

# *The Report on the Indigenous Knowledge Workshop*

Cairo, Egypt

January 1994

## **A Step Forward Against Desertification**

An important step forward in the fight against desertification took place in Cairo during 2–5 January 1994. Over 30 specialists, representing the different regions of Africa, took part in a workshop that produced important recommendations for the ongoing United Nations negotiations for a Convention on Desertification and Drought.

Focusing on the 'Impact of Indigenous Knowledge and Traditional Coping Strategies for the Prevention or Mitigation of Land Degradation and the Desertification Process in Africa,' the Workshop produced ten recommendations that will be placed before the negotiators. These recommendations cover ways that indigenous knowledge might be included in the Convention so as to speed the fight against desertification and ensure that local people have a say in the design and implementation of programmes combatting the process.

## **Opening Session**

The workshop was hosted by the Cairo based regional office of the International Development Research Centre (IDRC). The meetings were held at the Management Development Centre for Industry (MDCI), courtesy of the Government of Egypt.

### **Warm welcome**

Participants in the workshop were warmly welcomed to Cairo and MDCI by **General Mohammed Hussein**, First Undersecretary of State and Director of MDCI. Pointing out that Egypt is a 'full and active partner in the effort to protect the environment,' the Minister reviewed the important role in the economy and business life of Egypt played by the Centre.

The new environmental protection law that the Government of Egypt is in the process of writing was reviewed by His Excellency **Dr Atef Ebeid**, Minister of State for Administrative Development and the Environment. He spoke of the importance of desertification control to the people of Egypt. Only three per cent of Egypt is cultivatable and about ten percent of this has been lost to desertification in recent years. Desertification control is therefore a particularly pressing issue in Egypt today: one upon which the country is prepared to spend time and effort.

### **Canada's interest**

The interest of the Government of Canada in environmental problems on a world-wide basis, and in desertification control in particular, was outlined by His Excellency **Jacques Simard**, Ambassador of Canada to the Arab Republic of Egypt.

### **The policies of IDRC**

The Regional Director for IDRC, **Dr Fawzy Kishk** reported that IDRC has taken part in the Agenda 21 negotiations. The mission of the organization is 'empowerment through knowledge.'

This workshop is the first of three addressing the problems of desertification and drought in Africa. Its focus is upon the importance of indigenous knowledge in the prevention of desertification. An important factor in desertification is the human element and indigenous knowledge 'is like a thread running through the human community, touching on biodiversity, climate and countless other activities.'

An introduction to the workshop's procedures was provided by **Dr Egal Rached**, Senior Programme Specialist, Middle East and North Africa Region, IDRC, Cairo.

## **Desertification – A General Review**

A key-note address on the process of desertification and its ramifications for the environment of Africa, was provided by **Dr Mohammed El Kassas** who is widely honoured as the 'father of the environmental movement in Egypt.'

Desertification is defined as 'land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors including climatic variations and human activities.' In general, four land-use systems are affected, singly or in combination. These are woodlands, pasturelands, rainfed agricultural areas and irrigated farmlands.

The cause of the degradation of agriculturally used drylands relates to a combination of excessive human exploitation, when it oversteps the natural carrying capacity of the land, and the inherent fragility of the effected system. A variety of factors and processes or 'triggering events' lead to over exploitation including:

- pressure from increasing populations;
- cultural change;
- changes in the economic structure of the society; and
- unavoidable events from outside the society such as war and environmental catastrophes.

Most drylands are characterized by low and variable rainfall and the natural vegetative cover is light and often has a tenuous existence. The contain-

ment of desertification involves a combined variety of corrective legal, financial, technical and policy actions that provide the basis for the sustainable development of land and water resources in effected areas.

Activities to combat desertification have been carried on at the world level since the 1950s. From 1977 to 1992, the Plan of Action to Combat Desertification (PACD), was in force and administered by the United Nations Environment Programme (UNEP). Following from UNCED in June 1992, Agenda 21 identified six principal programme areas including strengthening the knowledge base, directly combatting land degradation, developing and strengthening poverty alleviation programmes, developing comprehensive antidesertification programmes, developing comprehensive drought preparedness schemes and promoting popular participation in environmental education. Subsequently in late 1992 the United Nations resolved to establish an 'Intergovernmental Negotiating Committee to Elaborate an International Convention to Combat Desertification' (INCD). INCD has held several negotiating sessions since then and the convention is well on its way to completion. As it is now, the convention supports corrective, rehabilitative and preventive measures and calls for the funding of a variety of programmes over a 20 year period.

## **The Current State of the Negotiations**

**Dr Robert J. Ryan**, Special Advisor and Deputy Executive Secretary to INCD, briefed the workshop on the current progress of the negotiations with an emphasis on how the workshop could be of assistance.

The negotiations began in Nairobi in May 1993 by giving the negotiators a common information base through presentations from experts at a workshop covering all aspects of the problem. Following the second negotiating session (Geneva, September 19-93), government input has been received and a first draft of the text of the convention has been produced. The third session will meet in New York in late January. The process is scheduled to finish in June of this year in Paris.

Related regional instruments (annexes to the convention) will also be negotiated. The Annex for Africa is now in the process of formulation but annexes for the other regions have yet to be worked

out. Nevertheless, it is expected that provisional implementation of the convention, and the African Annex, might begin immediately after the convention is signed in June 1994.

The conference of the parties who are signatures to the convention, which is being created to oversee the implementation process, is likely to be very powerful and very important. A bottom-up approach is to be taken in tackling the desertification problem with a focus upon local action using a cascading series of attacks on bottlenecks encountered in the process. It is expected that the later will include land tenure, world trade and other important elements.

The draft text calls for the protection and pro-

motion of indigenous technologies. Such references to indigenous knowledge have been facilitated by the information sharing process of which this conference is a part.

### **Comments:**

There is a need to ensure that all information is properly circulated so that the African negotiators are fully informed. It must be noted that the convention states that it is most important that African desires be placed first and that Africa has first priority for any action.

Land tenure is probably the most important and most troubling issue likely to hold up the implementation of the convention because the problems associated with it are so variable from nation to nation and from culture to culture.

The convention is unlikely to call for research

rather than action. Rather it is looking at the policy environment at the national level as well as action at the local level.

The reality of the negotiations have to be recognized. The NGOs, for example, have to master the draft text and take a broad view of it and then they can work through their own governments so as to influence the convention. NGOs in Africa should not only try to influence their governments, but also governments in the developed world.

If the convention means business, it must face the problem of funding. Africa will need something like USD5 billion per annum to implement the programmes the convention is discussing.

## **The Crisis of the Commons**

One of the most complex problems facing the fight against desertification is that of property rights. This broad and pervasive issue was discussed by **Dr Bahman Mansuri**, Director, Africa Division, the International Fund for Agricultural Development (IFAD) in his paper 'Common Knowledge and Common Property: User-based Resource Conservation Strategies in Sub-Saharan Africa.'

IFAD's interest in indigenous knowledge arises from the 'fact that it is an effective means of addressing and solving a problem.' IFAD considers the Convention to be 'an extremely important framework in seeking to address resource conservation issues in Sub-Saharan Africa.' The inclusion of indigenous knowledge in the Convention is vital to the development of sustained resource conservation.

IFAD understands that desertification is largely a result of what people do. In this instance, this means the activities of farmers, especially poor farmers. These activities are often modified by state policies as well as such factors as growth in the population. A second important factor is that the resource the farmers use is generally owned by someone, a group of people or by some kind of organization such as the State.

Central to an understanding of the process of conservation is that it must be of benefit to the farmers: the people who use the resource. Furthermore, in places where there is no cash economy, these benefits must be in tangible terms that improve the standard of living of those involved. Often this means improving the functioning of the local community.

When the resource is held in common the problem becomes acute because, if the community

disin-

tegrates, it is the individual user who obtains short-term benefits from the property. Therefore community based actions are very important for the successful conservation of resources. Antidesertification activities need to be integrated into ongoing development work while at the same time they should be aimed at building up the local community. This means that the community must be involved in defining the problem, seeking solutions as well as implementing programmes. It is here that indigenous knowledge has the biggest role to play.

The process of desertification is a global problem. Indigenous knowledge cannot provide all the answers on its own especially when one considers that some aspects of indigenous knowledge will not be applicable to the current situation. It is necessary that indigenous knowledge be integrated with modern scientific knowledge as well as with the latest resource management techniques that are applicable to a given area. 'It is in this area of integration that the Convention has a big role to play.' The Convention can create an 'enabling environment' for African farmers so they can work on antidesertification programmes not only for their individual benefit, but for the benefit of all of the people on this planet.

## **Pastoralism and Desertification in Egypt**

In their paper entitled 'Indigenous Knowledge Traditional Coping Strategies, and Land Degradation and Desertification, with Special Reference to Egypt's Northwest Coastal Zone,' **Drs Donald P. Cole and Selima Abdel-Rehim** stated that nomadic pastoralism in the Arab World (and elsewhere) has been widely denigrated as a primitive survival system and pastoralists have been accused of bringing about land degradation and desertification. Dr Abdel-Rehim presented their paper, illustrating it with slides and diagrams.

Their paper countered that view arguing that nomadic pastoralism developed as a specialized and highly skilled production system after the emergence of irrigation-based agriculture and urban civilization in the ancient Middle East. As rangeland livestock producers, nomadic pastoralists made sustained use of the grassland and semi-desert areas and provided the wider Arab society with camels, horses, sheep and goats as well as wool and other animal products.

The paper discussed the comprehensive indigenous knowledge of Arab nomadic pastoralists concerning the land, its vegetation and water resources. It also revealed the sophistication of traditional pastoral management of rangeland areas by the use of a highly decentralized system based on the household-sized herding unit. This system provided for maximum flexibility to respond to seasonal and annual variations in rangeland conditions and guarded against overgrazing and misuse of the ranges.

The grasslands and semidesert zones have

been opened up to nonpastoralist uses, including agriculture, mining, quarrying, industry and tourism as well as for the resettlement of people from peasant and urban areas. These new uses, along with warfare, have had a major impact on the rangelands and must be assessed for bringing about land degradation and desertification. Contemporary pastoralism uses the ranges more intensively because it is more sedentary than in the past with consequent overgrazing and other abuses.

There is a need in the region for the development of a modernized pastoralism requiring the application of modern rangeland science and range management programmes incorporating the expertise and skills of the indigenous system and including the pastoralists as main beneficiaries and participants. Also recommended are a cultural heritage programme and awareness programmes - one addressed to officials to promote recognition of the positive past and potential future contributions of 'environment friend-

ly' rangeland pastoralist production and the other to pastoralists

to promote recognition of the negative consequences of their present nontraditional overuse and misuse of rangeland resources. Comprehensive regional development plans must include rangeland livestock production as an integral sector in desert development. A system of rangeland preserves needs to be introduced along with further and improved water harvesting, where appropriate, and the reestablishment of systematic control and management of rangeland use through greater pastoralist participation in local and regional level government and decision making bodies.

### **Comments:**

The area discussed runs from Alexandria to Libya and used to be regarded as the vineyard of Rome in Classical times. The agricultural systems were developed as the result of a large-scale water management schemes built for the area by the Romans. This extensive system is now being rebuilt.

Under traditional systems, the sale of land follows Koranic law. Land and vegetation is held in common with water as the limiting resource that is used on a reciprocal basis. There are also reserve lands that are defined through communal discussion. Nowadays, the desert lands have been declared the private property of the various states. This is similar to the concept of Crown Land in England and some Commonwealth countries. When a person improves the land, they are considered to have some rights to it, but they still cannot use it as collateral for a loan.

The authors believe it is up to the state to carry out proper land-use surveys so that areas that can be used for agriculture, or for rangeland, are reserved. Then suburban development could be directed to other sites. Rangeland management programmes should involve the Bedouin and introduce modern systems of grazing. This is because using vehicular transport to move large herds of sheep and goats to places where rainfall has occurred is resulting in overgrazing.

## **Environmental Policy in West Africa**

A paper written by **James Fairhead**, of the Natural Resources Institute and **Melissa Leach**, University of Sussex, was read by **Dr. Yianne Lambrou**, Senior Programme Officer, Environment and Natural Resources Division, IDRC. Entitled 'Environmental Policy in Interaction with Local Resource Management in Kissidougou Prefecture, Guinea, West Africa,' it reported that local agricultural and forest management techniques have underlain the creation and maintenance of landscape features in Kissidougou Prefecture of Guinea's forest-savanna transition zone.

Social anthropological, oral historical, archival and serial photographic evidence shows how, over long periods, peri-village forest islands have been created from savannas, productive rice swamps from inland

valleys and productive upland soil and vegetation conditions from unimproved herbaceous savanna. From 1893, colonial policy in Kissidougou Prefecture, Guinea, was based on reading the regions's

environmental history backwards assuming forest islands to be relics of a once extensive, dense and humid forest cover that local agriculture and fire-setting had destroyed. Archival evidence shows how the deductions of botanists, agronomists and foresters, coupled with the assumptions of administrators and other visitors, mutually reinforced each other to create and sustain a vision of degradation so pervasive that it underlies modern environmental policy.

Colonial and post-colonial policies conceived within this vision have interacted with local land use. Given varying administrative capabilities, changes in local practices have been conditioned by policy as opposed to other social, economic, political or ecological factors while environmental changes have fortuitously coincided with policy objectives.

### Comments

Local practices have actually created problems in the area discussed in this paper because these policies are

no longer applicable. Also, donor policies have affected the activities of the local population as well.

It also should be noted that Guinea is very important in the ecosystems of western Africa because within its boundaries there are many headwaters of rivers that flow into neighbouring countries. This means that, for example, pollution or any activities that restricts the flow of the rivers affects the neighbouring countries who are downstream. Unfortunately administrative and constitutional problems hamper the nations of the region from formulating responses to common problems. A sense of nationalism rules rather than national-community feelings.

The Chairman pointed out that there are already organizations working on the issues both at a national and international level. The problem is the degree to which these organizations are effective. This paper, he continued, emphasises once again that land tenure issues are complex and need to be sorted out. For example, a person may have the right to plant crops but not to plant trees on a given plot of land. The land tenure issues will be discussed at the next conference in Dakar.

## Mixed Production Systems

Presenting on behalf of his co-authors, **Drs Y. Katerere and K. Nhira, Dr Roger Mpande** of Zimbabwe reported on 'The Mixed Production Systems of Southern Africa.'

The paper reviewed the impact of indigenous knowledge and traditional coping strategies on the mitigation of land degradation and the desertification process with specific emphasis on mixed cropping and land management in the countries of the Southern Africa Development Community (SADC).

Both colonial and post colonial governments have set out to replace or recreate rural institutions. What is needed now is to harness the political interests of the state and local elites so they recognize the role of traditional institutions in natural resource management.

The authors investigated some of the traditional options suitable for mitigating against land degradation. These include the use of intercropping instead of monocropping. Intercropping is recommended in situations where agriculture is carried out on a subsistence basis. The advantage of intercropping is that it minimizes soil erosion with very little effort because a layer of vegetative cover is continually maintained. The system also spreads the risk of crop failure over a broader time spectrum than does monocropping.

The cropping of wetlands and floodplains (Dambo cultivation) during droughts and dry seasons is also recommended. Banned by colonial authorities,

the technique should be resurrected as research shows it is sustainable. Additionally, it would give farmers using marginal lands access to better quality soil.

There are several traditional techniques of using organic fertilizer that should be developed and expanded. These include the use of termite mounds as sources of base materials. The application of animal manure needs to be improved and the positive results from mound cultivation should be considered as suitable for application to a wider area. The authors also noted that there are a wide variety of coping strategies used with grazing cattle that need to be investigated.

The authors recommend that research capabilities within the region should be expanded because the technologies that have been identified are site specific. There is also a strong need to monitor changes occurring to a specific technology in its setting over time in response to demographic and other changes. Furthermore, access to information on indigenous knowledge is still problematic. Thus regional or country centres to collate information on the technologies for purposes of information exchange should be established.

### Comments on the paper

Monocropping systems for cash crops were seen as a rational way of producing income for farmers in developing countries. Monocropping is more suitable for commercial operations where machinery is available.

Participants agreed with the authors that in countries where Dambo is banned, it should now be allowed because current research supports the view it is

environmentally sustainable. With reference to the traditional shifting cultivation systems that are widely practised in the area, it was agreed that population pressure and the desire for economic improvement work against their continued use.

## **Development and Desertification in the Horn of Africa**

The situation in the Horn and East Africa was discussed in a paper by Drs M. A. Mohammed Salih and Abdel Ghaffar M. Ahmed. Their paper was entitled 'The Case of the Horn and East Africa.'

The paper addressed the issues of desertification and development policies in the Horn and East Africa, as well as utilization and the encounter and interface between scientific knowledge and indigenous knowledge. Given the constraints imposed by the relatively low level of technology, members of 'traditional communities' have started to improve and perfect their technical knowledge. In doing so they are understanding the potentials and constraints of their environment so they can decide on options for effective action, especially when confronted with issues of desertification or land degradation in general.

A distinctive feature of indigenous knowledge is that it encompasses the continuum between the landscape and the vegetation that exists upon it so that the two can be manipulated by people in the process of producing food. African farming and herding is a series of variations upon the themes and processes observed within nature. Knowledge of ecological processes give resource users the flexibility to direct processes to their own advantage. Too often the illiteracy of indigenous people has been equated with ignorance when in fact the depth of their environmental knowledge is profound. For this reason, plans must be reconsidered in the context of a mix between a people's indigenous knowledge and the knowledge available to government. even more important is the establishment of a platform where these two systems of knowledge can interact on a basis of reciprocal understanding and respect.

The whole management of resource systems by local people, whether private or common, is based on indigenous knowledge. An attempt has to be made to capture the right mix between indigenous knowledge and modern knowledge for the sake of sustainable

livelihood with the environment. African countries in general need to redesign their self images and create a new science led and culturally-aware future.

### **Recommendations and comments**

The authors pointed out the need for people oriented planning and that organizations that plan need to be close to the communities for which they are planning. This perspective has to be maintained on a national and a regional basis. To assist in the collection and eventual use of indigenous knowledge, the authors suggested a centre of excellence be founded. The relevant point of contact has to be defined between top-down and bottom-up planning and planners.

One participant described the Desert Laboratory in Cairo as an example of the integration of indigenous knowledge and modern science. While another gave an example from Kenya where the top-down approach had not worked. The authors responded to these comments by suggesting that all development plans must cross national boundaries because these are artificial. This is one of the reasons why the establishment of an international institution to study indigenous knowledge and its relationship with development was advocated.

The presenter was asked if he was suggesting that systems based upon indigenous knowledge were not applicable to the current situation. The presenter responded by saying that what he meant was that we cannot go backwards in time. The past is gone and we must not be overly romantic about it. We can only do the best we can with the present and the present only includes a certain amount of the knowledge that was once available.

## **Antidesertification in the Sahel Region**

In a paper entitled 'Gestion des Ressources Naturelles et lutte contre le desertification en Afrique Sahelienne:

Logiques et strategies des communautés pastorales,' Dr Oussouby Touré, of the Centre de Suivi Ecologique, Dakar, Senegal, discussed errors made in attempts to manage land degradation in the region.

The drought situation in the Sahel of West Africa has exacerbated the situation created by a variety of social factors including an increase in the population. In an attempt to control the use of arid areas, the nomads of the region have been settled in villages. This policy of sedentization was tied to a policy of establishing modern systems of cattle raising. Modern water management methods have also been introduced.

The nomads resisted the government's sedentization efforts. The strength of this resistance was increased by the drought as the nomads attempted to institute their traditional reactions to the situation. Unfortunately, changes in their social structure resulted in a failure of the nomads to adjust to the worsening drought. The government's policies also failed to achieve their objectives. The result was the creation of a refugee situation where nomads left their traditional areas and congregated around the towns where food was available.

In an effort to solve this problem, and return people to the land, research into new policies that the government might adopt is now taking into account the opinions of the nomads. This research has also led to a better understanding of the ecosystems of the Sahel and the surrounding regions. This research is supporting the return of the nomads to their original style of living modified by science while increased knowledge and awareness of the ecosystem is leading to better management of the natural resources.

Rehabilitation efforts in the area are concentrating on reforestation activities. Efforts are being made to encourage the local communities to become involved in the management of the newly forested areas. There are two main questions that are important for the implementation of this programme. First, the choice of suitable enabling institutions and second the necessity of an examination of indigenous knowledge and its possible relationship to new trends and techniques in management. This is not a simple process. Indigenous knowledge must be matched with new knowledge and techniques. This task is made more complex by the fact that the communities involved in the use of rangelands are not homogeneous and are often alienated from existing state organizations.

There is also the necessity to undertake research that will result in permanent and sustainable rangeland management systems. Water resources are very important and management techniques for them need to be developed as well. Through all of this, the opinions and the needs of the pastoralist community must be taken into account. Of course all this activity requires funding as well as manpower and other resources and it is not worth doing unless programmes aimed at controlling poverty are included.

### **Comments on the paper**

Participants commented that the fragmentation of government policies is a problem. It was added that an important point was the necessity of making an inventory of existing resources. Several inventories exist but they need to be integrated. It was also suggested that modelling be looked at closely as a means of introducing effective technological change. There is also a need to both internationalize and decentralize organizations involved in planning and resource management.

In a question from the floor, Dr Touré was asked about problems that arose from the relationship between the herdsmen and the state, especially as regards their habit of crossing international boundaries. The author replied that transboundary nomadism is perceived as a big problem by the states of the region and that they have tried to control it. Herdsmen ignore the boundaries preferring to use their traditional approaches to land use. This problem is exacerbated by plans to carry out programmes on a national basis ignoring the need for international cooperation.

The management and distribution of water resources by the state is based on wells and their associated rangelands. This system ignores the fact that for the nomads, the definition of rangeland changes from year to year according to the quality of the available pasturage. The solution is to allow range users to use the resource in their traditional manner.

## **Water and Land Management Issues in the Maghreb**

The situation in the Maghreb region of North Africa was reviewed by Dr Slimane Bedrani, Centre de Recherches en Economie Appliquée pour le développement (CREAD), Algeria, in a paper entitled 'Savoirs locaux traditionnels,



dégradation des terres et processus de désertification dans les pays du Maghreb.'

Dr Bedrani described several systems used by the rural inhabitants of the Maghreb to harvest the available water, store it and distribute it. The methods include systems of directing rainfall into the aquifer layers of the rock, collecting it at springs, dividing it between users and distributing it. Known as 'foggaras' or horizontal wells, these water harvesting methods are used to irrigate market gardens and small holdings.

In drier areas, the Bedouin and other herdsmen have dug storage cisterns and constructed berms and ditches that direct rainfall into them. Water from the cisterns is then used to supply herds with their needs as well as for irrigating gardens and smallholdings. Water from these sources is distributed through the community using water collection dams and conduits.

It is important to note that these systems have all been developed in the past. Much of the development work is assigned to the period of Roman occupation when the area was a major supply of comestibles to the Empire. Some of the systems are now in the process of renovation but this work is being hampered by its relatively high cost. During Roman times costs were comparatively low because slave labour was used. Knowledge of the methods used in these traditional systems of water harvesting, as well as the agricultural systems that accompanied them, were generally held by the women and older persons in the communities. This was because the men were often engaged in nomadic herding activities or were away working for wages while the women and older people managed the farms.

In particular, the men take their herds up into the higher areas at seasons when there is grazing available on these areas. It is during this period that the water harvesting systems are most intensively utilized. Cultural and political changes are, however, resulting in the privatisation of the communal lowlands that were once used for pasturage near the family gardens and farms. These areas are now cropped with water being supplied by irrigation. As a result the annual cycle of transhumance is broken and, as the importance of herding diminishes, some men in the communities find they no longer have a role to play as herders. Instead, they seek wage earning jobs in nearby towns.

In conclusion, it is recommended that there is a need for a full inventory of all the water management structures in the region, used and unused. The possibility of renovating them and integrating them into modern water management and agricultural systems should also be investigated and costed. Furthermore, if there were some means of employing the men locally in wage-paying jobs, the local communities would be strengthened.

### **Comments from participants**

Several participants asked questions about the privatization of land in the area that formally was held in common. Dr Bedrani confirmed that land is usually communally owned. In Tunisia the state is distributing the plots that it controls and each family receives its share of the communal land. Also, agropastoralists are increasingly conscious of their 'ownership' of the plots and are stopping others from grazing on them. He added that he believed that the privately owned plots are better managed and looked after than is the communally owned land.

Problems occur, however, when the population begins to grow and people who do not own plots overuse the remaining public land. Unfortunately, experience has shown that where there is a shortage of a resource, it is increasingly difficult to get a consensus on the use and conservation of the resource.

## **Nomadism in the Western Sahel**

The relationship between indigenous knowledge, the nomadic people of the Sahel, government policies and modern science was discussed by Dr Ibrahim Touré.

Indigenous knowledge is knowledge that is especially held by the older people of any community. This means that when a person dies, a library dies with them. The acquisition and retention of knowledge is heavily tied up with people, especially in Africa.

The Sahel is a symbol of underdevelopment. It is full of people with an uncertain future. It is, however, an area that has developed complex societies with great achievements. Furthermore, the profile of the Sahel is a diversified one. It is not a homogenous region because there are areas with reasonable rainfall: enough to support some agricultural work.

Unfortunately, a characteristic of the Sahelian countries is the speed with which their populations are growing. Because the land cannot support the current number of people trying to live on it, there is a tremendous growth in the size of the urban areas and urban areas tend to waste resources. Solving the land-use problems requires solving a wide range of associated problems. These include land ownership and tenancy as well as social and political problems.

The people of the Sahel have three support systems: pastoralism, agro-pastoralism and agroforestry systems. Pastoralism is based on migratory livestock keeping and is very opportunistic. Camels and the small ruminants are herded about the area using the patches of good fodder. Woody fodder is particularly important for these people. In areas where there are reasonable water resources, pastoralists will combine herding with agriculture generally on a small scale. This system is termed agro-pastoralism. In general, however, all nomadic pastoralists have many problems related to water access as well as to environmental degradation.

Agroforestry systems are associated with the use of the forest cover under which crops are grown in areas of relatively reliable rainfall. These farmers often use *Acacia albida* as a tree cover as it improves the soil. Many communities will also keep goats in an associated migratory system. The broad objective of these systems is to minimize risks. In all these systems, forest fallows are extremely important because they allow the fertility of the soil to recover.

These basic management systems are improved by the conservation of soil and water. This is accomplished by rotating the crops. The fields are left fallow for several years after being cropped. This system works well as long as the amount of land available to each farmer is enough to let rotation take place slowly so that the land is rejuvenated. As the size of the population increases, however, these cycle-based systems break down and their coherence is lost. The result is land degradation followed by land abandonment as another community moves to urban areas.

Development has not paid enough attention to the practical needs of the herdsmen of the Sahel.

When the Sahel is managed properly it can be very productive. 'Researchers should question the reality of the commonly held belief about the Sahel that it is largely an unproductive area,' he stated.

The means must be found to allow the implementation of management techniques throughout the areas where they are suitable. The importance of the human dimension in the management of soils must also be recognized. Planners, scientists and policy makers must integrate their work. As well, research problems have been divided into too many small sized packages.

There is a need to combine and integrate. Furthermore research needs to be carried out into the integration of all the different systems. In particular, the techniques of conservation and rehabilitation need to be reviewed for the suitability of their application to the area.

The basic problems of the Sahel cannot be solved solely using traditional technologies. Modern techniques must be integrated with indigenous knowledge and this requires an understanding that indigenous knowledge is part of the intellectual property of the inhabitants and should be recognized as such.

### **Comments on the paper by Dr Touré**

Several comments were made about the role of population growth in land degradation. The consensus from the discussion was that it would be difficult with the present levels of production to maintain current population growth rates because agricultural production is not expanding as fast as is needed. Therefore the problem created by population growth has to be faced directly and that is through further improvements to agricultural production. Markets and trade have also to be upgraded because with improved production markets need to be improved too.

It was also suggested that research is needed into the way in which government policies can actually alter the behaviour of the population regarding the environment and its conservation.

## **The Need for Communication**

Dr Raphael Ndiaye, Coordinateur de l'Équipe Éducation Environnementale (ENDA), Dakar, presented a paper entitled 'Savoir Local dans la Lutte Contre la Désertification et pour la Gestion de Ressources Naturelles'. In his talk, Dr Ndiaye suggested that improving harvesting will in turn improve productivity as will improving the storage of all types of crops.

Dr Ndiaye said he believed that all who are involved in development have to move from participation to partnership. The solution to the problems of the Sahel is to be found within ourselves as well as in the people who are directly involved who are the holders of important indigenous knowledge. 'We have to appeal to our imagination.' Indigenous knowledge is very important for the preservation of an individual's identity as well as for the preservation of a nation because, 'A people without a memory is not a nation.'

A community needs to listen to itself and restore its belief in itself so that it can overcome obstacles and that this is very important for anti-desertification activities in areas where land degradation has destroyed the will of the people to struggle against adversity.

Strategies of communication must be developed that allow for the free exchange of information. At present this information exchange depends upon local conditions and, if a group of people have a cultural taboo on telling others about some long-accepted adaptive practice, ways of overcoming this taboo have to be discovered and applied. There is also a need for dissemination strategies so that the messages can go from local people to scientists and back again.

Communication needs training and it also needs co-operation in the use of all the possible means, including traditional means, of spreading the news. If this is not done, then scientists will continue to speak in terms of theory and the poor local people will never learn about new resource management techniques. Lack of two-way communications facil-

ities also means that new techniques will not be chosen correctly, neither will they be adapted so as to properly fit the environment in which they are applied.

Research has to look at the relationship between various cultures and the ecosystems to which they are adapted. It is important that national boundaries be ignored and that the natural boundaries of the ecological zones be used instead.

## **Comments**

Several participants commented that Dr Ndaiye's presentation was very passionate. They noted that he had expressed the need to take into consideration local knowledge and the need for its study. There was also a need to improve local knowledge so as to improve modern knowledge. In particular it was thought that we need to know whether or not local knowledge is adequate to solve the problems faced today by local people. It needs to be combined with modern knowledge so that it can be efficiently used. Furthermore, it is not that research is not carried out, rather the problem is that it lacks the means for extension. This means that new knowledge is not passed on to those

whom it would help the most. It is necessary for funding to be provided for research information to be communicated. Researchers are not hiding; it is a question of communication.

Knowledge must come from all available sources and the capacity to digest it must be there. Otherwise it is meaningless and will not help people. The cultural dignity of farmers must be supported and the partnership status that should exist between researchers, farmers and the wider population, must be acknowledged.

That farmers have needs must be acknowledged and accepted. It must be remembered that the person who works and lives or dies with the results of development is the man working in the field. The researcher deals with complicated matters but he must have his feet firmly in the mud along with those of the farmer. There are techniques that can be employed to breakdown the barriers between farmers and researchers and we must use them.

## **The Challenge to NGOs**

**Ann Heidenreich** made a presentation on behalf of Climate Network Africa (CNA), Nairobi, Kenya, entitled 'The NGO role in promoting practical solutions to bridging the gap between indigenous communities, scientists and policy makers.'

She reported that at the first session of INCD, a number of governments challenged NGOs to come up with practical advice on how to create an 'enabling environment' for community-based action against desertification. 'There is consensus that community participation is necessary,' she said, 'and there is very little knowledge at government levels on how to go about doing it.'

The same holds for the inclusion of indigenous knowledge in the development process. At this meeting there appears to be a consensus that indigenous knowledge should be the starting point for interventions against desertification. Many speakers have clarified that indigenous knowledge involves both technical interventions as well as social organization.

At the same time, there are numerous examples of the gap between local communities on the one hand and the scientific and political communities on the other. Development policy is often driven by real misconceptions about reality. One is that pastoral people 'underutilize' the land. Another factor

is what is referred to as the 'Tragedy of the Commons' meaning that communal land management systems are responsible for environmental degradation. A third is the assumption that environmental degradation is taking place as a result of local activities when in reality, the opposite is true.

So the problem addressed here is the gap in communications that exists between policy makers and scientists, on the one hand, and local communities on the other. The draft text of the desertification convention recognizes this gap and provides ample reference to the need to bridge it.

To address this challenge, NGOs have come up with a two-prong strategy which they would like to share with the Workshop. It is particularly relevant because it directly responds to the question of how to bring indigenous knowledge into the negotiation and implementation processes and because it is part of a programme supported by IDRC.

IDRC is funding five NGOs, one in each of the African sub-regions, to hire people to work full

time for three years on desertification. The job of these representatives is basically that of 'information brokers.' They are required to follow the negotiating process closely, to become familiar with existing national action plans, development agency programmes and scientific research as well to encourage and develop NGO activities in the field. Their terms of reference include spending time in the field with local communities to understand about land degradation and about ways of addressing it from the perspective of the local community.

Their job is to know what is going on in the political, scientific and NGO communities and to facilitate communication among them ensuring a solid input into the negotiating process from NGOs and local communities.

The NGOs are happy to note that the draft desertification convention recognizes the important role of NGOs in the preparation of national action programmes. This project, and others like it, are intended to provide NGOs with the capacity to participate effectively in this process.

When NGOs were challenged at the first INCD negotiating session to come up with concrete proposals for empowering local communities, a group of NGOs based in Nairobi decided to organize a meeting of local community leaders and put the question to them. Their answer was clear and straightforward. This group of local people said they needed three things:

- \* secure land tenure appropriate to the land management systems they practice;
- \* access to markets and fair prices for locally produced goods; and
- \* local networks and information systems.

These suggestions were passed on to the INCD secretariat and the NGOs are happy to find them all in the draft text for the desertification convention. These are roughly the same three areas that IDRC has chosen to cover as key issues of desertification in its three workshops.

The hope is that the creation of community-based documentation centres and radio stations will contribute to strengthening community organizations so that communities can participate more effectively in the negotiation and implementation processes.

## **The African RGOs**

**Dr Ousmane Boureima**, Chef du Service des Ressources en Eau au Secretariat Executif, Comité Permanent Inter-etats pour la Lutte contre la Secheresse au Sahel (CILSS), Burkina Faso, then made a presentation on behalf of CILSS.

There was a serious drought in West Africa from 1968 to 1974 and there have been several since that time. During droughts devegetation is a bad factor and it is worsened by increments in the local population. In the Sahel of West Africa, most of population is under 20 years of age and from 1962 to 1985 the population doubled. This means that the series of droughts that occurred in this period have had very serious effects. Communities have, and are continuing, to suffer and are using their resources faster than they can be replaced. This is especially true of wood. The increasing population has also restricted the ability of the people to respond in a traditional manner to the crisis. There is evidence that such responses are now useless anyway because of the amount of degradation that has already taken place.

The only solution is to integrate traditional methods (indigenous knowledge) with science to update it and make it applicable to the current situation. The states of the Sahel area have responded to the drought by establishing such organizations as CILSS. Part of the task of this organization is to familiarize the outside world with the problem as well as starting programmes to assist people. These programmes have helped but there are still gaps and problems. The dissemination of information needs to be improved as the states concerned are formulating programmes on a national basis without thinking about their neighbours. Indigenous knowledge is not being taken into account by the states although CILSS itself is attempting to create integrated programmes to manage water and other resources.

**Mr R.K. Sinange** representing the Intergovernmental Authority on Drought and Development (IGADD) reported on the activities of his organization.

IGADD is based in Djibouti and helps member states with meetings to ensure participation and prepares case studies on environmental and developmental issues important in the region. Topics include desertification and indigenous knowledge. IGADD has been investigating indigenous knowledge for a short time only and has not yet had time to prepare a full study of it.

IGADD is in the process of collecting data and information and seeing what is available in institutions. It has carried out a quick review of the information that is available in member states especially as regards indigenous knowledge and its integration with modern technology. IGADD can learn from CILSS, especially how to organize and run projects.

**Dr Ahmed Hanafy Abdel-Megid**, Programme Officer, United Nations Sudano-Sahelian Office, Khartoum, Sudan, then made a presentation on behalf of his organization.

The United Nations Sudano-Sahelian Office (UNSO) was established after the drought of the 1960s by the United Nations Secretary General. The organization looks after desertification issues for the 22 countries immediately to the South of the Sahara. When UNSO was founded, it was agreed that an office for it would be established in West Africa. Later the office was moved to New York and the organization now has a regional office in Nairobi. In 1977 UNSO's mandate was changed so it could look after the plan of

action to combat desertification, a joint UNDP/UNEP programme.

When IGAD was established, UNSO established a regional office in East Africa to work with IGAD. Currently, UNSO is sponsoring the participation of one delegate from each of the 22 countries at the INCD negotiating sessions. UNSO anticipates that after the convention is signed, it may have a different mandate, one that is worldwide. It expects to become a technical backstopping agency for desertification activities.

## **Stimulating Discussion**

The final session of the Workshop was notable for its stimulating discussion of both the issue in general and the recommendations that the participants agreed should be presented to the Convention's negotiators.

Indigenous Knowledge as it relates to desertification processes comprises a wide range of accumulated local experience about natural resource use and management techniques in both agricultural and pastoral systems, institutional and organizational arrangements as well as beliefs and values. All these dimensions need to be duly weighted and included in applying indigenous knowledge to development decisions and interventions at micro as well as macro levels.

Indigenous knowledge can be enhanced by the infusion of modern scientific knowledge. The challenge is to evolve the right mixes between indigenous knowledge and modern knowledge. This will require the creation of an enabling environment at national and international levels.

### **The recommendations**

1) Government officials should duly take into account, in the development and implementation of policies, indigenous knowledge as well as the experience and developmental perspec-

tives of local populations.

2) Government officials should also take all the necessary measures to protect, preserve and use indigenous knowledge by creating an enabling environment that includes the support of focal local institutions and the development of awareness programs. Sufficient funds should be made available for that purpose. Channels should be created to enable representative local institutions themselves to promote the importance of their local knowledge and insist that their knowledge is relevant despite processes undermining it.

3) Given the importance of combining traditional and modern knowledge systems, research should be carried on how adaptations and innovations are being made by local communities and outside agencies to analyze these processes and contribute to the development of appropriate hybrid knowledge systems and

- enabling environments.
- 4) It is an imperative that mechanisms be found for the effective involvement of local representative institutions in higher level decision-making processes. To facilitate such participation, decentralization of authority over natural resource use and management is a necessary condition. Equity and democratic principles should be applied in the empowerment of local representative institutions.
  - 5) In designing research and local level interventions the cultural, ethical, spiritual and institutional aspects of indigenous knowledge systems should be given full consideration.
  - 6) Recognizing the fundamental ecological, social, economic and cultural roles of traditional pastoral and agro-pastoral production systems, it is important and urgent that public authorities create suitable conditions and provide sufficient support to the local populations for their continued viability. This implies, inter alia, that:
    - a. political structures must develop new mechanisms to allow increased freedom of movement of people and herds in order to optimize the use of rangeland resources, including trans-boundary movement; and
    - b. development plans should include provision for the equitable and sustainable development of pastoral systems and rangelands.
  - 7) Indigenous knowledge and its use in local contexts should be documented by the communities concerned for their own use, access and control. Data bases should be created at local, national and international levels with a clear view toward further use and development of that knowledge. It should be recognized, however, that Indigenous knowledge can be location-specific and captures local processes as well as facts and that for this reason its standardization and replication elsewhere can be a complex undertaking requiring adaptation and assessment through participatory research.
  - 8) Special consideration should be given to gender-specific roles, vis-a-vis resource management, with women being recognized as important custodians of indigenous knowledge and their views incorporated into decision-making processes.
  - 9) Formal education systems are all based on modern scientific knowledge to the exclusion of indigenous knowledge and illiteracy has often been taken for ignorance. It is an imperative to develop, apply and fund curricula that include indigenous knowledge for all levels of education. To avoid the loss of local knowledge and skills it is indispensable to provide necessary support and improvements to informal education systems.
  - 10) Adequate funds must be secured and appropriate projects and programmes adopted to ensure the implementation of the above recommendations.

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