

AFRICAN INDIGENOUS KNOWLEDGE AND ITS RELEVANCE TO  
ENVIRONMENT AND DEVELOPMENT ACTIVITIES

Presented by: André Lalonde  
Environment and Development Consultant  
R.R. 3, Wakefield, Quebec - CANADA.

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## 1. Introduction

Indigenous peoples' cultures and their respective knowledge systems have been largely misunderstood or even dismissed by development planning experts in the past. This point was made recently in a final statement by the Brundtland Commission (WCED):

"Some traditional lifestyles are threatened with virtual extinction by insensitive development over which the indigenous people have no participation. Their traditional rights should be recognized and they should be given a more decisive voice in formulating policies about resource development in their areas" - (Our Common Future, 1987).

Many scientific and social researchers associated with the formulation of development assistance policies are now beginning to recognize the positive role that indigenous peoples' and their knowledge of the ecosystem, can play in the success of development projects and policies.

It is reasonable to assume, that important global development assistance activities including; local participation, capacity-building, and sustainable resource management - can be enhanced in cost-effective programs and strategies which understand and work with indigenous knowledge and indigenous decision-making systems.

Africa may be an ideal continent to learn about and begin seriously integrating indigenous knowledge with development planning techniques. Apart from the rich diversity and number of indigenous cultural groups throughout Africa (\*), much of the remaining unexploited, remote or sparsely populated areas of Africa today (where indigenous societies tend to live traditional lifestyles) are threatened by growing environmental and social pressures.

(\*) It is difficult, if not impossible to ascertain to what extent African indigenous (aboriginal) social livelihoods and applied knowledge systems of today, are reflected by "ancient tradition" rather than the product of colonialisation process and the market economy. As such, this paper uses the concepts of "traditional" and "indigenous" interchangeably to reflect today's rural African society whose long-standing traditional livelihoods was not critically altered or absorbed by the colonial and modern day market-economy (capitalist) forces.

## 2. Nature of African Indigenous Societies and Ecological Knowledge

Indigenous knowledge systems in Africa (as similar to other indigenous societies around the world) are traditionally applied in harmony with the natural and spiritual world. These traditional or cultural practices are ingeniously designed to address local ecological limitations by maintaining a sustainable utilization and protection of commonly shared natural resources.

This "ecosystem view" of many indigenous or traditional societies throughout Africa, (\*) appears to be in contrast to the modern (scientific) knowledge system which is represented by universities, research institutions and private firms etc. Research has shown that around the world, aboriginal or tribal connection to the local land and wildlife, is both symbolic (knowledge systems based on spiritual ritual, religious practice, taboos and naming etc.), and experiential (travel, foraging, residence etc.).

The wisdom and skills maintained by the "keepers of indigenous knowledge" (as applied in the traditional practices of farmers, hunters, gatherers, master fishermen, artisans etc.), are based on a dynamic and sophisticated understanding of their local surroundings. Change in the use of this knowledge is not random, but rather predicated upon conscious efforts by people to define their problems and seek solutions through local experiments and innovation, including evaluating and learning from appropriate technologies elsewhere.

The rapid and selective generation/manipulation of data by science, while generally useful and accurate for short-term predictions, does not always lend well for long-term predictions. African traditional knowledge systems may not necessarily be better suited to making long-term predictions of change, but indigenous knowledge (as observed in traditional survival strategies) may have some advantages in recognizing the onset of change and finding ingenious ways to accommodate and mitigate them at early stages, within the community decision-making structure.

Perhaps equally important, the growing human rights movement around the world, are becoming more unified and determined in their efforts to protect the remaining indigenous societies (especially those living in fragile ecosystems such as rainforests) and their traditional livelihoods, cultures and knowledge systems.

### 3. Some Constraints and Challenges for Maintaining and Transferring Indigenous Ecological Knowledge

#### - Constraints -

An investigator or user of traditional knowledge faces potential difficulties when the two paradigms (indigenous and state) are integrated for use in environment and development activities. Irrespective of "scientific objectivity", there are significant differences of perception, values and language between those who are interested in documenting and applying it (scientists), and those who possess the traditional knowledge.

As the practitioners, guardians and educators of such knowledge, the death of key elders, particularly women, and the resulting "extinction" of their collective wisdom, presents a serious constraint to the long-term survival of indigenous knowledge.

This is partly due to the fact that much of African traditional knowledge exists in oral form, or is learned from elders through shared practice and trial and error experimentation. It is also part of the complex unfolding of events stemming from the severe cultural disruption faced by native Africans during the colonial period. During this period, African tribal practices involving the use of traditional knowledge systems (e.g., indigenous medicine), were largely ignored, under-valued or replaced by colonial practices.

A "reverse psychology" example of this colonial bias over indigenous natural resource management technique, can be demonstrated in Kenya where much benefit was achieved with the British imposed soil conservation system involving terracing. Shortly after Kenya achieved independence, many local farmers began to shun the colonial, terracing system for often inferior, indigenous soil conservation practices. Despite Kenya's over-exploited and fragile soils, recent education and NGO extension work with local women's groups, has led to improved soil conservation (and agroforestry) techniques being implemented by local people, including the re-discovery of the merits of terracing.

- Challenges -

The task facing development agencies that are interested in integrating, or effectively using indigenous knowledge in areas such as renewable resource management and environmental programming etc., arises when planners and resource managers ask themselves, "how will I weigh and reflect on this new or alternative body of information and knowledge" - as compared to conventional or scientifically derived data and analysis.

Despite the inherent incompatibilities or "constraints" between indigenous or traditional knowledge systems and that of the State or scientific knowledge system, an important challenge is to find innovative mechanisms that serve to integrate both systems for mutual benefit (i.e. ecologically sound, sustainable development).

An understanding of indigenous knowledge and customs can help the development planner to establish a more flexible position to suggest project alternatives or innovative mitigative measures, in order to avoid inadvertent damage to the ecosystem or culture.

Also, indigenous technologies that are implemented in partnership with development agencies and indigenous societies, can be duplicated and adapted upon to help solve problems faced by another society in a similar agro-ecosystem located elsewhere in both developing and developed countries. The scientific system can make important contributions to help facilitate local adaptations to changing conditions. Through the identifying of the ecological functions of the various components of ecosystems and predicting the way new and improved agro-ecosystems can be designed for specific localities (McNeely et al. 1990).

#### 4. Case-Studies

The following case-studies (\*) provide insight into some of the lessons learned by recent development initiatives in Africa which sought to include the participation of local people in areas such as the following indigenous, low-cost approaches to protecting and sustaining the use of the common resource base:

- i. - The maintenance of biological diversity;
- ii. - Biological and crop, pest control technologies;
- iii. - Recycling and fixation of nutrients (soil fertility);
- iv. - Mechanisms for water and soil conservation.

##### i) Case-Studies Where Indigenous Knowledge Was Used To Improve Natural Resource Development Projects

###### Agroforestry Research Project in Kenya

The International Council for Research in Agroforestry (ICRAF) established an on-farm agroforestry research project in the Machakos District of Kenya in 1981. This was expanded in 1983, when a team of social and ecological scientists went beyond alley cropping field trials to include community-wide activities. It soon became clear that the project had not involved women in either the planning stages or testing of new technologies.

Based on a better understanding of the gender differences in local knowledge (e.g., soil management and draught/famine survival) and indigenous organizational structures, an improved action research program was established (using men and women). This facilitated the sharing of agroforestry knowledge and the use of wild plants as sources of food, fodder and medicine (Rocheleau, 1991).

(\*) Much of the research for these case-studies was made available through work done for the World Bank by the Center for Indigenous Knowledge for Agriculture and Rural Development. Founded in 1987, CIKARD is designed to provide a global clearing-house service by accessing, storing, and disseminating information on all activities involving indigenous knowledge and decision-making systems in development).

## Neem Bio-Pesticides in Niger

This USAID-funded project brought together a team of entomologists and social scientists from Niger and the University of Minnesota to promote the exchange of indigenous knowledge on uses of neem products. Although the leaves and seeds of neem (*Azadirachta indica*) have been used for their insecticidal properties for years in India, traditional farmers in Niger had long observed the immunity of the neem tree to desert locust attack.

Traditional farmers in Niger are now using neem products instead of dangerous and expensive imported chemicals (Radcliffe et al. 1991). Two relevant lessons learned in this case-study are:

- 1) It is possible to test scientifically the validity and cost-effectiveness of an indigenous technology; and,
- 2) It is possible to transfer an indigenous technology from one region (India) to similar agro-ecosystems in another country.

### ii) Case-Studies Where Projects Worked With And Through Indigenous Concepts And Social Systems

## Soil Regeneration in Rwanda

This project, funded by the German Agency for Technical Cooperation, has worked with and built upon local skills and knowledge to help reduce deforestation and soil erosion. The Nyabisindu project has also facilitated the development of new technologies that build upon traditional agricultural practices.

Although many Rwandans already knew of the agricultural benefits provided by mulches, animal and green manures, and various erosion control measures; traditional, extensive fallow systems have been gradually transformed into intensive farming systems in central and southern Rwanda. Techniques used include, hillside terracing, valley floor fishponds or raised gardens, composting, mulching, living crops and livestock.

Principles found useful in this case-study include: (Sands, 1987)

- 1) Use adaptable technologies that build upon traditional practices;
- 2) Involve local farmers in the design, implementation, management, and evaluation of the program; and,
- 3) Coordinate programs with existing governmental activities.

### iii) Case-Studies Where Development Projects Inadvertently Ignored Indigenous Sustainable Resource Management Patterns

#### Agro-Forestry Projects in West Africa

In Burkina Faso, government officials and forestry advisers selected a site described by project officials as "useless bushland". They proceeded to clear off the brush and trees in order to plant straight rows of exotic fuelwood species.

Neither the project designers nor the foresters had realized that this useless-looking brushland (fallow) was in reality, a part of a delicately balanced indigenous agro-forestry system. Local women depended on this land for a variety of important forest products such as, shea nuts used for cooking oil; various seeds and leaves used in nutritional sauces; grasses and barks for weaving and dyeing mats and baskets; leaves, pods and, and roots for home remedies; dead branches and sticks for cooking fuels; and fruits.

"Although various aspects of the indigenous systems are almost always strained and some may be dysfunctional, the rewards (e.g. benefits and shortfalls) of any given system already in place, will be used by local residents to measure the desirability of any new idea" (Hoskins, 1984).

#### Water-Harvesting in the Sahel

Water is life for the diversity of indigenous societies living in the Sahel region, and accordingly, is at the centre of social, cultural, economic, animal and botanical activity.

It is now evident that many previous water-harvesting development projects in the Sahel, have not been based on local, indigenous techniques. Techniques which have adapted to the local carrying capacity, have been used successfully for countless generations, by conserving and protecting the soil and water.

For example, Mossi farmers in Burkina Faso construct rock bunds and stone terraces. The Dogon of Mali construct a basin system in their fields which is effective in conserving rainfall. The Hausa in Niger's Ader Douthi Maggia, use rocks bunds and construct small weirs using sticks, grain stalks, and earth to divert flood water over their fields. Farmers in the Yatenga region of Burkina Faso use a water harvesting technique called "zay". The zay conserve and slow down excess runoff by the use of rock bunds. This system is used by local farmers to help rehabilitate degraded, barren and crusted soils (Reij et al. 1988).

## 5. Indigenous Societies and Conservation Areas

Most development agencies (including CIDA and the World Bank) have formally and informally investigated the concept and viability of cooperating with indigenous people in activities which protect and conserve important wildlife and fragile habitats according to a combination of the following conservation objectives: (McNeely and MacKinnon, 1990).

- i) Reserves, where a protected natural area corresponds with the territory of a particular native population;
- ii) Native-Owned Lands, where the protection of the area is by native people only;
- iii) Buffer Zones. Where a protected area serves as a physical or ecological barrier between native lands and the lands of others; and,
- iv) Research Stations, where certain areas under native management are organized as agricultural or ecological research stations.

The objective of protecting indigenous peoples and their cultures is highly sensitive and requires a development planner to carefully judge between:

- 1) supporting the continued practices and rights of communities who have established long-term traditional practices in national parks or other protected areas; or,
- 2) the pursuit of more conventional modern development efforts, including tourism projects which exploit or exclude the local population from any meaningful benefit or control of change.

Outright conflict between conservationists and indigenous objectives has occurred in Africa. Tribes have been expelled from national parks or denied use of resources within the protected area. For example, the Rendille were driven from the Sibiloi National Park in Kenya, the Ik expelled from Kidepo National Park in Uganda and the Maasai grazing rights in the Ngorongoro Crater were restricted in Tanzania - with disastrous results to the tribes and often, to the protected area itself.

As countries like Kenya and Tanzania have shown, tourism development in and around protected areas and parks, is not just a major foreign exchange earner, but can also provide opportunities in establishing effective measures to help bring benefits to local areas, including the providing of local employment, stimulation of local markets, improvement of transportation and communication infrastructure, and many others.

It is clear that a further understanding and respect for African traditional knowledge systems by development planners and researchers etc. can help bring about a more cooperative approach to modern land use planning. This approach, apart from having the potential to ameliorate or avoid some of the negative side effects of "eco-tourism" and various ill-planned, development projects, may also help support on-going research efforts to improve field methodologies for recording indigenous knowledge and integrating these with the international knowledge system.

It must be acknowledged that those who seek to document traditional knowledge, cannot afford to be naive about the possibility of their work being used to the detriment of those who entrust them with information. To gather and to apply traditional knowledge can be a worthy objective, however, this must be achieved through mutually supportive relationships and fair arrangements with traditional knowledge informants and their communities.

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