Global Advanced Research Journal of Agricultural Science (ISSN: 2315-5094) Vol. 1(8) pp. 201-209, October, 2012
Available online http://garj.org/garjas/index.htm

Review

Indigenous Knowledge System: The Need for Reform and the Way Forward

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Accepted 20 September, 2012

Indigenous knowledge is local knowledge that is unique to a given culture acquired by local people through the accumulation of experiences, informal experiments, and intimate understanding of the environment in a given culture. It is the actual knowledge of a given population that reflects the experiences based on traditions and includes more recent experiences with modern technologies. Local people, including farmers, landless laborers, women, rural artisans, and cattle-rearers, are the custodians of indigenous knowledge systems. Indigenous knowledge is dynamic, changing through indigenous mechanisms of creativity and innovativeness as well as through contact with other local and international knowledge systems. With the rapid environmental, social, economic and political changes occurring in many areas and the deaths of elderly people since there is no formal documentation, comes the danger that the indigenous knowledge they posses will be overwhelmed and lost forever. In this paper, we discuss the concept of indigenous knowledge, the various areas of using indigenous knowledge by the African societies, the need for reformation of indigenous knowledge. We also proposed six important considerations for moving forward.

Keywords: Indigenous Knowledge, sustainability, management, natural resources.

INTRODUCTION

Indigenous knowledge can play a key role in the design of sustainable agricultural systems, increasing the likelihood that rural populations will accept, develop, and maintain innovations and interventions. It can be defined as the sum of experience and knowledge of a given ethnic group that forms the basis for decision-making in the face of familiar and unfamiliar problems and challenges. Farmers of agrarian, as well as industrialized, societies have sophisticated ways of looking at the world. They have names for many different kinds of plants, ways to diagnose and treat human and animal diseases, and methods to crop fertile and infertile soils. This knowledge has accrued over many centuries, end is a critical and substantial aspect of the culture and technology of any society. Yet it has often been overlooked by Western scientific research and development (Warren, 1988).

Indigenous knowledge functions within the given socio-economic and spatial boundaries of the society and plays an active part in the culture of the population concerned, being preserved, communicated, and used by its members

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to serve some purpose in relation to productive activity within the society (Bell, 1979). It can be transferred by quite elaborate systems, often involving oral transmission using stories and myths. Yet few examples have been methodically recorded, and fewer still have been studied with the purpose of developing an integrated approach to solving agricultural and rural problems (Brokensha, *et al*., 1980).

Indigenous Knowledge System (IKS) refers to intricate knowledge systems acquired over generations by communities as they interact with the environment. It encompasses technological, economic philosophical, learning and governance systems. It refers to a body of empirical know ledge and beliefs handed down through generations of long-time inhabitants of a specific locale, by cultural transmission, about the relationship of living beings with each other and their environment (Warren, 1991; Johnson, 1992). IKS is about reopening crucial files that were closed in the process of modernization and development in which the cultural, socio-economic life of indigenous peoples was maimed or killed.

Indigenous knowledge encompasses spiritual relationships, relationships with the natural environment and the use of natural resources, relationships between people, and is reflected in language, social organization, values, institutions and laws. These knowledge systems are usually embedded in naturalistic epistemologies and belief systems, which differ radically from those of scientific systems (IUCN, 1997). However, indigenous knowledge has value not only for the culture in which it evolves but also for researchers who are interested in improving conditions in rural localities (Warren, 1991). The recognition of IKS is, therefore, crucial for economic and cultural empowerment of indigenous people in particular, and the world in general.

Notwithstanding the increased awareness about the role of indigenous knowledge in the socio-economic development of developing countries, it continues to be labeled variously and misconceived at international discussions and in modern literature (Nwokeabia, 2003); it, plays only a marginal role in biodiversity management and its contribution to safety in general is neglected. The misconceptions further aggravated by the little or no growth in the sector and the lack of understanding of the context in which fur instance practitioners apply traditional medicine. Consequently, indigenous knowledge is being lost under the impact of modernization and the ongoing globalization processes. There is, there fore, the need to protect and further develop the knowledge generated and perpetuated by local communities through deliberate policy arid institutional reform programmes.

Aspects of Indigenous Knowledge

IKS have enabled, and continue to enable diverse indigenous peoples throughout the world to adapt to and survive environmental change and other societal dynamics. Many long-established groups, which have mixed with native populations, have also developed knowledge systems to successfully manage their local resources. This section examines some of the key components of IKS as practiced, especially in African societies.

Food and Agricultural Science

Traditional agriculture in Africa is seen as an indigenous agricultural system that has developed over time with cropping patterns based on an agricultural knowledge system, expressed in the local language, viewed to be in dynamic equilibrium with the environment, influenced by innovations emerging from within the system as well as those adopted from other indigenous systems and the national and international agricultural systems (Warren and Cashman, 1988).

Traditional agriculture is an ecologically tolerant and resilient crop production system. It has optimized production security through an evolution which stresses low risk through adaptation to the local environment and probably is among the closest relationships between man Sand his environment. Crop security, essential to subsistence farmers, is assured through the development of a complex system involving such factors as diversity of crops, well dispersed plantings, heterogeneous genetic resources, minimum tillage, and varying fallow, as well as sharing of food and labour. Such practices are often rational responses to local conditions and are logical adaptations to risks.

The use of plant derivatives for insect control was common in the tropics before the advent of synthetic pesticides. An environmental advantage of most natural products is their biodegradability. Many of the products used act as repellents or anti-feedants and their advantages include reduced virus transmission and reduces or eliminates the effects of plant injury, not only on yield but cosmetically as well. Unlike ordinary insecticides based on a single active ingredient, plant derived insect repellents and anti-feedants comprise an array of chemicals which act concertedly on both behavioural and physiological processes. Thus, the chances .of pests developing resistance to such substances are less likely.

The most common indigenous farming systems are intercropping and bush fallowing. Intercropping involves the planting of different crops in the same field in a farming

season (Appiah-Opoku, 1999). Farmers often plant between 6-10 crop species sequentially on the same farmland. The mixture of crops is often made up of varieties that have different moisture, soil nutrients, and resilient levels. The practice ensures that the entire farm is not devastated in case of disease outbreak or pest attack. It also facilitates recycling of nutrients through crop and weed-residues and ensures constant vegetative cover. Under the bush fallowing system, farmers often abandon their farm plots after a 2- or 3-year period of cultivation. This allows for re-growth of natural vegetation and enrichment of the soil through decomposed organic materials before returning to the same plot for another cropping phase. Constraints to traditional agriculture are not lacking, however. This system shares many of the constraints of other agricultural systems, including the stress of environmental degradation and variability, particularly drought, deteriorating climatic conditions, and increasing health pressures. The unwillingness of people to discuss or share their knowledge, i.e. knowledge is power, represents another constraint. Additional problems include the high labour requirements of' the system in order to maximize production.

Engineering and Technology

Indigenous people improve their livelihood through the use of simple technology. Many of these communities work on finding and developing technologies that improve the lives of the poorest and provide openings for small local enterprises. These include bee-keeping, making soap from local materials, planting weeds that lure animal pests away from the fields, and traditional crop varieties that grow best in local conditions.

Traditional Medicine

Traditional medicine refers to ways of protecting and restoring health that existed before the arrival of modern medicine. As the name implies, these approaches to health belong to the traditions of each country, and have been handed down from generation to generation. Indigenous Africans like other indigenous peoples elsewhere, rely on Plant and animal based medicine to meet their health care requirements.

In a study by Appiah-Opoku (1999) in Ghana, he established distinguishing features of indigenous healers who provide health care with plant, animal or mineral substances and use methods that are based on socio-cultural and religious beliefs of the people. The following categories of indigenous healers were identified: herbalists, traditional priests (female priests, traditional birth attendants, and bone setters). The herbalists, for example, are knowledgeable in the medicinal uses of herbs and other naturally occurring substances, while bone setters use herbs and other naturally occurring substances to heal patients with fractured bones.

Reports of scarcity of species used for medicine are being received with increasing frequency. Few projects have been undertaken to propagate or breed species in demand for traditional medicine and most plant and animal species are taken from the wild. Plants are particularly vital components to African traditional medicine, but a wide range of animals are also used ranging from the large mammals such as African Elephant and Giraffe to the Leopard and Four-toed Hedgehog. A variety of birds, reptiles, amphibians, fish and invertebrates are also utilized (Appiah-Opoku, 1999). Over 100 key species of plants, and 29 species of animals, have become scarce or difficult to obtain during a survey of East and Southern Africa. Some of these species are known to be endangered, such as the African Wild Ass and the Green Turtle. Populations of plant species are experiencing serious decline and are now regarded as rare in many areas.

Natural Resource Management

The UN Conference on Environment and Development (UNCED) in 1992 highlighted an urgent need for developing mechanisms to protect the earth's biological diversity through local knowledge. Many of the documents signed at UNCED reflected the need to conserve the knowledge of the environment that is being lost in communities. Similarly, the World Conference on Science in Budapest in 1999 recommended that scientific and traditional knowledge be integrated in interdisciplinary projects dealing with links between culture, environment and development in areas such as the conservation of biological diversity, management of natural resources, understanding of natural hazards and mitigation of their impact.

Many indigenous communities did not need any "sermonizing" from global agencies and external interventions to appreciate the importance of effective and efficient natural resource management. For example, in the village of Zaipobly in La Cote d'Ivoire, West Africa, there is a community protected land, which covers an area of 454,000 hectares and is the largest remnant of the original humid tropical forest in West Africa. It contains an extraordinary specific wealth of numerous endemic species. Most of the relics in the forest have survived because they are considered to be sacred. A sacred forest is a place that is venerated and reserved for the cultural expression of a community.

For village dwellers, the forest fulfils many functions: it serves as protection, provides them with medicinal plants and food and is a place for the conservation of flora and fauna. It creates a favourable damp microclimate for rural

activities in the surrounding fallow lands. It also serves as a place for important socio-cultural meetings and serves as a last living testimonial for future generations of what a true forest is. In West Africa the ancient tradition of community forest management seems to hold the ancient keys for a meaningful model of forest conservation. However, government attempts at dealing with biodiversity loss have applied a reductionist approach which has implied the establishment of protected areas at the expense of the people (Appiah-Opoku, 1999). Experience shows that this eventually fails to achieve the proposed goal. And the solution is out there, in old systems which until recently remained extremely effective. Sacred and community forests that have contributed immensely to biodiversity conservation are also now under serious threat in Ghana. Once found dotted throughout the different vegetation zones of the country, their presence ensured that endemic species restricted to that zone were protected from extinction. Only a few of these reserves remain today, which serve as home to the endangered Mona monkey and other endangered animal and plant species. Some have become major tourist attractions, generating revenue fir local communities and the nation.

Sustainable Development

Sustainable development has been variously defined and explained. For example, the International Union for the Conservation of Nature and Natural Resources (IUCN) explains that, “for development to be sustainable it must take account of social and ecological factors, as well as economic ones; of the living and non-living resource-base; and of the long lean as well as the short term advantages and the advantages of alternative actions” (IUCN, 1980). The definition most often quoted, however, comes from the World Commission on Environment and Development (WCED), published in 1987, which refers to sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

Indigenous knowledge in respect of sustainable development provides an expanded view of the concept. African philosophies explain that there is a duty on the present generation to look beyond itself to future generations as well as to look hack at the past and respect departed ancestors. This is beautifully expressed in the traditional African concept which Bishop Desmond Tutu has reflected to in his sermons that, the human community consists of three elements - those who went before us, those who are with us here and now, and those who are yet to come. All three together constitute the human community and if sight is lost of any one of those component parts of the trinity, you then get a lopsided view of the human endeavour. That is a very important concept, which can help protect the environment as well as enhance the principles underlying sustainable development.

Traditional Ecological Knowledge

The term Traditional Ecological Knowledge (TEK) includes intimate and detailed knowledge of flora, fauna, natural occurrences and the development and use of traditional technologies (Mathooko, 2000). The amount of TEK in Africa, for instance is vast and its development is clue mainly to the wide diversity of peoples, cultures, landscape, eco-zones and eco-regions. Knowledge stemming from a long-term association with the ecosystem allows fishermen, bar instance, to compete with large, commercial fishing operations which do not have a full understanding of the fishing areas (McGoodwin, 1990). Local fishermen often possess ‘mental maps’ of fishing areas and the seabed and a fishing location is often memorized using a triangulation method. However, sonar technology has now marginalized mental mapping and even though it is expensive, young fishermen prefer ii.

In spite of its usefulness, the future of TEK among Africa communities is uncertain. Such knowledge should be recorded and eva1uted by people who possess the appropriate background in biology, ecology, resource management and the social sciences and also hold appropriate skills for translating cultural information so that it can be understood by other cultures and those who can address the social frame of reference. There cannot be any sustainable use of any resource if the interests of the local traditional communities are not taken into consideration. Modern science must accommodate TEK and vice versa. The two types of knowledge should be integrated the survival of TEK in Africa and similar communities depends on it.

Natural Disaster Management

In Africa, local communities had well-developed traditional IKS for environmental management and coping strategies, making them more resilient to environmental change. This knowledge had, and still has, a high degree of acceptability amongst the majority of populations in which it has been preserved. Specifically, from time immemorial, natural disaster management in Africa has been deeply rooted in local communities which apply and use indigenous knowledge to master and monitor climate and other natural systems and establish early warning indicators for their own benefit and future generations. These communities can easily identify with this knowledge and it facilitates their understanding of certain modern scientific concepts for environmental management, including disaster prevention, preparedness, response and mitigation.

For example, the application and use of indigenous knowledge for disaster management is prevalent in Swaziland. Floods can be predicted from the height of birds' nests near rivers. Moth numbers can predict drought. The position of the sun and the cry of a specific bird on trees near rivers may predict onset of the rainy season for farming. The presence of certain plant species indicates a low water table (Kamara, 2003).

Importance of Indigenous Knowledge

There are two basic reasons why it is important for researchers to consider IK when carrying out research projects. First and foremost, incorporating IK into research projects can contribute to local empowerment and development, increasing self-sufficiency and strengthening self-determination (Thrupp, 1989). Utilizing IK in research projects and management plans gives it legitimacy and credibility in the eyes of both local people and outside scientists, increasing cultural pride and thus motivation to solve local problems with local ingenuity and resources (ibid.). Local capacity-building is a crucial aspect of sustainable development, and researchers and development specialists should design approaches which support and strengthen appropriate indigenous knowledge and institutions.

Second, indigenous people can provide valuable input about the local environment and how to effectively manage its natural resources. Outside interest in indigenous knowledge systems has been fueled by the recent worldwide ecological crisis and the realization that its causes lie partly in the overexploitation of natural resources based on inappropriate attitudes and technologies. Scientists now recognize that indigenous people have managed the environments in which they have lived for generations, often without significantly damaging local ecologies (Emery, 1996). Many feel that indigenous knowledge can thus provide a powerful basis from which alternative ways of managing resources can be developed. IK technologies and know-how have an advantage over introduced forms in that they rely on locally available skills and materials and are thus often more cost-effective than introducing exotic technologies from outside sources (IIRR, 1996). As well, local people are familiar with them and so do not need any specialized training (ibid.).

The following are some of the features of IK which have relevance to conservation and sustainable development:

- Locally Appropriate: IK represents a way of life that has evolved with the local environment, so it is specifically adapted to the requirements of local conditions.
- Restraint in Resource Exploitation: production is for subsistence needs only; only what is needed for immediate survival is taken from the environment.
- Diversified Production Systems: there is no overexploitation of a single resource; risk is often spread out by utilizing a number of subsistence strategies.
- Respect for Nature: A conservation ethic often exists. The land is considered sacred, humans are dependent on nature for survival, all species are interconnected.
- Flexible: IK is able to adapt to new conditions and incorporate outside knowledge.
- social responsibility: there are strong family and community ties, and with them feelings of obligation and responsibility to preserve the land for future generations. (Dewalt, 1994).

Limitations of Indigenous Knowledge

As with scientific knowledge, however, IK has its limitations, and these must be recognized. IK is sometimes accepted uncritically because of naive notions that whatever indigenous people do is naturally in harmony with the environment. There is historical and contemporary evidence that indigenous peoples have also committed environmental sins' through over-grazing, over-hunting, or over-cultivation of the land. It is misleading to think of IK as always being 'good,' 'right' or 'sustainable'.

For example, a critical assumption of indigenous knowledge approaches is that local people have a good understanding of the natural resource base because they have lived in the same, or similar, environment for many generations, and have accumulated and passed on knowledge of the natural conditions, soils, vegetation, food and medicinal plants etc. However, under conditions where the local people are in fact recent migrants from a quite different ecological zone, they may not have much experience yet with their new environment. In these circumstances, some indigenous knowledge of the people may be helpful, or it may cause problems (e.g., use of agricultural systems adapted to other ecological zones). Therefore it is important, especially when dealing with recent migrants, to evaluate the relevance of different kinds of indigenous knowledge to local conditions.

Indigenous knowledge can also be eroded by wider economic and social forces. Pressure on indigenous peoples to integrate with larger societies is often great, and as they become more integrated, the social structures which generate indigenous knowledge and practices can break down. the growth of national and international markets, the imposition of educational and religious systems and the impact of various development processes are leading more and more to the homogenization' of the world's cultures (Grenier, 1998). Consequently, indigenous beliefs, values, customs, know-how and practices may be altered and the resulting knowledge base incomplete

Sometimes IK that was once well-adapted and effective

for securing a livelihood in a particular environment becomes inappropriate under conditions of environmental degradation (Thrupp, 1989). Although IK systems have a certain amount of flexibility in adapting to ecological change, when change is particularly rapid or drastic, the knowledge associated with them may be rendered unsuitable and possibly damaging in the altered conditions (Grenier, 1998).

Finally, an often overlooked feature of IK which needs to be taken into account is that, like scientific knowledge, sometimes the knowledge which local people rely on is wrong or even harmful (Thrupp, 1989). Practices based on, for example, mistaken beliefs, faulty experimentation, or inaccurate information can be dangerous and may even be a barrier to improving the well-being of indigenous people. However, researchers need to be careful when making such judgments.

The Loss of Indigenous Knowledge

With the rapid environmental, social, economic and political changes occurring in many areas inhabited by indigenous people comes the danger that the IK they possess will be overwhelmed and lost forever. Younger generations are acquiring different values and lifestyles as a result of exposure to global and national influences, and traditional communication networks are breaking down, meaning that Elders are dying without passing their knowledge on to children. In some cases, the actual existence of indigenous people themselves is threatened. Researchers can assist in preserving IK through the following:

- Record and use IK: document IK so that both the scientific and local community have access to it and can utilize it in the formulation of sustainable development plans.
- Raise awareness in the community about the value of IK: record and share IK success stories in songs, plays, story-telling, videos and other traditional or modern means of communication. Encourage people to take pride in their knowledge.
- Help communities record and document their local practices: Get local people involved in recording their IK by training them as researchers and providing means of documentation (computers, video equipment, etc.).
- Make IK available: disseminate IK back to the community through newsletters, videos, books and other media.
- Observe intellectual property rights: have agreements so that IK is not misused and benefits return to the community from which it originates.

The Need for Revitalization

Indigenous knowledge, also referred to as traditional or local knowledge, is embedded in the community and is unique to a given culture, location or society. The term refers to the large body of knowledge and skills (Indigenous Knowledge Systems and Practices/IKSP. Indigenous Technological Knowledge/ITK) that has been developed outside the formal educational system, and that enables communities to survive. The dominance of the western knowledge system has largely led to a prevailing situation in which indigenous knowledge is ignored and neglected. It is therefore easy to forget that, over many centuries, human beings have been producing knowledge and strategies enabling them to survive in a balanced relation with their natural and social environment.

As IK is closely related to survival and subsistence, it provides a basis for local-level

decision making in:

- Food security
- Human and animal health
- Education
- Natural resource management
- Various other community-based activities

IK is dynamic, the result of a continuous process of experimentation, innovation, and adaptation. It has the capacity to blend with knowledge based on science and technology, and should therefore be considered complementary to scientific and technological efforts to solve problems in social and economic development.

IK has the disadvantage of not having been captured and stored in a systematic way. The main reason for this constraint is that it is handed down orally from generation to generation. This creates an implicit danger that IKSP may become extinct.

Characteristics of Indigenous Knowledge

- IK is generated within communities
- IK is location and culture specific
- IK is the basis for decision making and survival strategies
- IK is not systematically documented
- IK concerns critical issues of human and animal life: primary production, human and animal life, natural resource management
- IK is dynamic and based on innovation, adaptation, and experimentation.
- IK is oral and rural in nature.

It is encouraging to observe that, over the past ten years, there has been a dramatic increase in interest in the role that indigenous knowledge can play in truly participatory approaches to sustainable development. This interest is reflected in a myriad of activities generated within communities, which are recording their knowledge for use in their school systems and for planning purposes within national institutions, where indigenous knowledge systems are now being regarded as an invaluable national

resource; and within the development community, where IK provides opportunities for designing development projects that emerge from priority problems identified within a community, and which build upon and strengthen community-level knowledge systems and organizations.

It may not be accidental that the growing interest in the potential contribution of indigenous knowledge to development is becoming manifest at a time when current development models have proven not too successful. Today, hundreds of millions of marginalized people all over the world are still being excluded from the mainstream of development. These people have not benefited from development efforts which have mostly been based on a top-down development model, with the maximization of productivity as its major target. The agricultural sector provides a prime example. The objective of the Green Revolution was to maximize yields through the introduction of new crops. These crops depended on the optimal availability of fertilizers and water to achieve high yields. From a production point of view the Green Revolution was a success, but its potential could only be fully realized iii areas with good soil and a secure water supply, and by farmers with access to financial inputs. However, for people without good land, no adequate access to irrigation facilities and a lack of financial means, the results have been of little use.

Many case studies and research projects have shown that there are no simple technical Western solutions that can be easily diffused and adopted by people on the margins. New insights reveal that development interventions have failed to induce people to participate because of the absence of instruments and mechanisms that enable them to use their own knowledge. Recent research has given valuable insights into how people use their own locally generated knowledge to change and to improve, for example, natural resource management. Greater efforts therefore should be undertaken to strengthen the capacity of local people to develop their own knowledge base and to develop methodologies to promote activities at the interface of scientific disciplines and indigenous knowledge.

The Way Forward

1. Scale up successful IK practices to help achieve the MDGs

There is ample evidence to suggest that one of the best ways to empower local communities is to enable them to apply their indigenous practices in development activities that affect them directly. While there is a growing interest by local institutions and governments in incorporating IK into programs and projects, the degree of that interest varies. In part, this is because some governments are still uncertain about the commitment of external partners in supporting such activities, who may have doubts about the efficacy of such an approach. These cases demonstrate that with appropriate adaptation and leveraging with other knowledge resources, IK can make a significant contribution in saving lives, educating children, increasing agricultural production, enhancing governance, etc. It would, therefore, make good development sense for the partners to increase their support for community-driven activities that rely on IK.

2. Enhance the capacity of local communities to develop, share, and apply their IK

One of the most effective ways to empower local communities is to help enhance their capacity to exchange and apply indigenous practices (either directly or in combination with other practices). In particular, experience suggests that brokering knowledge and bringing together knowledge seekers and providers is especially useful in increasing the participative problem-solving capacity of local communities. Specific action in this area could include support for:

- Development of national IK strategies and their incorporation into poverty reduction programs.
- Brokering of South-South knowledge and learning exchanges
- Facilitation of community-to-community exchanges
- Building of 1K professional associations, standards and ethics
- Supporting communities to develop businesses related to IK.

The governments could take the lead in creating the appropriate policy environment for these activities to evolve. Partners could support the process by providing resources for brokering and facilitation functions as well as the dissemination of lessons of experience (e.g., in the form of tool kits and guidelines, some prototypes of which have already been prepared). Projects, intermediaries and government agencies could be supported in providing opportunities for exposing traditional practitioners to the scientific research community and other professional associations. At the same time, the private sector could be encouraged through appropriate policies to invest in the development of products emanating from indigenous practices, or develop appropriate community - private sector partnerships.

3. Develop innovative protocols for the validation and protection of IK

As indicated in the earlier section of this article, existing international protocols governing intellectual property rights (IPR) are based essentially on the concept of patents. Similarly, protocols for validation of traditional medicine are

essentially based on researching the effect of single substances on a specific disease or illness. This makes their application in the case of traditional medicine problematic, given the multiple ingredients in a herbal treatment. Accordingly, more appropriate approaches need to be developed to address the issues of IPR and scientific validation in the case of IK. While there has been a start in this direction, as indicated earlier, more concerted action is called for. The governments can help by designing appropriate policies and legal covenants. The partners, led by WIPO in the case of IPR issues and by WHO in the case of traditional medicine, could contribute by promoting the use of appropriate international protocols and disseminate them through an information campaign that reaches the local practitioners and the communities, associations researchers, etc.

4. Develop a results framework for monitoring IK and measuring Its Impact:

With an increasing of number of projects and activities incorporating IK, a body of evidence is building up that will be useful in expanding IK applications across countries. It is, therefore, important to identify effective approaches to monitoring and evaluation of results in projects that incorporate IK, and to establish a better understanding and a larger database of quantifiable results of IK-driven activities. Sector-specific sets of indicators would need to be developed that demonstrate how the incorporation of useful IK (or addressing harmful practices) in development has made a difference. This framework would also help to distill successful approaches to replication and scale up. The framework should be referenced against the MDGs, indicating how IK can contribute to achieve them. This would also help to address the issues related to validation and IPR associated with IK. Governments could ensure that national IK strategies contain appropriate arrangements for measuring results. The partners could help by developing common methodologies based on successful country practices and disseminating these to the communities of practice.

5. Establish an Innovation fund to promote successful IK Practices

While IK is typically passed on from generation to generation, it is not static in that each generation can adapt and improve on earlier practices. Local communities have the potential for creativity and innovation. There is evidence to suggest that, when enabled, communities and traditional practitioners are capable of developing new problem solving approaches that build on their IK systems. There is also evidence to suggest that an innovation fund to support such activities could go a long way in stimulating further creative thinking among the communities. For example, the GTZ has evaluated a series of small scale innovation projects funded by Germany and found them to be particularly useful in promoting community-based initiatives, micro-enterprise development and local innovations. Similarly, the World Bank's Development Marketplace has spurred several very creative community-based solutions, some of which have involved IK. An innovation fund dedicated to IK could be modeled on the latter and provide a platform for partners to contribute resources as "venture capital" for IK-related innovation.

6. Organize a global IK conference to promote the above agenda

Despite recent progress, awareness of the role that IK can play in development is generally limited. Yet, there is a growing body of evidence to suggest that successful indigenous practices can contribute effectively to the development agenda. In this context, it would be timely to organize a global conference that would bring together policy makers, representatives of IK communities of practice and other community-based organizations, and the development partners, etc., to help generate a stronger commitment to implement the above agenda. The year 2005 would be a realistic target for such a conference and it would provide a springboard for IK's role in helping achieve the MDGs in the remaining decade before the target date in 2015. The IK Program of the World Bank is ready to collaborate with other partners, country authorities as well as community-based organizations in preparation and organization of such a conference. An international conference would underline the commitment of development partners to promote the use of IK in the development process.

CONCLUSION

Indigenous knowledge (IK) is the knowledge used by local people to make a living in a particular environment. It is dynamic creative and constantly growing and adapt to meet new conditions. The integration of IK into the development process will help to enrich it and make it more equitable. It has many positive aspects, and incorporating IK into projects can contribute to local empowerment and can provide valuable input to alternative natural resources management strategies.

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