowledge to sustainable development. Those persons who want to play an active role in the international IK network are kindly asked to let CIRAN enter data on their expertise into the database of the network. Those persons who want to play an active role in the international IK network can play a significant role in the production of the Monitor is by peer reviewing articles submitted for publication, when the editor searches the database for specialists in the field concerned. In addition, the editor may approach specialists with the request to review publications that bear relevance to indigenous knowledge and sustainable development.

Presently, the Indigenous Knowledge and Development Monitor has over 3000 subscribers. Thanks to funds provided by Nuffic and the Directorate-General for International Cooperation of the Netherlands’ Ministry of Foreign Affairs, readers living and/or working in the global South receive their copies free of charge.

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**Other Nuffic-CIRAN services to the IK Network are offered via the Internet:**

- IK pages: a gateway to indigenous knowledge on the Internet. The IK-pages systematically present the Internet’s main sources of secondary information regarding indigenous knowledge. But the site does more than this. It also indexes and provides access to primary sources of information through the use of an automatic search engine. http://www.nuffic.nl/ik-pages/
Biodiversity, traditional medicine and the sustainable use of indigenous medicinal plants in Indonesia

Traditional medicine may be seen as a product of the twofold wealth of Indonesia: its biodiversity and its cultural diversity. With a view to maintaining this diversity and ensuring the long-term future of the country’s health care system, Indonesia needs to devise a programme for the sustainable use of medicinal plants. The authors have identified seven urgent needs.

Indonesia is an archipelago comprising some 17,000 islands. Although it covers only 1.3% of the earth’s surface, it contains almost 15% of all higher plants, as well as a significant share of the world’s animal diversity (for details see Mittermeier & Mittermeier 1997). Indonesia is one of the world’s top two megacentres of biodiversity (alongside Brazil). It is also a country of enormous cultural diversity. Among its 210 million inhabitants, there are no fewer than 336 different cultures, speaking over 250 languages (Mittermeier & Mittermeier 1997). The fact that the country is an archipelago has serious implications for the country’s politics, economy and infrastructure. Indonesian governments and non-governmental organizations (NGOs) foster the use of the rich natural resources that are to be found all over the country, in an effort to make it less dependent on imports. For purposes of this article we will focus on the Indonesian flora, specifically those plants which have therapeutic properties.

The Indonesian Country Study on Biodiversity (ICSBD 1993) puts the number of species of flowering plants in Indonesia at between 25,000 and 30,000, while Mittermeier and Mittermeier estimate that there are 37,000 species of higher plants. Some 10% of the total flora of Indonesia is thought to have medicinal value (Schumacher 1996). Some 40 million Indonesians depend directly on biodiversity, and Indonesian communities make use of around 6000 plant species, 1000 animal species and 100 microbe species on a day-to-day basis (State Ministry for Environment 1997; Government of the Republic of Indonesia 1997).

Many plants which are useful for medicinal purposes have been imported, together with details of their use. In some cases this has led to the development of new uses, while formerly unknown species are regularly integrated into traditional Indonesian medical systems.

Traditional medicine in Indonesia

Not surprisingly, there are many different varieties of traditional medicine in Indonesia, all associated to a greater or lesser degree with the different ethnic groups and the historical processes that have shaped this archipelago nation. Among the various patterns are mixtures of older elements (from hunter-gatherer stages) and knowledge gained during the different historical periods. These are not only the influence of Hinduism, Buddhism and Islam, but also that of the colonial era and the period after independence.

The oldest and most widespread system, and the one which is best understood, is the jamu system of herbal medicine. It originated in Java, and probably dates back to the construction of the world-famous Borobudur in the late eighth and early ninth centuries (Jansen 1993). In the course of time, jamu spread not only to the whole island of Java and to neighbouring Bali, but also to many of the other islands. This dissemination was greatly furthered by the policy of resettlement, which dates back to the period of Dutch colonial rule. Under this policy, which was known as ‘colonization’, 200,000 people were moved away from rural Java during the period 1905-1940. After independence in 1945 the scheme was continued, as part of the Indonesian government’s Transmigration Programme. Between 1950 and 1994, upwards of 7 million people left Java and Bali as transmigrants, some 7% of them with government support (see Department of Information 1996). Today, jamu plays a decisive role in national development; it is an important component of national health care and plays a major role in the economy of the rural areas, as one of the authors has outlined in an earlier article in the Monitor (Sidik, ‘The current status of jamu, and suggestions for further research and development’, Indigenous Knowledge and Development Monitor 2(1), April 1994, pp. 13-15).

As a result of the continuous exchange of information between various cultural groups, traditional systems of medicine are not static but dynamic, regularly incorporating new knowledge
Utilization patterns

We will now look at a few examples, which illustrate the complex utilization patterns of medicinal plants in Indonesia. As a rule, people use specific plant species to cure specific diseases. In Kampung Gumpang, Aceh (North Sumatra), the Acehnese use puding hitam (Grapto.phyllum sp.) to cure eye diseases (sakit mata); besi-besi (Justicia gendarussa Burm.f., syn. Gendarussa vulgaris Nees.) for stomach-ache; and rutih or geceh, devil’s tree, dita bark tree (Alstonia scholaris (L.) R.Br.) for malaria. However, a particular plant species may also be utilized to cure different diseases within different ethnic communities in different regions of the country. This is true, for example, of alang-alang, lalang, cotton grass (Imperata cylindrica (L.) Beauv.), one of the most widespread grass species in Indonesia, which is found as high as 3000 m above sea level. Alang-alang grows wild in dry forest, open fields and dry land. The roots of this species are used to cure high blood pressure, fever, cough, and hepatitis. Another example is temu lawak (Curcuma xanthorrhiza Roxb.), used for a wide variety of different diseases (for details see P.T. Eisai Indonesia 1995). A third possibility is that different ethnic groups in different geographic areas, use different plant species for the same disease. For malaria, people in Aceh use rutih or geceh, while in Bengkulu they use medang (Belischmedea madang Blume), and in East Timor idara laut (Strychnos lucida R.Br.). This pattern reflects the geographic variability within the same area (Aceh and Bengkulu are both in Sumatra) and on different islands within Indonesia (Sumatra/Timor). And finally, people also make use of plant mixtures. For instance, people from Seberida, Province Riau (Sumatra) treat large wounds with a mixture of the bark of loban, wild pepper (Vitex trifolia L.), dukuh, langsat (Lansium domesticum Correa) and rambutan, rambutan (Nephelium lappaceum L.). It will be clear that the greater the geographic distance, the more pronounced the differences will be between the systems of traditional medicines and uses. While all the various systems are based on more or less the same plant material, users are limited by what is available in their own locality and the existing knowledge with regard to their use. This has resulted in an interesting series of often complex patterns of use.

Plants used

Considerable scientific research has been devoted to the plants used by indigenous peoples in Indonesia, ranging from Heyne’s classical publication (Heyne 1950) to the recent compilation of the medicinal herbs of Indonesia (P.T. Eisai 1995). Scientists have also repeatedly expressed their concern that many medicinal plants are already endangered and others are likely to become so in the near future. Rifai et al. (1992) listed 29 species of medicinal plants, grouping them according to the IUCN criteria. The majority of the species were considered rare, others were classified as ‘status unknown’, vulnerable, or endangered. Siswoyo et al. (1994) compiled a list of 1260 species of medicinal plants which originated in Indonesian forests. On the basis of an analysis of this study together with our own observations, a number of conclusions can be drawn. First, the majority of rare medicinal plants are trees. Second, most of the rare plants are rain forest species. Third, the potentially endangered species include jamu plants which are still collected from the wild: of the 55 most important species of plants used for jamu, about 25% are still collected from forests. Fourth, highly regarded species like purwoceng (Pimpinella priaslan), which is used as an aphrodisiac, have already become extremely rare or even locally extinct due to over-harvesting of wild populations. Given the commercialization of the jamu system, the importance of traditional herbal medicine in Indonesia, and its role as an export commodity (see Afisdal & Welsch 1991; Sidik 1994; Suhirman & Suhendar 1995), ways must be found to maintain the biological diversity of medicinal plants in Indonesia, while ensuring that the peoples of Indonesia will still be able to make use of their traditional medicines.

Sustainable use

Traditional medicine in Indonesia still relies to a large extent on plant materials taken from the wild. Most of these plants are species typical of more or less undisturbed forest ecosystems. It follows then that the harvesting of these natural resources must be carried out on a sustainable basis, in the interest of the long-term maintenance of the health care system of Indonesia. The most urgent needs can be categorized as follows.

Seven urgent needs

1. Inventory work on medicinal plants must be continued until it has been completed.
2. Information on how exactly these plants are used by traditional societies must be recorded now.
3. Species taken from the wild must be taxonomically identified.
4. The geographic distribution of medicinal plant species indigenous to Indonesia and their habitat requirements must be researched.
5. The wise use of indigenous medicinal plant species in Indonesia must be stimulated, starting with a thorough analysis of the sustainability of the present harvesting pattern.
6. Feasibility studies should be undertaken with a view to lessening impacts on the remaining natural stands of certain valuable species.
7. Designing and implementing monitoring programs for species that will still have to be collected in large quantities from the wild. Monitoring should be based on the principle of ‘adaptive management’ (Walters 1986). It should cover both domestic and international trade in indigenous medicinal plants, in accordance with national and international regulations.

Efforts to sustain and possibly even increase the supply of material used in traditional medicine should be seen in a broader context, including the use of wild plants for other than medicinal purposes. In this way, a broad agenda, action plan or national strategy for conservation and the sustainable utilization of the indigenous medicinal plants of Indonesia can be formulated and implemented. We hope to stimulate interest in such an action plan and find ways to implement it.

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References


Understanding interactions between indigenous knowledge and scientific information

How can indigenous knowledge and scientific knowledge best be integrated, in the interests of sustainable development? The first requirement is to understand the interaction between farmers’ existing knowledge and the new information they need to deal with emerging problems. The author discusses a pest management project in the Peruvian Andes in which a typology of cognitive interactions has been developed, alongside a model for further development.

It has been argued that indigenous knowledge and scientific information should be combined in order to solve emerging problems of a practical nature (Salas 1994; De Walt 1994; De Kruijt et al. 1995). However, little is known about the nature of the interaction between new and pre-existing knowledge among farmers. This article presents a typology of cognitive interactions between indigenous knowledge and scientific information and a model for information interpretation. It is based on analyses of information dissemination among potato farmers in the Peruvian Andes, following the completion of an integrated pest management extension programme.

Potatoes in the Andes

Farmers in the Peruvian Andes have grown potatoes for thousands of years and have succeeded in generating a great diversity of varieties, as well as special cropping techniques designed to cope with the variability of Andean agro-ecosystems. Farmers have traditionally made use of a number of pest control practices, the most important of which is crop rotation (Horton 1987). At present, the major pest problems are caused by the Andean potato weevil (APW) and the potato tuber moth (PTM), resulting in serious crop losses. The specific practices which farmers use to control the APW and the PTM include crop rotation; repellent plants; feeding the larvae to chickens; early harvesting; exposing damaged tubers to sunlight; and the use of chili juice, ash or lime (Rhoades et al. 1988; Ewell et al. 1990 and Ortiz 1997). However, the APW is still a serious source of concern to Andean potato growers (Ortiz et al. 1996).

Extension projects

The International Potato Center (CIP) and the National Research Institute of Peru conducted nearly ten years of basic and applied research into the integrated management of APW and PTM. From the early 1990s on, the findings have been disseminated among farmers (Alcazar et al. 1994; Palacios et al. 1994; Cisneros et al. 1995). Information on integrated pest management (IPM) began to reach Peruvian potato farmers through a number of collaborative projects set up by research and extension organizations (Fano et al. 1996). One of these projects, which involved the CIP and the non-governmental organization CARE-Peru, was designed to enhance farmers’ knowledge and skills with respect to insect reproduction and behaviour, and IPM practices. This project was implemented between 1993 and 1996 and documented by Ortiz (1997). It should be noted that research and extension projects related to IPM still reach only about 5% of potato growers in the Peruvian Andes (Ortiz et al. 1996). Nevertheless, even these preliminary results make it possible to examine the interaction between farmers’ knowledge and scientific information pertaining to insect reproduction and behaviour.

The process

The process described here involves the information flow which takes place when individuals who have certain knowledge are confronted with new information. Once the new information has been interpreted, an interaction takes place between the pre-existing knowledge and the new information. In the case that forms the basis of the present article, this happened when farmers, extension workers and researchers exchanged information during a number of training activities related to potato IPM (Chiri et al. 1996). This resulted in the formation of an agricultural information system (Röling 1990) devoted to potato IPM in Peru. Although cognitive processes are highly complex (Pennington 1986; Malim 1994), four main types of interaction between farmers’ knowledge and scientific information can be identified and are described below (Ortiz 1997).

Formative interaction occurs when new knowledge is formed which, in some cases, replaces the previous beliefs held by the individual. This happened when farmers had access to scientific information about insect biology (see photo). Many farmers had always thought that larvae and adults were different...
Most of them believed that the potato worm (APW larvae) originated in the soil, that plagues were sent from the sky by God, and that worms came from hailstones. Once farmers had access to, and were able to interpret, specific scientific information, new knowledge was formed and they were able to understand how the reproductive cycle of insects functions (Ortiz 1997).

**Modifying interaction** occurs when farmers’ knowledge is slightly adjusted by scientific information, so that farmers are better able to understand the biological principles behind the things they observe. This type of interaction was seen when farmers learned about the reproduction cycle of the potato tuber moth. They were familiar with this moth, as it is commonly found wherever potatoes are stored, and they already had some idea of the reproductive phases of the insect. They were able to identify adults, larvae and pupae, but thought that larvae originated from pupae, while it is actually the other way around. When they were given scientific information, they made a slight adjustment to their knowledge and gained a better understanding of the reproductive cycle of this insect. Another example of knowledge modification involved the practice of using sheets to pile potatoes on at harvest time, which is quite common in the Andes. APW larvae usually come out of tubers during harvest and remain in the sheets. When farmers shook out the sheets, the larvae were able to return to the ground and continue their cycle. Once farmers understood the importance of insect life cycles and the need to interrupt them, larvae were collected and used as food for chickens. In this way a traditional practice was slightly modified as a result of the interaction between farmers’ knowledge and scientific information (Ortiz 1997).

**Reinforcing interaction** occurs when scientific information confirms the farmers’ own knowledge. Reinforced knowledge allows them to feel confident about their own observations and practices. Here, certain practices already known to the farmers were also included in IPM, such as crop rotation, the use of repellent plants, and the use of chickens to get rid of larvae. These practices were better implemented when farmers understood insect reproduction and the need to interrupt insect life cycles (Ortiz 1997).

**Confusing interaction** occurs when there is a conflict between farmers’ knowledge and scientific information. This is often seen when scientific information is presented in an inappropriate manner, or when farmers lack a knowledge of biological principles related to insect behaviour.

**Modelling information interpretation**

I would now like to present a model (Figure 1) designed to simplify the complex cognitive processes by which scientific information about IPM of the potato crop is interpreted by farmers, and the factors that influence that interpretation. Such a model may help us to understand the principles which underly the process, and enable extension workers to design suitable approaches to farmers. There are three groups of factors which influence the interpretation of information.

The first group includes those factors which are related to the quantity, comprehensiveness, and sequence of the information, and the way in which it is presented to farmers. For example, we found that those activities that involved the direct participation of the farmers and the observation of insects in natural settings were usually a better way of acquiring suitable information. They facilitated formative, modifying and reinforcing interactions, while
conventional training activities (such as talks) tended to produce confusing interactions.

The second group of factors influencing information interpretation are related to the presence of key knowledge elements on the farmers’ cognitive map (i.e., everything that is known by a person and retained in his memory). The first possible conclusion from the model is that where there is no appropriate pre-existing knowledge (i.e., about insect biology), new information (i.e., about IPM practices) either cannot be interpreted or is likely to be misinterpreted, resulting in a confusing interaction and the formation of inappropriate knowledge. This scenario was common when farmers who had no knowledge of biological principles were first given information on IPM. A second conclusion from the model concerns the acquisition of a suitable minimum set of cognitive elements designed to help farmers interpret subsequent information and thus acquire appropriate IPM-related knowledge. The farmers’ understanding of natural phenomena generated a positive attitude towards new information. It was possible to change attitudes if the individual had access to new and meaningful information and transformed it into knowledge.

In short, interpretation follows the correct path if pre-existing and/or new knowledge allows individuals to process and understand information. Understanding generates new and appropriate knowledge that provides feedback to another interpretive cycle. Conversely, interpretation follows the wrong path if there is no appropriate pre-existing or newly acquired knowledge that can be used to process new information, leading to incorrect interpretation and confusion.

The third group of factors that influence information interpretation consists of the continuous inputs of external pest-control information which differs from that contained in the new information given to the farmers. In the present case, messages which contradicted IPM (i.e., use of insecticides) tended to cause confusion, interfering with the correct interpretation of IPM information. It is important to remember that scientific information and farmers’ knowledge does not interact in isolation, but rather within the dynamics of knowledge evolution in the farming community, and that there is sometimes conflict and competition between them.

**Challenges and conclusions**

Indigenous knowledge is constantly evolving. Its enrichment will depend on whether it can interact with new types of information, and can be used to solve emerging problems. However, the process by which pre-existing knowledge and new information interact needs to be explored, so that research and extension approaches can be designed to facilitate the acquisition of knowledge by farmers, and counteract the erosion of their prior knowledge.

This article has put forward a classification that may provide an insight into the different forms of interaction between farmers’ knowledge and scientific information pertaining to the use of IPM in the Andes. Identifying forms of interaction and the factors that influence the process of information interpretation may be useful in evaluating extension approaches. Where necessary, they can be adjusted with a view to creating a synthesis between indigenous and scientific knowledge that will be of benefit to decision makers.

To facilitate knowledge formation and the modification and reinforcement of indigenous knowledge, scientific information should reach farmers in an appropriate form. This means that research and extension projects are needed that enhance the farmers’ capacity to deal with pest problems.

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Farmers evaluating potato harvest and sharing information about the results of integrated pest management. Community of Chaquil Alto, Cajamarca, Peru 1996. Photo: Oscar Ortiz

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Indigenous knowledge in the Arctic: a review of research and applications

Indigenous knowledge is the object of increasing attention in the field of Arctic research and policy making. In this article the authors first present an overview of how IK (indigenous knowledge) is being approached in the Arctic, and then indicate ways in which such knowledge might be used in the future, not only for research purposes, but also within the community.

Within the Arctic region there are some two dozen distinct indigenous peoples, whose traditional economies are based on various combinations of reindeer herding, fishing, marine mammal hunting, gathering and terrestrial hunting and trapping (Huntington et al. 1998). The ability of these groups to thrive in a harsh climate depends on a detailed knowledge of their environment, its patterns and anomalies, and the characteristics of the animals and plants they use for food, clothing, and shelter. While such knowledge has also been important in the pursuit of traditional activities, it is now the object of special attention because of its applicability to modern environmental research and management.

Arctic indigenous knowledge was used by explorers like Roald Amundsen, who learned all he could about clothing made from skins, snow shelters, and winter travel from the Inuit he met while sailing the Northwest Passage in 1903-06. From the late 1940s onward, scientists based at the Naval Arctic Research Laboratory in Barrow, Alaska, have gained greatly from interactions with Iñupiaq field assistants (Albert 1988). For the most part these and other contributions of indigenous knowledge have gone unrecorded or have received little notice.

In the 1970s specific indigenous research began in the Arctic, starting in Canada and further developing throughout the North. This was stimulated primarily by the land claims movement in Canada, which led to the establishment and documentation of traditional use areas. These claims were substantiated by extensive mapping of hunting and travel areas and the associated ecological knowledge. These projects produced a wealth of knowledge, and also led to calls by indigenous leaders for a greater say in wildlife management.

In recent years, the number of projects devoted to the documentation and use of indigenous knowledge has increased greatly, but at the same time concerns have been voiced about the appropriateness of such use and its limitations (e.g., Cruikshank 1998). This article focuses on some of the recent research, the attention given to indigenous knowledge, and its applications in the Arctic; it concludes with several observations about the potential for further developments in this area.

Research

The documentation of indigenous knowledge in the Arctic, which began in the 1970s with land-use mapping in Canada, has expanded greatly in intensity and geographic scope in the past ten years. Many projects have dealt with the ecological aspects of indigenous knowledge, focusing either on single species such as beluga whales and caribou, or communities such as the Gwichin of the Northwest Territories (e.g., Ferguson and Messier 1997; McDonald et al. 1997; Gwichin Renewable Resources Board 1998; Huntington et al. 1999; Mymrin et al. 1999).

The first objective of such projects is to document indigenous knowledge, so that it can be disseminated more widely than is possible by traditional oral means. Such knowledge is used by people from outside the community, and also serves as a secondary means of passing on important information to future generations. The projects were also intended to expand the quality and quantity of information available for environmental research and management, in order to ensure that management regulations more accurately reflect local perspectives on wildlife patterns and on the use of local resources. To some extent, the projects also sought to give indigenous peoples a greater voice in decision making and activities affecting their lands and their resources.

The concerns of communities

The increase in the number of studies devoted to indigenous knowledge has been accompanied by concerns within Arctic indigenous communities about their appropriateness. Indigenous knowledge includes far more than observations about the migratory patterns of wildlife; it also touches upon the spiritual dimensions of a person’s relationship with the environment. Many people regard this as something intimate and personal, which should not be discussed with outsiders or revealed in a written document to be circulated outside the community. Just as a beating heart cannot be replaced by an
may be seen as boastful and improper. That one has expert knowledge about an animal must be treated with respect. Claiming or implying those who are humble, who share with others, who treat animals with respect. In addition to the sensitivity of the issue, there is also a purely practical concern: communities become suspicious when they hear about pharmaceutical companies and others using information from tropical peoples to develop, market, and make a profit on new medicines, without sharing those profits with the people who provided the information in the first place. Indigenous leaders are now calling for increased local control of research projects on indigenous knowledge and in some cases, cost-benefit analyses have led to the conclusion that the benefits of research are outweighed by the potential cost. The concept of intellectual property rights as applied to indigenous knowledge remains problematic in the Arctic, although it is being increasingly discussed. The further evolution of the issue will be shaped largely by the outcome of such discussions between indigenous peoples and researchers both inside and outside the Arctic community.

**Government agencies**

Around the Arctic, government agencies and others concerned with environmental management and economic development are increasingly devoting attention to indigenous knowledge. The Arctic Council (a cooperative initiative of the eight Arctic nations) includes as permanent participants four organizations representing indigenous peoples: the Inuit Circumpolar Conference, the Saami Council, the Association of Indigenous Peoples of the North in Russia, and the Aleut International Association. Most of the documents and work plans of the Council and its working groups contain references to indigenous knowledge, and they have sponsored seminars and workshops to promote the understanding and use of indigenous knowledge in environmental protection and sustainable development (Arctic Council 1996). Government agencies also describe indigenous knowledge as an important contributor to the decision-making processes pertaining to wildlife management and environmental impact assessment. That indigenous knowledge is gathered from public testimony at meetings and through original documentation projects. In Alaska, the draft environmental impact statement on the development of the Northstar oil field off the northern coast included extensive sections based on indigenous knowledge about migrating whales and other factors affecting or affected by the presence of oil drilling operations. Despite the increase in attention, however, there remains a significant gap between rhetoric and reality. Information based on Western scientific studies is still frequently regarded as superior, and the time and funds made available for the inclusion of indigenous knowledge are often woefully inadequate.

**Application**

The application of indigenous knowledge is developing in several directions. In the field of environmental impact assessment, the use of indigenous knowledge is less well-developed, but nonetheless recognized as important (Stevenson 1996). The role of indigenous knowledge in local small-scale development in the Arctic remains largely speculative. At a recent conference on sustainable development in the Arctic, many of the recommendations referred to indigenous knowledge, but displayed little understanding of how such knowledge could be incorporated into development planning or implementation (The Northern Review 1998).

For purposes of wildlife and environmental management in Alaska and Canada, cooperative management bodies bring hunters and elders from the community together with scientists and agency managers, in order to discuss research and management issues and priorities. In these contexts, indigenous knowledge can influence decision making through the informed participation of the indigenous representatives. A case in point is the Alaska Eskimo Whaling Commission, one of the first such bodies to be set up. Eskimo whalers told scientists that bowhead whales migrate under sea ice, often travelling far out to sea, which means that population estimates based on whales that could be seen in open water near the shore were inaccurate. The scientists used this knowledge to develop techniques such as tracking whales underwater by means of hydrophones and aerial surveys, in order to estimate the numbers of whales offshore. By improving the ability of scientists to detect the migrating animals, the whalers helped generate a more accurate count of the bowhead population, which in turn enabled them to argue for a higher harvest quota.
A common thread in all the various applications is the striving to base policy decisions on indigenous knowledge, whether for setting harvest quotas and areas, determining acceptable impacts and mitigation measures for industrial activities, or identifying appropriate and viable economic opportunities for small communities. While indigenous knowledge is often portrayed as an essential factor in making such decisions, the precise ways in which such knowledge is used and weighed against other factors remains unclear. Often indigenous knowledge is dismissed because of lack of external validation, or the fact that it has little direct relevance to the question at hand. By requiring that indigenous knowledge be shaped to fit the often narrow parameters of a particular decision, government agencies and others may be ignoring the need for a wider appraisal of the issue.

**Conclusions**

The use of indigenous knowledge in the Arctic is growing rapidly, though not without a degree of controversy and opposition. Its use in the future will depend in part on the ability of indigenous communities to determine how it is to be used and by whom. Limiting its use will limit its influence, but allowing access to all aspects of indigenous knowledge will reduce local control and trespass on the intimate and personal relationship between many indigenous people and their environment. The use of indigenous knowledge also depends on whether government agencies, scientists, and industry are willing, or can be persuaded, to give appropriate weight to such knowledge and to provide the time, funding, and opportunity to gather such knowledge and present it in an appropriate way to those involved in decision making.

In the long term the use of indigenous knowledge in the Arctic will depend on its continued existence. Will residents of Arctic communities retain the detailed understanding of the local environment that they have built up over countless generations? Today, younger generations spend less time on the land and are less dependent on its resources; as a result they have less opportunity to learn from their elders and less incentive to do so. The loss of indigenous languages compounds the problem, as specialized terms disappear and a literal language barrier makes it difficult for elders and young people to talk to each other.

While perpetuating the use and transmission of indigenous knowledge depends on the members of the indigenous communities themselves, they can be helped or hindered by official attitudes and actions. If it is regarded as an important source of accurate information and a cornerstone of community development, indigenous communities will continue to regard it as a vital resource, well worth preserving for the benefit of future generations.

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McDonald, Miriam, Lucassie Arragutainaq, Zack Novalinga (1997) Voices from the bay: traditional ecological knowledge of Inuit and Cree in the Hudson Bay bioregion, Ottawa: Canadian Arctic Resources Committee and Environmental Committee of the Municipality of Sanikiluaq.


Indigenous institutions and resource management in Ghana

This article examines the nature of indigenous institutions in the Ashanti region of Ghana. It explores beliefs and practices pertaining to resource management, and concludes that these provide a framework for successful resource management in much of the developing world.

Natural resource and environmental management policies in developing countries are increasingly mimicking Western models, while the contribution of indigenous cultures and institutions is often overlooked (Amanor 1994; Appiah-Opoku 1997). It is argued here that indigenous institutions can serve as points of entry to the search for local options and broad-based approaches to the management of natural resources. Indigenous institutions represent established local systems of authority and other phenomena derived from the sociocultural and historical processes of a given society. They originate from local cultures, have firm roots in the past, and are variously referred to as informal, pre-existing, or native institutions (Matowanyinka 1991; Appiah-Opoku & Mulamoottil 1997). They are often found at the local or community level, reflecting the knowledge and experiences of the local people.

In contrast, non-indigenous or formal institutions are established via forces external to a given community, and are characterized by functional and structural arrangements that are fairly standard. They reflect a specific image of development followed by Western countries since the industrial revolution (Uphoff 1992; Giarelli 1996; Appiah-Opoku 1997).

According to Apter (1968), the nature and organization of indigenous institutions revolve around three principles: behavioral alternatives; goal orientation; and social norms (see Table 1).

Environmental ethics and practices in indigenous societies are often rooted in these abstract principles.

Study area

Ghana is located on the Atlantic coast of West Africa and is bordered by Ivory Coast to the west, Togo to the east, and Burkina Faso to the north. The first recorded European contact with the people of Ghana occurred in 1553, and at different times in the course of the next three centuries the English, Danes, Dutch, Germans, and Portuguese all controlled various parts of the coast. In 1844 a bond between the British government and certain traditional chiefs gave the British jurisdiction over the coastal area of the country. In 1901 Britain assumed full responsibility for governing the hinterland, then occupied mainly by the Ashantis. British rule was marked by the gradual development of both formal and indigenous institutions in Ghana, and much of the old is still present in the country’s modern administrative set-up.

The study focused on the Ashanti region, since the culture and lifestyle of the Ashantis are typical of all Akans, who form the largest ethnic group in Ghana. Other considerations included the following:

- The people of Ashanti have managed to retain much of their original culture.
- Historical records on indigenous institutions in the region were easily available.
- The researcher was brought up in the region and is familiar with the local dialect.

Research

The objectives of the research were to identify indigenous institutions and their key characteristics, and to explore indigenous beliefs and practices pertaining to resource management.

A random sampling technique (Babbie 1990) was used to select six districts in Ashanti, where interviews were subsequently conducted. With the help of research assistants, a list of 304 potential key informants in 20 randomly selected small towns, villages, and hamlets was compiled, using census data, local tax records, and the ‘snowball technique’. In the end only 160 key informants were selected. The other individuals were not interviewed for various reasons, ranging from unavailability during repeated calls to unwillingness to participate in the survey. For instance, some traditional healers were not prepared to divulge information about their healing practices to the interviewers. In addition, some traditional priests and priestesses needed permission from their deities or gods, which in most cases was not granted.
Findings

Indigenous institutions in Ashanti fall into the following five categories: social, religious, political, judicial, and economic. These institutions are organized on the basis of traditional roles and systems of authority, and legitimized in such structures as family, chieftancy hierarchy, village council, and native or indigenous court systems (see Table 2).

Table 2. Summary of findings: key characteristics of indigenous institutions

<table>
<thead>
<tr>
<th>Category of indigenous institution</th>
<th>Type of institution</th>
<th>Key characteristics</th>
</tr>
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| Social institutions                | Kinship, clan, family and land tenure systems | • Network of relationships extend to the dead, unborn, and totems  
• Emphasize collective decision-making  
• Communal ownership of land |
| Religious institutions             | Ancestral worship, divinity and deities or gods | • Permeate all aspects of life  
• Form the basis of morality  
• Dictate code of conduct |
| Political institutions             | Chieftancy system at the family, community, village, town & paramountcy levels | • Hierarchical levels of authority  
• Custodians of lands  
• Transactive decision making |
| Judicial institutions              | Native court system at family, community, village, town & paramountcy levels | • Settle internal disputes and litigations  
• Guided by precedents and wisdom of elders |
| Economic institutions              | Indigenous healing, farming and hunting, wood carving, blacksmithing, pottery, weaving, and wine tapping | • Rooted in local culture and social values  
• Experiential knowledge  
• Have appropriate technologies for primary resource utilization  
• Uphold holistic view of nature |

*These are indigenous occupations within indigenous institutions.

Table 3. Summary of findings: indigenous beliefs and practices

<table>
<thead>
<tr>
<th>Indigenous beliefs</th>
<th>Indigenous beliefs</th>
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| • The earth has a power of its own which is helpful if propitiated or appeased, and harmful if abused or neglected  
• Ancestors are spirits who constantly observe the behaviour of the living,  
• Ancestors reward those who act in accordance with societal values and punish those who exhibit deviant behaviours  
• Spirits dwell in such natural resources as rivers, lakes, seas, rocks, hills and in certain (rare) animals  
• Every creature is endowed with a soul which survives after death  
• Certain animal and plant species have vindictive souls | • There is great respect for the earth  
Farming activities are suspended on sacred days  
Elders are respected and their age and experiential knowledge are recognized  
In the case of game, a taboo rests on nursing young ones, mating or drinking from a stream  
Farming along river banks is a taboo  
Fish from River Bafo are not eaten by inhabitants of villages upstream |

The study revealed several indigenous beliefs and practices that contribute to resource management. The earth and large bodies of water are regarded as sacred. For instance, the sacredness of Lake Bosumtwi near Kuntanase village means that no human waste may be deposited in it. Tradition forbids the use of boats on the lake. Instead, fishermen use flat boards, rafts, or pieces of wood (see photo, p. 15). In certain portions of the lake, fishing is forbidden altogether, while in July and August, when the spirit of the lake is believed to be resting, no fishing is allowed.

A number of local taboos and prohibitions are related to practices believed to defile the earth (see Table 3). There are also rituals to seek permission from the spirit of the earth to dig a grave for the dead. The general belief is that failure to honor the spirit of the earth or acknowledge its magnanimity in this way, may provoke anger and vengeance in the form of natural calamities such as famine, excessive rainfall, or death.

Discussion

No matter how much Western science has to offer, the knowledge in greatest demand in natural resource management is that which reconnects human beings to the biosphere and its bioregions, incorporating respect and implicit socio-cultural, moral, and spiritual expressions (Tyler 1993; Appiah-Opoku & Mulamoottil 1997). In this sense, indigenous institutions in Ashanti have much to offer. Their philosophy of life is aimed at the perpetuation of all objects, both animate and inanimate. Their collective environmental wisdom and ethics are expressed through religious beliefs and a range of sacred and cultural practices. For instance, the belief that the earth has a power of its own which is helpful if propitiated and harmful if neglected, is a powerful moral sanction against the wanton destruction of natural resources in Ashanti region. The constant reminder of the good deeds of ancestors acts as a spur to good conduct on the part of the living. Similarly, the belief that lesser gods or spirits dwell in such natural resources as lakes, seas, rocks, trees, hills and certain animals is tantamount to attaching intrinsic value to all objects—animate and inanimate. According to Desjardin (1993), many of the environmental concerns of the Western world are also rooted in the intrinsic value of nature. For instance, wilderness areas and scenic landscapes are valued by many people in the West because of the symbolic, aesthetic and cultural values attached to these areas.

There are other indigenous beliefs and practices in Ashanti designed to prevent the exhaustion of resources, and give them time to recover from exploitative pressures. At Akyeremade village near Ejsu, fish from the River Bafo is not eaten by inhabitants of the village, although no such prohibition applies in the villages downstream. A scientific explanation is put forward by Gause (1969), who shows that the disappearance of prey can be effectively countered by providing an area inaccessible to the predator, where the prey can maintain a minimal population. In effect, just such an experimental area exists on portions of Lake Bosumtwi where fishing is totally forbidden.

The indigenous restrictions on resource-use parallel scientific prescriptions. For instance, just as certain methods of fishing are traditionally forbidden on Lake Bosumtwi, developed countries such as Canada and the United States have regulations governing overly efficient fishing gear.
And just as in Ashanti indigenous beliefs and practices protect nursing animals and forests alongside riverbanks, there are scientific regulations for keeping forest areas such as national parks and watersheds free from human interference.

**Policy implications**

Indigenous institutions possess a framework of ideas, guiding principles, and institutional foundation that can serve as entry points in the search for local options and broad-based resource management initiatives in Ghana and much of the developing world.

However, there are constraints on indigenous institutions, including the difficulty of altering entrenched attitudes, and the rapid and continuing loss of indigenous belief systems and practices, due in part to the spread of a global consumer culture, and the effects of Western education on younger generations. In addition, in communities where Christianity has taken a strong hold, the worship of nature is discouraged, often resulting in the loss of traditional beliefs. In urban settlements in Ashanti, Western culture seems to have subverted indigenous practices, so that the people no longer have the same sense of community as their counterparts in rural areas (Anderson 1996).

Although indigenous institutions have suffered and continue to suffer some erosion, this does not necessarily render them outdated (Howes 1980; Adugna 1996; Appiah-Opoku 1997). Cultures advance on the basis of new experiences (Banuri & Marglin 1993). Thus, far from being anachronisms in today's world, indigenous institutions have much to offer contemporary policy makers searching for a bottom-up approach to resource management.

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**References**


Terracing with the aid of ‘gravity flow’

In the July 1999 issue of ‘Focus on:’ we presented an example of innovation in soil and water conservation devised in Ethiopia. As we promised then, this ‘Focus on:’ features a local innovation that also makes use of gravity and water flow, this time in the Philippines. After describing this practice, the author examines the concept of innovation itself. She concludes that not only is innovation a useful means of resource management, it also enables farmers to maintain the dynamics of farming.

In 1995 I conducted research on the environmental and farm-related knowledge of Kankanae farmers in Benguet province, Philippines. It was there that I came across a remarkable innovation in soil conservation and improvement that I would like to share. Benguet is a province in Northern Luzon. Its year-round climate is cool, and its topography is characterized by plateaus and mountains with slopes of over 50%. Only 10% of the total land area is utilized for agricultural purposes; the rest consists of grasslands and woodlands. Benguet is populated by two major ethnic groupings, the Ibaloi and the Kankanaeys. Roughly speaking, the Ibaloi occupy the southern part of the province and the Kankanaeys the northern part. Most Kankanaeys are engaged in farming, mainly vegetables crops.

**Terracing in the Philippines**

In the Philippines, terracing is a traditional conservation measure which farmers employ to prevent continuous soil erosion, particularly in steep areas. Thus in Benguet province, with its steep slopes and shallow soils, terracing is one of the techniques used to transform a terrain that is unsuitable for farming into productive land. Some old farmers I spoke with pointed out that terracing is nothing new. Their forefathers probably learned the technique from the people of neighboring Ifugao province, the site of the Banawe rice terraces, one of the seven wonders of the world. Using the simplest of tools, the incredibly steep, rocky mountains have been transformed into rice fields which rise like stairways to the sky.

**Terracing by means of gravity flow**

One of the farmers told me about the use of the gravity flow of water to construct terraces in steep areas which are not accessible to transport services of any kind. I learned from him that constructing a terrace requires not only labour but also special materials, such as stones or specific kinds of earth known locally as linsang. These are hard soils which have been compacted by the roots of various grasses and are used as an alternative for stones. The farmer told me that he did not have the financial resources to hire workers to help him move these materials, and this is why he resorted to what he said was an age-old method for constructing a terrace.

The first thing he does is to select an area which is close to a river or creek. Then he removes and puts aside the surface soils, which will later be used as filling materials. Then a channel is dug to divert the water from the river or creek in the direction of the site where the terrace is to be constructed. Instead of hiring workers or employing special tools, the farmer uses the gravity flow of the water to transport stones, debris and soil from the source to the terrace site, until sufficient material has been accumulated to construct the terrace. The terrace is then walled and the bed is flattened, after which the top soils, which are regarded as quite fertile, are put back on the bed of the new terrace. The farmer indicated that this technique is employed during periods when there is an abundant supply of water, and that this is almost always the case in sloping areas. It also became clear that the technique is laborious and time-consuming, and that it sometimes takes as long as a month to finish one terrace. In walling the terrace, most farmers prefer to use stones rather than earth, because they provide more stability. However, stones are becoming scarce in the area, and it costs too much to transport them from other areas. This means that Kankanae farmers have no choice but to use earth material. To increase the stability of the wall, pieces of stone or compacted earth are arranged one on top of the other in overlapping layers. This is done in order to avoid gaps in the wall, which could let in water, weakening the wall and even leading to the collapse of the entire terrace.

**Comparison with the devil’s tie**

I would now like to compare the two techniques: the Ethiopian devil’s tie as described in the July 1999 issue of this Monitor (IK&DM 7(2), pages 14-15) and the use of the gravity flow of water in constructing terraces. There are clear parallels between them: both innovations employ the power of water from the river in combination with stones, as a way of making farming possible in areas where it would otherwise be unthinkable. In the case of the devil’s tie, the force of water is used to transport soils from the river or other source in order to reclaim land; in the Philippines, the force of the water is used in the construction of a terrace. Both innovations are the result of the creativity of farmers, who have found ways to protect their soils from erosion and create new farmland. Moreover, both use the river as a resource in achieving their objectives.

As regards the differences between the two techniques, the devil’s tie is intended to control or divert water and soil from the river in order to reclaim land. The farmer told me that he did not have the financial resources to hire workers to help him move these materials, and this is why he resorted to what he said was an age-old method for constructing a terrace.

The first thing he does is to select an area which is close to a river or creek. Then he removes and puts aside the surface soils, which will later be used as filling materials. Then a channel is dug to divert the water from the river or creek in the direction of the site where the terrace is to be constructed. Instead of hiring workers or employing special tools, the farmer uses the gravity flow of the water to transport stones, debris and soil from the source to the terrace site, until sufficient material has been accumulated to construct the terrace. The terrace is then walled and the bed is flattened, after which the top soils, which are regarded as quite fertile, are put back on the bed of the new terrace. The farmer indicated that this technique is employed during periods when there is an abundant supply of water, and that this is almost always the case in sloping areas. It also became clear that the technique is laborious and time-consuming, and that it sometimes takes as long as a month to finish one terrace. In walling the terrace, most farmers prefer to use stones rather than earth, because they provide more stability. However, stones are becoming scarce in the area, and it costs too much to transport them from other areas. This means that Kankanae farmers have no choice but to use earth material. To increase the stability of the wall, pieces of stone or compacted earth are arranged one on top of the other in overlapping layers. This is done in order to avoid gaps in the wall, which could let in water, weakening the wall and even leading to the collapse of the entire terrace.

In the case of the farmers in the Philippines, while water is also diverted in order to transport stones, soils and other debris, the difference is that a permanent wall is then constructed. This prevents the collapse of the terrace and ensures that the soils on the terrace bed can be used for cultivation. No land is reclaimed from the river, but the sloping land is converted into a form that permits cultivation.

Another major difference has to do with the extent to which the practices have been adopted by local farmers. The devil’s tie is used wherever farmers are confronted with the problem encountered by Ato Johannes. By contrast, the technique of terracing using the gravity flow of water is much less popular among the people of Benguet province, because it is laborious.
and it takes time to complete the entire process. Moreover, it can only be used in areas close to a river or creek. The fact that there are other alternatives makes the technique even less popular among farmers.

**Why innovation?**

An innovation is a novelty that is translated into a new method, practice, service, process or system which changes the established way of doing things. It is the product of creativity, triggered by the need to solve a particular issue or problem. Farming is a highly dynamic enterprise that requires constant monitoring, and yet farmers all over the world have been able to deal with and adjust to their complex environment. They have to be innovative in order to adapt to the dynamic nature of the farming enterprise, and make the most of the resources available to them.

We may therefore say that when faced with difficulties in implementing their activities, farmers try to innovate or adopt existing innovations, depending on the available resources. This means that the resources which farmers have at their disposal are a major determinant of their behaviour, and that innovation is an important tool in resource management.

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*The water flowing from the river to the terrace.*
*Photo: Maria Corazon Y. Mendoza*
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CIKO recently completed a project entitled *Education of local communities and indigenous people of Cameroon on the risks of biotechnology*. The abstract of the project proposal is reproduced here.

The purpose of this project is to raise the awareness of the rural inhabitants and indigenous people of Cameroon regarding the existing and potential risks of biotechnology, without depriving them of the benefits of modern biotechnology or of the progressive aspects of their indigenous practices. Today, genetically engineered crops have found their way from local research centres to rural farms in our target provinces. In addition, imported items including engineered grains, fertilizers and herbicides pose real danger to our uninformed and largely illiterate rural inhabitants. Our project will address these issues. For a start, it will be carried out in target villages in the Northwest and West Provinces of Cameroon, and will utilize a combination of workshops, seminars and popular theater to train as well as raise the awareness of opinion leaders, traditional authorities and leaders of civil society. Popular theater, songs and sketches will target the general rural population. In each project village, we will select and train local dramatists whom we shall use in the training and sensitization exercises, which will last twenty days. The project will be carried out by five experts of the Cameroon Indigenous Knowledge Organization: a rural sociologist, an agronomist, an institutional analyst, a dramatist and an anthropologist. Since the bulk of the farming in the rural areas is carried by women, we will ensure that at least half of the trainees will be women.

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Participants were drawn from the USA, ARCIK was established to serve three which is unique to particular African indigenous knowledge. Indigenous producing documentation on Africa's conducting multidisciplinary research and ARCIK was established in 1991 as the activities which he sent to the editor. Olu Ajakaiye. The following is a summary Nigeria, has a new director: Professor D. The African Resource Centre for Indigenous knowledge. African Resource Centre for Indigenous Knowledge (ARCIK) in Ibadan, Nigeria, has a new director: Professor D. Olu Ajakaiye. The following is a summary of 1999, was called Practicing conflict management and resolution in Africa. It was organized in collaboration with United States Information Agency for the purpose of discussing the peaceful resolution of conflicts in Africa. Participants were drawn from the USA, Ghana, and other countries. ARCIK has already published several books, including Indigenous knowledge systems and practices: Case studies from Nigeria, by A.O. Phillips and S.O. Titilola; and Annotated bibliographies on indigenous knowledge, by ARCIK, NISER.

ARCIK maintains links with IK resource centres inside and outside Africa. These include the Nigerian Centre for Indigenous Knowledge (NIRCIK) at Ahmadu Bello University, Zaria; the Cameroon Indigenous Knowledge Organisation (CIKO), Buea, South West Province; the Ghana Resource Centre for Indigenous Knowledge (GHARCIK) at the School of Agriculture, University of Cape Coast; and the popular Centre for Indigenous Knowledge and Rural Development (CIKARD) in Iowa (USA). These links enhance the free flow of ideas about IK, and help to provide universal access to African IK. Since 1993 ARCIK and several Nigerian universities and polytechnics have exchanged information for purposes of research and training with three higher education institutions in Iowa (USA): the University of Iowa, the University of Northern Iowa, and De Moines Area Community College. Through these links, ARCIK has increased its contacts with the world.

ARCIK in the future will continue its primary role of research and the retrieval, storage and documentation of IK pertaining to the social, economic, political, cultural and technological aspects of life of African societies. Specifically, ARCIK will put new energy into its research activities so that it can more quickly feed other IK centres with information on IK in Africa. In order to facilitate its activities, ARCIK has mounted a programme to improve its use of printed and electronic media. This will enable the Centre to benefit more from international cooperation and globalization, for example by acquiring greater access to IK resources around the world. ARCIK will do what it can to help create a sustainable information society in Africa, and thus to reverse the situation that leaves Africa a perpetual observer of the information highway. The centre is preparing to take part in the World conference on Communication and information scheduled for 2002-2003 as part of the NATCOM-UNESCO programme. Through its various activities ARCIK will also help to establish the social-science information and communication network for West Africa which was proposed to UNESCO and approved in 1993. Right now ARCIK is concentrating on improving its own ICT facilities by the year 2000.

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The Centre for Indigenous Knowledge (CIKFAB) reports that Sierra Leone has been in a state of war, with rebel factions within the country, for the past nine years. The situation has greatly affected the functioning and activities of the Centre, as it has made it impossible for CIKFAB to collect information relating to indigenous knowledge and practices, especially in rural areas. However, with peace almost at hand in Sierra Leone, the Centre hopes to get back to work soon. 'We at the Centre are very anxious to resume activities and to promote indigenous knowledge and practices in the country,' says CIKFAB director Dr Dominic T. Ashley. Dr Ashley has submitted a paper for publication in the Indigenous Knowledge and Development Monitor. It deals with the need for government and non-government agricultural officers to recognize the importance and value of indigenous knowledge and practices.

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Bangladesh Resource Centre for Indigenous Knowledge (BARCIK) has been engaged in a number of activities over the past four months (July-October 1999). On 11 September BARCIK held a local workshop in Rajshahi on Indigenous knowledge and sustainable development. The aims were to share experiences relating to the status of indigenous knowledge (IK) in various sectors of rural development, to strengthen team activities at local level, and to enable participants to adopt shared strategies for the collection, documentation and dissemination of IK. The 48 participants included researchers, academics, development workers and practitioners. They discussed the subjects of the presentations:

- 'IK and sustainable development: the role of BARCIK'
- 'Irrigation management systems of the Barind Project', by S.M. Abdul Mannan of Barind Multipurpose Development Authority
- 'Importance of aquaculture for sustainable development of the rural economy of Bangladesh', by Mr Goal Azam Khan (former Project Director, Department of Fisheries)
- 'Adivasi culture and IK: a relative thought', by M.A. Latif, of Partner (a local NGO)
- 'Farmer's IK: lessons from the LIFE project', by Rakibul Hasan, of the CARE-LIFE project
- 'Rural communities and traditional medicine', by Md. Mohiuddin, of SACHETAN (a local organization)
- 'Aqua neem to prevent mosquito', by SKL. Mohammed Lalun, of Rajshahi NISKRITY (a local organization)
- 'A comparative study on cultivation of HYV and local varieties of potato', by Mr Feroz Hossain, of Rural Development Academy (a government institution)
- 'Status of existing husbandry practices for dairy cattle in the northern part of Bangladesh', by Samir Kumar Sarker, of Rural Development Academy
- 'Collection of farmers’ knowledge from a village', by Dr Mohammed Shahjahan, of Bangladesh Agricultural Research Institute (a government organization).

BARCIK is compiling a report on the workshop for dissemination to the participants and others. BARCIK will hold another five local workshops in October and November 1999. These are sponsored by the UMVERTEILEN Asia Group, Germany.

The findings and recommendations of the local workshops will be presented at the second national workshop BARCIK is organizing for the first week of December, 1999 (see the information under Conferences, p. 29).

BARCIK has published a new issue of its quarterly journal Grassroots Voice. Each issue contains a wealth of information on IK in Bangladesh and the South Asian region. The most recent issue features ten articles, including one by Dr Mahfuzul Haque, of the Sustainable Environment Management Programme of Ministry of Environment and Forest, on 'Indigenous knowledge and practices in disaster management in Bangladesh', and an article on 'Rain water harvesting: a cost-effective alternative water option', by Dr Abul Hasnat Milton, Zillur Rahman, and S.M.A Rashid, of NGO FORUM. BARCIK welcomes local and international subscribers to Grassroots Voice and invites readers to contact the Centre for information about subscriptions and sponsorship of the publication. The annual subscription rate is Taka 200 for local subscribers and USD 20 for foreign subscribers.

BARCIK is developing a training manual on IK and sustainable development, and intends also to build up a regional team of trainers. The aim of this double initiative is to make the field-level staff of NGOs more aware of the practical use of IK and to encourage its inclusion in development practice and resource management. The manual will suggest practical ways in which indigenous knowledge can be used to help organizations achieve sustainable and appropriate development. BARCIK is now identifying useful manuals and indigenous materials from various sources at home and abroad. Readers of the Indigenous Knowledge and Development Monitor are asked to support BARCIK’s effort by sending information or copies of relevant materials and publications.

India

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E-mail: cariks@bgl.vsnl.net.in

http://iias.leidenuniv.nl/host/ccris/cariks/htm

CIKIB
Centre for Indigenous Knowledge on Indian Bioresources
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Fax: +91-522-282 849.

The July issue of the Monitor reported that CIKIB director Dr S.K. Jain had been selected by the Society for Economic Botany in the United States to receive the coveted Distinguished Economic Botanist award for 1999. This meant delivering an important lecture in August at the international botanical conference in St. Louis. Unfortunately, an accident made this impossible. Soon after Dr Jain arrived in the United States, he fell and broke his leg. He was in hospital during the conference, following an operation on his leg. It took two months before he could return to Lucknow, where he continues to recover from the mishap.

CIKIHR
Centre for Indigenous Knowledge of Indian Herbal Resources
Dr N.C. Shah, Coordinator
Dr A.S. Bhadauria, Correspondent
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Indonesia

INRIK
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http://www.melsa.net.id/~inrik

On 16 June 1999 the Indonesian Resource Centre for Indigenous Knowledge (INRIK) at Padjadjaran University held a large, open meeting attended by some 150 persons, including representatives of government
and non-government organizations, scientists, researchers, university students, and local practitioners. The meeting was comprised of two main activities. First, a new book was launched, Petani: merajut tradisi dalam era globalisasi (Farmers: weaving tradition into practice in an era of globalization). Second, a workshop examined the issue of environmentally friendly, sustainable agriculture.

The meeting was opened by the vice chancellor of Padjadjaran University. The keynote speaker at the workshop was Ir Nelson Hutabarat, of the Ministry of Agriculture. The book, edited by Professor Kusnaka Adimihardja, is a compilation of papers written by researchers and agricultural practitioners working in Indonesia. The other contributors are Drs Bagong Sunyoto (Yayasan Pertanian dan Pembangunan Berkelanjutan / YaPOPB); Dr Bustami Rachman (lecturer, Jember University); Dra Savitri Dyah WIKR, M.A., and Dra Carolina, MSc. (researcher, Indonesian Institute for Science); Dr Herwasono Soedjito, (researcher, Herbarium Bogoriense), MSc.; Drs I Made Legawa, MS., (lecturer, Mahasarawati University); Professor Indra Wuryatno, S.U., (lecturer, Sebela Maret University); Dr Sulaiman Mamur (lecturer, University of Tadulako); and Dr Tunita T. Winarto, MSc., (lecturer, FISIP University of Indonesia).

INRIK at Padjadjaran University is currently working on a project entitled Medicinal plants in Kasepuhan, Halimun. The project is sponsored by CUSO-Indonesia. There is also collaboration with two partners:

- Together with PEMDA Kotamadya Bandung, KODAM III Sililwangi, PKK Kotamadya Bandung and Jurusan Biologi FMIPA UNPAD, INRIK is preparing a project in Bandung called Bio intensive gardening (BIG), with a pilot project in Kelurahan Jamika.
- With Yayasan Pertanian dan Pembangunan Berkelanjutan (YaPOPB), in Jakarta, INRIK is planning a project to study and document the local knowledge and local agricultural technology of the Kisam people in South Sumatra. INRIK and YaPOPB would welcome enquiries from partners who might be interested in helping to realize this activity.

**Philippines**

**PHIRCSDKI**

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**REPPKIA**

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**SLARKIK**

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**Sri Lanka**

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**EUROPE**

**Georgia**

**GERCİK**

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**GREECE**

**ELLRIK**

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**The Netherlands**

**CIRAN**

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http://www.nuffic.nl/ciran/index.html

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**CIRAN**

Through its INDISCO programme, the International Labour Organization (ILO) is establishing community-based indigenous-
Demonstrations of ‘Distance learning’, ‘Indigenous knowledge for development’, ‘ICTs and access in Africa’, and ‘Sector knowledge and statistical capacity-building’. Since Nuffic-CIRAN was one of the partners in the original Indigenous Knowledge and Development Initiative, the ‘Knowledge Partnerships for Africa’ kiosk offered Mr Von Liebenstein the opportunity to present information about the IK and Development Network.

On his way back to the Netherlands, Mr Von Liebenstein stopped in New York for a courtesy call on Mr Hans d’Orville, director of the IT for Development programme, which is part of the United Nations Development Programme (UNDP). He informed Mr d’Orville about how Nuffic-CIRAN and the World Bank (Knowledge Management and Learning Centre, Africa Region) are together organizing a special event on indigenous knowledge for the second Global Knowledge for Development Conference (GKDI), which will be held in Kuala Lumpur (Malaysia) in March 2000 (see the July 1999 issue of IKDM, p. 20). The IK event will be in the ‘empowerment’ section of the international GKDI conference. UNDP is responsible for this theme. Mr Von Liebenstein also met with Ms Caitlin Wiesen, UNDP manager of the Civil Society, Organizations and Participation Programme. They explored possibilities for cooperation with UNDP’s Bureau for Development Policy. On 13-14 October 1999, Nuffic-CIRAN was represented at the Dare to Share Fair held at the Ministry of Foreign Affairs in The Hague (the Netherlands). The keywords at the fair were ‘participatory and community approaches’, and the focus was on rural development and rural renewal. Because indigenous knowledge is at the heart of participatory approaches, Nuffic-CIRAN used the occasion to present the IK and Development Network with the help of a kiosk and a poster presentation entitled ‘Sharing Indigenous Knowledge’. The fair was opened by the Dutch Minister for Development Co-operation, Ms Eveline Herfkens. The fair and its associated workshops attracted many visitors, including his Royal Highness, Prince Claus of the Netherlands.

Thanks to an extra grant from Nuffic-CIRAN was able to publish a limited, non-commercial edition of Best Demonstrations of ‘Distance learning’, ‘Indigenous knowledge for development’, ‘ICTs and access in Africa’, and ‘Sector knowledge and statistical capacity-building’. Since Nuffic-CIRAN was one of the partners in the original Indigenous Knowledge and Development Initiative, the ‘Knowledge Partnerships for Africa’ kiosk offered Mr Von Liebenstein the opportunity to present information about the IK and Development Network.

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Thanks to an extra grant from Nuffic-CIRAN was able to publish a limited, non-commercial edition of Best Practices on Indigenous Knowledge. As readers will know, this joint initiative of Nuffic-CIRAN and UNESCO’s MOST programme is an online database at http://www.unesco.org/most/bpk/pub.htm.

The printed version has been sent to all contributors and distributed among the IK and Development Network. For more information about this publication, see p. 36.)
CEDESUR, P.O. Box 20.201
Sayago, Montevideo 12.900, Uruguay
Tel./fax: +59-82-308 1603.
E-mail: phegedus@adinet.com.uy

Please note the correct e-mail address to reach the Uruguayan Resource Centre for Indigenous Knowledge (URURCIK): it is phegedus@adinet.com.uy.

**Venezuela**

**VERSÍK**

Venezuelan Resource Secretariat for Indigenous Knowledge
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The Foundation for Tropical Alternative Agriculture and Sustainable Development (FUNDATADI) is an NGO created by CATADI, the Center for Tropical Alternative Agriculture and Sustainable Development, where VERSÍK is located. FUNDATADI is happy to announce that in July 1999 it signed a letter of agreement with the Kellogg Foundation and the University of the Andes (Venezuela) regarding a project FUNDATADI will carry out in Trujillo State (Venezuela).

The project, *Educational and local development*, will adhere to the UNIR project philosophy. UNIR projects have been implemented in 13 other universities in Latin America and the Caribbean. Their main purpose is to support university extension activities which are oriented towards improving the quality of life of poor rural communities through a participatory process of empowerment. At the same time, these communities function as ‘open classrooms’ where university students and faculty members (future leaders in their own areas) can become sensitized to the major issues affecting these communities. This will make them better able, after a process of ‘action-reaction-action’, to help the communities to find their own solutions. One of the intended products of an UNIR project is adaptation of the university curriculum at different levels. Local knowledge systems represent one of a project’s major concerns since they are considered to be the basis for any knowledge-related activity and/or decision.

Through FUNDATADI and CATADI, VERSÍK has continued its ongoing activities involving research and extension:

- the study of local knowledge systems pertaining to traditional food plants, which is funded by the National Council for Scientific and Technological Research (CONICIT);
- analysis of the contribution that home-gardens can make to on-site programmes for the conservation of edible and medicinal plants. This is the Venezuelan component of a project being carried out in five countries (Guatemala, Cuba, Vietnam, Ghana and Venezuela), which is funded by the German government and coordinated by IPGRI, Rome.

VERSÍK would like to invite postgraduate students from different disciplines and countries to do their thesis research in the context of one of these projects. We could offer them some support to help defray the costs of food, housing and local transportation. Spanish language proficiency is required. The topics students could work on are very diverse. Possibilities include gender issues, in situ biodiversity conservation, local knowledge systems, the botanic identification of plants (edible and medicinal), and power and empowerment through grassroot movements. We ask candidates to please get in touch with VERSÍK’s coordinator, Dr Consuelo Quiroz, before submitting their proposals for consideration.

**MIDDLE EAST**

**Iran**

**RRC**

Rural Research Centre Iran
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A little over a year ago, the Rural Research Centre (RRC) in Iran sponsored the establishment of a unique rural institution for research and innovation based on indigenous knowledge. This is the Rural Station for Indigenous Studies (RSIS), located in the ancient village of Khorhe in central Iran (Poshte godar Region, Markazi Province). The station’s research priorities include water harvesting, indigenous values and ethics in work and productivity, veterinary medicine, and food preparation and preservation. Although it has been functioning for only a short time, the RSIS has already become a dynamic centre for IK research and application. The key development issues, emphasized their potential for application. The key development issues, reflected in the structure of the second volume, will include:

- Creating jobs and raising productivity
- Healing the environment and protecting our health
- Community and participatory local development
- Appropriate education and cultural stewardship

The third volume will feature contributions on research methodology and indigenous epistemology.

**NORTH AMERICA**

**Canada**

**CTK**

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**United States of America**

**CIKARD**

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http://www.public.iastate.edu/~anthr_info/cikard

Please note the change in the CIKARD address: it is no longer 419 but 318B Curtis Hall.

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The CIKARD website at http://www.public.iastate.edu/~anthr_info/cikard is on-line again. Please note this new address. The newly designed CIKARD webpage can be used to gain access to the Indigenous Knowledge Abstract Search Engine, which allows researchers to do keyword searches of abstracts of IK publications. More abstracts will be added on a regular basis. The aim is to keep the CIKARD webpage dynamic and a useful tool for anyone interested in indigenous knowledge and its many subject areas. Other features of the site include links to other IK websites; a list of the periodicals and newsletters currently received by CIKARD (many of them obscure), together with contact addresses; and a bulletin board of IK organizations throughout the world that have contacted CIKARD. New features include a regular report on a ‘Featured indigenous knowledge group’. Most of the groups who contact us have no Internet or e-mail access but are doing pioneering IK research and development at the grassroots level. Another new feature is a list of the postal addresses of such groups and individuals. Finally, the CIKARD website now includes a D. Michael Warren page, which includes biographical information on this founder of the research center and leader in the movement to achieve global recognition for indigenous knowledge. Dr Warren’s last conference paper (unpublished), presented weeks before his death, is currently featured on this page.

Acting director Norma Wolff spent five weeks in Nigeria this past summer. She met with representatives of ARCIK (Professor S.O. Titilola) and YORCIK (Professor Layi Egunjobi and Dr Bolanle Wahab) to talk about relations between the three IK resource centres and about plans for the future.

Accompanying Dr Wolff was Kathryn Patch, an undergraduate student in the anthropology department of Iowa State University, who was the first recipient of the D. Michael Warren Memorial Student Research in Africa Grant. Ms Patch did research on indigenous knowledge involving women’s choices of medical treatment. She worked in the Yoruba area of Nigeria and the Techiman Bono area of Ghana, where Dr Warren carried out his initial research.

While Dr Wolff was in Nigeria, a new publication supported by CIKARD was launched at The Polytechnic, Ibadan. CON/TEXT: Research Reports of the Consortium for Indigenous Textiles and Clothing Research, Nigeria & USA was edited by N.H. Wolff and B. Wahab of YORCIK. CON/TEXT features original research and will be published annually.

Alexander Millen is the new CIKARD graduate assistant. He brings with him experience with the Internet and webpage design. He has taken the lead in redesigning CIKARD’s homepage, and is now responsible for operating the website. Although Mr Millen came to the position with no prior knowledge of indigenous knowledge research, he is eager to learn and to enhance the role of CIKARD in the IK community.

ICIK
Interinstitutional Consortium for Indigenous Knowledge
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Calls

FOR PAPERS

Sustainable rural livelihoods
The International Rural Sociological Association (IRSA), together with the Brazilian Society for Economy and Rural Sociology (SOBER), the Latin American Rural Sociological Association (ALASRU), and the Brazilian Sociological Society (SBS), announce the 10th World Congress for Rural Sociology. It will be held in Rio de Janeiro, Brazil, from 30 July to 5 August 2000. The conference will address a wide range of issues facing rural communities today. The overall theme is: Sustainable rural livelihoods: Building communities, protecting resources, fostering human development. Over 50 workshop topics have been devised and coordinators have been appointed. The following selection might be of interest to readers of the Indigenous Knowledge and Development Monitor:

Theme No. 1. Local knowledge
Coordinators: Alberto Arce, the Netherlands (alberto.arce@alg.asnw.wau.nl); Julia Guivant, Brazil (jguivant@eth.ufsc.br)

3. Rural development and indigenous issues
Coordinators: Elspeth Young, Australia (elspeth.young@anu.edu.au); Alejandro Saavedra, Chile (asavedra@uch.cl)

4. Rural communities and information technology
Coordinators: Ken Stevens, Canada (stevens@morgan.ucs.mun.ca); Mariano Valderama, Peru (mariano@cepes.org.pe)

8. The construction of coherence and endogenous development
Coordinators: Gaston Remmers, the Netherlands (gaston1@dds.nl); Paul Engel, Chile (penguin@udec.cl)

9. Local organizations
Coordinators: Alex Koutsouris, Greece (alex@kar.forthnet.gr); Alicia Villafane, Argentina (alivilla@satlink.com)

10. Rural community development
Coordinators: Goran Djurfeldt, Sweden (goran.djurfeldt@soc.lu.se); Carlos Amtmann, Chile (camtmann@valdivia.ucu.uch.cl)

15. Promoting participation in rural development
Coordinators: Ian Flora, USA (jflora@iastate.edu); Sergio Gomez, Chile (gyg@reuna.cl)

32. Issues in agricultural extension
Coordinators: Shankar Chamala, Australia (s.chamala@mailbox.uq.edu.au); Edilberto Niño, Mexico (alasru@colpos.colpos.mx)

For a full list of workshops (thematic groups) and coordinators, please check the IRSA website at http://www.ag.auburn.edu/irsa/ABSTRACTS are due 31 January 2000 and must be submitted in English, irrespective of the language in which the full paper will be presented. Abstracts must contain the title, the name and institution of the author(s), keywords to describe the paper, and an indication of which workshop (thematic group) it should be allocated to. Abstracts should be written in font Times New Roman 12, double-spaced, and be no more than 20 lines of text (about 250 words). They will need to be sent via the Internet–either as an e-mail message or an attachment (PC only and no viruses please!), or on diskette by conventional air-mail. Abstracts can also be sent as hard copy, but please, no faxed copies. A template for Abstracts will be prepared and placed on the website shortly. Please use this template for the preparation of your abstract.

A CD-ROM of submitted conference papers will be prepared for distribution at the Congress, but participation in this is optional. Authors can choose not to have their work included if they prefer. In order to be published on the CD-ROM, the complete paper must be submitted by 30 April 2000 in the required format: double-spaced Times New Roman 12. Papers should be no longer than 15 pages. They can be in any one of the official conference languages: English, Spanish, French or Portuguese. Please check the website prior to submitting the paper for the most up-to-date information on rules for submission of papers.

Please submit abstracts and papers to: Congrex do Brasil, IRSA World Congress of Rural Sociology, Av. Presidente Wilson 164, 9 andar, 20030-020 Rio de Janeiro RJ Brazil.
E-mail: IRSA@congrex.com.br

FOR RESEARCH PAPERS

Ethnforestry
Ethnforestry can be defined as local communities’ continual, customary
practice of creating, conserving, managing and using forest resources. An ethno-forestry practice is thus specific to a given area and appropriate to a specific environment. It may be possible to take up lessons based on experience elsewhere and adapt them to suit local forestry needs, but over time an external practice always develops into a local variety.

The International Network on Ethnoforestry (INEF) is a new network working to promote the integration of indigenous knowledge on forest management into formal forestry practices. (See Networks, international organizations, p. 27.) INEF’s efforts are supported by two organizations: the Indian Institute of Forest Management (IIFM) and Asia Forest Network (headquarters, University of California). In order to disseminate information about operational ethno-forestry practices, INEF and its partner organizations are planning to publish a book describing the current state of the art in ethno-forestry. The book will bring together information from all the countries and cultures where ethno-forestry is represented. Contributions are invited. We welcome reports of research on the following topics pertaining to forestry:

- Indigenous plantation practices
- Indigenous protection practices
- Indigenous production practices
- Indigenous knowledge for integrated watershed management
- Indigenous knowledge for NTFP management
- Indigenous knowledge for sustainable forest management
- Traditional agro-forestry systems
- Indigenous practices for managing tropical forests
- Traditional knowledge and empowerment
- Case studies demonstrating how local knowledge on forest management can be integrated with formal forestry
- Methods for sharing and integrating indigenous knowledge
- Any other aspect of ethno-forestry

Contributions should be sent before 30 January 2000. Please send documents in WORD 97, as e-mail attachments, to dpandey@vsnl.com or to deep@iifm.org. But if your article has graphics, please send it on diskette and in hard copy by post to Professor Deep N. Pandey, Indian Institute of Forest Management, P.O. Box 357, Nehru Nagar, Bhopal, India-462 003.

International Network on Ethnoforestry (INEF)

The International Network on Ethnoforestry was established on 4 January 1999 at the Indian Institute of Forest Management in India. INEF is a group of concerned foresters, scientists, international agencies and NGOs working to document and disseminate indigenous knowledge on forest management and to integrate it with formal forestry. Their work concerns cultures and indigenous peoples across the globe.

INEF is supported by the Indian Institute of Forest Management (IIFM) at Bhopal (India), which provides a headquarters for INEF. The network is coordinated by Deep N. Pandey and assisted by 30 faculty members at IIFM. INEF is also supported by the Asia Forest Network of the University of California (USA).

At present, INEF has 255 members (from 77 countries) interested in sharing and applying indigenous knowledge on forest management in order to gain recognition for that knowledge, to help secure the livelihoods of indigenous peoples, and to achieve sustainable forest management around the world. INEF members understand that ethno-forestry has to be understood in the wider context of traditional ecological knowledge. The philosophy of sustainability is implicit in indigenous knowledge systems. All over the globe, context-specific knowledge of forestry can be integrated into the formal science of forestry. This will help to effectively address the problems of forest depletion and to lift current threats to the livelihoods of local communities.

INEF’s current activities include the compilation of an annotated bibliography indicating the global status of ethno-forestry, a research project on ethno-forestry in India, and the training of stakeholders. But the most dynamic activity of the network is the ongoing electronic discussion taking place through the INEF mailing list. (See Mailing Lists, p. 29.)

Envisaged new activities include the publication of a research journal, to be called Ethno-forestry. INEF has no source of funding as yet, and hopes readers of the Indigenous Knowledge and Development Monitor will come forward with ideas.

For more information please contact: Professor Deep N. Pandey, Coordinator, Indian Forest Service, INEF, Indian Institute of Forest Management, P.O. Box No 357, Nehru Nagar, Bhopal-462003, India.
Tel.: +91-755-775 716. Fax: +91-755-772 878.

E-mail: dpandey@vsnl.com and: deep@iifm.org

Home page of INEF: http://www.egroups.com/groups/inef

Home page of INEF Coordinator: http://education.vsnl.com/deep/index.html

Traditions for Tomorrow

Traditions for Tomorrow / Tradiciones para el Mañana is an organization that since its establishment in 1986 has been helping indigenous communities in the South to preserve and strengthen their cultural identity. TIFF is active in 13 Latin American countries. Rural Indian communities may submit project proposals to TIFF, for which the organization then tries to find funds—either from among its own members, or from government agencies, nongovernment organizations, private companies or foundations. TIFF acts as a partner to these communities by encouraging participatory cultural and educational projects that strengthen the communities’ social organization, thus making them better able to take responsibility for their own development. TIFF is officially affiliated to UNESCO.

In 1996, on the occasion of its tenth anniversary, TIFF and the Swiss foundation Charles Léopold Mayer pour le Progrès de l’Homme jointly published a book in French’ that presents 11 of the projects. In the book, the people themselves talk about their own projects. We read, for example, how radio broadcasts in the Bolivian highlands are able to connect local people scattered over long distances, how the Sumu of Nicaragua achieved the publication of the first schoolbooks in their own language, and how young Kunas of Panama built a cultural community house where they can meet to discover their own history, beliefs and knowledge. One of the most interesting projects, however, resulted in the publication in 1994 of a 20-volume encyclopedia of local, rural knowledge. This is the Biblioteca campesina - Tradición oral Cajamarquina. Between 1987 and 1994, farmers in several hundred communities in the Peruvian department Cajamarca contributed their knowledge, most of which had existed only as oral tradition and had never been published. The titles of the various volumes are quite poetic and evocative: for example, ‘Braided shadow’ (manufacture of hats), ‘Blessed mud’ (ceramics), and ‘We shall awake when we dance’ (dances and festivals).

The initiative to assemble the encyclopedia was taken by La Red de Bibliotecas Rurales de Cajamarca (the network of rural libraries of Cajamarca). This network defines itself as an institution and at the same time an educational and cultural movement, sustained and led by the campesinos themselves. Producing the encyclopedia was the network’s way of empowering the individual campesino and revitalizing community culture. While working on the encyclopedia, the network...
of libraries grew so that now it is present in all 13 provinces of the Cajamarca, linking 600 communities. The encyclopedia not only has found its way to all the libraries and households in the Cajamarca, but many orders for it have been placed from outside Latin America as well. TTF funded the project from 1988 to 1994 and is now considering funding a revision of the 20 volumes. Villagers in the area from which the local knowledge was drawn have formed a cultural organization to ensure that the new spirit does not fade away. Their association is called ‘Acu Quinde’ in the local language (Quecha) after the humming bird, a bird that can fly while apparently motionless and move forward while looking back.

For more information, contact:
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Websites

In this new feature we recommend websites that deal with the subjects treated in this issue of the Indigenous Knowledge and Development Monitor. CIRAN’s information specialists have searched the Internet for relevant, useful pages. Sometimes the sites offer background information; other times the information is supplementary.

Biodiversity, traditional medicine and plants
Links to interesting websites on biodiversity, traditional medicine and the use of medicinal plants can be found on the IK pages of Nuffic-CIRAN. For biodiversity, click first on ‘topics’, then on ‘biodiversity’, and then on ‘environment.natural resources’. For medicinal plants and traditional medicine, click first on ‘topics’, then on ‘biology.food.health’.

IK and western science
An article well worth reading is called ‘MMS (Minerals Management Service) works to combine traditional knowledge and western science’. The article describes its efforts in Alaska to incorporate traditional knowledge into federal policy documents.

http://www.mms.gov/alaska/ref/tradknow/mms2.htm

Potatoes
The website of the International Potato Center (CIP) offers a good starting point, with information on projects, resources, databases, publications and training—all related to growing potatoes. A Spanish version is also available.

http://www.cipotato.org/ciphome.htm

Potatoes are a staple crop in the Peruvian Andes, a region characterized by several different altitude zones and considerable agricultural diversity. Farmers in the region have a long history of growing potatoes. This crop is cultivated during the rainy season on valley floors and hillsides, and during the dry season under irrigation. Peru is the focus of ILEIA research, which is featured on the website. The short description of a project by Marielle Dubbeling is especially interesting.

http://www.oneworld.org/ileia/newsletters/13-4-13-4-36.pdf

IPM
Articles on pest control and integrated pest management (IPM) can also be found in the ILEIA newsletters.
Vol. 13, number 2: ‘Rejuvenate local knowledge’
http://www.oneworld.org/ileia/newsletters/news132.htm
Vol. 13, number 4: ‘Fighting back with IPM’
http://www.oneworld.org/ileia/newsletters/news134.htm

IK in the Arctic
CAFF, the Program for the Conservation of Arctic Flora and Fauna, falls under the Arctic Environmental Protection Strategy, which is directed towards conserving species and habitat, and is committed to integrate indigenous peoples and their knowledge into this effort. The work of CAFF is described here. It is grouped under several main themes, including habitat conservation, species conservation, and biodiversity conservation in the Arctic region.

http://www.grida.no/caff

The Inuit are the indigenous peoples of the Arctic region. The Inuit Circumpolar Conference was held on 15-17 November 1996. It brought together hunters, elders, researchers and resource managers to discuss the documentation and application of local knowledge. Recommendations were made for integrating the two ‘ways of knowing’: traditional indigenous knowledge and scientific knowledge.

http://www.grida.no/caff/inuvTEK.htm or http://www.inusiaat.com/tek.htm

Indigenous institutions and resource management
This is a very large bibliography of indigenous knowledge and institutions, which was compiled by Charlotte Hess. It has 1123 citations, fills 78 pages when printed, and is almost 293 Kbytes to download. It contains no abstracts or links, and is dated December 1998. Although it is perhaps weak on Africa, it is interesting for a first start.

http://www.indiana.edu/~workshop/ssl/in digbib.html

COMPAS: Intercultural dialogue on cosmovisions and agricultural development.
This project focuses on the world view or ‘cosmovision’ of local communities. It studies how communities have organized themselves, and how they learn, experiment and adjust their way of life. In the first phase, local organizations studied the cosmovisions of farming communities in Ghana, amongst others.

http://www.nuffic.nl/ciran/ikdm/4-2/articles/haverkort.html

Soil and water conservation
On the IK pages of Nuffic-CIRAN, you will find websites on soil conservation and water conservation. Click on ‘topics’ and then on ‘environment.natural resources’.

http://www.nuffic.nl/ik-pages/

Eldis is a gateway to online information on development in countries of the South. Its web pages on water deal with social, economic, political and environmental issues related to this resource. Eldis offers links to selected organizations, networks, full-text and bibliographic databases, discussion lists, directories of www resources, and regional sources. It also offers statistics, and lists of dams and rivers.

http://ntl.ida.ac.uk/eldis/water/water.htm

Agro-ecology
Agroecology Home is a website maintained by the Center for Agroecology and Sustainable Food Systems, a research and education group at the University of California, Santa Cruz. It is an information resource for developing sustainable agro-ecosystems. The Center emphasizes international training and research, and the application of agro-ecological science for solving real world problems. Interesting features on the website include case studies of agro-ecology in the field, a textbook on agro-ecology, and announcements of seminars and courses. The site also offers a search possibility and is available in Spanish.

http://www.agroecology.org/
**Mailing Lists**

**Ethnoforestry Mailing List**

In June 1999, a new mailing list was started by the coordinator of the International Network on Ethnoforestry, Deep N. Pandey. This list, called INEF mailing list, facilitates discussion of the challenge of integrating indigenous knowledge related to forest management into formal forestry practices. At present, the mailing list has 243 subscribers from 70 countries in Asia, Europe, Africa, North and South America, plus several island nations. Major international organizations are also represented, including the UN Food and Agriculture Organization (FAO), the World Bank, and the International Development Research Council (IDRC).

The INEF mailing list is a moderated list in the sense that it excludes messages not related to indigenous knowledge, and the type of advertisements that offer to make you rich. The moderator does not alter content nor filter out any points of view, as long as the messages deal with ethnoforestry, indigenous knowledge and sustainable development. The list moderator, Deep Narayan Pandey, has 15 years of experience in forestry and is currently attached to the Indian Institute of Forest Management (IIFM) as Associate Professor. Through the National Network on Joint Forest Management, and the Asia Forest Network, Dr Pandey plays a key role in policy and advocacy pertaining to participatory forestry.

Since the list began in June of this year, 57 messages have been posted on the INEF mailing list. The moderator is quite satisfied with the quality of the messages and hopes INEF members will refine the discussion further. Among the topics that have been discussed intensively are ethnoforestry, shifting cultivation, and case studies or best practices. An archive and links are available at http://www.eigroups.com/group/inef/info.html.

The INEF mailing list was set up with no termination date in mind, unlike some mailing lists, which are aimed at achieving a particular goal. The INEF list has various objectives, the first one of which is to compile an annotated bibliography under the title ‘Global status of ethnoforestry’. Already data on more than 250 papers and websites has been submitted for inclusion in the bibliography. Another achievement of the INEF mailing list is the recent completion of the curriculum for a course called ‘Ethnoforestry and Ethics’, which will be taught at IIFM.

To subscribe to the INEF mailing list, send an e-mail to the moderator at dpandey@bom6.vsnl.net.in, or visit the website at http://www.eigroups.com/group/inef/info.html.

**Conferences**

**COMING**

**Workshop postponement**

The organizing committee of the international workshop Oral traditions as critical resource for an interdisciplinary approach to development regrets to announce that this conference, scheduled to be held in Mysore, India, 24-25 September 1999, has been postponed. (See the July 1999 issue, IK&DM 7(2), p. 24). The workshop will be rescheduled as a seminar probably in April or May 2000. As soon as the new date has been fixed, readers of the Indigenous Knowledge and Development Monitor will be fully informed. News will also be announced on the conference website at http://iias.leidenuniv.nl/host/ccrss/sep99ws.htm.

**Documentation and application of indigenous knowledge**

Dhaka (Bangladesh) 4-5 December 1999

This is the second national workshop organized by Bangladesh Resource Centre for Indigenous Knowledge (BARCIK) in cooperation with the IK research project of the Socioeconomic Methodologies Programme of the Department for International Development of Durham University (UK). The primary objectives of the workshops are:

- to encourage development agencies to use indigenous knowledge and techniques in their projects;
- to demonstrate how well the ideas work in practice;
- to strengthen team activities and establish shared strategies for the collection, documentation and dissemination of indigenous knowledge;
- to recommend areas for further research.

The December workshop will continue the work of the indigenous knowledge network in Bangladesh. For those working with IK in Bangladesh, it offers an excellent opportunity to get together and discuss current activities, priorities for future work, and the future direction of the network.

Participants are asked to give 15-minute presentations on their findings. There will also be a session at which participants will make recommendations for future IK research in Bangladesh on the basis of experiences within their own organizations. These presentations will be no longer than five minutes. And finally, participants must submit a written summary of their findings for publication in the workshop report. This should be no longer than 3000 words. Anyone wishing to take part should register and send in their papers as soon as possible.

**Workshop on ethnoveterinary practices is rescheduled**

The international workshop on ethnoveterinary practices in sub-Saharan Africa which was to take place in Zaria, Nigeria, on 12-16 December 1999 has been postponed. (See the July 1999 issue of the Monitor, pages 24-25.) Professor Jerome O. Gefu writes that so many workshop participants have expressed serious concern about possible problems with flight schedules as a result of a millennium bug, that it became imperative to move the workshop date further away from the change to the new year. The new date for the workshop is now 13-17 February 2000. ‘Our apologies for any inconvenience,’ says Professor Gefu.

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E-mail: jogeufu@abu.edu.ng

**Medicinal plants, traditional medicines and local communities in Africa: Challenges and opportunities of the next Millennium**

Nairobi (Kenya) 16-19 May 2000

The Environment Liaison Centre International (ELCI) in collaboration with other organizations is planning to organize a four-day international conference on the promotion and development of medicinal plants and traditional medicine in Africa in Nairobi, Kenya. This conference will be organized in parallel to the Fifth Meeting of the Conference of the Parties (COP - 5) of the Convention on Biological Diversity (CBD) which is to be held also in Nairobi, from 15-26 May 2000.

At the global level, the Convention on Biological Diversity provides a legal framework for the conservation of biological diversity including access to and exchange of genetic materials and for bio-diversity prospecting. Also at the global level, the World Health Organization (WHO) has earmarked the year 2000 as the year which all should have access to health. This is a laudable goal which is still far from being achieved in Africa. A number of international organizations now have started to support projects and programmes within Africa which are drawing on the cultural acceptability and economic accessibility of safe and effective
traditional medical practices.

The conference will review current initiatives in promoting the development of medicinal plants and traditional medicine in Africa. It will examine how medicinal plants and traditional medicine in Africa is far more relevant, valid and useful than had been supposed. The conference will explore medicinal plants, traditional medicine and its organization. Among the issues to be addressed by the conference are:

- The place and contribution of traditional medicine in primary health care
- Aspects of participatory research into medicinal plants and traditional medicine in Africa
- Country experiences
- Lessons learnt and new perspectives

For more information, to register or to submit abstracts, please contact: Ernest Rukangira, Environment Liaison Centre International, P.O. Box 72461, Nairobi, Kenya.
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E-mail: erukangira@iconnect.co.ke

PAST

Environmental services and land use policy Bridging the gap between policy and research in Southeast Asia

Chang Mai (Thailand)
30 May - 2 June 1999

This workshop on methodology was organized by the International Centre for Research in Agroforestry (ICRAF), sponsored by the Asian Development Bank, and hosted by Chang Mai University. The workshop assembled researchers, policy-makers and resource managers from around the world to discuss the issues surrounding sustainable agricultural systems in Southeast Asia. Researchers presented their findings on topics ranging from fire management to biodiversity assessment and watershed management. Sessions were structured to encourage an exchange of ideas between the audience and the speakers.

A number of presentations described attempts to use indigenous knowledge (IK) as an empirical tool for policy development. One of the featured projects involved using what local people know about birds in order to assess biodiversity and predict the impact of habitat alteration on overall diversity. As presented, this technique could be very useful for involving indigenous peoples in ‘wildlands’ conservation, and should be of interest to researchers working on people and parks issues.

Researchers primarily concerned with agroforestry issues will be interested in the latest version of WinAkt, the Agroforestry Knowledge Toolkit for Windows, which was demonstrated at the conference. This knowledge-based systems software was developed by the University of Wales in Bangor in order to facilitate the acquisition and use of indigenous ecological knowledge.

The organizers of the conference should be commended for facilitating an interdisciplinary forum that that not only exposed the gaps between research and policy, but enabled the participants to access the individuals who are engaging the issues surrounding sustainability throughout the world.

(Edward H. Thomas, USA)

ICRAF expects that an edited volume of the proceedings will follow.

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E-mail: D.Thomas@cgiar.org
or: Dr Thomas Tomich, ICRAF Indonesia, P.O. Box 161 Bogor 16001, Indonesia.
Tel.: +62-251-625 415.
Fax: +62-251-625 416.
E-mail: T.Tomich@cgiar.org

Medicinal plants as important products of Caribbean agriculture

St. Croix, US Virgin Islands
14-16 June 1999

This second international workshop on herbal medicines in the Caribbean was held at the University of the Virgin Islands, St. Croix, US Virgin Islands. It had four sponsors: the Cooperative Extension Service and Agricultural Experiment Station of the University of the Virgin Islands in St. Croix, the Virgin Islands Department of Agriculture, the Caribbean Network for Integrated Rural Development (CNIRD), and the Inter-American Institute for Cooperation on Agriculture (IIA).

Workshop participants came from most of the English-speaking Caribbean countries, plus Suriname, Haiti, Puerto Rico, the Dominican Republic, the USA, Canada and Malaysia. The presentation covered a range of issues, including a holistic approach to herbal medicines and discourses on alternative medicine, the variety of uses and benefits to be derived from medicinal plants, and the production and marketing of common medicinal and culinary plants. The aim was to create a greater awareness of the value of the traditional healing practices in the context of a world dominated by conventional science.

The Caribbean Association of Researchers and herbal Practitioners (CARAPA) had been formed in 1998 at the first international workshop on herbal medicines in the Caribbean. CARAPA is concerned about deepening public awareness of herbal medicines so that indigenous knowledge will be appropriately valued and practitioners will derive recognition and economic benefits. CARAPA’s vision is to promote responsible bio-prospecting and the appropriate use of indigenous Caribbean herbs, based on sound information about their properties and their therapeutic effectiveness.

CARAPA says that its mission can best be realized if herbalists and practitioners of alternative medicines are organized into groups. These groups can lobby at the national level and ultimately at the regional level, urging Caribbean governments to institute policies and legislative measures that bring alternative and herbal medicines within the realm of conventional medicines.

In line with this vision and mission, CARAPA sees it as an opportunity in 1999 to start involving the agricultural sector in the production and commercialization of medicinal and culinary plants. At the international workshop in St. Croix, CARAPA representatives of Trinidad and Tobago, Jamaica, St. Lucia, Belize, and St. Vincent and the Grenadines expressed the intention to pursue activities leading to the formulation of national policies. They decided that such policies should address at least three issues: the maintenance of plant biodiversity through the conservation and use of indigenous plant materials, the development of technologies for the effective and profitable production and marketing of medicinal and culinary plants, and the appropriate use of medicinal plants.

At this second workshop it was agreed that the third international workshop on herbal medicines in the Caribbean should be held in 2000 in Jamaica.

The proceedings of the second workshop are being published by the University of the Virgin Islands Cooperative Extension Service. Copies will be available either from this service at Kingshill, St. Croix, US Virgin Islands 00810, or from CNIRD, 40, Eastern Main Road, St. Augustine, Trinidad and Tobago.

For more information, also about membership of CARAPA, please contact: CNIRD, which is the secretariat for CARAPA: 40, Eastern Main Road, St. Augustine, Trinidad and Tobago.
Tel.: +1-868-662 6473.
Fax: +1-868-662 26612.
E-mail: cnird@carib-link.net

Collecting and safeguarding oral traditions

Khon Kaen (Thailand)
16-19 August 1999

Oral traditions are an important basis for an understanding of cultures and social traditions throughout the world. Today’s technologies give us the means to collect and preserve original oral renditions of stories, music, recollections, sacred traditions and personal histories. In many societies without a written tradition, oral heritage provides a vital link from the past, through the present, to the future. But also for societies with well-established documentary traditions, oral heritage enhances the written record with its rich texture and direct link to history.

Words like ‘tradition’, ‘culture’, ‘memory’, ‘self-identity’, ‘civilization’ and
In his keynote address, Professor John Waiko, Minister of Education, Science and Culture of Papua New Guinea, drew attention to many aspects of the value of tradition. He referred to the tension between traditions and modern education. How, for instance, is it possible to adopt oral traditions and adapt to change without turning one’s back on cultural diversity? How can cultural competence be acquired to complement new skills, and how can scientific progress be assimilated? This is the context in which the challenges of the new information technologies must be integrated into national education systems in the next millennium.

Many speakers gave reports on the situation in their own country, region or institution. Dietrich Schüller (Austria) and Kevin Bradley (Australia) also conducted a complete course on how best to record and listen to what local practitioners have to say.

Research projects

Agroecology Research Group

The Agroecology research group at the University of California, Santa Cruz (USA), is composed of graduate students and post-doctoral researchers associated with the university’s Environmental Studies Department and/or the Center for Agroecology and Sustainable Food Systems. The group is led by Professor Stephen R.

Glissman, who has a long history of research in this field. Agroecology applies ecological science to the study of sustainable agricultural management, and includes an analysis of socio-economic, ecological and cultural factors that affect the sustainability of rural communities. Much of the group’s work focuses on traditional agroecosystems and the local knowledge that is employed to manage them. Current research projects include:

- The potential use of indicators to measure levels of agroecosystem sustainability (S.R. Glissman)
- Evaluation of the sustainability of tropical agroecosystems (including coffee and homegardens) in Mexico and Central Americas (S.R. Glissman and Ernesto Méndez)
- Interdisciplinary analysis of interactions between soil fertility and food security in East Africa (Dorothy Overpeck, dorothy@cats.ucsc.edu)

The Agroecology research group is also engaged in a variety of teaching and outreach activities. Dr Erle Ellis recently created an interactive web page to encourage collaboration (see Websites, p. 28).

In August 1999, for the first time, a short international course on agroecology was given with the help of Dr Miguel Altiere, a leading agroecologist from the University of California at Berkeley.

The following is a brief description of the current research project on sustainability indicators.

Indicators of sustainability in agroecosystems

A sustainable agroecosystem can be described as one that maintains the resource base upon which it depends, relies on a minimum of artificial inputs from outside the farm system, manages pests and diseases through internal regulating mechanisms, and is able to recover from the disturbances caused by cultivation and harvest. But the description...
Important aspects of social and ecological systems that interact at each level in sustainable food systems

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is abstract. It is quite a different matter to point to an actual agroecosystem and identify it as sustainable or not, or to specify exactly how to build a sustainable system. Ultimately, sustainability is a test of time. An agroecosystem is sustainable if it has continued to be productive over a long period of time without degrading the resource base on which it depends, not all of which is local. But how long is ‘a long period of time’? How do you determine whether or not degradation of resources has occurred? Can you design a ‘sustainable’ system when the proof of sustainability always lies in the future?

Parameters of sustainability are abstract. It is quite a different matter to point to an actual agroecosystem and identify it as sustainable or not, or to specify exactly how to build a sustainable system. Ultimately, sustainability is a test of time. An agroecosystem is sustainable if it has continued to be productive over a long period of time without degrading the resource base on which it depends, not all of which is local. But how long is ‘a long period of time’? How do you determine whether or not degradation of resources has occurred? Can you design a ‘sustainable’ system when the proof of sustainability always lies in the future? Can parameters of sustainability be identified, and then can the levels at which these must be maintained be defined?

The process of identifying indicators of sustainability begins with two kinds of existing systems: natural ecosystems and traditional agroecosystems. Both have stood the test of time in terms of maintaining productivity over long periods, and each offers a different kind of knowledge foundation. Natural ecosystems are an important reference point for understanding the ecological basis of sustainability. Traditional agroecosystems offer abundant examples of agricultural practices that are actually sustainable; they also offer insights into how social systems—cultural, political, and economic—fit into the sustainability equation. Sustainable food systems, for example, are based on a social system that has cultural, social, economic and political components. These shape the way human actors design and manage agroecosystems, and also place constraints on it. The natural ecosystem provides the raw materials and physical context for the agroecosystem, while local components and global components, such as solar radiation and climatic patterns. The table below presents important aspects of social and ecological systems that interact at each level in sustainable food systems. With the knowledge derived from analysis of these systems, researchers can devise principles, practices, and designs with which to convert conventional, unsustainable agroecosystems into sustainable ones. For information about the group’s activities, please contact Erle C. Ellis, e-mail: erle@agroecology.org

Researchers and graduate students interested in perhaps visiting the group should contact Stephen R. Gliessman, e-mail: gliess@zzyx.ucsc.edu

Communications can be directed in Spanish to Ernesto Méndez, e-mail: vemendez@cats.ucsc.edu.

**Medicinal plants and local communities, Africa**

The project is expected to produce three main results:

1. In each country involved in the project, ten priority medicinal plants will be identified and targeted for research and development that reflect both community priorities and a scientific assessment.

2. In each country involved in the project, a national centre will be established for demonstrating the issues and providing training related to biodiversity, medicinal plants and traditional medicine.

3. An African regional network of some 200 scientists, researchers and traditional healers will be exchanging information pertaining to medicinal plants, traditional medicine and indigenous knowledge.

In connection with the project, two international regional workshops have been held, one for the English-speaking and one for the French-speaking part of Africa. (See IEDEM 6[1] for information about these workshops.) Reports of the workshops have been published in English and French. The reports contain recommendations and clear action plans on four key issues:

1. **protection and conservation of medicinal plants and traditional knowledge and implementation of**
article 8(j) of the Convention on Biological Diversity;
2. participatory research and involvement of local communities and traditional healers;
3. standardization processes and protocols for research on new drugs and for development of a traditional-medicine industry;
4. integration of traditional medicine in the public health system.

Copies of the reports can be obtained from the MPLC-A project coordinator, Dr Ernest Rukangira (for the address, see below). A description of the project as a ‘best practice’ can be found online at http://www.unesco.org/most/bpikreg.htm.

The project has also been selected for the World Exposition EXPO 2000, which will take place in Hanover, Germany, in October 2000. The survey results are of course also being shared with the local communities in question.

For more information, please contact:
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The LinKS project:
local knowledge to conserve biodiversity and achieve food security

The LinKS project entitled ‘Gender, biodiversity and local knowledge systems to strengthen agricultural and rural development’ is a regional effort in Southeast Africa aimed at raising awareness of the value of rural men’s and women’s knowledge related to the use and management of the agricultural biological systems they depend on for food security. The project seeks to strengthen the ability of local institutions to adopt approaches that recognize and apply farmers’ own knowledge and experience. It is conducted from the MPLC-A project coordinator, Dr Ernest Rukangira (for the address, see above). A description of the project as a ‘best practice’ can be found online at http://www.unesco.org/most/bpikreg.htm.

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Tel.: +254-2-576 114.
Fax: +254-2-562 175.
E-mail: erukangira@iconnect.co.ke

The project seeks to strengthen the ability to manage and apply that knowledge.

The first project activity has been to find out who is doing what in the participating countries in the fields of gender, biodiversity and local knowledge systems. In Zimbabwe and Tanzania, concrete activities have already started. But surveys there have revealed that while many activities are going on, they suffer from being undertaken in isolation from each other. There proved to be no mechanisms for sharing outputs. The LinKS strategy is thus to build on, and add value to, the ongoing work of key partner organizations. The project secretariat assists the partner organizations by providing training in participatory methods and in the analysis of difference and diversity at the community level. The partner organizations are helped to document farmers’ knowledge and experience related to agro-biodiversity management. Equally important is that researchers are trained also to document their own experiences and methods for eliciting knowledge from farmers. Mechanisms will be set up to ensure that the information generated and the experience gained is shared, so that it can be put to use by local communities, NGOs, research institutions and governments.

For more information, please contact one or more of the following:

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Soil and water conservation 2:
innovations of a woman farmer

In the July 1999 issue of the Monitor, ‘Focus’ featured the innovation of a farmer in the following:

- links between the crucial issues of local knowledge systems, gender roles and relationships, food provision, and the conservation and management of agrobiodiversity;
- links between the knowledge of how to preserve agrobiodiversity and put it to use, and the people and forces that have an impact on men and women’s ability to manage and apply that knowledge.

The case study, presented here, was recorded by Million Alemayehu, of Debre Berhan, in June 1999. Mr Alemayehu is not directly connected to the ISCW programme. Ms Ann Waters-Bayer of ISCW informs us that he works for the Bureau of Agriculture in the Amhara region of Ethiopia, and over the years has shown tremendous interest in indigenous practices and innovation. Mr Alemayehu’s postal address is P.O. Box 34036, Addis Ababa, Ethiopia.

Mrs Ayelech Fikre is a 61-year-old woman living in Ankober Wereda (District) in the North Shewa Administrative Zone of Amhara National Regional State. She is a widow with one adopted son, who is now married and has two children. Mrs Ayelech is head of this family, which farms approximately one hectare of land inherited from her father. It is situated in a weyna dega (medium highland) agro-climatic zone, on a hillside with an elevation of 2150 metres. Annual rainfall is approximately 870 mm, and there are two rainy seasons. The short one (belg) is from January to April, and the long one (meher) is from July to September. The main crops grown by Mrs Ayelech are sorghum, teff, maize, wheat, horsebean and barley.

After the death of her father some 35 years ago, Mrs Ayelech started to apply various indigenous agricultural practices—at her own initiative and using her own knowledge. The practices have included stone-bund construction, soil-fertility management, and rainwater harvesting. This article will focus on soil-fertility management; that is, what Mrs Ayelech does to reverse erosion caused by rain.

After constructing the stone bunds, Mrs Ayelech noticed that the soil immediately below the bunds was less fertile than the soil above them. She thought about how to improve the fertility of the soil below the bunds and systematically began to try different methods: applying composted manure, intercropping, rotating crops, and planting a row of croton (Crotom macrostachyus) below each stone bund. The compost is prepared every year. Animal manure, vegetation (mainly croton leaves), and waste from the household and from animal feed are put into a pit in Mrs Ayelech’s backyard.

The croton plants growing below the stone bunds stabilize the bunds besides improving the soil’s fertility. The leaves are chopped up and spread over the less fertile parts of the farm. After the leaves have dried, they are ploughed into the soil as part of the process of land preparation.

Mrs Ayelech has been practising intercropping and crop rotation since she started farming. She intercrops sorghum with soybean, and maize with horsebean. She says that her main objective in intercropping is to maximize production on her single hectare.

Mrs Ayelech trained her adopted son very well in all her farming practices, and he now assists her. She is also very keen to
share her experiences with other farmers, as well as with government experts, and is ready to accept any new ideas which can help her obtain better yields.

**Ethnomedical phytotherapy among the Gaddi tribe of Kangra Valley, Himachal Pradesh, India**

The Kangra valley in the Indian state of Himachal Pradesh is situated in the Himalayan belt, which includes heights of 400 metres in the Shivalik range to 8,000 metres in the snow-clad Dhauladhar ranges. This rugged area lies between latitude 31° 27’ – 32° 28’ 54” N and longitude 76° 3’ – 77° 6’ 45” E. Due to its varied topography, the valley is endowed with a rich and diverse plant life, including different kinds of medicinal and commercial plants. The diverse forest ecosystems play a vital role in the life, economy and health care of the tribals who inhabit the region. The valley is home to Gujjars, Gaddi and other hill communities. They gather many medicinal herbs from the ambient vegetation and use herbal treatment to treat diseases and disorders. Much of this knowledge is in danger of being lost.

With a view to collecting information on the traditional uses of plants, wild as well as cultivated, and discovering new or little-known uses of potential plants of economic and medicinal value, a study was conducted which focused on the tribal tracts of Kangra Valley, inhabited by the Gaddi tribe. Fieldwork was carried out in September-October 1997 and March 1998. The area, consisting of the tribal tracts of Palampur, Dharamshala and the Kangra forest division, was surveyed. Ethnomedicinal information on the plants and plant products used by the tribe to meet their primary health care needs was obtained from the Gaddi medicine men and other informants. That information was analyzed and compared with data previously collected and stored at the National Botanical Institute in Lucknow. The research resulted in a longlist of 69 plants, ranging from Achyranthes aspera L. (Amaranthaceae), prickly chaff flower, to Zanthoxylum armatum DC. (Rutaceae) Syn. Z. alatum Roxb. The list provides the Latin name, followed by the local name, and the English name, if available. Information about locality and details of its use or uses is recorded.

The vast majority of plants listed (47 out of 69) are generally used for only one purpose. Of the ‘multi-purpose plants’, rambel, or citroli (Marsdenia roylei Wight) is used for the greatest number of ailments. An aqueous extract of its root is mixed with buttermilk and black pepper, forming an ointment for snakebites. An aqueous extract of the plant is used to treat spermatorrhoea (10 ml twice a day for 15 days). A paste made from the root, combined with black pepper and cow’s milk, is applied to boils and blisters, and an aqueous extract made from the leaves is used as an antidote for rabies (100 ml twice a day). Most of the uses recorded here are known to specialists. However, they include seven treatments not previously recorded in the literature. These are No. 33 lati jahri (Geranium wallichianum D. Don), a decoction of which is prepared from the whole plant and used to treat toothache; No. 41 pulina, horsemint (Mentha longifolia L. Huds.), applied as a paste to treat rheumatism; No. 46 alomari, garbin, wood sorrel (Oxalis corniculata L.), which is made into a paste and used in the treatment of dysentery (one teaspoonful twice a day for three days); No. 56 bekhalal (Prinsepia utilis Royle), the seed oil of which is applied externally for extended periods to treat the symptoms of rheumatism; No. 64 phul, pustajari; stinking-roger (Tagetes minuta L. Syn. T. glandulifera Schr.,), the leaves of which are made into a paste for treating burns; No. 67 Banasa (Viola pilsa Blume, Syn. V. serpen Wall. ex Ging., non Ridley), a decoction of which the Gaddi use together with black pepper to treat coughs and colds (5-10 ml twice a day for three days); and No. 69 tirmira (Zanthoxylum armatum DC. Syn. Z. alatum Roxb.), the leaves and seeds of which are used for treating toothache.

After clinical trials, phytochemists and pharmacologists will be able to determine the active therapeutic ingredients of the plants. The valley offers an enormous potential source of medicinal plants which could form the basis of a herbal drug farm for the processing and production of herbal medicines, thus generating employment avenues for the tribals and the local rural populations.

The full list of plants and their uses will be put online on the Internet when this Monitor is put online. A hard copy is available upon request from the editor. Readers can obtain the list (in digital form or hard copy) by contacting her at Nuffic-CIRAN, P.O. Box 29777, 2502 LT The Hague, the Netherlands, fax: +31-70-4260 329; e-mail: ikdm@nuffic.nl

For more information, please contact: Dr K.K. Singh or Kaushal Kumar, Taxonomy and Ethnobotany Division, National Botanical Research Institute (Council of Scientific and Industrial Research), Rana Pratap Marg, PB No. 436 Lucknow-226 001, India. Fax: +91-522-282 849.

The editor would like to thank Dr Ardeshir B. Damania and Dr Y.L. Nene for their help. Special thanks are owed to Ms Sheila Vijayakumar of the Asian Agri-History Association in Secunderabad (India) who kindly verified the uses and indicated which treatments had never before been recorded in the literature, and who provided additional plant names in English.


The authors, Bandyopadhyay and MacPherson, are affiliated with Hong Kong University of Science and Technology and City University of Hong Kong, respectively. This micro-study deals with the influence of socio-economic and cultural factors on the health of women in rural India. Based on empirical data collected in late 1993 and early 1994 in four districts of West Bengal, it investigates how these factors affect maternal and child health care practices, health-care behaviour, reproductive health, family planning, perceptions of illness and disease, and utilization of health-care services. The authors’ findings suggest that improvement in the socio-economic status of the individual family and development of the village have a major impact on the health-seeking behaviour of people. These factors have a positive influence on the utilization of health services and family-planning services and the adoption of the small-family norm, irrespective of religious beliefs or caste affiliation. But the findings also reveal that cultural factors play an even greater role, more strongly influencing age at marriage (lowering it), preferred sex of children (sons), and uptake of post-natal health services (reducing it). This confirms the existence of medical pluralism (observed by several researchers in earlier studies done elsewhere) and goes a step further, indicating a distinction between ‘consumer-oriented’ health-care behaviour for ailments perceived as major, and ‘welfare-oriented’ behaviour and utilization of services for ailments perceived as minor.

Unfortunately, the figures against which the research findings are compared are outdated. Maternity mortality rates from 1985 are quoted, and abortion-related mortality rates from 1977. For population and literacy, figures are used from the Indian census of 1981. WHO figures from 1985 are used to point out that only 60 percent of births in the world are assisted by trained attendants. Would it not have been more useful to use more recent data, which are readily available— for instance, figures, from the Indian census of 1991, the latest Human Development Report, and the UNFPA reports published every year?

While the importance of quantitative data should not be...
discounted, the study can be criticized for sometimes remaining at the level of facts and figures. For instance, the authors mention religion as an influencing factor, but do not explain how. One reason mentioned for women of Motipur village preferring to deliver their babies at home rather than in hospital is that they feel intimidated by health-care officials and are wary of them, as they are afraid they will be sterilized immediately after birth without their knowledge or consent. Did the authors not think this was worth investigating? If it were corroborated in other villages as well, could this not be an important reason for the low utilization of post-natal health services, rather than tradition alone? A suggestion for future research: it might be interesting to examine intergenerational differences regarding the research questions, using educational attainment within a household as a variable.

While reiterating the importance of women’s education and general socio-economic development, the authors call upon policy-makers to improve maternal and child health by addressing the comprehensive health-care needs of rural women while keeping in mind the positive and negative influences of traditional values. On the whole, the research provides useful material—particularly regarding the importance of cultural factors in development—which policy-makers should take into consideration when formulating programmes. (Dr Jyotsna Agnihotri Gupta, research associate and guest lecturer, Leiden University, the Netherlands, and independent consultant in the field of gender, health and development)

Broerse, J.E.W. (1998) Towards a new development strategy: How to include small-scale farmers in the technological innovation process. 263 pp. ISBN 90-5166-673-X. NLG 49.50 plus postage. PhD Thesis, Faculty of Biology, Vrije Universiteit, Amsterdam. Eburon Publishers, P.O. Box 2867, 2601 CW Delft, the Netherlands. E-mail: info@eburon.nl

This thesis records the lessons learned by a multi-disciplinary group of researchers who used a participatory approach to developing biotechnological innovations for small-scale farmers in the developing world. Discussing two conventional approaches, the transfer-of-technology and the multidisciplinary approach, the author rightly concludes that these do not include farmers in the decision-making process. For this reason, the Department of Biology and Society at the Vrije Universiteit, Amsterdam, has developed a more participatory approach by incorporating elements of the participatory technology development (PTD) approach, thus giving farmers a more prominent role throughout the innovation process. Although the results of the improved approach were better, various organizations still hesitated to adopt it, as the author relates in Chapters 8 and 9.

Reading the book brought an English proverb to mind: ‘The proof of the pudding is in the eating.’ For me the IBU approach has not yet been proven. We do not know if it indeed can generate biotechnological innovations that farmers will adopt. Unfortunately, the author has to admit that in his case, the IBU approach did not generate innovation at all. The author can say that this is because many of the necessary conditions were not met, but we cannot conclude from this that the IBU approach would have worked if the conditions had been met.

Furthermore, although it is laudable that the author—a biologist by training—has incorporated into her work theories from the social sciences regarding participation, she has failed to refer to any theories dealing with the generation and diffusion of agricultural technologies. This is unfortunate since her research would have benefited from ideas generated by these theories, e.g. on what makes innovations suitable for farmers.

Nevertheless, the book makes interesting reading, not in the least because of the author’s frankness in discussing the shortcomings of the participatory methods of research and technology development used by the researchers. (Marcel Put, research associate, Amsterdam Research Institute for Global Issues and Development Studies (AGIDS), Faculty of Social and Behavioural Sciences, University of Amsterdam, the Netherlands)


This book explores the issue of agricultural sustainability and rural development in its broadest sense. The 12 chapters deal with such topics as farm size (are small farms more sustainable?); the role of markets versus the government; gender and sustainable development; sustainability and agricultural production technology; sustainability and public policy; and sustainability and information. When possible, case studies provide instructive examples of how to achieve sustainable agriculture as an integral part of sustainable development. The final chapter seeks to synthesize the various issues from an interdisciplinary point of view and to identify challenges for future cross-disciplinary research.

My preference lies with chapters 1, 2, 5 and 11. The first chapter, by Tesfa G. Gebremedhin and Ralph D. Christy, deals with sustainability and the industrialization of agriculture. It raises important questions and points out that the shift towards large-scale agriculture accelerates environmental degradation and reduces the quality of rural life. Chapter 2, by Gerard E. D’Souza, John Ikkerd and Lynndee Kemmet, deals with farm size. The authors predict that farms in the future may need to be smaller rather than larger if they are to remain productive and competitive in the post-industrial, knowledge-based era of economic and social development. Chapter 5, written by Sonya Salmon, Richard L. Farnsworth and Donald G. Bullock, is on family, community and sustainability in agriculture. In this chapter, farmers are divided into two groups: those with ‘power genes’, who adopt conventional farming, and those with ‘soil genes’, who adopt sustainable farming. A ‘power-gene’ farmer likes machines, and buys the latest and most powerful he can. A ‘soil-gene’ farmer has old or used equipment, and does anything to use less power. He also cuts back on chemicals, but does so as much for the sake of efficiency and economy as for environmental reasons. Family consensus, community pressure and the land-tenure system are crucial factors which determine whether or not a farmer wants to adopt sustainable farming practices. It is a social issue rather than a purely technical one. To change from conventional to sustainable agriculture requires a paradigm shift regarding beliefs about nature and farming. Chapter 11, on sustainability and information, is written by David Silberman and Leslie Lipper. I like the
way it explores the importance of information for purposes of scientific research, precision technology, recovery from market failures, and the management of shared resources. The authors believe that precision technology which uses information to apply inputs more accurately can increase productivity and decrease pollution.

Personally, I was not so happy with three chapters: Chapter 6 about gender because it is too vague, Chapter 8 about economics because it lacks depth, and Chapter 10 about land use because it is too macro-oriented.

Almost all of the 24 contributors are associated with an American university or research institute. One, Winfred E.H. Blum, is at Vienna University (Austria) and another, Mary C. Ahearn, works at the US Department of Agriculture. This perhaps explains the often difficult language used in the book and the often very theoretical treatment of the topics. Still, I would recommend the book to university teachers. It will broaden students’ minds and help them gain insight into the essence and intricacies of sustainability and environmental issues. Another strong point of the book is that it covers new and interesting subjects that perhaps have never before been discussed in this context: for example, precision technology, the management of shared resources, systems of property rights, and the industrialization of agriculture. The discussions of land use and the modelling approach are also very interesting.


The full text is also available on the Internet: http://www.unesco.org/most/bpikpub.htm

The ‘best practices’ described in UNESCO’s MOST database (MOST = Management of Social Transformations) are initiatives aimed at combatting problems of poverty and social exclusion. This database now has a new section for sustainable strategies by which poor people can raise their living standards. The practices also provide guidelines for policy-makers and development practitioners who are trying to find ecologically sound ways of solving development problems under culturally diverse circumstances.

Best practices on indigenous knowledge is a co-product of Nuffic-CIRAN and the UNESCO-MOST programme. The publication is non-commercial and only 600 copies were printed. Nuffic-CIRAN has sent copies to the contributors of the best practices, to all IK Resource Centres, and to individuals and organizations in the IK network who are known to be working specifically to further the cause of sustainable development. UNESCO has given the publication to the 188 delegates of the UNESCO General Conference and to certain members of its own international network. There are very few copies left, which is why Nuffic-CIRAN asks anyone who would like one to download the publication from the Internet if possible.


Fax: +49-611-903 0556.

Produced by the Zimbabwean AGRITEX, in conjunction with the German Integrated Rural Development Programme (GTZ/IRDEP), this booklet details one programme’s experiences with participatory extension approaches (or PEA). It presents one way in which participatory approaches, today widely recognised concepts in rural development, can be incorporated into extension activities at a local level.

The content of the booklet is based on 12 steps for implementing the process of PEA. These range from community preparation and community-level action planning to implementation, farmer experimentation, and monitoring and evaluation. The explanations of the approaches are somewhat uneven. Some of the steps are described clearly and in detail using examples from rural Zimbabwe, while others are skimmed over in a few sentences (particularly the more analytical steps, such as ‘prioritising problems and needs’). In addition, the booklet relies heavily on large excerpts of text to express its main points, and it is filled with the jargon of sustainable development. As a result, its usefulness as a manual for people working in the field may be somewhat limited.

One of the clear strengths of this work is its attention to problems encountered during the PEA process. Rather than presenting a ‘perfect’ plan, the description of various stages is accompanied by a realistic assessment of the hurdles involved. Again, real examples illustrate how approaches which appear excellent in theory can fall apart in practice. As failures are usually more educational than successes, the booklet benefits from this honesty.

In summary, Learning together through participatory extension is a useful guide for anyone interested in how participatory approaches to extension and development may be implemented on the ground. Its generally detailed descriptions of the successes and failures of participatory extension will be valuable for extension workers and project staff in Southern Africa as well as farther afield.

(Landon B. Myer, South African Medical Research Council, CERSA-Hlabisa, Mtubatuba, South Africa)


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The guidelines can also be found on the KFPE Home Page at http://www.kfpe.unibe.ch.

This concise, well written booklet by the Swiss Commission for Research Partnership with Developing Countries (KFPE) aims to chart a new course for research partnerships between developing and industrialized nations. KFPE hopes to further research in developing countries by encouraging the kind of cooperative research that is typically carried out in research partnerships between industrialized nations. The authors stress that if the dire predictions of environmental degradation and climate change are true, a global effort will be necessary to solve these problems. However, in order to effect the needed changes, not only must scientists engage politicians and the public, they must also help developing countries to become partners in any potential research. KFPE states that only through true partnerships can researchers on either side of this equation make an enduring contribution to increasing the research capacity of both the industrialized and developing partners.

The booklet provides guidelines for bridging the gap between industrialized and developing partners. The authors have organized the work around 11 principles
they describe as ‘practical suggestions’ for achieving equality in research partnersh-ips. For each of the 11 principles, the overall aim is outlined, some practical suggestions are offered, and a short checklist of relevant questions to be answered at each juncture is provided. The practical application of these principles can be found in the appendix.

Underlying the booklet is the assumption that scientists in industrialized nations are interested in making a long-term commitment to working with research partners in developing countries. True partners must be willing to share in the responsibility for defining, monitoring, applying and profiting from any research. Given the growing interest in indigenous-knowledge research, perhaps this document will encourage funding agencies to adopt result-oriented agendas and to fund agents who can address political and social aspects of problems as well as conduct classical research. More importantly, in my opinion, developing countries may be able to employ these guidelines to demand more equitable relationships with researchers.

As the authors say, ‘Poor countries do not deserve poor science.’ Demanding that researchers help to solve local problems while building local research capacity is sure to refocus the scientists of nations on making a long-term commitment to working with research partners in developing countries. True partners must be willing to share in the responsibility for defining, monitoring, applying and profiting from any research. Given the growing interest in indigenous-knowledge research, perhaps this document will encourage funding agencies to adopt result-oriented agendas and to fund agents who can address political and social aspects of problems as well as conduct classical research. More importantly, in my opinion, developing countries may be able to employ these guidelines to demand more equitable relationships with researchers.

The theoretical discussions which form the basis of this volume make an important contribution to the study of different forms of IK. This contribution does not come in the form of a new methodology, or a novel insight into resource use, but rather through a fresh way of thinking about the place and role of indigenous environmental knowledge and how researchers can apply the study of IK to issues surrounding sustainable development. Those working with IK have been widely criticized (and also complemented) for the general lack of a theoretical basis to guide their research. This volume merits attention for compensating this lack, as well as for the strength of the individual contributions it contains.

The main shortcoming of the volume is that it seems to be aimed primarily at an academic audience. The writing styles of the authors exhibit the two extremes of academic writing, switching at times from rich, elegant prose and preparing for field work. This work is of enduring significance, and one would hope that the publishers of subsequent editions take greater care with the production quality.

indigenous knowledge, and makes an important contribution to the way we think about and conduct research with local communities. As a result, it belongs on the shelf of any academic who is working with cognition of the natural world and human ecology. However, for those working in the more practical area of sustainable development—such as policy-makers, project staff and extension workers—this book suffers from the same lack of direct applicability which the volume’s contributors are attempting to overcome. With luck, some of the ideas outlined here will be further distilled into a more accessible format in the near future. (Landon B. Myer, South African Medical Research Council, CERSA-Hlabisa, Mtubatuba, South Africa)


For Australasia and the rest of the world: The Federation Press, P.O. Box 45, Annandale. NSW, 2038; 71 John Street, Leichhardt, NSW, 2040, Australia. Tel.: +61-2-9552 2200. Fax: +61-2-9552 1681.

This book is not about indigenous knowledge and indigenous peoples. It is about modern knowledge for indigenous peoples—individuals as well as representatives of organizations and groups. It deals with the various forms of human rights legislation at an international level: what there is, and when, how and by whom it can be used. The book is a report from a conference held in Sydney in 1995. This explains its emphasis on the situation of Indigenous Australians with the aim to the international regulations. Nevertheless, readers from other parts of the world will find it well worth reading. All seven contributors are lawyers, including Sara Pritchard, the editor, who teaches Human Rights Law at an Australian university. She specializes in the area of sustainable development—such as policy-makers, project staff and extension workers—this book suffers from the same lack of direct applicability which the volume’s contributors are attempting to overcome. With luck, some of the ideas outlined here will be further distilled into a more accessible format in the near future. (Landon B. Myer, South African Medical Research Council, CERSA-Hlabisa, Mtubatuba, South Africa)

The first part of the book provides useful insight into the nature, possibilities and limitations of international law. Parts two and three present an overview of the two UN systems pertaining to human rights: the charter-based system and the treaty-based system. Part three also contains practical guidelines for making use of the instruments, indicating who can file complaints, how this has to be done, and what can and cannot be expected to result from such complaints. This might be the most interesting and the most directly useful part of the book, especially for the peoples who are directly concerned and for the organizations that represent them. Part four provides insight into the work of the committees that administer the conventions, and describes the reporting process. Finally, part five deals very directly with human rights standards and with the application of the convention pertaining to the peoples.

As complements to national legislation in the broad field of racial discrimination and human rights, the UN conventions are certainly very important. However, they can be used only if they—and the ways in which they can be used—are known to the peoples they concern, and to their representatives. As Sarah Pritchard says in the introductory chapter, ‘A basic knowledge of international law is necessary in the armory of those concerned to secure recognition and protection of the rights of Indigenous peoples everywhere.’ In this respect the book makes a remarkable contribution.

For the general reader, the book might have two major problems, however. First, because the contributions are the proceedings of a conference, there is a lack of coordination among them. This leads to repetition, most of all in part three, where the procedures for filing individual complaints are described for each convention. This could have been avoided, since the procedures and basic regulations are the same for all the conventions. Second, the contributions are by lawyers who are addressing lawyers. This was appropriate for the conference, but not for the book. So while there is an explanation for ‘pacta sunt servanda’, for example, there is no explanation for other technical terms, such as ‘uti possidetis’ or ‘lus eogens.’ Furthermore, especially in part one, references are made to legal cases, mainly from Australia, without any indication of what the case was about. This sometimes leaves the reader who is not a legal expert somewhat at a loss. An overview in the form of a short table of the international legal instruments would also have helped readers to find their way through the system (and through the book).

Nevertheless, these shortcomings in no way reduce the usefulness of the book. Of course, an updated version describing the present state of these important international legal instruments would be very welcome! (Dr Robert Zwahlen, Senior Environmentalist, Environmental Department, Electrowatt Engineering Ltd., Zurich, Switzerland)

Wal, Hans van der (1998) Chinatec shifting cultivation and secondary vegetation. A case-study on secondary vegetation resulting from indigenous shifting cultivation in the Chinantla, Mexico. BOS Document 19, 121 pp. ISSN 0923-8751. NLG25. BOS Foundation, Organization for International Forestry Cooperation. Copies available from IKC-N (Publications), P.O. Box 30, 6700 AA Wageningen, the Netherlands. Tel.: +31-317-474 801. Fax: +31-317-427 561. E-mail: balie@ikcn.agro.nl

The total land area covered with secondary forest is increasing rapidly worldwide. The loss of primary forest is of course a worrying development, but secondary forests could also play an important role in sustainable agricultural systems and for the sustainable use and management of tropical forest resources, as this publication shows.

This study was carried out by Hans van der Wal and published by the BOS Foundation in Wageningen (the Netherlands). It is an interesting attempt to combine data gathered from farmers with data gathered using conventional forestry and statistical methods. Together, these could be used to determine possible paths for the development of secondary succession. The combined information could also be useful for the redesign of shifting cultivation systems as practised by indigenous peoples around the world. (Annex 2 contains a useful overview of indigenous shifting cultivation patterns as practised by indigenous peoples in Central America, the Amazon region, and Africa.)

The author attempts to establish which factors influence the ecology of secondary vegetation in a mountainous area occupied by six indigenous communities in the Chinantla area of Mexico. After assessing the general ecological context, the author studied the secondary vegetation in plots representing the range of environmental factors (altitude, climate, natural vegetation types). Although the Chinatec Indians in this area use three different forms of shifting cultivation, the research focused on the type most commonly used. The author interviewed farmers about their past and present use of the plots, and collected data about the trees and shrubs. He analyzed this data using conventional forestry and statistical techniques (cluster and correspondence analysis).

The study concludes that a history of how plots have been used provides a useful entry for studying secondary vegetation, and that both indigenous and scientific knowledge are needed if the influence of land use on the development of secondary vegetation is to be assessed and monitored. The author offers general recommendations for improving the most common Chinatec system of shifting cultivation.
One example is a system of ‘riding on succession’, whereby useful local species are seeded or planted into frequently used fields in order to speed up secondary succession. Further research would be needed, however, before results could be applied globally and at a more practical level (by farmers).

Although the accent of this study is ecological, it does highlight the potential of secondary forests for sustainable land and forest management. It also highlights the need for more research into the social, economic and ecological factors affecting the relationship between local, shifting-agricultural practices and secondary vegetation.

(Rene van Dongen, School of the Nations, Guyana)

PREVIEW: IMPORTANT NEW BOOKS

The appearance of important new publications is reported here, and the books are briefly described. We have requested review copies, which will be sent to experts for their opinions regarding the books' practical usefulness. The reviewers' comments will be published in a subsequent issue of the Indigenous Knowledge and Development Monitor.

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E-mail: publish@oxfam.org.uk

This book aims to help people keep their animals healthy. It covers a wide range of issues that affect the health of livestock. The book deals with cattle, buffaloes, goats, sheep, pigs, horses, donkeys and camels. It also describes some important problems of dogs, rabbits and poultry. It is easy to read, thanks to fairly basic English and legible print. Important words that the reader may not understand are italicized and explained somewhere in the book. A word list and index make these explanations easy to find. There are also clear, instructive illustrations throughout the book.

Forse, Bill, (1999) where there is no vet. 368 pp. ISBN 0-85598-409-0. GRP14.95; USD24.95. Macmillan Press Ltd., London and Oxford, UK. To order, contact: Oxfam Publications, 274 Banbury Road, Oxford OX2 7DZ, UK. Tel.: +44-1865-311 311. Fax: +44-1865-313 713. E-mail: publish@oxfam.org.uk

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Guidelines for contributions to the Indigenous Knowledge and Development Monitor

**Articles**

- Not more than 1750 words.
- If possible, please send us your text on paper as well as on disk. (Our computer only reads flat ASCII, Word Perfect and Word; disks must be MS-DOS or MS-Windows compatible; and either 5 1/4 inch, 360K, 1.2 MB or 3 1/2 inch, 720K, 1.44 MB.)
- Please add photos and/or illustrations to your article. Make sure that there are no copyright problems. Please provide us with a caption and the name(s) of the photographer or illustrator.
- Articles must be written in English. Concerning grammar and spelling: we use Collins Cobuild English Usage. We would greatly appreciate your contribution conform to its rules, if possible.
- References: An author, when quoting someone else's work, should make sure that she/he is not infringing a copyright.

++ Please specify all references in the text by author, year of publication, and page numbers; e.g. (Warren, 1992:55).
++ In the list of references please state author (year of publication) title (in italics). Place of publisher: publisher.


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**Lead:** We would appreciate it if you provide us with a leading paragraph of around 40 words.

**Communications**

- Not more than 400 words.
- Please make sure always to provide the name and full address of contact person for further information.
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‘Science and other systems of knowledge’:
A new impetus for indigenous knowledge
from the World Conference on Science

As a programme specialist for UNESCO’s intersectoral Coastal Regions and Small Islands initiative, Dr Douglas Nakashima has worked among the Inuit and Eeyou (Cree) of Arctic and Subarctic Canada for more than 15 years. Dr Paul de Guchteneire is coordinator of the Management of Social Transformations programme of UNESCO. He was previously director of the Steinmetz Archive for social science data in the Netherlands and President of the International Federation of Data Organizations.

by Douglas Nakashima and Paul de Guchteneire

From 26 June to 1 July 1999, delegates from over 150 countries participated in the World Conference on Science in Budapest, Hungary, jointly organized by UNESCO and the International Council for Science (ICSU). Through lengthy negotiations, the participants finalized the contents of two documents—the Declaration on Science and the Framework for Action—that establish priorities for science in the 21st century. Among the more contentious issues are science ethics, the funding of science through debt relief and ... indigenous knowledge.

In the session on ‘Science and other systems of knowledge’, indigenous experts and scientists explored the topic of local and traditional knowledge. The animated debate that followed these presentations raised issues of pressing concern: is indigenous knowledge ‘science’?; how to protect indigenous intellectual property; how to ensure the provision of informed consent; the threat posed by formal intellectual property; how to ensure the provision of ... traditional knowledge... indigenous knowledge surfaced from time to time during the preparatory period. Some scientists expressed surprise at seeing this issue on the agenda of the World Conference on Science (WCS) attracted different circles of actors. Here, science per se - essentially the basic and natural sciences - held centre stage, while environment and conservation were one issue among many.

Perhaps for this reason, a certain unease with indigenous knowledge surfaced from time to time during the preparatory period. Some scientists expressed surprise at seeing this issue on the agenda of a World Conference on Science. Regional preparatory meetings, however, spoke out strongly in support of its inclusion. Dissenting voices were heard again during the thematic debate in Budapest, suggesting that by including ‘indigenous or traditional knowledge’ scientists might be lending a credibility which was ill-deserved.

These undercurrents, which animated discussions behind the scenes, did not impede the unanimous endorsement of the Declaration and Agenda at the conference’s closing. But the polemic did not end there. The debate re-emerged later in the year at the 26th General Assembly of ICSU in Cairo (Egypt), where endorsement of WCS recommendations was a main agenda item. In plenary debates, certain delegates took exception to the phrase ‘traditional and local knowledge systems’ and expressed concern that this would open the door to anti- and pseudo-scientific approaches, such as creationism and astrology.

The concept of ‘traditional and local knowledge’ is clear to those of us who work with local communities, and the concern that creationism and astrology might fall into the same basket seems unfounded. We have often debated, however, whether this knowledge should be qualified as ‘folk’, ‘traditional’, ‘indigenous’ or ‘local’, and while we all have our preferences, no single term is completely satisfactory. For the purposes of the WCS Declaration and Agenda, a clear definition of what is and is not included is a reasonable requirement. It can be met without undue complication by giving recognition to the empirical bases of traditional and local knowledge, while respecting the cultural frameworks in which these systems are constructed.

If we dare venture into murkier waters, however, we might consider that the discomfort of these scientists gives expression to a more fundamental concern ... about the relationship between science and these other systems of knowledge, other understandings of the world. Of course, if indigenous knowledge is conceived as just another information set from which data can be extracted to plug into scientific frameworks of understanding, then we do not trouble the scientific worldview. However, this practical approach—that of the pharmaceutical industry or of conservation ecologists who validate traditional information and use it to attain pre-defined ends—may threaten the integrity of traditional knowledge systems. On the other hand, if science is seen as one knowledge system among many, then scientists must reflect on the relativity of their knowledge and their interpretations of ‘reality’. For the survival of traditional knowledge as a dynamic, living and culturally meaningful system, this debate cannot be avoided.

In response to the World Conference on Science, UNESCO will address fundamental concerns such as these with partners in Member States, while pursuing initiatives for integrating indigenous knowledge into sustainable development and poverty alleviation. Part of this effort is the expansion of the ‘Best Practices on Indigenous Knowledge’ database, jointly developed by CIRAN and UNESCO’s Management of Social Transformations (MOST) programme. These activities will be linked to others, such as pilot projects on traditional management through the Coasts and Small Islands initiative, ethnobotanical research in biosphere reserves, and intangible heritage conservation via the Culture Sector. By its very nature, indigenous knowledge is interdisciplinary, and by combining natural sciences, social sciences and culture, UNESCO can offer an integrated response to this challenging issue.

As the World Conference on Science focused on the issue of ‘natural sciences and technology in society’, the social and human sciences played a secondary role.

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